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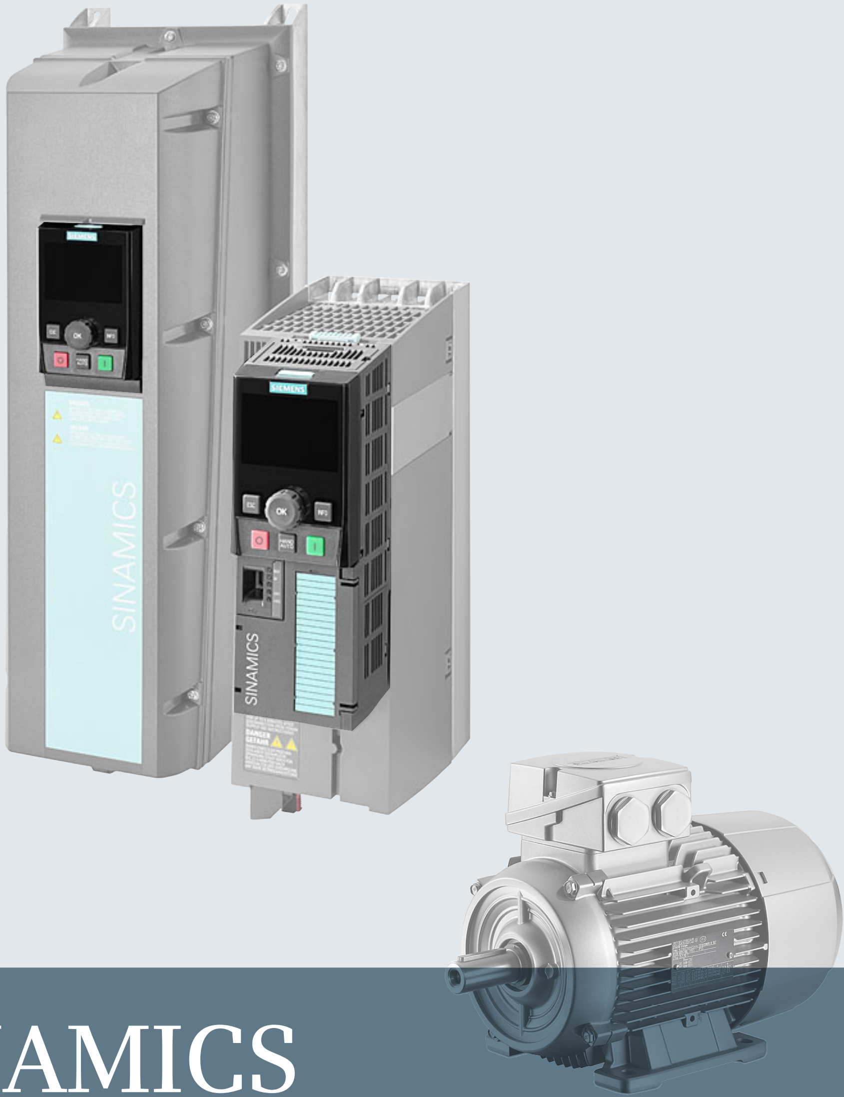


# SINAMICS

## SINAMICS G120

CU230P-2 Control Units

List Manual

Edition 04/2014

Answers for industry.

SIEMENS

# SINAMICS

# SINAMICS G120
# CU230P-2 Control Units

List Manual



Valid for

| Control Units | Firmware version |
|---|---|
| CU230P-2_HVAC | 4.7 |
| CU230P-2_BT | 4.7 |
| CU230P-2_DP | 4.7 |
| CU230P-2_PN | 4.7 |
| CU230P-2_CAN | 4.7 |


**04/2014**
A5E33838102B AA

## Legal information

### Warning notice system

This Manual contains information which you must observe to ensure your own personal safety as well as to avoid material damage. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to equipment damage have no safety alert symbol. Depending on the hazard level, warnings are indicated in a descending order as follows:

| ⚠ DANGER |
|---|
| indicates that death or serious injury **will** result if proper precautions are not taken. |

| ⚠ WARNING |
|---|
| indicates that death or serious injury **could** result if proper precautions are not taken. |

| ⚠ CAUTION |
|---|
| indicates that minor personal injury can result if proper precautions are not taken. |

| NOTICE |
|---|
| indicates that property damage can result if proper precautions are not taken. |

If more than one level of danger is simultaneously applicable, the warning notice for the highest level is used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

### Qualified personnel

The product/system described in this documentation may only be operated by **personnel qualified** for the specific task in accordance with the relevant documentation for the specific task, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

### Proper Use of Siemens Products

Note the following:

| ⚠ WARNING |
|---|
| Siemens products are only permitted to be used for the applications listed in the catalog and in the associated technical documentation. If third-party products and components are used, then they must be recommended or approved by Siemens. These products can only function correctly and safely if they are transported, stored, set up, mounted, installed, commissioned, operated and maintained correctly. The permissible ambient conditions must be adhered to. Notes in the associated documentation must be observed. |

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### Disclaimer of liability

We have checked the contents of this publication for consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. The information given in this document is reviewed at regular intervals and any corrections that might be necessary are made in the subsequent editions.

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# Table of contents

# Fundamental safety instructions 1

## Content

## 1.1 General safety instructions

| ⚠ **WARNING** |
|---|
| **Risk of death if the safety instructions and remaining risks are not carefully observed**<br>If the safety instructions and residual risks are not observed in the associated hardware documentation, accidents involving severe injuries or death can occur.<br>• Observe the safety instructions given in the hardware documentation.<br>• Consider the residual risks for the risk evaluation. |

| ⚠ **WARNING** |
|---|
| **Danger to life or malfunctions of the machine as a result of incorrect or changed parameterization**<br>As a result of incorrect or changed parameterization, machines can malfunction, which in turn can lead to injuries or death.<br>• Protect the parameterization (parameter assignments) against unauthorized access.<br>• Respond to possible malfunctions by applying suitable measures<br>(e.g. EMERGENCY-STOP or EMERGENCY-OFF). |

## 1.2 Industrial security

**Note**

**Industrial security**

Siemens provides products and solutions with industrial security functions that support the secure operation of plants, solutions, machines, devices, and/or networks. They are important components of a holistic industrial security concept. With this in mind, Siemens' products and solutions undergo continuous development. Siemens recommends strongly that you regularly check for product updates.

To ensure that Siemens products and solutions are operated securely, suitable preventive measures (e.g. cell protection concept) and each component must be integrated into a state-of-the-art holistic industrial security concept. Third-party products that may be in use should also be considered. You will find more information about industrial security at:

http://www.siemens.com/industrialsecurity

To receive information about product updates on a regular basis, register for our product newsletter. You will find more information at:

http://support.automation.siemens.com

**WARNING**

**Danger as a result of unsafe operating states resulting from software manipulation**

Software manipulation (e.g. by viruses, Trojan horses, malware, worms) can cause unsafe operating states to develop in your installation which can result in death, severe injuries and/or material damage.

- Keep the software up to date.

  Information and newsletters can be found at:

  http://support.automation.siemens.com
- Incorporate the automation and drive components into a holistic, state-of-the-art industrial security concept for the installation or machine.

  For more information, visit:

  http://www.siemens.com/industrialsecurity
- Make sure that you include all installed products into the holistic industrial security concept.

# Parameters

# 2

## Content

# 2.1 Overview of parameters

## 2.1.1 Explanation of the parameter list

### Basic structure of the parameter descriptions

The data in the following example has been chosen at random. The table below contains all the information that can be included in a parameter description. Some of the information is optional.

The "List of parameters" (Page 27) has the following structure:

**- - - - - - - - - - - - Start of example - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -**

| **pxxxx[0...n]** | **BICO: Full parameter name / abbreviated name** | | |
|---|---|---|---|
| CU/PM variants | **Access level:** 3 | **Calculated:** p0340 = 1 | **Data type:** FloatingPoint32 |
| | **Can be changed:** C(x), U, T | **Scaling:** p2002 | **Dyn. index:** CDS, p0170 |
| | **Unit group:** 6_2 | **Unit selection:** p0505 | **Func. diagram:** 8070 |
| | **Min** | **Max** | **Factory setting** |
| | 0.00 [Nm] | 10.00 [Nm] | 0.00 [Nm] |

**Description:** Text

**Value:**
0: Name and meaning of value 0
1: Name and meaning of value 1
2: Name and meaning of value 2
etc.

**Recommendation:** Text

**Index:**
[0] = Name and meaning of index 0
[1] = Name and meaning of index 1
[2] = Name and meaning of index 2
etc.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Name and meaning of bit 0 | Yes | no | 8060 |
| 01 | Name and meaning of bit 1 | Yes | no | - |
| 02 | Name and meaning of bit 2 | Yes | no | 8052 |
| | etc. | | | |

**Dependency:** Text
Refer to: pxxxx, rxxxx
Refer to: Fxxxxx, Axxxxx

**Danger:** ⚠ **Warning:** ⚠ **Caution:** ⚠ Safety notices with a warning triangle

**Notice:** Safety notice without a warning triangle

**Note:** Information that might be useful.

**- - - - - - - - - - - - End of example - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -**

The individual pieces of information are described in detail below.

**pxxxx[0...n]** **Parameter number**

The parameter number is made up of a "p" or "r", followed by the parameter number and the index or bit field (optional).

Examples of the representation in the parameter list:

- p... Adjustable parameters (read and write parameters)
- r... Display parameters (read only)
- p0918 Adjustable parameter 918
- p2051[0...13] Adjustable parameter 2051, indices 0 to 13
- p1001[0...n] Adjustable parameter 1001, indices 0 to n (n = configurable)
- r0944 Display parameter 944
- r2129.0...15 Display parameter 2129 with bit field from bit 0 (smallest bit) to bit 15 (largest bit)

Other examples of the notation in the documentation:

- p1070[1] Adjustable parameter 1070, index 1
- p2098[1].3 Adjustable parameter 2098, index 1 bit 3
- p0795.4 Adjustable parameter 795, bit 4

The following applies to adjustable parameters:

The parameter value as delivered is specified under "Factory setting" with the relevant unit in square brackets. The value can be adjusted within the range defined by "Min" and "Max".

The term "linked parameterization" is used in cases where changes to adjustable parameters affect the settings of other parameters.

Linked parameterization can occur, for example, as a result of the following actions and parameters:

- Setting the PROFIBUS telegram (BICO interconnection)

  p0922
- Set component lists

  p0230, p0300, p0301, p0400
- Automatic calculation and pre-assignment

  p0340, p3900
- Restoring the factory settings

  p0970

The following applies to display parameters:

The fields "Min", "Max" and "Factory setting" are specified with a dash "-" and the relevant unit in square brackets.

---

**Note**

The parameter list can contain parameters that are not visible in the expert lists of the particular commissioning software (e.g. parameters for trace functions).

---

### BICO: Full parameter name / abbreviated name

The following abbreviations can appear in front of the BICO parameter name:

- BI: Binector Input
  This parameter is used for selecting the source of a digital signal.
- BO: Binector output
  This parameter is available as a digital signal for interconnection with other parameters.
- CI: Connector Input
  This parameter is used for selecting the source of an "analog" signal.
- CO: Connector output
  This parameter is available as an "analog" signal for interconnection with other parameters.
- CO/BO: Connector/Binector Output
  This parameter is available as an "analog" and digital signal for interconnection with other parameters.

**Note**

A BICO input (BI/CI) cannot be interconnected with just any BICO output (BO/CO, signal source).
When interconnecting a BICO input using the commissioning software, only the corresponding possible signal sources are listed.

Function diagrams 1020 ... 1030 explain the symbols for BICO parameters and how to deal with BICO technology.

### CU/PM variants

Indicates for which Control Units (CU) and/or Power Modules (PM) the parameter is valid. If no CU or PM is listed, then the parameter is valid for all variants.

The following information relating to "CU" and "PM" can be displayed under the parameter number:

Table 2-1 Information in the "CU/PM variants" field

| CU/PM variants | Meaning |
|---|---|
| | All Control Units have this parameter. |
| CU230P-2_BT | CU230P-2 (exclusively for Siemens IC BT) |
| CU230P-2_BT (PM330) | CU230P-2 (exclusively for Siemens IC BT) and PM330 |
| CU230P-2_CAN | CU230P-2 with CAN interface |
| CU230P-2_CAN (PM330) | CU230P-2 with CAN interface and PM330 |
| CU230P-2_DP | CU230P-2 with PROFIBUS interface |
| CU230P-2_DP (PM330) | CU230P-2 with PROFIBUS interface and PM330 |
| CU230P-2_HVAC | CU230P-2 with RS485 interface for USS, Modbus and BACnet |

Table 2-1 Information in the "CU/PM variants" field, continued

| CU/PM variants | Meaning |
|---|---|
| CU230P-2_HVAC (PM330) | CU230P-2 with RS485 interface and PM330 |
| CU230P-2_PN | CU230P-2 with PROFINET interface |
| CU230P-2_PN (PM330) | CU230P-2 with PROFINET interface and PM330 |
| PM230 | Power Module for pumps and fans (3 AC 400 V) |
| PM240 | Power Module for standard applications with dynamic braking (3 AC 400 V) |
| PM250 | Power Module (3 AC 400 V with energy recovery) |
| PM260 | Power Module (3 AC 690 V with energy recovery) |
| PM330 | Power Module for pumps and fans |

## Access level

Specifies the minimum access level required to be able to display and change the relevant parameter. The required access level can be set using p0003.

The system uses the following access levels:

- 1: Standard (not adjustable, included in p0003 = 3)
- 2: Extended (not adjustable, included in p0003 = 3)
- 3: Expert
- 4: Service

  Parameters with this access level are password protected.

**Note**

Parameter p0003 is CU-specific (belongs to the Control Unit).

A higher access level will also include the functions of the lower levels.

## Calculated

Specifies whether the parameter is influenced by automatic calculations.

p0340 determines which calculations are to be performed:

- p0340 = 1 includes the calculations from p0340 = 2, 3, 4, 5.
- p0340 = 2 calculates the motor parameters (p0350 ... p0360, p0625).
- p0340 = 3 includes the calculations from p0340 = 4, 5.
- p0340 = 4 only calculates the controller parameters.
- p0340 = 5 only calculates the controller limits.

**Note**

For p3900 > 0, p0340 = 1 is also called automatically.

After p1900 = 1, 2, p0340 = 3 is also called automatically.

Parameters with a reference to p0340 after "Calculated" depend on the Power Module being used and the motor. In this case, the values at "Factory setting" do not correspond to the actual values because these values are calculated during the commissioning. This also applies to the motor parameters.

## Data type

The information on the data type can consist of the following two items (separated by a slash):

- First item

  Data type of the parameter.
- Second item (for binector or connector input only)

  Data type of the signal source to be interconnected (binector-/connector output).

Parameters can have the following data types:

| | | |
|---|---|---|
| • Integer8 | I8 | 8-bit integer number |
| • Integer16 | I16 | 16-bit integer number |
| • Integer32 | I32 | 32-bit integer number |
| • Unsigned8 | U8 | 8 bits without sign |
| • Unsigned16 | U16 | 16 bits without sign |
| • Unsigned32 | U32 | 32 bits without sign |
| • FloatingPoint32 | Float | 32-bit floating point number |

Depending on the data type of the BICO input parameter (signal sink) and BICO output parameter (signal source), the following combinations are possible when creating BICO interconnections:

Table 2-2 Possible combinations of BICO interconnections

| | BICO input parameter | | | |
|---|---|---|---|---|
| | CI parameter | | | BI parameter |
| **BICO output parameter** | **Unsigned32 / Integer16** | **Unsigned32 / Integer32** | **Unsigned32 / FloatingPoint32** | **Unsigned32 / Binary** |
| CO: Unsigned8 | x | x | – | – |
| CO: Unsigned16 | x | x | – | – |
| CO: Unsigned32 | x | x | – | – |
| CO: Integer16 | x | x | r2050 | – |
| CO: Integer32 | x | x | r2060 | – |
| CO: FloatingPoint32 | x | x | x | – |
| BO: Unsigned8 | – | – | – | x |
| BO: Unsigned16 | – | – | – | x |
| BO: Unsigned32 | – | – | – | x |
| BO: Integer16 | – | – | – | x |
| BO: Integer32 | – | – | – | x |
| BO: FloatingPoint32 | – | – | – | – |
| Legend: x : | BICO interconnection permitted | | | |
| –: | BICO interconnection not permitted | | | |
| rxxxx: | BICO interconnection is only permitted for the specified CO parameters | | | |

## Can be changed

The "-" sign indicates that the parameter can be changed in any object state and that the change will be effective immediately.

The information "C(x), T, U" ((x): optional) means that the parameter can be changed only in the specified drive unit state and that the change will not take effect until the unit switches to another state. This can be a single state or multiple states.

The following states are available:

- C(x) commissioning — C: **C**ommissioning

  Drive commissioning is in progress (p0010 > 0).

  Pulses cannot be enabled.

  The parameter can only be changed in the following drive commissioning settings (p0010 > 0):

  - C: Can be changed for all settings p0010 > 0.
  - C(x): Can only be changed for the settings p0010 = x.

  A modified parameter value does not take effect until drive commissioning mode is exited with p0010 = 0.

- U Operation — U: R**u**n

  Pulses are enabled.

- T Ready — T: Ready **t**o run

  The pulses are not enabled and the status "C(x)" is not active.

## Scaling

Specification of the reference variable with which a signal value is automatically converted for a BICO interconnection.

The following reference variables are available:

- p2000 ... p2006: Reference speed, reference voltage, etc.
- PERCENT: 1.0 = 100 %
- 4000H: 4000 hex = 100 %

## Dyn. index (dynamic index)

For parameters with a dynamic index [0...n], the following information is specified here:

- Data set (if available).
- Parameter for the number of indices (n = number - 1).

The following information can be contained in this field:

- "CDS, p0170" (Command Data Set, CDS count)

  Example:

  p1070[0] → main setpoint [command data set 0]

  p1070[1] → main setpoint [command data set 1], etc.
- "DDS, p0180" (Drive Data Set, DDS count)
- "MDS, p0130" (Motor Data Set, MDS count)
- "PDS, p0120" (Power unit Data Set, PDS count)

Data sets can only be created and deleted when p0010 = 15.

---

**Note**

Information on the data sets can be taken from the following references:

Operating Instructions SINAMICS G120 Frequency Converter with CU230P-2 HVAC, CU230P-2 DP, CU230P-2 CAN Control Units.

---

## Unit group and unit selection

The standard unit of a parameter is specified in square brackets after the values for "Min", "Max", and "Factory setting".

For parameters where the unit can be switched over, the specifications for "Unit group" and "Unit selection" determine the group to which this parameter belongs and with which parameter the unit can be changed over.

**Example:**

Unit group: 7_1, unit selection: p0505

The parameter belongs to unit group 7_1 and the unit can be changed over using p0505.

All the potential unit groups and possible unit selections are listed below.

Table 2-3 Unit group (p0100)

| Unit group | Unit selection for p0100 = | | | Reference variable for % |
|---|---|---|---|---|
| | 0 | 1 | 2 | |
| 7_4 | Nm | lbf ft | Nm | - |
| 14_6 | kW | hp | kW | - |
| 25_1 | kg $m^2$ | lb $ft^2$ | kg $m^2$ | - |
| 27_1 | kg | lb | kg | - |
| 28_1 | Nm/A | lbf ft/A | Nm/A | - |

Table 2-4 Unit group (p0505)

| Unit group | Unit selection for p0505 = | | | | Reference variable for % |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | |
| 2_1 | Hz | % | Hz | % | p2000 |
| 3_1 | 1 rpm | % | 1 rpm | % | p2000 |
| 5_1 | Vrms | % | Vrms | % | p2001 |
| 5_2 | V | % | V | % | p2001 |
| 5_3 | V | % | V | % | p2001 |
| 6_2 | Arms | % | Arms | % | p2002 |
| 6_5 | A | % | A | % | p2002 |
| 7_1 | Nm | % | lbf ft | % | p2003 |
| 7_2 | Nm | Nm | lbf ft | lbf ft | - |
| 14_5 | kW | % | hp | % | r2004 |
| 14_10 | kW | kW | hp | hp | - |
| 21_1 | °C | °C | °F | °F | - |
| 21_2 | K | K | °F | °F | - |
| 39_1 | $1/s^2$ | % | $1/s^2$ | % | p2007 |

Table 2-5 Unit group (p0595)

| Unit group | Unit selection for p0595 = | | Reference variable for % |
|---|---|---|---|
| | Value | Unit | |
| 9_1 | The values that can be set and the technological units are shown in p0595. | | |

Table 2-6 Unit group (p11026)

| Unit group | Unit selection for p11026 = | | Reference variable for % |
|---|---|---|---|
| | Value | Unit | |
| 9_2 | The values that can be set and the technological units are shown in p11026. | | |

Table 2-7 Unit group (p11126)

| Unit group | Unit selection for p11126 = | | Reference variable for % |
|---|---|---|---|
| | Value | Unit | |
| 9_3 | The values that can be set and the technological units are shown in p11126. | | |

Table 2-8 Unit group (p11226)

| Unit group | Unit selection for p11226 = | | Reference variable for % |
|---|---|---|---|
| | Value | Unit | |
| 9_4 | The values that can be set and the technological units are shown in p11226. | | |

## Function diagram

The parameter is included in this function diagram. The structure of the parameter function and its relationship with other parameters is shown in the specified function diagram.

## Parameter values

| | |
|---|---|
| Min | Minimum value of the parameter [unit] |
| Max | Maximum value of the parameter [unit] |
| Factory setting | Value when delivered [unit] |

In the case of a binector/connector input, the signal source of the default BICO interconnection is specified. A non-indexed connector output is assigned the index [0].

A different value may be displayed for certain parameters (e.g. p1800) at the initial commissioning stage or when establishing the factory settings.
Reason:
The setting of these parameters is determined by the operating environment of the Control Unit (e.g. depending on converter type, power unit).

## Description

Explanation of the function of a parameter

## Values

Lists the possible values of a parameter.

## Recommendation

Information about recommended settings.

## Index

The name and meaning of each individual index is specified for indexed parameters.

The following applies to the values (Min, Max, Factory setting) for indexed adjustable parameters:

- Min, Max:

  The adjustment range and unit apply to all indices.

- Factory setting:

  When all indices have the same factory setting, index 0 is specified with the unit to represent all indices.

  When the indices have different factory settings, they are all listed individually with the unit.

## Bit field

For parameters with bit fields, the following information is provided about each bit:

- Bit number and signal name
- Meaning for signal states 1 and 0
- Function diagram (FP) (optional).

  The signal is shown in this function diagram.

## Dependency

Conditions that must be fulfilled in conjunction with this parameter. Also includes special effects that can occur between this parameter and others.

Where necessary, "Refer to:" indicates the following information:

- List of other relevant parameters to be considered.
- List of faults and alarms to be considered.

## Safety guidelines

Important information that must be observed to avoid the risk of physical injury or material damage.

Information that must be observed to avoid any problems.

Information that the user may find useful.

| | |
|---|---|
| **Danger** ⚠ | The description of this safety notice can be found at the beginning of this manual, see "Legal information" (Page 4). |
| **Warning** ⚠ | The description of this safety notice can be found at the beginning of this manual, see "Legal information" (Page 4). |
| **Caution** ⚠ | The description of this safety notice can be found at the beginning of this manual, see "Legal information" (Page 4). |

| | |
|---|---|
| **Notice** | The description of this safety notice can be found at the beginning of this manual, see "Legal information" (Page 4). |
| **Note** | Information that the user may find useful. |

### 2.1.2 Number ranges of parameters

**Note**

The following number ranges represent an overview for all the parameters available for the SINAMICS drive family.

The parameters for the product described in this List Manual are described in detail in "List of parameters" (Page 27).

Parameters are grouped into the following number ranges:

Table 2-9 Number ranges for SINAMICS

| Range | | Description |
|---|---|---|
| From | To | |
| 0000 | 0099 | Display and operation |
| 0100 | 0199 | Commissioning |
| 0200 | 0299 | Power section |
| 0300 | 0399 | Motor |
| 0400 | 0499 | Encoder |
| 0500 | 0599 | Technology and units, motor-specific data, probes |
| 0600 | 0699 | Thermal monitoring, maximum current, operating hours, motor data, central probe |
| 0700 | 0799 | Control Unit terminals, measuring sockets |
| 0800 | 0839 | CDS, DDS data sets, motor changeover |
| 0840 | 0879 | Sequence control (e.g. signal source for ON/OFF1) |
| 0880 | 0899 | ESR, parking, control and status words |
| 0900 | 0999 | PROFIBUS/PROFIdrive |
| 1000 | 1199 | Setpoint channel (e.g. ramp-function generator) |
| 1200 | 1299 | Functions (e.g. motor holding brake) |
| 1300 | 1399 | U/f control |
| 1400 | 1799 | Closed-loop control |
| 1800 | 1899 | Gating unit |
| 1900 | 1999 | Power unit and motor identification |
| 2000 | 2009 | Reference values |
| 2010 | 2099 | Communication (fieldbus) |
| 2100 | 2139 | Faults and alarms |
| 2140 | 2199 | Signals and monitoring |
| 2200 | 2359 | Technology controller |
| 2360 | 2399 | Staging, hibernation |
| 2500 | 2699 | Position control (LR) and basic positioning (EPOS) |
| 2700 | 2719 | Reference values, display |

Table 2-9 Number ranges for SINAMICS, continued

| Range | | Description |
|---|---|---|
| From | To | |
| 2720 | 2729 | Load gearbox |
| 2800 | 2819 | Logic operations |
| 2900 | 2930 | Fixed values (e. g. percentage, torque) |
| 3000 | 3099 | Motor identification results |
| 3100 | 3109 | Real-time clock (RTC) |
| 3110 | 3199 | Faults and alarms |
| 3200 | 3299 | Signals and monitoring |
| 3400 | 3659 | Infeed closed-loop control |
| 3660 | 3699 | Voltage Sensing Module (VSM), Braking Module internal |
| 3700 | 3779 | Advanced Positioning Control (APC) |
| 3780 | 3819 | Synchronization |
| 3820 | 3849 | Friction characteristic |
| 3850 | 3899 | Functions (e. g. long stator) |
| 3900 | 3999 | Management |
| 4000 | 4599 | Terminal Board, Terminal Module (e. g. TB30, TM31) |
| 4600 | 4699 | Sensor Module |
| 4700 | 4799 | Trace |
| 4800 | 4849 | Function generator |
| 4950 | 4999 | OA application |
| 5000 | 5169 | Spindle diagnostics |
| 5200 | 5230 | Current setpoint filter 5 ... 10 (r0108.21) |
| 5400 | 5499 | System droop control (e. g. shaft generator) |
| 5500 | 5599 | Dynamic grid support (solar) |
| 5600 | 5614 | PROFIenergy |
| 5900 | 6999 | SINAMICS GM/SM/GL/SL |
| 7000 | 7499 | Parallel connection of power units |
| 7500 | 7599 | SINAMICS SM120 |
| 7700 | 7729 | External messages |
| 7770 | 7789 | NVRAM, system parameters |
| 7800 | 7839 | EEPROM read/write parameters |
| 7840 | 8399 | Internal system parameters |
| 8400 | 8449 | Real-time clock (RTC) |
| 8500 | 8599 | Data and macro management |
| 8600 | 8799 | CAN bus |
| 8800 | 8899 | Communication Board Ethernet (CBE), PROFIdrive |

Table 2-9 Number ranges for SINAMICS, continued

| Range | | Description |
|---|---|---|
| From | To | |
| 8900 | 8999 | Industrial Ethernet, PROFINET, CBE20 |
| 9000 | 9299 | topology |
| 9300 | 9399 | Safety Integrated |
| 9400 | 9499 | Parameter consistency and storage |
| 9500 | 9899 | Safety Integrated |
| 9900 | 9949 | topology |
| 9950 | 9999 | Diagnostics, internal |
| 10000 | 10199 | Safety Integrated |
| 11000 | 11299 | Free technology controller 0, 1, 2 |
| 20000 | 20999 | Free function blocks (FBLOCKS) |
| 21000 | 25999 | Drive Control Chart (DCC) |
| 50000 | 53999 | SINAMICS DC MASTER (closed-loop DC current control) |
| 61000 | 61001 | PROFINET |

## 2.2 List of parameters

Product: SINAMICS G120, Version: 4702900, Language: eng
Objects: CU230P-2_BT, CU230P-2_CAN, CU230P-2_DP, CU230P-2_HVAC, CU230P-2_PN

### r0002 Drive operating display / Drv op_display

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 200 | - |

**Description:** Operating display for the drive.

**Value:**
0: Operation - everything enabled
10: Operation - set "enable setpoint" = "1" (p1142)
12: Operation - RFG frozen, set "RFG start" = "1" (p1141)
13: Operation - set "enable RFG" = "1" (p1140)
14: Operation - MotID, excit. running
16: Operation - withdraw braking with OFF1 using "ON/OFF1" = "1"
17: Operation - braking with OFF3 can only be interrupted with OFF2
18: Operation - brake on fault, remove fault, acknowledge
19: Operation - DC braking active (p1230, p1231)
21: Ready for operation - set "Operation enable" = "1" (p0852)
22: Ready for operation - de-magnetizing running (p0347)
31: Ready for switching on - set "ON/OFF1" = "0/1" (p0840)
35: Switching on inhibited - carry out first commissioning (p0010)
41: Switching on inhibited - set "ON/OFF1" = "0" (p0840)
42: Switching on inhibited - set "OC/OFF2" = "1" (p0844, p0845)
43: Switching on inhibited - set "OC/OFF3" = "1" (p0848, p0849)
45: Switching on inhibited - remove fault, acknowledge fault
46: Switching on inhibited - exit comm mode (p0010)
70: Initialization
200: Wait for booting/partial booting

**Dependency:** Refer to: r0046

**Notice:** For several missing enable signals, the corresponding value with the highest number is displayed.

**Note:** OC: Operating condition

RFG: Ramp-function generator

COMM: Commissioning

MotID: Motor data identification

### p0003 Access level / Acc_level

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** C, U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 3 | 4 | 3 |

**Description:** Sets the access level to read and write parameters.

**Value:**
3: Expert
4: Service

**Note:** A higher set access level also includes the lower one.

Access level 3 (experts):

Expert know-how is required for these parameters (e.g. BICO parameterization).

Access level 4 (service):

For these parameters, it is necessary that authorized service personnel enter the appropriate password (p3950).

## p0010 Drive commissioning parameter filter / Drv comm. par_filt

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** C(1), T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2800, 2818 |
| **Min** | **Max** | **Factory setting** |
| 0 | 49 | 1 |

**Description:** Sets the parameter filter to commission a drive.

Setting this parameter filters out the parameters that can be written into in the various commissioning steps.

**Value:**
0: Ready
1: Quick commissioning
2: Power unit commissioning
3: Motor commissioning
5: Technological application/units
15: Data sets
29: Only Siemens int
30: Parameter reset
39: Only Siemens int
49: Only Siemens int

**Dependency:** Refer to: r3996

**Notice:** When the parameter is reset to a value of 0, short-term communication interruptions may occur.

**Note:** The drive can only be powered up outside the drive commissioning (inverter enable). To realize this, this parameter must be set to 0.

By setting p3900 to a value other than 0, the quick commissioning is completed, and this parameter is automatically reset to 0.

Procedure for "Reset parameter": Set p0010 to 30 and p0970 to 1.

Once the Control Unit has been booted up for the first time, the motor parameters suitable for the power unit have been defined, and the control parameters have been calculated accordingly, p0010 is automatically reset to 0.

p0010 = 3 is used for the subsequent commissioning of additional drive data sets (creating data sets: see p0010 = 15).

p0010 = 29, 39, 49: Only for internal Siemens use!

## p0014 Buffer memory mode / Buf mem mode

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 2 | 0 |

**Description:** Sets the mode for the buffer memory.

**Value:**
0: Save in a non-volatile fashion (RAM)
1: Buffer memory active (non-volatile)
2: Clear buffer memory

**Dependency:** If p0014 = 1, changes in the same parameter, as well as in following parameters will not be copied to the buffer memory:

Refer to: p0040, p0340, p0650, p0802, p0803, p0804, p0952, p0969, p0970, p0971, p0972, p1900, p1910, p1960, p2111, p2380, p3900, p3981, p8400, p8401, p8608, p8611

**Notice:** For p0014 = 2, entries in the buffer memory are lost and cannot be retrieved.

After the value has been modified, no further parameter modifications can be made and the status is shown in r3996. Modifications can be made again when r3996 = 0.

**Note:** The parameter is not influenced by setting the factory setting.

Re p0014 = 0:

Parameter changes are saved in the volatile memory (RAM).

Non-volatile storage from RAM to ROM is carried out in the following cases:

- p0971 = 1

- change from p0014 = 0 to 1

Re p0014 = 1:

With this setting, alarm A01066 followed by alarm A01067 can occur if parameters are continually changed via a fieldbus system.

Parameter changes are entered in the volatile memory (RAM) and also in the non-volatile buffer memory.

In the following cases, the entries in the buffer memory are transferred into the ROM and then the buffer memory is cleared:

- p0971 = 1
- power down/power up the Control Unit
- change from p0014 = 1 to 0

Re p0014 = 2:

The procedure to clear the entries in the buffer memory is initiated.

p0014 is automatically set to 0 after the entries have been cleared.

## p0015 Macro drive unit / Macro drv unit

CU230P-2_BT
CU230P-2_CAN
CU230P-2_HVAC

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** C, C(1) | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 999999 | 12 |

**Description:** Runs the corresponding macro files.

**Dependency:** Refer to: p1000, r8570

**Notice:** After the value has been modified, no further parameter modifications can be made and the status is shown in r3996. Modifications can be made again when r3996 = 0.

When executing a specific macro, the corresponding programmed settings are made and become active.

**Note:** Macros available as standard are described in the technical documentation of the particular product.

## p0015 Macro drive unit / Macro drv unit

CU230P-2_DP
CU230P-2_PN

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** C, C(1) | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 999999 | 7 |

**Description:** Runs the corresponding macro files.

**Dependency:** Refer to: p1000, r8570

**Notice:** After the value has been modified, no further parameter modifications can be made and the status is shown in r3996. Modifications can be made again when r3996 = 0.

When executing a specific macro, the corresponding programmed settings are made and become active.

**Note:** Macros available as standard are described in the technical documentation of the particular product.

## r0018 Control Unit firmware version / CU FW version

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 4294967295 | - |

**Description:** Displays the firmware version of the Control Unit.

**Dependency:** Refer to: r0197, r0198

**Note:** Example:

The value 1010100 should be interpreted as V01.01.01.00.

## r0020 Speed setpoint smoothed / n_set smth

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2000 | **Dyn. index:** - |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 5020, 6799 |
| **Min** | **Max** | **Factory setting** |
| - [rpm] | - [rpm] | - [rpm] |

**Description:** Displays the currently smoothed speed setpoint at the input of the speed controller or U/f characteristic (after the interpolator).

**Dependency:** Refer to: r0060

**Note:** Smoothing time constant = 100 ms

The signal is not suitable as a process quantity and may only be used as a display quantity.

The speed setpoint is available smoothed (r0020) and unsmoothed (r0060).

## r0021 CO: Actual speed smoothed / n_act smooth

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2000 | **Dyn. index:** - |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 6799 |
| **Min** | **Max** | **Factory setting** |
| - [rpm] | - [rpm] | - [rpm] |

**Description:** Displays the smoothed actual value of the motor speed.

For U/f control and when slip compensation is deactivated (see p1335), the synchronous speed to the output frequency is shown in r0021.

**Dependency:** Refer to: r0022, r0063

**Note:** Smoothing time constant = 100 ms

The signal is not suitable as a process quantity and may only be used as a display quantity.

The speed actual value is available smoothed (r0021, r0022) and unsmoothed (r0063).

For U/f control, the mechanical speed calculated from the output frequency and the slip is shown in r0063[2] even if slip compensation is deactivated.

## r0022 Speed actual value rpm smoothed / n_act rpm smooth

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2000 | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6799 |
| **Min** | **Max** | **Factory setting** |
| - [rpm] | - [rpm] | - [rpm] |

**Description:** Displays the smoothed actual value of the motor speed.

r0022 is identical to r0021, however, it always has units of rpm and contrary to r0021 cannot be changed over.

For U/f control and when slip compensation is deactivated (see p1335), the synchronous speed to the output frequency is shown in r0022.

**Dependency:** Refer to: r0021, r0063

**Note:** Smoothing time constant = 100 ms

The signal is not suitable as a process quantity and may only be used as a display quantity.

The speed actual value is available smoothed (r0021, r0022) and unsmoothed (r0063).

For U/f control, the mechanical speed calculated from the output frequency and the slip is shown in r0063[2] even if slip compensation is deactivated.

## r0024 Output frequency smoothed / f_outp smooth

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2000 | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 5300, 5730, 6300, 6799 |
| **Min** | **Max** | **Factory setting** |
| - [Hz] | - [Hz] | - [Hz] |

**Description:** Displays the smoothed converter frequency.

**Dependency:** Refer to: r0066

**Note:** Smoothing time constant = 100 ms

The signal is not suitable as a process quantity and may only be used as a display quantity.

The output frequency is available smoothed (r0024) and unsmoothed (r0066).

## r0025 CO: Output voltage smoothed / U_outp smooth

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2001 | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 5730, 6300, 6799 |
| **Min** | **Max** | **Factory setting** |
| - [Vrms] | - [Vrms] | - [Vrms] |

**Description:** Displays the smoothed output voltage of the power unit.

**Dependency:** Refer to: r0072

**Note:** Smoothing time constant = 100 ms

The signal is not suitable as a process quantity and may only be used as a display quantity.

The output voltage is available smoothed (r0025) and unsmoothed (r0072).

## r0026 CO: DC link voltage smoothed / Vdc smooth

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2001 | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6799 |
| **Min** | **Max** | **Factory setting** |
| - [V] | - [V] | - [V] |

**Description:** Displays the smoothed actual value of the DC link voltage.

**Dependency:** Refer to: r0070

**Notice:** When measuring a DC link voltage < 200 V, for the Power Module (e.g. PM240) a valid measured value is not supplied. In this case, when an external 24 V power supply is connected, a value of approx. 24 V is displayed in the display parameter.

**Note:** Smoothing time constant = 100 ms

The signal is not suitable as a process quantity and may only be used as a display quantity.

The DC link voltage is available smoothed (r0026) and unsmoothed (r0070).

r0026 sets itself to the lower value of the pulsating DC link voltage.

## r0027 CO: Absolute actual current smoothed / I_act abs val smth

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2002 | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 5730, 6799, 8850, 8950 |
| **Min** | **Max** | **Factory setting** |
| - [Arms] | - [Arms] | - [Arms] |

**Description:** Displays the smoothed absolute actual current value.

**Dependency:** Refer to: r0068

**Notice:** This smoothed signal is not suitable for diagnostics or evaluation of dynamic operations. In this case, the unsmoothed value should be used.

**Note:** Smoothing time constant = 300 ms
The signal is not suitable as a process quantity and may only be used as a display quantity.
The absolute current actual value is available smoothed (r0027) and unsmoothed (r0068).

## r0028 Modulation depth smoothed / Mod_depth smth

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2002 | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 5730, 6799, 8950 |
| **Min** | **Max** | **Factory setting** |
| - [%] | - [%] | - [%] |

**Description:** Displays the smoothed actual value of the modulation depth.
**Dependency:** Refer to: r0074
**Note:** Smoothing time constant = 100 ms
The signal is not suitable as a process quantity and may only be used as a display quantity.
The modulation depth is available smoothed (r0028) and unsmoothed (r0074).

## r0029 Current actual value field-generating smoothed / Id_act smooth

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2002 | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6799 |
| **Min** | **Max** | **Factory setting** |
| - [Arms] | - [Arms] | - [Arms] |

**Description:** Displays the smoothed field-generating actual current.
**Dependency:** Refer to: r0076
**Note:** Smoothing time constant = 300 ms
The signal is not suitable as a process quantity and may only be used as a display quantity.
The field-generating current actual value is available smoothed (r0029) and unsmoothed (r0076).

## r0030 Current actual value torque-generating smoothed / Iq_act smooth

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2002 | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6799 |
| **Min** | **Max** | **Factory setting** |
| - [Arms] | - [Arms] | - [Arms] |

**Description:** Displays the smoothed torque-generating actual current.
**Dependency:** Refer to: r0078
**Note:** Smoothing time constant = 300 ms
The signal is not suitable as a process quantity and may only be used as a display quantity.
The torque-generating current actual value is available smoothed (r0030) and unsmoothed (r0078).

## r0031 Actual torque smoothed / M_act smooth

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2003 | **Dyn. index:** - |
| **Units group:** 7_1 | **Unit selection:** p0505 | **Func. diagram:** 5730, 6799 |
| **Min** | **Max** | **Factory setting** |
| - [Nm] | - [Nm] | - [Nm] |

**Description:** Displays the smoothed torque actual value.
**Dependency:** Refer to: r0080
**Note:** Smoothing time constant = 100 ms
The signal is not suitable as a process quantity and may only be used as a display quantity.
The torque actual value is available smoothed (r0031) and unsmoothed (r0080).

## r0032 CO: Active power actual value smoothed / P_actv_act smth

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** r2004 | **Dyn. index:** - |
| **Units group:** 14_10 | **Unit selection:** p0505 | **Func. diagram:** 5730, 6799, 8750, 8850, 8950 |
| **Min** | **Max** | **Factory setting** |
| - [kW] | - [kW] | - [kW] |

**Description:** Displays the smoothed actual value of the active power.

**Dependency:** Refer to: r0082

**Notice:** This smoothed signal is not suitable for diagnostics or evaluation of dynamic operations. In this case, the unsmoothed value should be used.

**Note:** Power delivered at the motor shaft.

The active power is available smoothed (r0032 with 100 ms) and unsmoothed (r0082).

## r0034 CO: Motor utilization thermal / Mot_util therm

PM230
PM240
PM250, PM260

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8017 |
| **Min** | **Max** | **Factory setting** |
| - [%] | - [%] | - [%] |

**Description:** Displays the motor utilization from motor temperature model 1 (I2t).

**Dependency:** The thermal motor utilization is only determined for permanent-magnet synchronous motors when the motor temperature model 1 (I2t) is activated.

For motor temperature model 1 (I2t) (p0612.0 = 1), the following applies:

- r0034 = (motor model temperature - 40 K) / (p0605 - 40 K) * 100 %

Refer to: p0611, p0612, p0615

**Notice:** After the drive is switched on, the system starts to determine the motor temperature with an assumed model value. This means that the value for the motor utilization is only valid after a stabilization time.

**Note:** Smoothing time constant = 100 ms

The signal is not suitable as a process quantity and may only be used as a display quantity.

For r0034 = -200.0 %, the following applies:

The value is invalid (e.g. the motor temperature model is not activated or has been incorrectly parameterized).

## r0035 CO: Motor temperature / Mot temp

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2006 | **Dyn. index:** - |
| **Units group:** 21_1 | **Unit selection:** p0505 | **Func. diagram:** 8016, 8017 |
| **Min** | **Max** | **Factory setting** |
| - [°C] | - [°C] | - [°C] |

**Description:** Display and connector output for the actual temperature in the motor.

**Note:** For r0035 not equal to -200.0 °C, the following applies:

- this temperature display is valid.
- a KTY sensor is connected.
- for induction motors, the thermal motor model is activated (p0601 = 0).

For r0035 equal to -200.0 °C, the following applies:

- this temperature display is not valid (temperature sensor error).
- A PTC sensor or bimetallic NC contact is connected.
- for synchronous motors, the thermal motor model is activated (p0601 = 0).

## r0036 CO: Power unit overload I2t / PU overload I2t

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8014 |
| **Min** | **Max** | **Factory setting** |
| - [%] | - [%] | - [%] |

**Description:** Displays the power unit overload determined using the I2t calculation.

A current reference value is defined for the I2t monitoring of the power unit. It represents the current that can be conducted by the power unit without any influence of the switching losses (e.g. the continuously permissible current of the capacitors, inductances, busbars, etc.).

If the I2t reference current of the power unit is not exceeded, then an overload (0 %) is not displayed.

In the other case, the degree of thermal overload is calculated, whereby 100% results in a trip.

**Dependency:** Refer to: p0290, p0294

## r0037[0...19] CO: Power unit temperatures / PU temperatures

PM230
PM240
PM250, PM260

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2006 | **Dyn. index:** - |
| **Units group:** 21_1 | **Unit selection:** p0505 | **Func. diagram:** 8014 |
| **Min** | **Max** | **Factory setting** |
| - [°C] | - [°C] | - [°C] |

**Description:** Display and connector output for the temperature in the power unit.

**Index:**
[0] = Inverter maximum value
[1] = Depletion layer maximum value
[2] = Rectifier maximum value
[3] = Air intake
[4] = Interior of power unit
[5] = Inverter 1
[6] = Inverter 2
[7...10] = Reserved
[11] = Rectifier 1
[12] = Reserved
[13] = Depletion layer 1
[14] = Depletion layer 2
[15] = Depletion layer 3
[16] = Depletion layer 4
[17] = Depletion layer 5
[18] = Depletion layer 6
[19] = Reserved

**Notice:** Only for internal Siemens troubleshooting.

**Note:** The value of -200 indicates that there is no measuring signal.

r0037[0]: Maximum value of the inverter temperatures (r0037[5...10]).

r0037[1]: Maximum value of the depletion layer temperatures (r0037[13...18]).

r0037[2]: Maximum value of the rectifier temperatures (r0037[11...12]).

The maximum value is the temperature of the hottest inverter, depletion layer, or rectifier.

r0037[2, 3, 6, 11, 14...18] is only relevant for chassis power units.

In the case of a fault, the particular shutdown threshold depends on the power unit, and cannot be read out.

## r0037[0...19] CO: Power unit temperatures / PU temperatures

PM330

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2006 | **Dyn. index:** - |
| **Units group:** 21_1 | **Unit selection:** p0505 | **Func. diagram:** 8014 |
| **Min** | **Max** | **Factory setting** |
| - [°C] | - [°C] | - [°C] |

**Description:** Display and connector output for the temperature in the power unit.

**Index:**
[0] = Inverter maximum value
[1] = Depletion layer maximum value

[2] = Rectifier maximum value
[3] = Air intake
[4] = Interior of power unit
[5] = Inverter 1
[6] = Inverter 2
[7] = Inverter 3
[8] = Reserved
[9] = Reserved
[10] = Reserved
[11] = Rectifier 1
[12] = Reserved
[13] = Depletion layer 1
[14] = Depletion layer 2
[15] = Depletion layer 3
[16] = Depletion layer 4
[17] = Depletion layer 5
[18] = Depletion layer 6
[19] = Reserved

**Notice:** Only for internal Siemens troubleshooting.

**Note:** The value of -200 indicates that there is no measuring signal.

r0037[0]: Maximum value of the inverter temperatures (r0037[5...10]).

r0037[1]: Maximum value of the depletion layer temperatures (r0037[13...18]).

r0037[2]: Maximum value of the rectifier temperatures (r0037[11...12]).

The maximum value is the temperature of the hottest inverter, depletion layer, or rectifier.

In the case of a fault, the particular shutdown threshold depends on the power unit, and cannot be read out.

## r0038 Power factor smoothed / Cos phi smooth

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6799, 8850, 8950 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the smoothed actual power factor. This refers to the electrical power of the basic fundamental signals at the converter output terminals.

**Notice:** For infeed units, the following applies:

For active powers < 25 % of the rated power, this does not provide any useful information.

**Note:** Smoothing time constant = 300 ms

The signal is not suitable as a process quantity and may only be used as a display quantity.

## r0039[0...2] Energy display / Energy displ

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - [kWh] | - [kWh] | - [kWh] |

**Description:** Displays the energy values at the output terminals of the power unit.

**Index:**
[0] = Energy balance (sum)
[1] = Energy drawn
[2] = Energy fed back

**Dependency:** Refer to: p0040

**Note:** Re index 0:

Sum of the energy drawn and energy that is fed back.

## p0040 Reset energy consumption display / Energy usage reset

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned8 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 1 | 0 |

**Description:** Setting to reset the display in r0039 and r0041.
Procedure:
Set p0040 = 0 --> 1
The displays are reset and the parameter is automatically set to zero.

**Dependency:** Refer to: r0039

## r0041 Energy consumption saved / Energy cons saved

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - [kWh] | - [kWh] | - [kWh] |

**Description:** Displays the saved energy referred to 100 operating hours.

**Dependency:** Refer to: p0040

**Note:** This display is used for a fluid-flow machine.
The flow characteristic is entered into p3320 ... p3329.
For an operating time of below 100 hours, the display is interpolated up to 100 hours.

## p0045 Display values smoothing time constant / Disp_val T_smooth

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6714, 8012 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [ms] | 10000.00 [ms] | 4.00 [ms] |

**Description:** Sets the smoothing time constant for the following display values:
r0063[1], r0068[1], r0080[1], r0082[1].

## r0046.0...31 CO/BO: Missing enable sig / Missing enable sig

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2634 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display and BICO output for missing enable signals that are preventing the closed-loop drive control from being commissioned.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | OFF1 enable missing | Yes | No | 7954 |
| 01 | OFF2 enable missing | Yes | No | - |
| 02 | OFF3 enable missing | Yes | No | - |
| 03 | Operation enable missing | Yes | No | - |
| 04 | DC braking enable missing | Yes | No | - |
| 10 | Ramp-function generator enable missing | Yes | No | - |
| 11 | Ramp-function generator start missing | Yes | No | - |
| 12 | Setpoint enable missing | Yes | No | - |
| 16 | OFF1 enable internal missing | Yes | No | - |
| 17 | OFF2 enable internal missing | Yes | No | - |
| 18 | OFF3 enable internal missing | Yes | No | - |
| 19 | Pulse enable internal missing | Yes | No | - |

| | | | | |
|---|---|---|---|---|
| 20 | DC braking internal enable missing | Yes | No | - |
| 21 | Power unit enable missing | Yes | No | - |
| 25 | Function bypass active | Yes | No | - |
| 26 | Drive inactive or not operational | Yes | No | - |
| 27 | De-magnetizing not completed | Yes | No | - |
| 30 | Speed controller inhibited | Yes | No | - |
| 31 | Jog setpoint active | Yes | No | - |

**Dependency:** Refer to: r0002

**Note:** The value r0046 = 0 indicates that all enable signals for this drive are present.

Bit 00 = 1 (enable signal missing), if:

- the signal source in p0840 is a 0 signal.

- there is a "switching on inhibited".

Bit 01 = 1 (enable signal missing), if:

- the signal source in p0844 or p0845 is a 0 signal.

Bit 02 = 1 (enable signal missing), if:

- the signal source in p0848 or p0849 is a 0 signal.

Bit 03 = 1 (enable signal missing), if:

- the signal source in p0852 is a 0 signal.

Bit 04 =1 (DC brake active) when:

- the signal source in p1230 has a 1 signal

Bit 10 = 1 (enable signal missing), if:

- the signal source in p1140 is a 0 signal.

Bit 11 = 1 (enable signal missing) if the speed setpoint is frozen, because:

- the signal source in p1141 is a 0 signal.

- the speed setpoint is entered from jogging and the two signal sources for jogging, bit 0 (p1055) and bit 1 (p1056) have a 1 signal.

Bit 12 = 1 (enable signal missing), if:

- the signal source in p1142 is a 0 signal.

Bit 16 = 1 (enable signal missing), if:

- there is an OFF1 fault response. The system is only enabled if the fault is removed and was acknowledged and the "switching on inhibited" withdrawn with OFF1 = 0.

Bit 17 = 1 (enable signal missing), if:

- commissioning mode is selected (p0010 > 0).

- there is an OFF2 fault response.

- the drive is not operational.

Bit 18 = 1 (enable signal missing), if:

- OFF3 has still not been completed or an OFF3 fault response is present.

Bit 19 = 1 (internal pulse enable missing), if:

- sequence control does not have a finished message.

Bit 20 = 1 (internal DC brake active), if:

- the drive is not in the state "Operation" or in "OFF1/OFF3".

- the internal pulse enable is missing (r0046.19 = 0).

Bit 21 = 1 (enable signal missing), if:

- the power unit does not issue an enable signal (e.g. because DC link voltage is too low).

- The hibernation mode is active.

Bit 25 = 1 (function bypass active) if:

- the bypass function is active.

Bit 26 = 1 (enable signal missing), if:

- the drive is not operational.

Bit 27 = 1 (enable signal missing), if:

- de-magnetization not completed.

Bit 30 = 1 (speed controller inhibited), if one of the following reasons is present:

- the pole position identification is active.

- motor data identification is active (only certain steps).

Bit 31 = 1 (enable signal missing), if:

- the speed setpoint from jog 1 or 2 is entered.

## r0047 Motor data identification and speed controller optimization / MotID and n_opt

PM230
PM240
PM250, PM260

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 300 | - |

**Description:** Displays the actual status for the motor data identification (stationary measurement) and the speed controller optimization (rotating measurement).

**Value:**
0: No measurement
115: Measurement q leakage inductance (part 2)
120: Speed controller optimization (vibration test)
140: Calculate speed controller setting
150: Measurement moment of inertia
170: Measurement magnetizing current and saturation characteristic
195: Measurement q leakage inductance (part 1)
200: Rotating measurement selected
220: identification leakage inductance
230: Identification rotor time constant
240: Identification stator inductance
250: Identification stator inductance LQLD
270: Identification stator resistance
290: Identification valve lockout time
300: Stationary measurement selected

## r0047 Motor data identification and speed controller optimization / MotID and n_opt

PM330

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 300 | - |

**Description:** Displays the actual status for the motor data identification (stationary measurement) and the speed controller optimization (rotating measurement).

**Value:**
0: No measurement
115: Measurement q leakage inductance (part 2)
120: Speed controller optimization (vibration test)
140: Calculate speed controller setting
150: Measurement moment of inertia
170: Measurement magnetizing current and saturation characteristic
195: Measurement q leakage inductance (part 1)
200: Rotating measurement selected
220: identification leakage inductance
230: Identification rotor time constant
240: Identification stator inductance
250: Identification stator inductance LQLD
270: Identification stator resistance
290: Identification valve lockout time
295: Calibration output voltage measurement
300: Stationary measurement selected

## r0050.0...1 CO/BO: Command Data Set CDS effective / CDS effective

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned8 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8560 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the effective Command Data Set (CDS).

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | CDS eff bit 0 | ON | OFF | - |
| 01 | CDS eff bit 1 | ON | OFF | - |

**Dependency:** Refer to: p0810, p0811, r0836

**Note:** The Command Data Set selected using a binector input (e.g. p0810) is displayed using r0836.

## r0051.0...1 CO/BO: Drive Data Set DDS effective / DDS effective

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Unsigned8 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8565 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the effective Drive Data Set (DDS).

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | DDS eff bit 0 | ON | OFF | - |
| 01 | DDS eff bit 1 | ON | OFF | - |

**Dependency:** Refer to: p0820, p0821, r0837

**Note:** When selecting the motor data identification routine and the rotating measurement, the drive data set changeover is suppressed.

## r0052.0...15 CO/BO: Status word 1 / ZSW 1

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display and connector output for status word 1.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Rdy for switch on | Yes | No | - |
| 01 | Ready | Yes | No | - |
| 02 | Operation enabled | Yes | No | - |
| 03 | Fault present | Yes | No | - |
| 04 | Coast down active (OFF2) | No | Yes | - |
| 05 | Quick Stop active (OFF3) | No | Yes | - |
| 06 | Switching on inhibited active | Yes | No | - |
| 07 | Alarm present | Yes | No | - |
| 08 | Deviation setpoint/actual speed | No | Yes | - |
| 09 | Control request | Yes | No | - |
| 10 | Maximum speed reached | Yes | No | - |
| 11 | I, M, P limit reached | No | Yes | - |
| 13 | Alarm motor overtemperature | No | Yes | - |
| 14 | Motor rotates forwards | Yes | No | - |
| 15 | Alarm drive converter overload | No | Yes | - |

**Notice:** p2080 is used to define the signal sources of the PROFIdrive status word interconnection.

**Note:** Re bit 03:

This signal is inverted if it is interconnected to a digital output.

Re r0052:

The status bits have the following sources:

Bit 00: r0899 Bit 0

Bit 01: r0899 Bit 1

Bit 02: r0899 Bit 2

Bit 03: r2139 Bit 3 (or r1214.10 for p1210 > 0)

Bit 04: r0899 Bit 4

Bit 05: r0899 Bit 5

Bit 06: r0899 Bit 6

Bit 07: r2139 Bit 7

Bit 08: r2197 Bit 7

Bit 09: r0899 Bit 7
Bit 10: r2197 Bit 6
Bit 11: r0056 Bit 13 (negated)
Bit 13: r2135 Bit 14 (negated)
Bit 14: r2197 Bit 3
Bit 15: r2135 Bit 15 (negated)

## r0053.0...11 CO/BO: Status word 2 / ZSW 2

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display and BICO output for status word 2.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | DC braking active | Yes | No | - |
| 01 | \|n_act\| > p1226 (n_standstill) | Yes | No | - |
| 02 | \|n_act\| > p1080 (n_min) | Yes | No | - |
| 03 | I_act >= p2170 | Yes | No | - |
| 04 | \|n_act\| > p2155 | Yes | No | - |
| 05 | \|n_act\| <= p2155 | Yes | No | - |
| 06 | \|n_act\| >= r1119 (n_set) | Yes | No | - |
| 07 | Vdc <= p2172 | Yes | No | - |
| 08 | Vdc > p2172 | Yes | No | - |
| 09 | Ramp-up/ramp-down completed | Yes | No | - |
| 10 | Technology controller output at the lower limit | Yes | No | - |
| 11 | Technology controller output at the upper limit | Yes | No | - |

**Notice:** p2081 is used to define the signal sources of the PROFIdrive status word interconnection.

**Note:** The following status bits are displayed in r0053:

Bit 00: r1239 Bit 8
Bit 01: r2197 Bit 5 (negated)
Bit 02: r2197 Bit 0 (negated)
Bit 03: r2197 Bit 8
Bit 04: r2197 Bit 2
Bit 05: r2197 Bit 1
Bit 06: r2197 Bit 4
Bit 07: r2197 Bit 9
Bit 08: r2197 Bit 10
Bit 09: r1199 Bit 2 (negated)
Bit 10: r2349 Bit 10
Bit 11: r2349 Bit 11

## r0054.0...15 CO/BO: Control word 1 / STW 1

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays control word 1.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | ON/OFF1 | Yes | No | - |
| 01 | OC / OFF2 | Yes | No | - |
| 02 | OC / OFF3 | Yes | No | - |
| 03 | Operation enable | Yes | No | - |
| 04 | Ramp-function generator enable | Yes | No | - |

| | | | | |
|---|---|---|---|---|
| 05 | Continue ramp-function generator | Yes | No | - |
| 06 | Speed setpoint enable | Yes | No | - |
| 07 | Acknowledge fault | Yes | No | - |
| 08 | Jog bit 0 | Yes | No | 3030 |
| 09 | Jog bit 1 | Yes | No | 3030 |
| 10 | Master ctrl by PLC | Yes | No | - |
| 11 | Direction reversal (setpoint) | Yes | No | - |
| 13 | Motorized potentiometer raise | Yes | No | - |
| 14 | Motorized potentiometer lower | Yes | No | - |
| 15 | CDS bit 0 | Yes | No | - |

**Note:** The following control bits are displayed in r0054:

Bit 00: r0898 Bit 0
Bit 01: r0898 Bit 1
Bit 02: r0898 Bit 2
Bit 03: r0898 Bit 3
Bit 04: r0898 Bit 4
Bit 05: r0898 Bit 5
Bit 06: r0898 Bit 6
Bit 07: r2138 Bit 7
Bit 08: r0898 Bit 8
Bit 09: r0898 Bit 9
Bit 10: r0898 Bit 10
Bit 11: r1198 Bit 11
Bit 13: r1198 Bit 13
Bit 14: r1198 Bit 14
Bit 15: r0836 Bit 0

## r0055.0...15 CO/BO: Supplementary control word / Suppl STW

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2513 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display and BICO output for supplementary control word.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Fixed setp bit 0 | Yes | No | - |
| 01 | Fixed setp bit 1 | Yes | No | - |
| 02 | Fixed setp bit 2 | Yes | No | - |
| 03 | Fixed setp bit 3 | Yes | No | - |
| 04 | DDS select. bit 0 | Yes | No | - |
| 05 | DDS select. bit 1 | Yes | No | - |
| 08 | Technology controller enable | Yes | No | - |
| 09 | DC braking enable | Yes | No | - |
| 11 | Droop enable | Yes | No | - |
| 12 | Torque control active | Yes | No | - |
| 13 | External fault 1 (F07860) | No | Yes | - |
| 15 | CDS bit 1 | Yes | No | - |

**Note:** CDS: Command Data Set

DDS: Drive Data Set (DDS)

The following control bits are displayed in r0055:

Bit 00: r1198.0
Bit 01: r1198.1
Bit 02: r1198.2
Bit 03: r1198.3
Bit 04: r0837.0
Bit 05: r0837.1
Bit 08: r2349.0 (negated)
Bit 09: r1239.11

Bit 11: r1406.11
Bit 12: r1406.12
Bit 13: r2138.13 (negated)
Bit 15: r0836.1

## r0056.0...15 CO/BO: Status word, closed-loop control / ZSW cl-loop ctrl

PM230
PM240, PM330

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display and BICO output for the status word of the closed-loop control.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Initialization completed | Yes | No | - |
| 01 | De-magnetizing completed | Yes | No | - |
| 02 | Pulse enable available | Yes | No | - |
| 04 | Magnetizing completed | Yes | No | - |
| 05 | Voltage boost when starting | Active | Inactive | 6301 |
| 06 | Acceleration voltage | Active | Inactive | 6301 |
| 07 | Frequency negative | Yes | No | - |
| 08 | Field weakening active | Yes | No | - |
| 09 | Voltage limit active | Yes | No | 6714 |
| 10 | Slip limit active | Yes | No | 6310 |
| 11 | Frequency limit active | Yes | No | - |
| 12 | Current limiting controller voltage output active | Yes | No | - |
| 13 | Current/torque limiting | Active | Inactive | 6060 |
| 14 | Vdc_max controller active | Yes | No | 6220, 6320 |
| 15 | Vdc_min controller active | Yes | No | 6220, 6320 |

## r0056.0...13 CO/BO: Status word, closed-loop control / ZSW cl-loop ctrl

PM250
PM260

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display and BICO output for the status word of the closed-loop control.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Initialization completed | Yes | No | - |
| 01 | De-magnetizing completed | Yes | No | - |
| 02 | Pulse enable available | Yes | No | - |
| 04 | Magnetizing completed | Yes | No | - |
| 05 | Voltage boost when starting | Active | Inactive | 6301 |
| 06 | Acceleration voltage | Active | Inactive | 6301 |
| 07 | Frequency negative | Yes | No | - |
| 08 | Field weakening active | Yes | No | - |
| 09 | Voltage limit active | Yes | No | 6714 |
| 10 | Slip limit active | Yes | No | 6310 |
| 11 | Frequency limit active | Yes | No | - |
| 12 | Current limiting controller voltage output active | Yes | No | - |
| 13 | Current/torque limiting | Active | Inactive | 6060 |

## r0060 CO: Speed setpoint before the setpoint filter / n_set before filt.

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2000 | **Dyn. index:** - |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 2701, 2704, 5020, 6030, 6799 |
| **Min** | **Max** | **Factory setting** |
| - [rpm] | - [rpm] | - [rpm] |

**Description:** Displays the actual speed setpoint at the input of the speed controller or U/f characteristic (after the interpolator).

**Dependency:** Refer to: r0020

**Note:** The speed setpoint is available smoothed (r0020) and unsmoothed (r0060).

## r0062 CO: Speed setpoint after the filter / n_set after filter

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2000 | **Dyn. index:** - |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 6020, 6030, 6031 |
| **Min** | **Max** | **Factory setting** |
| - [rpm] | - [rpm] | - [rpm] |

**Description:** Display and connector output for the speed setpoint after the setpoint filters.

## r0063[0...2] CO: Speed actual value / n_act

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2000 | **Dyn. index:** - |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 6020, 6799 |
| **Min** | **Max** | **Factory setting** |
| - [rpm] | - [rpm] | - [rpm] |

**Description:** Displays the actual speed of the closed-loop speed control and the U/f control.

For U/f control and when slip compensation is deactivated (see p1335), the synchronous speed to the output frequency is shown in r0063[0].

**Index:**
[0] = Unsmoothed
[1] = Smoothed with p0045
[2] = Calculated from f_set - f_slip

**Dependency:** Refer to: r0021, r0022

**Note:** The speed actual value r0063[0] is additionally displayed - smoothed with p0045 - in r0063[1].

The speed (r0063[2]) calculated from the output frequency and slip can only be compared with the speed actual value (r0063[0]) in the steady-state.

## r0064 CO: Speed controller system deviation / n_ctrl system dev

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2000 | **Dyn. index:** - |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 5040, 6040 |
| **Min** | **Max** | **Factory setting** |
| - [rpm] | - [rpm] | - [rpm] |

**Description:** Displays the actual system deviation of the speed controller.

## r0065 Slip frequency / f_Slip

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2000 | **Dyn. index:** - |
| **Units group:** 2_1 | **Unit selection:** p0505 | **Func. diagram:** 6310, 6700, 6727, 6730, 6732 |
| **Min** | **Max** | **Factory setting** |
| - [Hz] | - [Hz] | - [Hz] |

**Description:** Displays the slip frequency for induction motors (ASM).

## r0066 CO: Output frequency / f_outp

**Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32
**Can be changed:** - | **Scaling:** p2000 | **Dyn. index:** -
**Units group:** 2_1 | **Unit selection:** p0505 | **Func. diagram:** 6300, 6310, 6730, 6731, 6799

| Min | Max | Factory setting |
|---|---|---|
| - [Hz] | - [Hz] | - [Hz] |

**Description:** Display and connector output for the output frequency of the power unit.

**Dependency:** Refer to: r0024

**Note:** The output frequency is available smoothed (r0024) and unsmoothed (r0066).

For vector control and operation with encoder (p0400 > 0), the following applies:

The parameter value corresponds to the actual encoder speed.

## r0067 CO: Output current maximum / I_outp max

**Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32
**Can be changed:** - | **Scaling:** p2002 | **Dyn. index:** -
**Units group:** 6_2 | **Unit selection:** p0505 | **Func. diagram:** 6300, 6640, 6724

| Min | Max | Factory setting |
|---|---|---|
| - [Arms] | - [Arms] | - [Arms] |

**Description:** Display and connector output for the maximum output current of the power unit.

**Dependency:** The maximum output current is determined by the parameterized current limit and the motor and converter thermal protection.

Refer to: p0290, p0640

## r0068[0...1] CO: Absolute current actual value / I_act abs val

**Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32
**Can be changed:** - | **Scaling:** p2002 | **Dyn. index:** -
**Units group:** 6_2 | **Unit selection:** p0505 | **Func. diagram:** 6300, 6714, 6799, 7017, 8014, 8017, 8018

| Min | Max | Factory setting |
|---|---|---|
| - [Arms] | - [Arms] | - [Arms] |

**Description:** Displays actual absolute current.

**Index:**
[0] = Unsmoothed
[1] = Smoothed with p0045

**Dependency:** Refer to: r0027

**Notice:** The value is updated with the current controller sampling time.

**Note:** Absolute current value = sqrt(Iq^2 + Id^2)

The absolute value of the current actual value is available smoothed (r0027 with 300 ms, r0068[1] with p0045) and unsmoothed (r0068[0]).

## r0069[0...6] CO: Phase current actual value / I_phase act value

**Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32
**Can be changed:** - | **Scaling:** p2002 | **Dyn. index:** -
**Units group:** 6_5 | **Unit selection:** p0505 | **Func. diagram:** 6730

| Min | Max | Factory setting |
|---|---|---|
| - [A] | - [A] | - [A] |

**Description:** Display and connector output for the measured actual phase currents as peak value.

**Index:**
[0] = Phase U
[1] = Phase V
[2] = Phase W
[3] = Phase U offset
[4] = Phase V offset
[5] = Phase W offset
[6] = Total U, V, W

**Note:** In indices 3 ... 5, the offset currents of the 3 phases, which are added to correct the phase currents, are displayed.
The sum of the 3 corrected phase currents is displayed in index 6.

## r0070 CO: Actual DC link voltage / Vdc act val

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2001 | **Dyn. index:** - |
| **Units group:** 5_2 | **Unit selection:** p0505 | **Func. diagram:** 6723, 6724, 6730, 6731, 6799 |
| **Min** | **Max** | **Factory setting** |
| - [V] | - [V] | - [V] |

**Description:** Display and connector output for the measured actual value of the DC link voltage.

**Dependency:** Refer to: r0026

**Notice:** When measuring a DC link voltage < 200 V, for the Power Module (e.g. PM240) a valid measured value is not supplied. In this case, when an external 24 V power supply is connected, a value of approx. 24 V is displayed in the display parameter.

**Note:** The DC link voltage is available smoothed (r0026) and unsmoothed (r0070).

## r0071 Maximum output voltage / U_output max

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2001 | **Dyn. index:** - |
| **Units group:** 5_1 | **Unit selection:** p0505 | **Func. diagram:** 6301, 6640, 6700, 6722, 6723, 6724, 6725, 6727 |
| **Min** | **Max** | **Factory setting** |
| - [Vrms] | - [Vrms] | - [Vrms] |

**Description:** Displays the maximum output voltage.

**Dependency:** The maximum output voltage depends on the actual DC link voltage (r0070) and the maximum modulation depth (p1803).

**Note:** As the (driven) motor load increases, the maximum output voltage drops as a result of the reduction in DC link voltage.

## r0072 CO: Output voltage / U_output

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2001 | **Dyn. index:** - |
| **Units group:** 5_1 | **Unit selection:** p0505 | **Func. diagram:** 5700, 6730, 6731, 6799 |
| **Min** | **Max** | **Factory setting** |
| - [Vrms] | - [Vrms] | - [Vrms] |

**Description:** Display and connector output for the actual output voltage of the power unit.

**Dependency:** Refer to: r0025

**Note:** The output voltage is available smoothed (r0025) and unsmoothed (r0072).

## r0073 Maximum modulation depth / Modulat_depth max

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6723, 6724 |
| **Min** | **Max** | **Factory setting** |
| - [%] | - [%] | - [%] |

**Description:** Displays the maximum modulation depth.

**Dependency:** Refer to: p1803

## r0074 CO: Modulat_depth / Modulat_depth

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 5730, 6730, 6731, 6799, 8940, 8950 |
| **Min** | **Max** | **Factory setting** |
| - [%] | - [%] | - [%] |

**Description:** Displays the actual modulation depth.

**Dependency:** Refer to: r0028

**Note:** For space vector modulation, 100% corresponds to the maximum output voltage without overcontrol.

Values above 100 % indicate an overcontrol condition - values below 100% have no overcontrol.

The phase voltage (phase-to-phase, rms) is calculated as follows:(r0074 x r0070) / (sqrt(2) x 100 %).

The modulation depth is available smoothed (r0028) and unsmoothed (r0074).

## r0075 CO: Current setpoint field-generating / Id_set

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2002 | **Dyn. index:** - |
| **Units group:** 6_2 | **Unit selection:** p0505 | **Func. diagram:** 6700, 6714, 6725 |
| **Min** | **Max** | **Factory setting** |
| - [Arms] | - [Arms] | - [Arms] |

**Description:** Display and connector output for the field-generating current setpoint (Id_set).

**Note:** This value is irrelevant for the U/f control mode.

## r0076 CO: Current actual value field-generating / Id_act

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2002 | **Dyn. index:** - |
| **Units group:** 6_2 | **Unit selection:** p0505 | **Func. diagram:** 5700, 5714, 5730, 6700, 6714, 6799 |
| **Min** | **Max** | **Factory setting** |
| - [Arms] | - [Arms] | - [Arms] |

**Description:** Display and connector output for the field-generating current actual voltage (Id_act).

**Dependency:** Refer to: r0029

**Note:** This value is irrelevant for the U/f control mode.

The field-generating current actual value is available smoothed (r0029) and unsmoothed (r0076).

## r0077 CO: Current setpoint torque-generating / Iq_set

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2002 | **Dyn. index:** - |
| **Units group:** 6_2 | **Unit selection:** p0505 | **Func. diagram:** 6700, 6710 |
| **Min** | **Max** | **Factory setting** |
| - [Arms] | - [Arms] | - [Arms] |

**Description:** Display and connector output for the torque-generating current setpoint.

**Note:** This value is irrelevant for the U/f control mode.

## r0078 CO: Current actual value torque-generating / Iq_act

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2002 | **Dyn. index:** - |
| **Units group:** 6_2 | **Unit selection:** p0505 | **Func. diagram:** 6310, 6700, 6714, 6799 |
| **Min** | **Max** | **Factory setting** |
| - [Arms] | - [Arms] | - [Arms] |

**Description:** Display and connector output for the torque-generating current actual voltage (Iq_act).

**Dependency:** Refer to: r0030

**Note:** This value is irrelevant for the U/f control mode.
The torque-generating current actual value is available smoothed (r0030 with 300 ms) and unsmoothed (r0078).

## r0079 CO: Torque setpoint / M_set

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2003 | **Dyn. index:** - |
| **Units group:** 7_1 | **Unit selection:** p0505 | **Func. diagram:** 6020, 6060, 6710 |
| **Min** | **Max** | **Factory setting** |
| - [Nm] | - [Nm] | - [Nm] |

**Description:** Display and connector output for the torque setpoint at the output of the speed controller.

## r0080[0...1] CO: Torque actual value / M_act

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2003 | **Dyn. index:** - |
| **Units group:** 7_1 | **Unit selection:** p0505 | **Func. diagram:** 6714, 6799 |
| **Min** | **Max** | **Factory setting** |
| - [Nm] | - [Nm] | - [Nm] |

**Description:** Display and connector output for actual torque value.

**Index:** [0] = Unsmoothed
[1] = Smoothed with p0045

**Dependency:** Refer to: r0031, p0045

**Note:** The value is available smoothed (r0031 with 100 ms, r0080[1] with p0045) and unsmoothed (r0080[0]).

## r0082[0...2] CO: Active power actual value / P_act

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** r2004 | **Dyn. index:** - |
| **Units group:** 14_5 | **Unit selection:** p0505 | **Func. diagram:** 6714, 6799 |
| **Min** | **Max** | **Factory setting** |
| - [kW] | - [kW] | - [kW] |

**Description:** Displays the instantaneous active power.

**Index:** [0] = Unsmoothed
[1] = Smoothed with p0045
[2] = Electric power

**Dependency:** Refer to: r0032

**Note:** The mechanical active power is available smoothed (r0032 with 100 ms, r0082[1] with p0045) and unsmoothed (r0082[0]).

## r0083 CO: Flux setpoint / Flex setp

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 5722 |
| **Min** | **Max** | **Factory setting** |
| - [%] | - [%] | - [%] |

**Description:** Displays the flux setpoint.

## r0084[0...1] CO: Flux actual value / Flux act val

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6730, 6731 |
| **Min** | **Max** | **Factory setting** |
| - [%] | - [%] | - [%] |

**Description:** Displays the flux actual value.

**Index:** [0] = Unsmoothed
[1] = Smoothed

## r0087 CO: Actual power factor / Cos phi act

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the actual active power factor.
This value refers to the electrical power of the basic fundamental signals at the output terminals of the converter.

## r0089[0...2] Actual phase voltage / U_phase act val

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2001 | **Dyn. index:** - |
| **Units group:** 5_3 | **Unit selection:** p0505 | **Func. diagram:** 6719 |
| **Min** | **Max** | **Factory setting** |
| - [V] | - [V] | - [V] |

**Description:** Displays the actual phase voltage.

**Index:** [0] = Phase U
[1] = Phase V
[2] = Phase W

**Note:** The values are determined from the transistor power-on duration.

## p0100 IEC/NEMA mot stds / IEC/NEMA mot stds

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** C(1) | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 2 | 0 |

**Description:** Defines whether the motor and drive converter power settings (e.g. rated motor power, p0307) are expressed in [kW] or [hp].
Depending on the selection, the rated motor frequency (p0310) is either set to 50 Hz or 60 Hz.
For p0100 = 0, 2, the following applies: The power factor (p0308) should be parameterized.
For p0100 = 1, the following applies: The efficiency (p0309) should be parameterized.

**Value:**
0: IEC-Motor (50 Hz, SI units)
1: NEMA motor (60 Hz, US units)
2: NEMA motor (60 Hz, SI units)

**Dependency:** If p0100 is changed, all of the rated motor parameters are reset. Only then are possible unit changeovers made.
The units of all motor parameters are changed that are involved in the selection of IEC or NEMA (e.g. r0206, p0307, r0333, r0334, p0341, p0344, r1969).
Refer to: r0206, p0210, p0300, p0304, p0305, p0307, p0308, p0309, p0310, p0311, p0314, p0320, p0322, p0323, p0335, r0337, p1800

**Note:** The parameter value is not reset when the factory setting is restored (p0010 = 30, p0970).

## p0124[0...n] CU detection via LED / CU detection LED

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned8 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** PDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 1 | 0 |

**Description:** Identification of the Control Unit using an LED.

**Note:** While p0124 = 1, the READY LED flashes green/orange or red/orange with 2 Hz at the appropriate Control Unit.

## p0133[0...n] Motor configuration / Motor config

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** C(1, 3) | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | 0000 bin |

**Description:** Configuration of the motor when commissioning the motor.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Motor connection type | Delta | Star | - |
| 01 | Motor 87 Hz operation | Yes | No | - |

**Dependency:** For standard induction motors (p0301 > 10000), bit 0 is automatically preassigned the connection type of the selected data set.

For p0100 > 0 (60 Hz rated motor frequency), it is not possible to select bit 1.

Refer to: p0304, p0305, p1082

**Note:** Re bit 00:

When changing the bits, the rated motor voltage p0304 and the rated motor current p0305 are automatically converted to the selected connection type (star/delta).

Re bit 01:

87 Hz operation is only possible in the delta connection type. When selected, the maximum speed p1082 is automatically preassigned for a maximum output frequency of 87 Hz.

## p0170 Number of Command Data Sets (CDS) / CDS count

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Unsigned8 |
| **Can be changed:** C(15) | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8560 |
| **Min** | **Max** | **Factory setting** |
| 2 | 4 | 2 |

**Description:** Sets the number of Command Data Sets (CDS).

**Dependency:** Refer to: p0010, r3996

**Notice:** When the data sets are created, short-term communication interruptions may occur.

**Note:** It is possible to toggle between command parameters (BICO parameters) using this data set changeover.

## p0180 Number of Drive Data Sets (DDS) / DDS count

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned8 |
| **Can be changed:** C(15) | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8565 |
| **Min** | **Max** | **Factory setting** |
| 1 | 4 | 1 |

**Description:** Sets the number of Drive Data Sets (DDS).

**Dependency:** Refer to: p0010, r3996

**Notice:** When the data sets are created, short-term communication interruptions may occur.

## r0197[0...1] Bootloader version / Bootloader vers

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the bootloader version.

Index 0:

Displays the bootloader version.

| | |
|---|---|
| | Index 1:<br>Displays the bootloader version 3 (for CU320-2 and CU310-2)<br>Value 0 means that boot loader 3 is not available. |
| **Dependency:** | Refer to: r0018, r0198 |
| **Note:** | Example:<br>The value 1010100 should be interpreted as V01.01.01.00. |

## r0198[0...2] BIOS/EEPROM data version / BIOS/EEPROM vers

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

| | |
|---|---|
| **Description:** | Displays the BIOS and EEPROM data version.<br>r0198[0]: BIOS version<br>r0198[1]: EEPROM data version EEPROM 0<br>r0198[2]: EEPROM data version EEPROM 1 |
| **Dependency:** | Refer to: r0018, r0197 |
| **Note:** | Example:<br>The value 1010100 should be interpreted as V01.01.01.00. |

## r0200[0...n] Power unit code number actual / PU code no. act

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** PDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

| | |
|---|---|
| **Description:** | Displays the unique code number of the power unit. |
| **Note:** | r0200 = 0: No power unit data found |

## p0201[0...n] Power unit code number / PU code no

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** C(2) | **Scaling:** - | **Dyn. index:** PDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 65535 | 0 |

| | |
|---|---|
| **Description:** | Sets the actual code number from r0200 to acknowledge the power unit being used.<br>When commissioned for the first time, the code number is automatically transferred from r0200 into p0201. |
| **Note:** | The parameter is used to identify when the drive is being commissioned for the first time.<br>The power unit commissioning can only be exited (p0201 = r0200), if the actual and acknowledged code numbers are identical (p0010 = 2).<br>When the code number is changed, the connection voltage (p0210) is checked and, if necessary, adjusted. |

## r0203[0...n] Actual power unit type / PU actual type

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** PDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 2 | 400 | - |

| | |
|---|---|
| **Description:** | Displays the type of power unit found. |
| **Value:** | 2: MICROMASTER 440<br>3: MICROMASTER 411<br>4: MICROMASTER 410<br>5: MICROMASTER 436 |

6: MICROMASTER 440 PX
7: MICROMASTER 430
100: SINAMICS S
101: SINAMICS S (value)
102: SINAMICS S (combi)
103: SINAMICS S120M (distributed)
112: PM220 (SINAMICS G120)
113: PM230 (SINAMICS G120)
114: PM240 (SINAMICS G120)
115: PM250 (SINAMICS G120 / S120)
116: PM260 (SINAMICS G120)
118: SINAMICS G120 Px
120: PM340 (SINAMICS S120)
126: SINAMICS ET200PRO
130: PM250D (SINAMICS G120D)
133: SINAMICS G120C
135: SINAMICS PMV40
136: SINAMICS PMV60
137: SINAMICS PMV80
138: SINAMICS G110M
150: SINAMICS G
151: PM330 (SINAMICS G120)
200: SINAMICS GM
250: SINAMICS SM
260: SINAMICS MC
300: SINAMICS GL
350: SINAMICS SL
400: SINAMICS DCM

**Note:** For parallel circuit configurations, the parameter index is assigned to a power unit.

## r0204[0...n] Power unit hardware properties / PU HW property

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** PDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the properties supported by the power unit hardware.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 01 | RFI filter available | Yes | No | - |
| 07 | F3E regenerative feedback into the line supply | Yes | No | - |
| 08 | Internal Braking Module | Yes | No | - |
| 12 | Safe Brake Control (SBC) supported | No | Yes | - |
| 14 | Internal LC output filter | Yes | No | - |
| 15 | Line voltage | 1-phase | 3-phase | - |

## p0205 Power unit application / PU application

PM230
PM330

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** C(1, 2) | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 1 | 1 |

**Description:** The duty cycles can be overloaded provided that the drive converter is operated with its base load current before and after the overload. This is based on a load duty cycle of 300 s.

**Value:**
0: Load duty cycle with high overload for vector drives
1: Load duty cycle with low overload for vector drives

**Dependency:** Refer to: r3996

**Notice:** The parameter value is not reset when the factory setting is restored (see p0010 = 30, p0970).

When the power unit use is changed, short-term communication interruptions may occur.

**Note:** When the parameter is changed, all of the motor parameters (p0305 ... p0311), the technological application (p0500) and the control mode (p1300) are pre-assigned according to the selected application. The parameter has no influence when calculating the thermal overload.

p0205 can only be changed to the settings that are saved in the power unit EEPROM.

## p0205 Power unit application / PU application

PM240
PM250, PM260

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** C(1, 2) | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 1 | 0 |

**Description:** The duty cycles can be overloaded provided that the drive converter is operated with its base load current before and after the overload. This is based on a load duty cycle of 300 s.

**Value:**
0: Load duty cycle with high overload for vector drives
1: Load duty cycle with low overload for vector drives

**Dependency:** Refer to: r3996

**Notice:** The parameter value is not reset when the factory setting is restored (see p0010 = 30, p0970).

When the power unit use is changed, short-term communication interruptions may occur.

**Note:** When the parameter is changed, all of the motor parameters (p0305 ... p0311), the technological application (p0500) and the control mode (p1300) are pre-assigned according to the selected application. The parameter has no influence when calculating the thermal overload.

p0205 can only be changed to the settings that are saved in the power unit EEPROM.

## r0206[0...4] Rated power unit power / PU P_rated

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** 14_6 | **Unit selection:** p0100 | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - [kW] | - [kW] | - [kW] |

**Description:** Displays the rated power unit power for various load duty cycles.

**Index:**
[0] = Rated value
[1] = Load duty cycle with low overload
[2] = Load duty cycle with high overload
[3] = S1 cont duty cyc
[4] = S6 load duty cycle

**Dependency:** IECdrives (p0100 = 0): Units kW

NEMA drives (p0100 = 1): Units hp

Refer to: p0100, p0205

## r0207[0...4] Rated power unit current / PU PI_rated

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8014 |
| **Min** | **Max** | **Factory setting** |
| - [Arms] | - [Arms] | - [Arms] |

**Description:** Displays the rated power unit power for various load duty cycles.

**Index:**
[0] = Rated value
[1] = Load duty cycle with low overload
[2] = Load duty cycle with high overload
[3] = Reserved
[4] = Reserved

**Dependency:** Refer to: p0205

## r0208 Rated power unit line supply voltage / PU U_rated

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - [Vrms] | - [Vrms] | - [Vrms] |

**Description:** Displays the rated line supply voltage of the power unit.

r0208 = 400 : 380 - 480 V +/-10 %

r0208 = 500 : 500 - 600 V +/-10 %

r0208 = 690 : 660 - 690 V +/-10 %

## r0209[0...4] Power unit maximum current / PU I_max

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8750, 8850, 8950 |
| **Min** | **Max** | **Factory setting** |
| - [Arms] | - [Arms] | - [Arms] |

**Description:** Displays the maximum output current of the power unit.

**Index:**
[0] = Catalog
[1] = Load duty cycle with low overload
[2] = Load duty cycle with high overload
[3] = Reserved
[4] = Reserved

**Dependency:** Refer to: p0205

## p0210 Drive unit line supply voltage / V_connect

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** C(2), T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 1 [V] | 63000 [V] | 400 [V] |

**Description:** Sets the drive unit supply voltage (rms value of the phase-to-phase line supply voltage).

**Dependency:** Set p1254, p1294 (automatic detection of the Vdc switch-on levels) = 0.

The switch-in thresholds of the Vdc_max controller (r1242, r1282) are then directly determined using p0210.

**Notice:** If, in the switched-off state (pulse inhibit), the supply voltage is higher than the entered value, the Vdc controller may be automatically de-activated in some cases to prevent the motor from accelerating the next time the system is switched on. In this case, an appropriate alarm A07401 is output.

**Note:** Setting ranges for p0210 as a function of the rated power unit voltage:

U_rated = 230 V:

- p0210 = 200 ... 240 V

U_rated = 400 V:

- p0210 = 380 ... 480 V

U_rated = 690 V:

- p0210 = 660 ... 690 V

## p0219 Braking resistor braking power / R_brake P_brake

PM240
PM330

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** C(1, 2), T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** 14_6 | **Unit selection:** p0100 | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.00 [kW] | 20000.00 [kW] | 0.00 [kW] |

**Description:** Sets the braking power of the connected braking resistor.

**Dependency:** Refer to: p1127, p1240, p1280, p1531

**Note:** When setting a value for the braking power, the following calculations are made:

- p1240, p1280: Vdc_max control is deactivated.
- p1531 = - p0219: the power limit when generating is set (limited to - p1530).
- The minimum ramp-down time is calculated (p1127) as a function of p0341, p0342 and p1082 (not for vector control with speed encoder).

If the parameter is reset again to zero, then the Vdc_max controller is reactivated and the power limit as well as the ramp-down time are recalculated.

## p0230 Drive filter type motor side / Drv filt type mot

PM230
PM240
PM250, PM260

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** C(1, 2) | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 4 | 0 |

**Description:** Sets the type of the filter at the motor side.

**Value:**
0: No filter
1: Motor reactor
2: dv/dt filter
3: Sine-wave filter Siemens
4: Sine-wave filter third-party

**Dependency:** The following parameters are influenced using p0230:

p0230 = 1:

--> p0233 (power unit, motor reactor) = filter inductance

p0230 = 3:

--> p0233 (power unit, motor reactor) = filter inductance

--> p0234 (power unit sine-wave filter capacitance) = filter capacitance

--> p0290 (power unit overload response) = inhibit pulse frequency reduction

--> p1082 (maximum speed) = Fmax filter / pole pair number

--> p1800 (pulse frequency) >= nominal pulse frequency of the filter

--> p1802 (modulator modes) = space vector modulation without overcontrol

p0230 = 4:

--> p0290 (power unit overload response) = inhibit pulse frequency reduction

--> p1802 (modulator modes) = space vector modulation without overcontrol

The user must set the following parameters according to the data sheet of the sine-wave filter and also the user must check whether they are permitted.

--> p0233 (power unit, motor reactor) = filter inductance

--> p0234 (power unit sine-wave filter capacitance) = filter capacitance

--> p1082 (maximum speed) = Fmax filter / pole pair number

--> p1800 (pulse frequency) >= nominal pulse frequency of the filter

Refer to: p0233, p0234, p0290, p1082, p1800, p1802

**Note:** The parameter cannot be changed if the power unit (e.g. PM260) is equipped with an internal sine-wave filter.

For sine-wave filters, the test pulse evaluation to detect short-circuits is always deactivated.

if a filter type cannot be selected, then this filter type is not permitted for the Motor Module.

p0230 = 1:

Power units with output reactor are limited to output frequencies of 150 Hz.

p0230 = 3:

Power units with sine-wave filter are limited to output frequencies of 200 Hz.

## p0230 Drive filter type motor side / Drv filt type mot

PM330

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** C(1, 2) | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 2 | 0 |

**Description:** Sets the type of the filter at the motor side.

**Value:** 0: No filter
1: Motor reactor
2: dv/dt filter

**Dependency:** The following parameters are influenced using p0230:

p0230 = 1:

--> p0233 (power unit, motor reactor) = filter inductance

Refer to: p0233, p0234, p0290, p1082, p1800, p1802

**Note:** if a filter type cannot be selected, then this filter type is not permitted for the Motor Module.

p0230 = 1:

Power units with output reactor are limited to output frequencies of 150 Hz.

## r0231[0...1] Power cable length maximum / Cable length max

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - [m] | - [m] | - [m] |

**Description:** Displays the maximum permissible cable lengths between the drive unit and motor.

**Index:** [0] = Unshielded
[1] = Shielded

**Note:** The display value is used to provide information for service and maintenance.

## p0233 Power unit motor reactor / PU mot reactor

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** C(2), U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.000 [mH] | 1000.000 [mH] | 0.000 [mH] |

**Description:** Enter the inductance of a filter connected at the power unit output.

**Dependency:** This parameter is automatically pre-set when you select a filter via p0230 if a SIEMENS filter is defined for the power unit.

Refer to: p0230

**Note:** When exiting the quick commissioning using p3900 = 1, the parameter value is set to the value of the defined SIEMENS filter or to zero. For this reason, the parameter value of a third-party filter only has to be entered outside the commissioning phase (p0010 = 0) and then the controller calculation (p0340 = 3) is carried out.

The parameter cannot be changed if the power unit (e.g. PM260) is equipped with an internal sine-wave filter.

## p0234 Power unit sine-wave filter capacitance / PU sine filter C

PM230
PM240
PM250, PM260

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** C(2), U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.000 [µF] | 1000.000 [µF] | 0.000 [µF] |

**Description:** Enters the capacitance of a sine-wave filter connected at the power unit output.

**Dependency:** This parameter is automatically pre-set when you select a filter via p0230 if a SIEMENS filter is defined for the power unit.

Refer to: p0230

**Note:** The parameter value includes the sum of all of the capacitances of a phase connected in series (phase - ground).

When exiting the quick commissioning using p3900 = 1, the parameter value is set to the value of the defined SIEMENS filter or to zero. For this reason, the parameter value of a third-party filter only has to be entered outside the commissioning phase (p0010 = 0).

The parameter cannot be changed if the power unit (e.g. PM260) is equipped with an internal sine-wave filter.

## r0238 Internal power unit resistance / PU R internal

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - [ohm] | - [ohm] | - [ohm] |

**Description:** Displays the internal resistance of the power unit (IGBT and line resistance).

## p0247 Voltage measurement configuring / U_mes config

PM330

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** C(2), U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | 0000 0000 0010 0000 bin |

**Description:** Sets the configuration for the output voltage measurement of the power unit.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Activate voltage measurement | Yes | No | - |
| 01 | Siemens internal | Yes | No | - |
| 02 | Siemens internal | Yes | No | - |
| 05 | Use voltage measured values for flying restart | Yes | No | - |
| 07 | Voltage calibration when switching on | Yes | No | - |
| 08 | Voltage monitoring when switching on | Yes | No | - |
| 09 | Voltage monitoring cyclic | Yes | No | - |

**Note:** Only special power units support this function (e.g. PM330).

Re bit 01:

The controller can be set using p0245 and p0246.

## p0287[0...1] Ground fault monitoring thresholds / Gnd flt threshold

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.0 [%] | 100.0 [%] | [0] 6.0 [%]<br>[1] 16.0 [%] |

**Description:** Sets the shutdown thresholds for the ground fault monitoring.

The setting is made as a percentage of the maximum current of the power unit (r0209).

**Index:** [0] = Threshold at which pre-charging starts
[1] = Threshold at which pre-charging stops

**Dependency:** Refer to: p1901

**Note:** This parameter is only relevant for chassis power units.

## r0289 CO: Maximum power unit output current / PU I_outp max

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2002 | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - [Arms] | - [Arms] | - [Arms] |

**Description:** Displays the actual maximum output current of the power unit taking into account derating factors.

## p0290 Power unit overload response / PU overld response

PM230
PM240
PM250, PM260

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8014 |
| **Min** | **Max** | **Factory setting** |
| 0 | 13 | 2 |

**Description:** Sets the response to a thermal overload condition of the power unit.

The following quantities can result in a response to thermal overload:

- heat sink temperature (r0037.0).

- chip temperature (r0037.1).

- power unit overload I2t (r0036).

Possible measures to avoid thermal overload:

- reduce the output current limit r0289 and r0067 (for closed-loop speed or torque control) or the output frequency (for U/f control) indirectly via the output current limit and the intervention of the current limiting controller).

- reduce the pulse frequency.

A reduction, if parameterized, is always realized after an appropriate alarm is output.

**Value:**
0: Reduce output current or output frequency
1: No reduction shutdown when overload threshold is reached
2: Reduce I_output or f_output and f_pulse (not using I2t)
3: Reduce the pulse frequency (not using I2t)
12: I_output or f_output and automatic pulse frequency reduction
13: Automatic pulse frequency reduction

**Dependency:** If a sine-wave filter is parameterized as output filter (p0230 = 3, 4), then only responses can be selected without pulse frequency reduction (p0290 = 0, 1).

For a thermal power unit overload, an appropriate alarm or fault is output, and r2135.15 or r2135.13 set.

Refer to: r0036, r0037, p0230, r2135

**Notice:** If the thermal overload of the power unit is not sufficiently reduced by the actions taken, the drive is always shut down. This means that the power unit is always protected irrespective of the setting of this parameter.

**Note:** The setting p0290 = 0, 2 is only practical if the load decreases with decreasing speed (e.g. for applications with variable torque such as for pumps and fans).

Under overload conditions, the current and torque limit are reduced, and therefore the motor is braked and forbidden speed ranges (e.g. minimum speed p1080 and suppression [skip] speeds p1091 ... p1094) can be passed through.

For p0290 = 2, 3, 12, 13, the I2t overload detection of the power unit does not influence the response "Reduce pulse frequency".

When the motor data identification routine is selected, p0290 cannot be changed.

For short-circuit/ground fault detection, when the test pulse evaluation is active via p1901 "Test pulse evaluation configuration", the pulse frequency at the instant of switch on is briefly reduced.

## p0290 Power unit overload response / PU overld response

PM330

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8014 |
| **Min** | **Max** | **Factory setting** |
| 0 | 3 | 2 |

**Description:** Sets the response to a thermal overload condition of the power unit.

The following quantities can result in a response to thermal overload:

- heat sink temperature (r0037.0).

- chip temperature (r0037.1).

- power unit overload I2t (r0036).

Possible measures to avoid thermal overload:

- reduce the output current limit r0289 and r0067 (for closed-loop speed or torque control) or the output frequency (for U/f control) indirectly via the output current limit and the intervention of the current limiting controller).

- reduce the pulse frequency.

A reduction, if parameterized, is always realized after an appropriate alarm is output.

**Value:**
0: Reduce output current or output frequency
1: No reduction shutdown when overload threshold is reached
2: Reduce I_output or f_output and f_pulse (not using I2t)
3: Reduce the pulse frequency (not using I2t)

**Dependency:** If a sine-wave filter is parameterized as output filter (p0230 = 3, 4), then only responses can be selected without pulse frequency reduction (p0290 = 0, 1).

For a thermal power unit overload, an appropriate alarm or fault is output, and r2135.15 or r2135.13 set.

Refer to: r0036, r0037, p0230, r2135

**Notice:** If the thermal overload of the power unit is not sufficiently reduced by the actions taken, the drive is always shut down. This means that the power unit is always protected irrespective of the setting of this parameter.

**Note:** The setting p0290 = 0, 2 is only practical if the load decreases with decreasing speed (e.g. for applications with variable torque such as for pumps and fans).

Under overload conditions, the current and torque limit are reduced, and therefore the motor is braked and forbidden speed ranges (e.g. minimum speed p1080 and suppression [skip] speeds p1091 ... p1094) can be passed through.

For p0290 = 2, 3, the I2t overload detection of the power unit does not influence the response "Reduce pulse frequency".

When the motor data identification routine is selected, p0290 cannot be changed.

For short-circuit/ground fault detection, when the test pulse evaluation is active via p1901 "Test pulse evaluation configuration", the pulse frequency at the instant of switch on is briefly reduced.

## p0292[0...1] Power unit temperature alarm threshold / PU T_alrm thresh

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 [°C] | 25 [°C] | [0] 5 [°C]<br>[1] 15 [°C] |

**Description:** Sets the alarm threshold for power unit overtemperatures. The value is set as a difference to the tripping (shutdown) temperature.

Drive:

If this threshold is exceeded, an overload alarm is generated and the system responds as parameterized in p0290.

Infeed:

When the threshold value is exceeded, only an overload alarm is output.

**Index:**
[0] = Heat sink temperature
[1] = Power semiconductor (chip) temperature

**Dependency:** Refer to: r0037, p0290

## p0294 Power unit alarm with I2t overload / PU I2t alrm thresh

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8014 |
| **Min** | **Max** | **Factory setting** |
| 10.0 [%] | 100.0 [%] | 95.0 [%] |

**Description:** Sets the alarm threshold for the I2t power unit overload.

If this threshold is exceeded, an overload alarm is generated and the system responds as parameterized in p0290.

**Dependency:** Refer to: r0036, p0290

**Note:** The I2t fault threshold is 100 %. If this value is exceeded, fault F30005 is output.

## p0295 Fan run-on time / Fan run-on time

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 [s] | 600 [s] | 0 [s] |

**Description:** Sets the fan run-on time after the pulses for the power unit have been canceled.

**Note:** - Under certain circumstances, the fan can continue to run for longer than was set (e.g. as a result of the excessively high heat sink temperature).

- For values less than 1 s, a 1 s run on time for the fan is active.
- for a PM230 power unit, sizes D - F the parameter is ineffective.

## r0296 DC link voltage undervoltage threshold / Vdc U_lower_thresh

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - [V] | - [V] | - [V] |

**Description:** Threshold to detect a DC link undervoltage.

If the DC link voltage falls below this threshold, the drive unit is tripped due to a DC link undervoltage condition.

## r0297 DC link voltage overvoltage threshold / Vdc U_upper_thresh

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8750, 8760, 8850, 8864, 8950, 8964 |
| **Min** | **Max** | **Factory setting** |
| - [V] | - [V] | - [V] |

**Description:** Threshold to detect a DC link overvoltage.

If the DC link voltage exceeds the threshold specified here, the drive unit is tripped due to DC link overvoltage.

## p0300[0...n] Motor type selection / Mot type sel

PM230
PM250, PM260

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** C(1, 3) | **Scaling:** - | **Dyn. index:** MDS, p0130 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6310 |
| **Min** | **Max** | **Factory setting** |
| 0 | 100 | 0 |

**Description:** Selecting the motor type.

The first digit of the parameter value always defines the general motor type and corresponds to the third-party motor belonging to a motor list:

1 = Induction motor

2 = Synchronous motor

The type information must be entered to filter motor-specific parameters and to optimize the operating characteristics and behavior. For example, for synchronous motors, power factor (p0308) is neither used nor displayed (in the BOP/IOP).

**Value:**

0: No motor
1: Induction motor
2: Synchronous motor
10: 1LE1 induction motor
13: 1LG6 induction motor
17: 1LA7 induction motor
19: 1LA9 induction motor
100: 1LE1 induction motor

**Dependency:** When selecting a motor type from the 1LE1, 1LG6, 1LA7, 1LA9 series, parameters p0335, p0626, p0627, and p0628 of the thermal motor model are pre-assigned as a function of p0307 and p0311.

**Caution:** If a motor is selected, which is not contained in the motor lists (p0300 < 100), then the motor code number must be reset (p0301 = 0), if previously a motor was parameterized from the motor list.

**Note:** Once the Control Unit has been powered up for the first time or if the factory settings have been defined accordingly, the motor type is pre-configured to induction motor (p0300 = 1).

If a motor type has not been selected (p0300 = 0), then the drive commissioning routine cannot be exited.

## p0300[0...n] Motor type selection / Mot type sel

PM240

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** C(1, 3) | **Scaling:** - | **Dyn. index:** MDS, p0130 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6310 |
| **Min** | **Max** | **Factory setting** |
| 0 | 600 | 0 |

**Description:** Selecting the motor type.

The first digit of the parameter value always defines the general motor type and corresponds to the third-party motor belonging to a motor list:

1 = Induction motor

2 = Synchronous motor

6 = Synchronous reluctance motor

The type information must be entered to filter motor-specific parameters and to optimize the operating characteristics and behavior. For example, for synchronous motors, power factor (p0308) is neither used nor displayed (in the BOP/IOP).

**Value:**
0: No motor
1: Induction motor
2: Synchronous motor
6: Reluctance motor
10: 1LE1 induction motor
13: 1LG6 induction motor
17: 1LA7 induction motor
19: 1LA9 induction motor
100: 1LE1 induction motor
600: 1FP1 reluctance motor

**Dependency:** When selecting a motor type from the 1LE1, 1LG6, 1LA7, 1LA9 series, parameters p0335, p0626, p0627, and p0628 of the thermal motor model are pre-assigned as a function of p0307 and p0311.

**Caution:** If a motor is selected, which is not contained in the motor lists (p0300 < 100), then the motor code number must be reset (p0301 = 0), if previously a motor was parameterized from the motor list.

**Note:** Once the Control Unit has been powered up for the first time or if the factory settings have been defined accordingly, the motor type is pre-configured to induction motor (p0300 = 1).

If a motor type has not been selected (p0300 = 0), then the drive commissioning routine cannot be exited.

## p0300[0...n] Motor type selection / Mot type sel

PM330

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** C(1, 3) | **Scaling:** - | **Dyn. index:** MDS, p0130 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6310 |
| **Min** | **Max** | **Factory setting** |
| 0 | 100 | 0 |

**Description:** Selecting the motor type.

The first digit of the parameter value always defines the general motor type and corresponds to the third-party motor belonging to a motor list:

1 = Induction motor

2 = Synchronous motor

The type information must be entered to filter motor-specific parameters and to optimize the operating characteristics and behavior. For example, for synchronous motors, power factor (p0308) is neither used nor displayed (in the BOP/IOP).

**Value:**
0: No motor
1: Induction motor
2: Synchronous motor
10: 1LE1 induction motor
13: 1LG6 induction motor
14: 1xx1 SIMOTICS FD induction motor
17: 1LA7 induction motor
18: 1LA8 / 1PQ8 standard induction motor series
19: 1LA9 induction motor
100: 1LE1 induction motor

**Dependency:** When the motor type is changed, the code number in p0301 may be reset to 0.

When selecting a motor type from the 1LE1, 1LG6, 1LA7, 1LA8, 1LA9 series, parameters p0335, p0626, p0627, and p0628 of the thermal motor model are pre-assigned as a function of p0307 and p0311.

**Caution:** If a motor is selected, which is not contained in the motor lists (p0300 < 100), then the motor code number must be reset (p0301 = 0), if previously a motor was parameterized from the motor list.

**Note:** Once the Control Unit has been powered up for the first time or if the factory settings have been defined accordingly, the motor type is pre-configured to induction motor (p0300 = 1).

If a motor type has not been selected (p0300 = 0), then the drive commissioning routine cannot be exited.

## p0301[0...n] Motor code number selection / Mot code No. sel

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** C(1, 3) | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 65535 | 0 |

**Description:** The parameter is used to select a motor from a motor parameter list.

When changing the code number (with the exception to the value 0), all of the motor parameters are pre-assigned from the internally available parameter lists.

**Dependency:** Code numbers can only be selected for motor types that correspond to the motor type selected in p0300.

Refer to: p0300

**Note:** The motor code number can only be changed if the matching catalog motor was first selected in p0300.

When selecting a catalog motor (p0300 >= 100), drive commissioning can only be exited if a code number is selected.

If a change is made to a non-catalog motor, then the motor code number should be reset (p0301 = 0).

## p0304[0...n] Rated motor voltage / Mot U_rated

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** C(1, 3) | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6301, 6724 |
| **Min** | **Max** | **Factory setting** |
| 0 [Vrms] | 20000 [Vrms] | 0 [Vrms] |

**Description:** Sets the rated motor voltage (rating plate).

**Notice:** When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

**Note:** When the parameter value is entered the connection type of the motor (star-delta) must be taken into account.

Once the Control Unit has booted for the first time or if the factory settings have been restored, the parameter is pre-assigned to match the power unit.

## p0305[0...n] Rated motor current / Mot I_rated

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** C(1, 3) | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6301 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [Arms] | 10000.00 [Arms] | 0.00 [Arms] |

**Description:** Sets the rated motor current (rating plate).

**Notice:** When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

If p0305 is changed during quick commissioning (p0010 = 1), then the maximum current p0640 is pre-assigned accordingly.

**Note:** When the parameter value is entered the connection type of the motor (star-delta) must be taken into account.

Once the Control Unit has booted for the first time or if the factory settings have been restored, the parameter is pre-assigned to match the power unit.

## p0306[0...n] Number of motors connected in parallel / Motor qty

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** Unsigned8 |
| **Can be changed:** C(1, 3) | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 1 | 50 | 1 |

**Description:** Sets the number (count) of motors that can be operated in parallel using one motor data set.
Depending on the motor number entered, internally an equivalent motor is calculated.
The following should be observed in motors connected in parallel:
Rating plate data should only be entered for one motor: p0305, p0307
The following parameters are also only valid for one motor: p0320, p0341, p0344, p0350 ... p0361
All other motor parameters take into account the replacement/equivalent motor (e.g. r0331, r0333).

**Recommend.:** For motors connected in parallel, external thermal protection should be provided for each individual motor.

**Dependency:** Refer to: r0331, r0370, r0373, r0374, r0376, r0377, r0382

**Caution:** The motors to be connected in parallel must be of the same type and size (same order no. (MLFB)).
The mounting regulations when connecting motors in parallel must be carefully maintained!
The number of motors set must correspond to the number of motors that are actually connected in parallel.
After changing p0306, it is imperative that the control parameters are adapted (e.g. using automatic calculation with p0340 = 1, p3900 > 0).
For induction motors that are connected in parallel, but which are not mechanically coupled with one another, then the following applies:
- an individual motor must not be loaded beyond its stall point.

**Notice:** If p0306 is changed during quick commissioning (p0010 = 1), then the maximum current p0640 is appropriately pre-assigned.

**Note:** Only operation with U/f characteristic makes sense if more than 10 identical motors are connected in parallel.

## p0307[0...n] Rated motor power / Mot P_rated

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** C(1, 3) | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** 14_6 | **Unit selection:** p0100 | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.00 [kW] | 100000.00 [kW] | 0.00 [kW] |

**Description:** Sets the rated motor power (rating plate).

**Dependency:** IECdrives (p0100 = 0): Units kW
NEMA drives (p0100 = 1): Units hp
NEMA drives (p0100 = 2): Unit kW
Refer to: p0100

**Notice:** When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected.
Information in p0300 should be carefully observed when removing write protection.

**Note:** Once the Control Unit has booted for the first time or if the factory settings have been restored, the parameter is pre-assigned to match the power unit.

## p0308[0...n] Rated motor power factor / Mot cos phi rated

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** C(1, 3) | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.000 | 1.000 | 0.000 |

**Description:** Sets the rated motor power factor (cos phi, rating plate).
For a parameter value of 0.000, the power factor is internally calculated and displayed in r0332.

**Dependency:** This parameter is only available for p0100 = 0, 2.
Refer to: p0100, p0309, r0332

**Notice:** When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected.
Information in p0300 should be carefully observed when removing write protection.

**Note:** The parameter is not used for synchronous motors (p0300 = 2xx).

Once the Control Unit has booted for the first time or if the factory settings have been restored, the parameter is pre-assigned to match the power unit.

## p0309[0...n] Rated motor efficiency / Mot eta_rated

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** C(1, 3) | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.0 [%] | 99.9 [%] | 0.0 [%] |

**Description:** Sets the rated motor efficiency (rating plate).

For a parameter value of 0.0, the power factor is internally calculated and displayed in r0332.

**Dependency:** This parameter is only visible for NEMA motors (p0100 = 1, 2).

Refer to: p0100, p0308, r0332

**Note:** The parameter is not used for synchronous motors.

## p0310[0...n] Rated motor frequency / Mot f_rated

PM230
PM240
PM250, PM260

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** C(1, 3) | **Scaling:** - | **Dyn. index:** MDS, p0130 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6301 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [Hz] | 650.00 [Hz] | 0.00 [Hz] |

**Description:** Sets the rated motor frequency (rating plate).

**Dependency:** The number of pole pairs (r0313) is automatically re-calculated when the parameter is changed (together with p0311), if p0314 = 0.

The rated frequency is restricted to values between 1.00 Hz and 650.00 Hz.

Refer to: p0311, r0313, p0314

**Notice:** When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

If p0310 is changed during quick commissioning (p0010 = 1), the maximum speed p1082, which is also associated with quick commissioning, is pre-assigned accordingly.

**Note:** Once the Control Unit has been booted up for the first time or if the factory settings have been defined accordingly, the parameter is defined in accordance with the power unit.

## p0310[0...n] Rated motor frequency / Mot f_rated

PM330

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** C(1, 3) | **Scaling:** - | **Dyn. index:** MDS, p0130 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6301 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [Hz] | 103.00 [Hz] | 0.00 [Hz] |

**Description:** Sets the rated motor frequency (rating plate).

**Dependency:** The number of pole pairs (r0313) is automatically re-calculated when the parameter is changed (together with p0311), if p0314 = 0.

The rated frequency is restricted to values between 1.00 Hz and 100.00 Hz.

Refer to: p0311, r0313, p0314

**Notice:** When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

If p0310 is changed during quick commissioning (p0010 = 1), the maximum speed p1082, which is also associated with quick commissioning, is pre-assigned accordingly.

**Note:** Once the Control Unit has been booted up for the first time or if the factory settings have been defined accordingly, the parameter is defined in accordance with the power unit.

## p0311[0...n] Rated motor speed / Mot n_rated

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** C(1, 3) | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.0 [rpm] | 210000.0 [rpm] | 0.0 [rpm] |

**Description:** Sets the rated motor speed (rating plate).

For p0311 = 0, the rated motor slip of induction motors is internally calculated and displayed in r0330.

It is especially important to correctly enter the rated motor speed for vector control and slip compensation for U/f control.

**Dependency:** If p0311 is changed and for p0314 = 0, the pole pair (r0313) is re-calculated automatically.

Refer to: p0310, r0313, p0314

**Notice:** When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

If p0311 is changed during quick commissioning (p0010 = 1), the maximum speed p1082, which is also associated with quick commissioning, is pre-assigned accordingly.

**Note:** Once the Control Unit has been booted up for the first time or if the factory settings have been defined accordingly, the parameter is defined in accordance with the power unit.

## r0313[0...n] Motor pole pair number, actual (or calculated) / Mot PolePairNo act

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 5300 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the number of motor pole pairs. The value is used for internal calculations.

r0313 = 1: 2-pole motor

r0313 = 2: 4-pole motor, etc.

**Dependency:** For p0314 > 0, the entered value is displayed in r0313.

For p0314 = 0, the pole pair number (r0313) is automatically calculated from the rated power (p0307), rated frequency (p0310) and rated speed (p0311).

Refer to: p0307, p0310, p0311, p0314

**Note:** For the automatic calculation, the pole pair number is set to the value of 2 if the rated speed or the rated frequency is zero.

## p0314[0...n] Motor pole pair number / Mot pole pair No.

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** C(1, 3) | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 255 | 0 |

**Description:** Sets the motor pole pair number.

p0314 = 1: 2-pole motor

p0314 = 2: 4-pole motor, etc.

**Dependency:** For p0314 = 0, the pole pair number is automatically calculated from the rated frequency (p0310) and the rated speed (p0311) and displayed in r0313.

**Notice:** If p0314 is changed during quick commissioning (p0010 = 1), the maximum speed p1082, which is also associated with quick commissioning, is pre-assigned accordingly.

For induction motors, the value need only be input if the rated data of a generator is entered therefore resulting in a negative rated slip. In this case, the number of pole pairs in r0313 is too low by 1 and must be manually corrected.

## p0316[0...n] Motor torque constant / Mot kT

PM230
PM240
PM250, PM260

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** C(1, 3), U, T | **Scaling:** - | **Dyn. index:** MDS, p0130 |
| **Units group:** 28_1 | **Unit selection:** p0100 | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.00 [Nm/A] | 400.00 [Nm/A] | 0.00 [Nm/A] |

**Description:** Sets the torque constant of the synchronous motor.
p0316 = 0:
The torque constant is calculated from the motor data.
p0316 > 0:
The selected value is used as torque constant.

**Notice:** When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

**Note:** This parameter is not used for induction motors (p0300 = 1xx).

## p0320[0...n] Motor rated magnetizing current/short-circuit current / Mot I_mag_rated

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** C(3), U, T | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.000 [Arms] | 5000.000 [Arms] | 0.000 [Arms] |

**Description:** Induction motors:
Sets the rated motor magnetizing current.
For p0320 = 0.000 the magnetizing current is internally calculated and displayed in r0331.
Synchronous motors:
Sets the rated motor short-circuit current.

**Notice:** When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

**Note:** The magnetizing current p0320 for induction motors is reset when quick commissioning is exited with p3900 > 0.
If, for induction motors, the magnetizing current p0320 is changed outside the commissioning phase (p0010 > 0), then the magnetizing inductance p0360 is changed so that the EMF r0337 remains constant.

## p0322[0...n] Maximum motor speed / Mot n_max

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** C(1, 3) | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.0 [rpm] | 210000.0 [rpm] | 0.0 [rpm] |

**Description:** Sets the maximum motor speed.

**Dependency:** Refer to: p1082

**Notice:** When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.
If p0322 is changed during quick commissioning (p0010 = 1), the maximum speed p1082, which is also associated with quick commissioning, is pre-assigned accordingly.

**Note:** The parameter has no significance for a value of p0322 = 0.

## p0323[0...n] Maximum motor current / Mot I_max

PM230
PM240
PM250, PM260

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** C(1, 3) | **Scaling:** - | **Dyn. index:** MDS, p0130 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.00 [Arms] | 20000.00 [Arms] | 0.00 [Arms] |

**Description:** Sets the maximum permissible motor current (e.g. de-magnetizing current for synchronous motors).

**Notice:** When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

If p0323 is changed during quick commissioning (p0010 = 1), then the maximum current p0640 is pre-assigned accordingly.

**Note:** The parameter has no effect for induction motors.

The parameter has not effect for synchronous motors if a value of 0.0 is entered. The user-selectable current limit is entered into p0640.

## p0325[0...n] Motor pole position identification current 1st phase / Mot PolID I 1st ph

| | | | |
|---|---|---|---|
| PM230 | **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| PM240 | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** MDS, p0130 |
| PM250, PM260 | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | 0.000 [Arms] | 10000.000 [Arms] | 0.000 [Arms] |

**Description:** Sets the current for the 1st phase of the two-stage technique for pole position identification routine.

The current of the 2nd phase is set in p0329.

The two-stage technique is selected with p1980 = 4.

**Dependency:** Refer to: p0329, p1980

**Notice:** When the motor code (p0301) is changed, it is possible that p0325 is not pre-assigned.

p0325 can be pre-assigned using p0340 = 3.

**Note:** The value is automatically pre-assigned for the following events:

- For p0325 = 0 and automatic calculation of the closed-loop control parameters (p0340 = 1, 2, 3).
- for quick commissioning (p3900 = 1, 2, 3).

## p0327[0...n] Optimum motor load angle / Mot phi_load opt

| | | | |
|---|---|---|---|
| PM230 | **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| PM240 | **Can be changed:** C(3), U, T | **Scaling:** - | **Dyn. index:** MDS, p0130 |
| PM250, PM260 | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | 0.0 [°] | 135.0 [°] | 90.0 [°] |

**Description:** Sets the optimum load angle for synchronous motors with reluctance torque.

The load angle is measured at the rated motor current.

**Notice:** When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

**Note:** This parameter has no significance for induction motors.

For synchronous motors without reluctance torque, a angle of 90 degrees must be set.

When quick commissioning is exited with p3900 > 0, then the parameter is reset if a catalog motor has not been selected (p0300).

## p0328[0...n] Motor reluctance torque constant / Mot kT_reluctance

| | | | |
|---|---|---|---|
| PM230 | **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| PM240 | **Can be changed:** C(3), U, T | **Scaling:** - | **Dyn. index:** MDS, p0130 |
| PM250, PM260 | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | -1000.00 [mH] | 1000.00 [mH] | 0.00 [mH] |

**Description:** Sets the reluctance torque constant for synchronous motors with reluctance torque (e.g. 1FE ... motors).

This parameter has no significance for induction motors.

**Notice:** When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

**Note:** For synchronous motors without reluctance torque, the value 0 must be set.

## p0329[0...n] Motor pole position identification current / Mot PolID current

PM230
PM240
PM250, PM260

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** C(3), U, T | **Scaling:** - | **Dyn. index:** MDS, p0130 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.00 [Arms] | 10000.00 [Arms] | 0.00 [Arms] |

**Description:** Sets the current for the pole position identification routine (p1980 = 1).
For a two-stage technique (p1980 = 4) , the current is set for the 2nd phase.
The current for the 1st phase is set in p0325.

**Dependency:** The following applies for vector drives:
If a maximum current (p0323) was not parameterized, then p0329 is limited to the rated motor current.
Refer to: p0325, p1980

**Notice:** When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

## r0330[0...n] Rated motor slip / Mot slip_rated

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - [Hz] | - [Hz] | - [Hz] |

**Description:** Displays the rated motor slip.

**Dependency:** The rated slip is calculated from the rated frequency, rated speed and number of pole pairs.
Refer to: p0310, p0311, r0313

**Note:** The parameter is not used for synchronous motors (p0300 = 2xx).

## r0331[0...n] Actual motor magnetizing current/short-circuit current / Mot I_mag_rtd act

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6722 |
| **Min** | **Max** | **Factory setting** |
| - [Arms] | - [Arms] | - [Arms] |

**Description:** Induction motor:
Displays the rated magnetizing current from p0320.
For p0320 = 0, the internally calculated magnetizing current is displayed.
Synchronous motor:
Displays the rated short-circuit current from p0320.

**Dependency:** If p0320 was not entered, then the parameter is calculated from the rating plate parameters.

## r0332[0...n] Rated motor power factor / Mot cos phi rated

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the rated power factor for induction motors.
For IEC motors, the following applies (p0100 = 0):
For p0308 = 0, the internally-calculated power factor is displayed.
For p0308 > 0, this value is displayed.
For NEMA motors, the following applies (p0100 = 1, 2):
For p0309 = 0, the internally-calculated power factor is displayed.
For p0309 > 0, this value is converted into the power factor and displayed.

**Dependency:** If p0308 is not entered, the parameter is calculated from the rating plate parameters.

**Note:** The parameter is not used for synchronous motors (p0300 = 2xx).

## r0333[0...n] Rated motor torque / Mot M_rated

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** 7_4 | **Unit selection:** p0100 | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - [Nm] | - [Nm] | - [Nm] |

**Description:** Displays the rated motor torque.

**Dependency:** IEC drives (p0100 = 0): unit Nm

NEMA drives (p0100 = 1): unit lbf ft

**Note:** For induction motors, r0333 is calculated from p0307 and p0311.

For synchronous motors, r0333 is calculated from p0305, p0316, p0327 and p0328.

## p0335[0...n] Motor cooling type / Mot cool type

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** C(1, 3), T | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 128 | 0 |

**Description:** Sets the motor cooling system used.

**Value:**
0: Non-ventilated
1: Forced cooling
2: Liquid cooling
128: No fan

**Dependency:** For 1LA7 motors (p0300), the parameter is pre-set as a function of p0307 and p0311.

**Notice:** When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

**Note:** The parameter influences the thermal 3-mass motor model.

1LA7 motors, frame size 56 are operated without fan.

## r0337[0...n] Rated motor EMF / Mot EMF_rated

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - [Vrms] | - [Vrms] | - [Vrms] |

**Description:** Displays the rated EMF of the motor.

**Note:** EMF: Electromotive force

## p0340[0...n] Automatic calculation motor/control parameters / Calc auto par

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** C(3), T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 5 | 0 |

**Description:** Setting to automatically calculate motor parameters and U/f open-loop and closed-loop control parameters from the rating plate data.

**Value:**
0: No calculation
1: Complete calculation
2: Calculation of equivalent circuit diagram parameters
3: Calculation of closed-loop control parameters
4: Calculation of controller parameters
5: Calculation of technological limits and threshold values

**Notice:** After the value has been modified, no further parameter modifications can be made and the status is shown in r3996. Modifications can be made again when r3996 = 0.

The following parameters are influenced using p0340:

p0340 = 1:

--> All of the parameters influenced for p0340 = 2, 3, 4, 5

--> p0341, p0342, p0344, p0612, p0640, p1082, p1231, p1232, p1333, p1349, p1611, p1654, p1726, p1825, p1828 ... p1832, p1909, p1959, p2000, p2001, p2002, p2003, p3927, p3928

p0340 = 2:

--> p0350, p0354 ... p0360

--> p0625 (matching p0350), p0626 ... p0628

p0340 = 3:

--> All of the parameters influenced for p0340 = 4, 5

--> p0346, p0347, p0622, p1320 ... p1327, p1582, p1584, p1616, p1755, p1756, p2178

p0340 = 4:

--> p1290, p1292, p1293, p1338, p1339, p1340, p1341, p1345, p1346, p1461, p1463, p1464, p1465, p1470, p1472, p1703, p1715, p1717, p1740, p1756, p1764, p1767, p1780, p1781, p1783, p1785, p1786, p1795

p0340 = 5:

--> p1037, p1038, p1520, p1521, p1530, p1531, p1570, p1580, p1574, p1802, p1803, p2140, p2142, p2148, p2150, p2161, p2162, p2163, p2164, p2170, p2175, p2177, p2194, p2390, p2392, p2393

**Note:** p0340 = 1 contains the calculations of p0340 = 2, 3, 4, 5.

p0340 = 2 calculates the motor parameters (p0350 ... p0360).

p0340 = 3 contains the calculations of p0340 = 4, 5.

p0340 = 4 only calculates the controller parameters.

p0340 = 5 only calculates the controller limits.

When quick commissioning is exited using p3900 > 0, p0340 is automatically set to 1.

At the end of the calculations, p0340 is automatically set to 0.

## p0341[0...n] Motor moment of inertia / Mot M_mom of inert

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1 | **Data type:** FloatingPoint32 |
| **Can be changed:** C(3), U, T | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** 25_1 | **Unit selection:** p0100 | **Func. diagram:** 5042, 5210, 6020, 6030, 6031 |
| **Min** | **Max** | **Factory setting** |
| 0.000000 [kgm²] | 100000.000000 [kgm²] | 0.000000 [kgm²] |

**Description:** Sets the motor moment of inertia (without load).

**Dependency:** IEC drives (p0100 = 0): unit kg m^2

NEMA drives (p0100 = 1): unit lb ft^2

The parameter value is included, together with p0342, in the rated starting time of the motor.

Refer to: p0342, r0345

**Notice:** When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

**Note:** The product of p0341 * p0342 is used when the speed controller (p0340 = 4) is calculated automatically.

## p0342[0...n] Ratio between the total and motor moment of inertia / Mot MomInert Ratio

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1 | **Data type:** FloatingPoint32 |
| **Can be changed:** C(3), U, T | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 5042, 5210, 6020, 6030, 6031 |
| **Min** | **Max** | **Factory setting** |
| 1.000 | 10000.000 | 1.000 |

**Description:** Sets the ratio between the total moment of inertia/mass (load + motor) and the intrinsic motor moment of inertia/mass (no load).

**Dependency:** This means that together with p0341, the rated starting (accelerating time) of the motor is calculated for a vector drive.

Refer to: p0341, r0345

**Note:** The product of p0341 * p0342 is used when the speed controller (p0340 = 4) is calculated automatically.

## r0343[0...n] Rated motor current identified / Mot I_rated ident

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.00 [Arms] | 10000.00 [Arms] | - [Arms] |

**Description:** Displays the identified rated motor current.

## p0344[0...n] Motor weight (for the thermal motor model) / Mot weight th mod

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1 | **Data type:** FloatingPoint32 |
| **Can be changed:** C(3), T | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** 27_1 | **Unit selection:** p0100 | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.0 [kg] | 50000.0 [kg] | 0.0 [kg] |

**Description:** Sets the motor weight.

**Dependency:** IEC drives (p0100 = 0): unit kg

NEMA drives (p0100 = 1): unit lb

**Notice:** When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

**Note:** The parameter influences the thermal 3 mass model of the induction motor.

The parameter is not used for synchronous motors (p0300 = 2xx).

## r0345[0...n] Nominal motor starting time / Mot t_start_rated

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - [s] | - [s] | - [s] |

**Description:** Displays the rated motor starting time.

This time corresponds to the time from standstill up to reaching the motor rated speed and the acceleration with motor rated torque (r0333).

**Dependency:** Refer to: r0313, r0333, p0341, p0342

## p0346[0...n] Motor excitation build-up time / Mot t_excitation

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3 | **Data type:** FloatingPoint32 |
| **Can be changed:** C(3), U, T | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.000 [s] | 20.000 [s] | 0.000 [s] |

**Description:** Sets the excitation build-up time of the motor.

This involves the delay time between enabling the pulses and enabling the ramp-function generator. The induction motor is magnetized during this time.

**Caution:** If there is insufficient magnetization under load or if the acceleration rate is too high, then an induction motor can stall (refer to the note).

**Note:** The parameter is calculated using p0340 = 1, 3.

For induction motors, the result depends on the rotor time constant (r0384). If this time is excessively reduced, this can result in an inadequate magnetizing of the induction motor. This is the case if the current limit is reached while building up magnetizing. For induction motors, the parameter cannot be set to 0 s (internal limit: 0.1 * r0384).

For permanent-magnet synchronous motors and vector control, the value depends on the stator time constant (r0386). Here, it defines the time to establish the current for encoderless operation immediately after the pulses have been enabled.

## p0347[0...n] Motor de-excitation time / Mot t_de-excitat

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3 | **Data type:** FloatingPoint32 |
| **Can be changed:** C(3), U, T | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.000 [s] | 20.000 [s] | 0.000 [s] |

**Description:** Sets the de-magnetizing time (for induction motors) after the inverter pulses have been canceled.

The inverter pulses cannot be switched in (enabled) within this delay time.

**Note:** The parameter is calculated using p0340 = 1, 3.

For induction motors, the result depends on the rotor time constant (r0384).

if this time is shortened too much, then this can result in an inadequate de-magnetizing of the induction motor and in an overcurrent condition when the pulses are subsequently enabled (only when the flying restart function is activated and the motor is rotating).

## p0350[0...n] Motor stator resistance cold / Mot R_stator cold

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,2 | **Data type:** FloatingPoint32 |
| **Can be changed:** C(3), U, T | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.00000 [ohm] | 2000.00000 [ohm] | 0.00000 [ohm] |

**Description:** Sets the stator resistance of the motor at ambient temperature p0625 (phase value).

**Dependency:** Refer to: p0625, r1912

**Notice:** When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

**Note:** The motor identification routine determines the stator resistance from the total stator resistance minus the cable resistance (p0352).

## p0352[0...n] Cable resistance / R_cable

PM230
PM240
PM250, PM260

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** C(3), U, T | **Scaling:** - | **Dyn. index:** MDS, p0130 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.00000 [ohm] | 120.00000 [ohm] | 0.00000 [ohm] |

**Description:** Resistance of the power cable between the power unit and motor.

**Caution:** The cable resistance should be entered prior to motor data identification. If it is used subsequently, the difference by which p0352 was changed must be subtracted from the stator resistance p0350 or motor data identification must be repeated.

**Note:** The parameter influences the temperature adaptation of the stator resistance.

The motor identification sets the cable resistance to 20% of the measured total resistance if p0352 is zero at the time that the measurement is made. If p0352 is not zero, then the value is subtracted from the measured total stator resistance to calculate stator resistance p0350. In this case, p0350 is a minimum of 10% of the measured value.

The cable resistance is reset when quick commissioning is exited with p3900 > 0.

## p0352[0...n] Cable resistance / R_cable

PM330

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** C(3), U, T | **Scaling:** - | **Dyn. index:** MDS, p0130 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.00000 [ohm] | 120.00000 [ohm] | 0.00000 [ohm] |

**Description:** Resistance of the power cable between the power unit and motor.

**Caution:** The cable resistance should be entered prior to motor data identification. If it is used subsequently, the difference by which p0352 was changed must be subtracted from the stator resistance p0350 or motor data identification must be repeated.

The difference with which p0352 was manually changed, must also be subtracted from reference parameter p0629 of the Rs measurement.

**Note:** The parameter influences the temperature adaptation of the stator resistance.

The motor identification sets the cable resistance to 20% of the measured total resistance if p0352 is zero at the time that the measurement is made. If p0352 is not zero, then the value is subtracted from the measured total stator resistance to calculate stator resistance p0350. In this case, p0350 is a minimum of 10% of the measured value.

The cable resistance is reset when quick commissioning is exited with p3900 > 0.

## p0354[0...n] Motor rotor resistance cold / Mot R_r cold

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,2 | **Data type:** FloatingPoint32 |
| **Can be changed:** C(3), U, T | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6727 |
| **Min** | **Max** | **Factory setting** |
| 0.00000 [ohm] | 300.00000 [ohm] | 0.00000 [ohm] |

**Description:** Sets the rotor/secondary section resistance of the motor at the ambient temperature p0625.

This parameter value is automatically calculated using the motor model (p0340 = 1, 2) or using the motor data identification routine (p1910).

**Dependency:** Refer to: p0625

**Notice:** When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

**Note:** The parameter is not used for synchronous motors (p0300 = 2).

## p0356[0...n] Motor stator leakage inductance / Mot L_stator leak.

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,2 | **Data type:** FloatingPoint32 |
| **Can be changed:** C(3), U, T | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.00000 [mH] | 1000.00000 [mH] | 0.00000 [mH] |

**Description:** Induction machine: sets the stator leakage inductance of the motor.

Synchronous motor: Sets the stator quadrature axis inductance of the motor.

This parameter value is automatically calculated using the motor model (p0340 = 1, 2) or using the motor identification routine (p1910).

**Notice:** When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

**Note:** If the stator leakage inductance (p0356) for induction motors is changed outside the commissioning phase (p0010 > 0), the magnetizing inductance (p0360) is automatically adapted to the new EMF (r0337). You are then advised to repeat the measurement for the saturation characteristic (p1960).

For permanent-magnet synchronous motors (p0300 = 2), this is the non-saturated value and is, therefore, ideal for a low current.

## p0357[0...n] Motor stator inductance d axis / Mot L_stator d

PM230
PM240
PM250, PM260

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,2 | **Data type:** FloatingPoint32 |
| **Can be changed:** C(3), U, T | **Scaling:** - | **Dyn. index:** MDS, p0130 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.00000 [mH] | 1000.00000 [mH] | 0.00000 [mH] |

**Description:** Sets the stator direct-axis inductance of the synchronous motor.

This parameter value is automatically calculated using the motor model (p0340 = 1, 2) or using the motor identification routine (p1910).

**Note:** For permanent-magnet synchronous motors (p0300 = 2), this is the non-saturated value and is ideal for a low current.

## p0358[0...n] Motor rotor leakage inductance / Mot L_rot leak

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,2 | **Data type:** FloatingPoint32 |
| **Can be changed:** C(3), U, T | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6727 |
| **Min** | **Max** | **Factory setting** |
| 0.00000 [mH] | 1000.00000 [mH] | 0.00000 [mH] |

**Description:** Sets the rotor/secondary section leakage inductance of the motor.

The value is automatically calculated using the motor model (p0340 = 1, 2) or using the motor identification routine (p1910).

**Notice:** When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

**Note:** If the rotor leakage inductance (p0358) for induction motors is changed outside the commissioning phase (p0010 > 0), then the magnetizing inductance (p0360) is automatically adapted to the new EMF (r0337). You are then advised to repeat the measurement for the saturation characteristic (p1960).

## p0360[0...n] Motor magnetizing inductance / Mot Lh

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,2 | **Data type:** FloatingPoint32 |
| **Can be changed:** C(3), U, T | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6727 |
| **Min** | **Max** | **Factory setting** |
| 0.00000 [mH] | 10000.00000 [mH] | 0.00000 [mH] |

**Description:** Sets the magnetizing inductance of the motor.

This parameter value is automatically calculated using the motor model (p0340 = 1, 2) or using the motor identification routine (p1910).

**Notice:** When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

**Note:** The parameter is not used for synchronous motors (p0300 = 2).

## p0362[0...n] Motor saturation characteristic flux 1 / Mot saturat.flux 1

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** C(3), U, T | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6723, 6726 |
| **Min** | **Max** | **Factory setting** |
| 10.0 [%] | 800.0 [%] | 60.0 [%] |

**Description:** The saturation characteristics (flux as a function of the magnetizing current) is defined using 4 points.

This parameter specifies the y coordinate (flux) for the 1st value pair of the characteristic.

Sets the first flux value of the saturation characteristic as a [%] referred to the rated motor flux (100 %).

**Dependency:** The following applies for the flux values:

p0362 < p0363 < p0364 < p0365

Refer to: p0366

**Note:** For induction motors, p0362 = 100 % corresponds to the rated motor flux.

When quick commissioning is exited with p3900 > 0, then the parameter is reset if a catalog motor has not been selected (p0300).

## p0363[0...n] Motor saturation characteristic flux 2 / Mot saturat.flux 2

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** C(3), U, T | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6723, 6726 |
| **Min** | **Max** | **Factory setting** |
| 10.0 [%] | 800.0 [%] | 85.0 [%] |

**Description:** The saturation characteristics (flux as a function of the magnetizing current) is defined using 4 points.

This parameter specifies the y coordinate (flux) for the 2nd value pair of the characteristic.

Sets the second flux value of the saturation characteristic as a [%] referred to the rated motor flux (100 %).

**Dependency:** The following applies for the flux values:

p0362 < p0363 < p0364 < p0365

Refer to: p0367

**Note:** For induction motors, p0363 = 100 % corresponds to the rated motor flux.

When quick commissioning is exited with p3900 > 0, then the parameter is reset if a catalog motor has not been selected (p0300).

## p0364[0...n] Motor saturation characteristic flux 3 / Mot saturat.flux 3

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** C(3), U, T | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6723, 6726 |
| **Min** | **Max** | **Factory setting** |
| 10.0 [%] | 800.0 [%] | 115.0 [%] |

**Description:** The saturation characteristics (flux as a function of the magnetizing current) is defined using 4 points.

This parameter specifies the y coordinate (flux) for the 3rd value pair of the characteristic.

Sets the third flux value of the saturation characteristic as a [%] referred to the rated motor flux (100 %).

**Dependency:** The following applies for the flux values:

p0362 < p0363 < p0364 < p0365

Refer to: p0368

**Note:** For induction motors, p0364 = 100 % corresponds to the rated motor flux.

When quick commissioning is exited with p3900 > 0, then the parameter is reset if a catalog motor has not been selected (p0300).

## p0365[0...n] Motor saturation characteristic flux 4 / Mot saturat.flux 4

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** C(3), U, T | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6723, 6726 |
| **Min** | **Max** | **Factory setting** |
| 10.0 [%] | 800.0 [%] | 125.0 [%] |

**Description:** The saturation characteristics (flux as a function of the magnetizing current) is defined using 4 points.

This parameter specifies the y coordinate (flux) for the 4th value pair of the characteristic.

Sets the fourth flux value of the saturation characteristic as a [%] referred to the rated motor flux (100 %).

**Dependency:** The following applies for the flux values:

p0362 < p0363 < p0364 < p0365

Refer to: p0369

**Note:** For induction motors, p0365 = 100 % corresponds to the rated motor flux.

When quick commissioning is exited with p3900 > 0, then the parameter is reset if a catalog motor has not been selected (p0300).

## p0366[0...n] Motor saturation characteristic I_mag 1 / Mot sat. I_mag 1

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** C(3), U, T | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6723, 6726 |
| **Min** | **Max** | **Factory setting** |
| 5.0 [%] | 800.0 [%] | 50.0 [%] |

**Description:** The saturation characteristics (flux as a function of the magnetizing current) is defined using 4 points.

This parameter specifies the x coordinate (magnetizing current) for the 1st value pair of the characteristic.

Sets the first magnetization current of the saturation characteristic in [%] with reference to the rated magnetization current (r0331).

**Dependency:** The following applies for the magnetizing currents:

p0366 < p0367 < p0368 < p0369

Refer to: p0362

**Note:** When quick commissioning is exited with p3900 > 0, then the parameter is reset if a catalog motor has not been selected (p0300).

## p0367[0...n] Motor saturation characteristic I_mag 2 / Mot sat. I_mag 2

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** C(3), U, T | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6723, 6726 |
| **Min** | **Max** | **Factory setting** |
| 5.0 [%] | 800.0 [%] | 75.0 [%] |

**Description:** The saturation characteristics (flux as a function of the magnetizing current) is defined using 4 points.

This parameter specifies the x coordinate (magnetizing current) for the 2nd value pair of the characteristic.

Sets the second magnetization current of the saturation characteristic in [%] with reference to the rated magnetization current (r0331).

**Dependency:** The following applies for the magnetizing currents:

p0366 < p0367 < p0368 < p0369

Refer to: p0363

**Note:** When quick commissioning is exited with p3900 > 0, then the parameter is reset if a catalog motor has not been selected (p0300).

## p0368[0...n] Motor saturation characteristic I_mag 3 / Mot sat. I_mag 3

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** C(3), U, T | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6723, 6726 |
| **Min** | **Max** | **Factory setting** |
| 5.0 [%] | 800.0 [%] | 150.0 [%] |

**Description:** The saturation characteristics (flux as a function of the magnetizing current) is defined using 4 points.

This parameter specifies the x coordinate (magnetizing current) for the 3rd value pair of the characteristic.

Sets the third magnetization current of the saturation characteristic in [%] with reference to the rated magnetization current (r0331).

**Dependency:** The following applies for the magnetizing currents:

p0366 < p0367 < p0368 < p0369

Refer to: p0364

**Note:** When quick commissioning is exited with p3900 > 0, then the parameter is reset if a catalog motor has not been selected (p0300).

## p0369[0...n] Motor saturation characteristic I_mag 4 / Mot sat. I_mag 4

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** C(3), U, T | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6723, 6726 |
| **Min** | **Max** | **Factory setting** |
| 5.0 [%] | 800.0 [%] | 210.0 [%] |

**Description:** The saturation characteristics (flux as a function of the magnetizing current) is defined using 4 points.

This parameter specifies the x coordinate (magnetizing current) for the 4th value pair of the characteristic.

Sets the fourth magnetization current of the saturation characteristic in [%] with reference to the rated magnetization current (r0331).

**Dependency:** The following applies for the magnetizing currents:

p0366 < p0367 < p0368 < p0369

Refer to: p0365

**Note:** When quick commissioning is exited with p3900 > 0, then the parameter is reset if a catalog motor has not been selected (p0300).

## r0370[0...n] Motor stator resistance cold / Mot R_stator cold

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - [ohm] | - [ohm] | - [ohm] |

**Description:** Displays the motor stator resistance at an ambient temperature (p0625).
The value does not include the cable resistance.

**Dependency:** Refer to: p0625

## r0372[0...n] Cable resistance / Mot R_cable

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - [ohm] | - [ohm] | - [ohm] |

**Description:** Displays the total cable resistance between power unit and motor, as well as the internal converter resistance.

**Dependency:** Refer to: r0238, p0352

## r0373[0...n] Motor rated stator resistance / Mot R_stator rated

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - [ohm] | - [ohm] | - [ohm] |

**Description:** Displays the rated motor stator resistance at rated temperature (total of p0625 and p0627).

**Dependency:** Refer to: p0627

**Note:** The parameter is not used for synchronous motors (p0300 = 2xx).

## r0374[0...n] Motor rotor resistance cold / Mot R_r cold

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - [ohm] | - [ohm] | - [ohm] |

**Description:** Displays the motor rotor resistance at an ambient temperature p0625.

**Dependency:** Refer to: p0625

**Note:** The parameter is not used for synchronous motors (p0300 = 2xx).

## r0376[0...n] Rated motor rotor resistance / Mot rated R_rotor

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - [ohm] | - [ohm] | - [ohm] |

**Description:** Displays the nominal rotor resistance of the motor at the rated temperature.
The rated temperature is the sum of p0625 and p0628.

**Dependency:** Refer to: p0628

**Note:** The parameter is not used for synchronous motors (p0300 = 2xx).

## r0377[0...n] Motor leakage inductance total / Mot L_leak total

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - [mH] | - [mH] | - [mH] |

**Description:** Displays the stator leakage inductance of the motor including the motor reactor (p0233).

## r0382[0...n] Motor magnetizing inductance transformed / Mot L_magn transf

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - [mH] | - [mH] | - [mH] |

**Description:** Displays the magnetizing inductance of the motor.

**Note:** The parameter is not used for synchronous motors (p0300 = 2xx).

## r0384[0...n] Motor rotor time constant / damping time constant d axis / Mot T_rotor/T_Dd

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6722 |
| **Min** | **Max** | **Factory setting** |
| - [ms] | - [ms] | - [ms] |

**Description:** Displays the rotor time constant.

**Note:** The parameter is not used for synchronous motors.

The value is calculated from the total of the inductances on the rotor side (p0358, p0360) divided by the rotor resistance (p0354). The temperature adaptation of the rotor resistance for induction motors is not taken into account.

## r0386[0...n] Motor stator leakage time constant / Mot T_stator leak

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - [ms] | - [ms] | - [ms] |

**Description:** Displays the stator leakage time constant.

**Note:** The value is calculated from the total of all leakage inductances (p0233, p0356, p0358) divided by the total of all motor resistances (p0350, p0352, p0354). The temperature adaptation of the resistances is not taken into account.

## r0395[0...n] Actual stator resistance / R_stator act

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - [ohm] | - [ohm] | - [ohm] |

**Description:** Displays the actual stator resistance (phase value).

The parameter value also contains the temperature-independent cable resistance.

**Dependency:** In the case of induction motors the parameter is also affected by the motor temperature model.

Refer to: p0350, p0352, p0620

**Note:** In each case, only the stator resistance of the active Motor Data Set is included with the stator temperature of the thermal motor model.

## r0396[0...n] Actual rotor resistance / R_rotor act

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6730 |
| **Min** | **Max** | **Factory setting** |
| - [ohm] | - [ohm] | - [ohm] |

**Description:** Displays the actual rotor resistance (phase value).

The parameter is affected by the motor temperature model.

**Dependency:** Refer to: p0354, p0620

**Note:** In each case, only the rotor resistance of the active Motor Data Set is included with the rotor temperature of the thermal motor model.

This parameter is not used for synchronous motors (p0300 = 2xx).

## p0500 Technology application / Tec application

PM230

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** C(1, 5), T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 3 | 3 | 3 |

**Description:** Sets the technology application.

The parameter influences the calculation of open-loop and closed-loop control parameters that is e.g. initiated using p0340 = 5.

**Value:** 3: Pumps and fans, efficiency optimization

**Notice:** If the technological application is set to p0500 = 0 ... 3 during commissioning (p0010 = 1, 5, 30), the operating mode (p1300) is pre-set accordingly.

**Note:** The calculation of parameters dependent on the technology application can be called up as follows:

- when exiting quick commissioning using p3900 > 0
- when writing p0340 = 1, 3, 5

For p0500 = 3 and when the calculation is initiated, the following parameters are set:

- p1574 = 2 V
- p1580 = 80 % (efficiency optimization)
- p1750.2 = 1: Encoderless control of the induction motor is effective down to zero frequency.
- p1802 = 10 (SVM/FLB with overmodulation and modulation depth reduction over 57 Hz)
- p1803 = 115 %

## p0500 Technology application / Tec application

PM240
PM250, PM260

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** C(1, 5), T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 3 | 0 |

**Description:** Sets the technology application.

The parameter influences the calculation of open-loop and closed-loop control parameters that is e.g. initiated using p0340 = 5.

**Value:**
0: Standard drive
1: Pumps and fans
2: Sensorless closed-loop control down to f = 0 (passive loads)
3: Pumps and fans, efficiency optimization

**Notice:** If the technological application is set to p0500 = 0 ... 3 during commissioning (p0010 = 1, 5, 30), the operating mode (p1300) is pre-set accordingly.

**Note:** The calculation of parameters dependent on the technology application can be called up as follows:

- when exiting quick commissioning using p3900 > 0
- when writing p0340 = 1, 3, 5

For p0500 = 0, 5 and when the calculation is initiated, the following parameters are set:

- p1574 = 10 V
- p1611 = 80 % (only p0500 = 5)
- p1750.2 = 0
- p1802 = 4 (SVM/FLB without overcontrol) (PM240: p1802 = 0, PM260: p1802 = 2)
- p1803 = 106 % (PM260: p1803 = 103 %)

For p0500 = 1 and when the calculation is initiated, the following parameters are set:

- p1574 = 2 V
- p1750.2 = 0
- p1802 = 4 (SVM/FLB without overcontrol) (PM240: p1802 = 0)
- p1803 = 106 % (PM260: p1803 = 103 %)

For p0500 = 2 and when the calculation is initiated, the following parameters are set:

- p1574 = 2 V (separately-excited synchronous motor: 4 V)
- p1750.2 = 1
- p1802 = 4 (SVM/FLB without overcontrol) (PM240: p1802 = 0)
- p1803 = 106 % (PM260: p1803 = 103 %)

For p0500 = 3 and when the calculation is initiated, the following parameters are set:

- p1574 = 2 V
- p1750.2 = 1
- p1802 = 4 (SVM/FLB without overcontrol) (PM240: p1802 = 0)
- p1803 = 106 % (PM260: p1803 = 103 %)

Re p1750:

The setting of p1750 is only relevant for induction motors.

p1750.2 = 1: Encoderless control of the induction motor is effective down to zero frequency.

This operating mode is possible for passive loads. These include applications where the load does not generate regenerative torque when breaking away and the motor comes to a standstill (zero speed) itself when the pulses are inhibited.

Re p1802 / p1803:

p1802 and p1803 are only changed, in all cases, if a sine-wave output filter (p0230 = 3, 4) has not been selected.

## p0500 Technology application / Tec application

PM330

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** C(1, 5), T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 1 | 3 | 3 |

**Description:** Sets the technology application.

The parameter influences the calculation of open-loop and closed-loop control parameters that is e.g. initiated using p0340 = 5.

**Value:**
1: Pumps and fans
3: Pumps and fans, efficiency optimization

**Notice:** If the technological application is set to p0500 = 0 ... 3 during commissioning (p0010 = 1, 5, 30), the operating mode (p1300) is pre-set accordingly.

**Note:** The calculation of parameters dependent on the technology application can be called up as follows:

- when exiting quick commissioning using p3900 > 0
- when writing p0340 = 1, 3, 5

For p0500 = 1 and when the calculation is initiated, the following parameters are set:

- p1570 = 100 %
- p1580 = 0 % (no efficiency optimization)
- p1574 = 2 V
- p1750.2 = 0
- p1802 = 9 or 19 (optimized pulse pattern for p0300 = 14 )
- p1803 = 106 %

For p0500 = 3 and when the calculation is initiated, the following parameters are set:
- p1570 = 103 % (flux boost for full load)
- p1580 = 100 % (efficiency optimization)
- p1574 = 2 V
- p1750.2 = 1: Encoderless control of the induction motor is effective down to zero frequency.
- p1802 = 9 or 19 (optimized pulse pattern for p0300 = 14 )
- p1803 = 106 %

## p0505 Selecting the system of units / Unit sys select

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** C(5) | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 1 | 4 | 1 |

**Description:** Sets the actual system of units.

**Value:**
1: SI system of units
2: System of units referred/SI
3: US system of units
4: System of units referred/US

**Dependency:** The parameter can only be changed in an offline project using the commissioning software.

**Caution:** If a per unit representation is selected and if the reference parameters (e.g. p2000) are subsequently changed, then the physical significance of several control parameters is also adapted at the same time. As a consequence, the control behavior can change (see p1576, p1621, p1744, p1752, p1755 and p1609, p1612, p1619, p1620).

**Note:** Reference parameter for the unit system % are, for example, p2000 ... p2004. Depending on what has been selected, these are displayed using either SI or US units.

## p0573 Inhibit automatic reference value calculation / Inhibit calc

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 1 | 0 |

**Description:** Setting to inhibit the calculation of reference parameters (e.g. p2000) when automatically calculating the motor and closed-loop control parameters (p0340, p3900).

**Value:**
0: No
1: Yes

**Notice:** The inhibit for the reference value calculation is canceled when new motor parameters (e.g. p0305) are entered and only one drive data set exists (p0180 = 1). This is the case during initial commissioning.

Once the motor and control parameters have been calculated (p0340, p3900), the inhibit for the reference value calculation is automatically re-activated.

**Note:** If value = 0:

The automatic calculation (p0340, p3900) overwrites the reference parameters.

If value = 1:

The automatic calculation (p0340, p3900) does not overwrite the reference parameters.

## p0595 Technological unit selection / Tech unit select

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** C(5) | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 1 | 46 | 1 |

**Description:** Selects the units for the parameters of the technology controller.

For p0595 = 1, 2, the reference quantity set in p0596 is not active.

**Value:**
1: %
2: 1 referred no dimensions
3: bar

4: °C
5: Pa
6: ltr/s
7: m³/s
8: ltr/min
9: m³/min
10: ltr/h
11: m³/h
12: kg/s
13: kg/min
14: kg/h
15: t/min
16: t/h
17: N
18: kN
19: Nm
20: psi
21: °F
22: gallon/s
23: inch³/s
24: gallon/min
25: inch³/min
26: gallon/h
27: inch³/h
28: lb/s
29: lb/min
30: lb/h
31: lbf
32: lbf ft
33: K
34: rpm
35: parts/min
36: m/s
37: ft³/s
38: ft³/min
39: BTU/min
40: BTU/h
41: mbar
42: inch wg
43: ft wg
44: m wg
45: % r.h.
46: g/kg

**Dependency:** Only the unit of the technology controller parameters are switched over (unit group 9_1).

Refer to: p0595

**Note:** When switching over from % into another unit, the following sequence applies:

- set p0596
- set p0595 to the required unit

## p0596 Technological unit reference quantity / Tech unit ref qty

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.01 | 340.28235E36 | 1.00 |

**Description:** Sets the reference quantity for the technological units.

When changing over using changeover parameter p0595 to absolute units, all of the parameters involved refer to the reference quantity.

**Dependency:** Refer to: p0595

**Notice:** When changing over from one technological unit into another, or when changing the reference parameter, a changeover is not made.

## p0601[0...n] Motor temperature sensor type / Mot_temp_sens type

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** C(3), U, T | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8016 |
| **Min** | **Max** | **Factory setting** |
| 0 | 4 | 0 |

**Description:** Sets the sensor type for the motor temperature monitoring.

**Value:**
0: No sensor
1: PTC alarm & timer
2: KTY84
4: Bimetallic NC contact alarm & timer

**Dependency:** A thermal motor model is calculated corresponding to p0612.

**Caution:** Re p0601 = 2:

If the motor temperature sensor is not connected but another encoder, then the temperature adaptation of the motor resistances must be switched out (p0620 = 0). Otherwise, in controlled-loop operation, torque errors will occur that will mean that the motor will not be able to be stopped.

**Note:** Re p0601 = 1:

Tripping resistance = 1650 Ohm. Wire breakage and short-circuit monitoring.

## p0604[0...n] Mot_temp_mod 2/KTY alarm threshold / Mod 2/KTY A thresh

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** C(3), U, T | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** 21_1 | **Unit selection:** p0505 | **Func. diagram:** 8016 |
| **Min** | **Max** | **Factory setting** |
| 0.0 [°C] | 240.0 [°C] | 130.0 [°C] |

**Description:** Sets the alarm threshold for monitoring the motor temperature for motor temperature model 2 or KTY.

After the alarm threshold is exceeded, alarm A07910 is output and a timer is started.

If the delay time has expired and the alarm threshold has, in the meantime, not been fallen below, then fault F07011 is output.

**Dependency:** Refer to: p0612

**Notice:** When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

**Note:** The hysteresis is 2 K.

When quick commissioning is exited with p3900 > 0, then the parameter is reset if a catalog motor has not been selected (p0300).

## p0605[0...n] Mot_temp_mod 1/2 threshold / Mod 1/2 threshold

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** C(3), U, T | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** 21_1 | **Unit selection:** p0505 | **Func. diagram:** 8016, 8017 |
| **Min** | **Max** | **Factory setting** |
| 0.0 [°C] | 240.0 [°C] | 145.0 [°C] |

**Description:** Sets the threshold for monitoring the motor temperature for motor temperature model 1/2 or KTY.

Motor temperature model 1 (p0612.0 = 1): alarm threshold

- Alarm A07012 is output after the alarm threshold is exceeded.

Motor temperature model 2 (p0612.1 = 1) or KTY: fault threshold

- Fault F07011 is output after the fault threshold is exceeded.

**Dependency:** Refer to: p0611, p0612

**Notice:** When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

Motor temperature model 1:

p0605 also defines the target temperature of the model for r0034 = 100 %. Therefore, p0605 has no influence on the time up to alarm A07012 being issued. The time is only determined by time constant p0611, the actual current and the reference value p0305.

**Note:** The hysteresis is 2 K.

When quick commissioning is exited with p3900 > 0, then the parameter is reset if a catalog motor has not been selected (p0300).

## p0610[0...n] Motor overtemperature response / Mot temp response

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** C(3), T | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8016, 8017 |
| **Min** | **Max** | **Factory setting** |
| 0 | 12 | 12 |

**Description:** Sets the system response when the motor temperature reaches the alarm threshold.

**Value:**
0: No response only alarm no reduction of I_max
1: Messages, reduction of I_max
2: Messages, no reduction of I_max
12: Messages, no reduction of I_max, temperature storage

**Dependency:** Refer to: p0601, p0604, p0605, p0614, p0615

**Note:** The I_max reduction is not executed for PTC (p0601 = 1) or bimetallic NC contact (p0601 = 4).

The I_max reduction results in a lower output frequency.

If value = 0:

An alarm is output and I_max is not reduced.

If value = 1:

An alarm is output and a timer is started. A fault is output if the alarm is still active after this timer has expired.

- for KTY84, the following applies: I_max. is reduced

- for PTC, the following is valid: I_max. is not reduced

If value = 2:

An alarm is output and a timer is started. A fault is output if the alarm is still active after this timer has expired.

If value = 12:

Behavior is always the same as for value 2.

For motor temperature monitoring without temperature sensor, when switching off, the model temperature is saved in a non-volatile fashion. When switching on, the same value (reduced by p0614) is taken into account in the model calculation. As a consequence, the UL508C specification is fulfilled.

## p0611[0...n] I2t motor model thermal time constant / I2t mot_mod T

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** C(1, 3), U, T | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8017 |
| **Min** | **Max** | **Factory setting** |
| 0 [s] | 20000 [s] | 0 [s] |

**Description:** Sets the winding time constant.

The time constant specifies the warm-up time of the cold stator winding when loaded with the motor standstill current (rated motor current, if the motor standstill current is not parameterized) up until a temperature rise of 63 % of the continuously permissible winding temperature has been reached.

**Dependency:** This parameter is only used for synchronous motors (p0300 = 2xx, 4).

Refer to: r0034, p0612, p0615

**Notice:** This parameter is automatically pre-set from the motor database for motors from the motor list (p0301).

When selecting a catalog motor, this parameter cannot be changed (write protection). Information in p0300 should be carefully observed when removing write protection.

When exiting commissioning, p0612 is checked, and where relevant, is preassigned to a value that matches the motor power, if a temperature sensor was not parameterized (see p0601).

**Note:** When parameter p0611 is reset to 0, then this switches out the thermal I2t motor model (refer to p0612).

If no temperature sensor is parameterized, then the ambient temperature for the thermal motor model is referred to p0625.

## p0612[0...n] Mot_temp_mod activation / Mot_temp_mod act

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** p0340 = 1 | **Data type:** Unsigned16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8017 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0000 0010 0000 0010 bin |

**Description:** Setting to activate the motor temperature model.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Activating motor temperature model 1 (I2t) | Yes | No | - |
| 01 | Activate motor temperature model 2 | Yes | No | - |
| 09 | Activate motor temperature model 2 expansions | Yes | No | - |

**Dependency:** For synchronous motors, when exiting commissioning, temperature model 1 is automatically activated if a time constant has been entered in p0611.

Refer to: r0034, p0604, p0605, p0611, p0615, p0625, p0626, p0627, p0628

**Note:** Mot_temp_mod: motor temperature model

Re bit 00:

This bit is used to activate/deactivate the motor temperature model for permanent-magnet synchronous motors.

Re bit 01:

This bit is used to activate/deactivate the motor temperature model for induction motors.

## p0614[0...n] Thermal resistance adaptation reduction factor / Therm R_adapt red

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 [%] | 100 [%] | 30 [%] |

**Description:** Sets the reduction factor for the overtemperature of the thermal adaptation of the stator/rotor resistance.

The value is a starting value when switching on. Internally, after switch-on, the reduction factor has no effect corresponding to the thermal time constant.

**Dependency:** Refer to: p0610

**Note:** The reduction factor is only effective for p0610 = 12, and refers to the overtemperature.

## p0615[0...n] Mot_temp_mod 1 (I2t) fault threshold / I2t F thresh

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** C(3), U, T | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** 21_1 | **Unit selection:** p0505 | **Func. diagram:** 8017 |
| **Min** | **Max** | **Factory setting** |
| 0.0 [°C] | 220.0 [°C] | 180.0 [°C] |

**Description:** Sets the fault threshold for monitoring the motor temperature for motor temperature model 1 (I2t).

- Fault F07011 is output after the fault threshold is exceeded.

- fault threshold for r0034 = 100 % * (p0615 - 40) / (p0605 - 40).

**Dependency:** The parameter is only used for permanent-magnet synchronous motors (p0300 = 2xx).

Refer to: r0034, p0611, p0612

**Notice:** When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

**Note:** The hysteresis is 2 K.

## p0620[0...n] Thermal adaptation, stator and rotor resistance / Mot therm_adapt R

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** p0340 = 1 | **Data type:** Integer16 |
| **Can be changed:** C(3), U, T | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 2 | 1 |

**Description:** Sets the thermal adaptation of the stator/primary section resistance and rotor/secondary section resistance according to r0395 and r0396.

**Value:**
0: No thermal adaptation of stator and rotor resistances
1: Resistances adapted to the temperatures of the thermal model
2: Resistances adapted to the measured stator winding temperature

**Note:** For p0620 = 1, the following applies:

The stator resistance is adapted using the temperature in r0035 and the rotor resistance together with the model temperature in r0633.

For p0620 = 2, the following applies:

The stator resistance is adapted using the temperature in r0035. If applicable, the rotor temperature for adapting the rotor resistance is calculated from the stator temperature (r0035) as follows:

theta_R = (r0628 + r0625) / (r0627 + r0625) * r0035

## p0621[0...n] Identification stator resistance after restart / Rst_ident Restart

PM230
PM240
PM250, PM260

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** C(3), T | **Scaling:** - | **Dyn. index:** MDS, p0130 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 2 | 0 |

**Description:** Selects the identification of the stator resistance after booting the Control Unit (only for vector control).

The identification is used to measure the actual stator resistance and from the ratio of the result of motor data identification (p0350) to the matching ambient temperature (p0625) the actual mean temperature of the stator winding is calculated. The result is used to initialize the thermal motor model.

p0621 = 1:

Identification of the stator resistance only when the drive is powered up for the first time (pulse enable) after booting the Control Unit.

p0621 = 2:

Identification of the stator resistance every time the drive is powered up (pulse enable).

**Value:**
0: No Rs identification
1: Rs identification after switching-on again
2: Rs identification after switching-on each time

**Dependency:** - perform motor data identification (see p1910) with cold motor.

- enter ambient temperature at time of motor data identification in p0625.

Refer to: p0622, r0623

**Notice:** The calculated stator temperature can only be compared with the measured value of a temperature sensor (KTY) to a certain extent, as the sensor is usually the warmest point of the stator winding, whereas the measured value of identification reflects the mean value of the stator winding.

Furthermore this is a short-time measurement with limited accuracy that is performed during the magnetizing phase of the induction motor.

**Note:** The measurement is carried out:

- For induction motors
- When vector control is active (see p1300)
- If a temperature sensor (KTY) has not been connected
- When the motor is at a standstill when switched on

When a flying restart is performed on a rotating motor, the temperatures of the thermal motor model are set to a third of the overtemperatures. This occurs only once, however, when the CU is booted (e.g. after a power failure).

If identification is activated, the magnetizing time is determined via p0622 and not via p0346. Quick magnetizing (p1401.6) is de-energized internally and alarm A07416 is displayed. The speed is enabled after completion of the measurement.

## p0621[0...n] Identification stator resistance after restart / Rst_ident Restart

PM330

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** C(3), T | **Scaling:** - | **Dyn. index:** MDS, p0130 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 2 | 0 |

**Description:** Selects the identification of the stator resistance after booting the Control Unit (only for vector control).

The identification is used to measure the actual stator resistance and from the ratio of the result of motor data identification (p0350) to the matching ambient temperature (p0625) the actual mean temperature of the stator winding is calculated. The result is used to initialize the thermal motor model.

p0621 = 1:

Identification of the stator resistance only when the drive is powered up for the first time (pulse enable) after booting the Control Unit.

p0621 = 2:

Identification of the stator resistance every time the drive is powered up (pulse enable).

If a reference value for the stator resistance at an ambient temperature is entered into p0629, then the setting value for the stator temperature is generated from this value and not from p0350.

When activating the measurement (p0621 = 1, 2), p0629 is determined when first starting the drive. p0629 should be saved for subsequent use. In order that p0629 matches the ambient temperature (p0625), the function should be activated with the motor in the cold condition.

**Value:**
0: No Rs identification
1: Rs identification after switching-on again
2: Rs identification after switching-on each time

**Dependency:** - perform motor data identification (see p1910) with cold motor.

- enter ambient temperature at time of motor data identification in p0625.

- Reference stator resistance p0629 saved after it has been determined.

Refer to: p0622, r0623, p0629

**Notice:** The calculated stator temperature can only be compared with the measured value of a temperature sensor (KTY) to a certain extent, as the sensor is usually the warmest point of the stator winding, whereas the measured value of identification reflects the mean value of the stator winding. The accuracy depends very heavily on how precisely the motor feeder cable resistance is known (see p0352).

The accuracy of the measurement can be improved by entering the feeder cable resistance p0352 and by determining the reference stator resistance p0629 for the ambient temperature. p0629 is the measured value r0623, which was determined immediately after the first commissioning with the motor in a cold state. For p0621 = 1, p0629 is also measured when switching on for the first time and not after the Control Unit has powered up.

**Note:** The measurement is carried out:

- For induction motors

- When vector control is active (see p1300)

- If a temperature sensor (KTY) has not been connected

- When the motor is at a standstill when switched on

When a flying restart is performed on a rotating motor, the temperatures of the thermal motor model are set to a third of the overtemperatures. This occurs only once, however, when the CU is booted (e.g. after a power failure).

If identification is activated, the magnetizing time is determined via p0622 and not via p0346. Quick magnetizing (p1401.6) is de-energized internally and alarm A07416 is displayed. The speed is enabled after completion of the measurement.

## p0622[0...n] Motor excitation time for Rs_ident after powering up again / t_excit Rs_id

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3 | **Data type:** FloatingPoint32 |
| **Can be changed:** C(3), U, T | **Scaling:** - | **Dyn. index:** MDS, p0130 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.000 [s] | 20.000 [s] | 0.000 [s] |

**Description:** Sets the excitation time of the motor for the stator resistance identification after powering up again (restart).

**Dependency:** Refer to: p0621, r0623

**Note:** For p0622 < p0346 the following applies:

If identification is activated, the magnetizing time is influenced by p0622. The speed is enabled after measurement is complete, but not before the time in p0346 has elapsed (see r0056 bit 4). The time taken for measurement also depends on the settling time of the measured current.

For p0622 >= p0346 the following applies:

Parameter p0622 is internally limited to the magnetizing time p0346, so that p0346 represents the maximum possible magnetizing time during identification. The entire measurement period (magnetizing plus measurement settling time plus measuring time) will always be greater than p0346.

## r0623 Rs identification stator resistance after switch on again / Rs-id Rs aft sw-on

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - [ohm] | - [ohm] | - [ohm] |

**Description:** Displays the stator resistance determined using the Rs identification after switching on again.

**Dependency:** Refer to: p0621, p0622

## p0625[0...n] Motor ambient temperature during commissioning / Mot T_ambient

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,2 | **Data type:** FloatingPoint32 |
| **Can be changed:** C(3), U, T | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** 21_1 | **Unit selection:** p0505 | **Func. diagram:** 8017 |
| **Min** | **Max** | **Factory setting** |
| -40 [°C] | 80 [°C] | 20 [°C] |

**Description:** Defines the ambient temperature of the motor for calculating the motor temperature model.

**Dependency:** Refer to: p0350, p0354

**Note:** The parameters for stator and rotor resistance (p0350, p0354) refer to this temperature.

If the thermal I2t motor model is activated for permanent-magnet synchronous motors (refer to p0611), p0625 is included in the model calculation if a temperature sensor is not being used (see p0601).

## p0626[0...n] Motor overtemperature, stator core / Mot T_over core

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** p0340 = 1,2 | **Data type:** FloatingPoint32 |
| **Can be changed:** C(3), U, T | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** 21_2 | **Unit selection:** p0505 | **Func. diagram:** 8017 |
| **Min** | **Max** | **Factory setting** |
| 10 [K] | 200 [K] | 50 [K] |

**Description:** Defines the rated overtemperature of the stator core referred to the ambient temperature.

**Dependency:** For 1LA7 motors (p0300), the parameter is pre-set as a function of p0307 and p0311.

Refer to: p0625

**Notice:** When selecting a standard induction motor listed in the catalog (p0300 > 100, p0301 > 10000), this parameter is automatically preassigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

**Note:** When quick commissioning is exited with p3900 > 0, then the parameter is reset if a catalog motor has not been selected (p0300).

## p0627[0...n] Motor overtemperature, stator winding / Mot T_over stator

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** p0340 = 1,2 | **Data type:** FloatingPoint32 |
| **Can be changed:** C(3), U, T | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** 21_2 | **Unit selection:** p0505 | **Func. diagram:** 8017 |
| **Min** | **Max** | **Factory setting** |
| 15 [K] | 200 [K] | 80 [K] |

**Description:** Defines the rated overtemperature of the stator winding referred to the ambient temperature.

**Dependency:** For 1LA7 motors (p0300), the parameter is pre-set as a function of p0307 and p0311.

Refer to: p0625

**Notice:** When selecting a standard induction motor listed in the catalog (p0300 > 100, p0301 > 10000), this parameter is automatically preassigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

**Note:** When quick commissioning is exited with p3900 > 0, then the parameter is reset if a catalog motor has not been selected (p0300).

## p0628[0...n] Motor overtemperature rotor winding / Mot T_over rotor

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** p0340 = 1,2 | **Data type:** FloatingPoint32 |
| **Can be changed:** C(3), U, T | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** 21_2 | **Unit selection:** p0505 | **Func. diagram:** 8017 |
| **Min** | **Max** | **Factory setting** |
| 20 [K] | 200 [K] | 100 [K] |

**Description:** Defines the rated overtemperature of the squirrel cage rotor referred to ambient temperature.

**Dependency:** For 1LA7 motors (p0300), the parameter is pre-set as a function of p0307 and p0311.

Refer to: p0625

**Notice:** When selecting a standard induction motor listed in the catalog (p0300 > 100, p0301 > 10000), this parameter is automatically preassigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

**Note:** When quick commissioning is exited with p3900 > 0, then the parameter is reset if a catalog motor has not been selected (p0300).

## p0629[0...n] Stator resistance reference / R_stator ref

PM330

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,2 | **Data type:** FloatingPoint32 |
| **Can be changed:** C(3), U, T | **Scaling:** - | **Dyn. index:** MDS, p0130 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.00000 [ohm] | 2000.00000 [ohm] | 0.00000 [ohm] |

**Description:** Reference value for the identification of the stator resistance every time the drive is powered up.

**Dependency:** The measurement of the reference value is activated by the automatic calculation (p0340 = 1, 2), if the following conditions apply:

- the motor temperature is at this instant in time less than 30 °C (r0035).
- a KTY temperature sensor is not being used (p0601).

Refer to: p0621, r0623

**Note:** The reference value to identify the stator resistance is determined at the first identification. This must be realized when the motor is in a cold state, as the value refers to the ambient temperature p0625. The feeder cable resistance should be entered into p0352 before the measurement.

The result must be saved after the first measurement so that the reference is available after the CU has a powered up. When changing p0350 or p0352, the reference value p0629 should be re-determined.

## r0630[0...n] Mot_temp_mod ambient temperature / Mod T_ambient

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2006 | **Dyn. index:** MDS |
| **Units group:** 21_1 | **Unit selection:** p0505 | **Func. diagram:** 8017 |
| **Min** | **Max** | **Factory setting** |
| - [°C] | - [°C] | - [°C] |

**Description:** Displays the ambient temperature of the motor temperature model (models 2 and 3).

## r0631[0...n] Mot_temp_mod stator iron temperature / Mod T_stator

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2006 | **Dyn. index:** MDS |
| **Units group:** 21_1 | **Unit selection:** p0505 | **Func. diagram:** 8017 |
| **Min** | **Max** | **Factory setting** |
| - [°C] | - [°C] | - [°C] |

**Description:** Displays the stator iron temperature of the motor temperature model (models 2 and 3).

## r0632[0...n] Mot_temp_mod stator winding temperature / Mod T_winding

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2006 | **Dyn. index:** MDS |
| **Units group:** 21_1 | **Unit selection:** p0505 | **Func. diagram:** 8017 |
| **Min** | **Max** | **Factory setting** |
| - [°C] | - [°C] | - [°C] |

**Description:** Displays the stator winding temperature of the motor temperature model (models 2 and 3).

## r0633[0...n] Mot_temp_mod rotor temperature / Mod rotor temp

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2006 | **Dyn. index:** MDS |
| **Units group:** 21_1 | **Unit selection:** p0505 | **Func. diagram:** 8017 |
| **Min** | **Max** | **Factory setting** |
| - [°C] | - [°C] | - [°C] |

**Description:** Displays the rotor temperature of the motor temperature model (model 2).

**Note:** For motor temperature model 3 (p0612.2 = 1), this parameter is not valid:

## p0640[0...n] Current limit / Current limit

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** p0340 = 1 | **Data type:** FloatingPoint32 |
| **Can be changed:** C(1, 3), U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 5722, 6640 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [Arms] | 10000.00 [Arms] | 0.00 [Arms] |

**Description:** Sets the current limit.

**Dependency:** Refer to: r0209, p0323

**Note:** The parameter is part of the quick commissioning (p0010 = 1); this means that it is appropriately pre-assigned when changing p0305. The current limit p0640 is limited to r0209.

The resulting current limit is displayed in r0067 and if required, r0067 is reduced by the thermal model of the power unit.

The torque and power limits (p1520, p1521, p1530, p1531) matching the current limit are automatically calculated when exiting the quick commissioning using p3900 > 0 or using the automatic parameterization with p0340 = 3, 5.

p0640 is limited to 4.0 x p0305.

p0640 is pre-assigned for the automatic self commissioning routine (e.g. to 1.5 x p0305, with p0305 = r0207[1]).

p0640 must be entered when commissioning the system. This is the reason that p0640 is not calculated by the automatic parameterization when exiting the quick commissioning (p3900 > 0).

## p0641[0...n] CI: Current limit variable / Curr lim var

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** T | **Scaling:** PERCENT | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6640 |
| **Min** | **Max** | **Factory setting** |
| - | - | 1 |

**Description:** Sets the signal source for the variable current limit.

The value is referred to p0640.

## p0644[0...n] Current limit excitation induction motor / Imax excitat ASM

PM330

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** C, U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 50.0 [%] | 300.0 [%] | 300.0 [%] |

**Description:** Maximum excitation current of the induction motor referred to the permissible rated current of the power unit (r0207[0]).

**Dependency:** Only effective for vector control.

**Note:** The parameter is preassigned in the automatic calculation for chassis power units.

## p0650[0...n] Actual motor operating hours / Mot t_oper act

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 [h] | 4294967295 [h] | 0 [h] |

**Description:** Displays the operating hours for the corresponding motor.

The motor operating time counter continues to run when the pulses are enabled. When the pulse enable is withdrawn, the counter is held and the value saved.

**Dependency:** Refer to: p0651

**Note:** The operating hours counter in p0650 can only be reset to 0.

The operating hours counter only runs with drive data set 0 and 1 (DDS).

## p0651[0...n] Motor operating hours maintenance interval / Mot t_op maint

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 [h] | 150000 [h] | 0 [h] |

**Description:** Sets the service/maintenance intervals in hours for the appropriate motor.

An appropriate fault is output when the operating hours set here are reached.

**Dependency:** Refer to: p0650

**Note:** For p0651 = 0, the operating hours counter is disabled.

When setting p0651 to 0, then p0650 is automatically set to 0.

The operating hours counter only runs with drive data set 0 and 1 (DDS).

## r0720[0...4] CU number of inputs and outputs / CU I/O count

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2119 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the number of inputs and outputs

**Index:**
[0] = Number of digital inputs
[1] = Number of digital outputs
[2] = Number of digital input/outputs bidirectional
[3] = Number of analog inputs
[4] = Number of analog outputs

## r0721 CU digital inputs terminal actual value / CU DI term act val

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2201, 2221, 2256 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the actual value at the digital inputs.

This means that the actual input signal can be checked at terminal DI x or DI/DO x prior to switching from the simulation mode (p0795.x = 1) to terminal mode (p0795.x = 0).

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | DI 0 (T. 5) | High | Low | - |
| 01 | DI 1 (T. 6) | High | Low | - |
| 02 | DI 2 (T. 7) | High | Low | - |

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 03 | DI 3 (T. 8) | High | Low | - |
| 04 | DI 4 (T. 16) | High | Low | - |
| 05 | DI 5 (T. 17) | High | Low | - |
| 11 | DI 11 (T. 3, 4) AI 0 | High | Low | - |
| 12 | DI 12 (T. 10, 11) AI 1 | High | Low | - |

**Note:** AI: Analog Input
DI: Digital Input
T: Terminal

## r0722.0...12 CO/BO: CU digital inputs status / CU DI status

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2020, 2030, 2031, 2100, 2119, 2120, 2130, 2131, 2132, 2133 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the status of the digital inputs.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | DI 0 (T. 5) | High | Low | - |
| 01 | DI 1 (T. 6) | High | Low | - |
| 02 | DI 2 (T. 7) | High | Low | - |
| 03 | DI 3 (T. 8) | High | Low | - |
| 04 | DI 4 (T. 16) | High | Low | - |
| 05 | DI 5 (T. 17) | High | Low | - |
| 11 | DI 11 (T. 3, 4) AI 0 | High | Low | - |
| 12 | DI 12 (T. 10, 11) AI 1 | High | Low | - |

**Dependency:** Refer to: r0723

**Note:** AI: Analog Input
DI: Digital Input
T: Terminal

## r0723.0...12 CO/BO: CU digital inputs status inverted / CU DI status inv

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2020, 2030, 2031, 2100, 2119, 2120, 2130, 2131, 2132, 2133 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the inverted status of the digital inputs.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | DI 0 (T. 5) | High | Low | - |
| 01 | DI 1 (T. 6) | High | Low | - |
| 02 | DI 2 (T. 7) | High | Low | - |
| 03 | DI 3 (T. 8) | High | Low | - |
| 04 | DI 4 (T. 16) | High | Low | - |
| 05 | DI 5 (T. 17) | High | Low | - |
| 11 | DI 11 (T. 3, 4) AI 0 | High | Low | - |
| 12 | DI 12 (T. 10, 11) AI 1 | High | Low | - |

**Dependency:** Refer to: r0722

**Note:** AI: Analog Input
DI: Digital Input
T: Terminal

## p0724 CU digital inputs debounce time / CU DI t_debounce

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.000 [ms] | 20.000 [ms] | 4.000 [ms] |

**Description:** Sets the debounce time for digital inputs.

**Note:** The digital inputs are read in cyclically every 2 ms (DI 11, DI 12 every 4 ms).

To debounce the signals, the set debounce time is converted into integer multiple debounce clock cycles Tp (Tp = p0724 / 2 ms).

DI: Digital Input

## p0730 BI: CU signal source for terminal DO 0 / CU S_src DO 0

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2119, 2030, 2130 |
| **Min** | **Max** | **Factory setting** |
| - | - | 52.3 |

**Description:** Sets the signal source for terminal DO 0 (NO: T. 19 / NC: T. 18).

**Recommend.:**
r0052.0 Ready for switching on
r0052.1 Ready for operation
r0052.2 Operation enabled
r0052.3 Fault present
r0052.4 Coast down active (OFF2)
r0052.5 Quick stop active (OFF3)
r0052.6 Switching on inhibited active
r0052.7 Alarm present
r0052.9 Control request
r0052.14 Motor rotates forwards
r0053.0 DC braking active
r0053.1 n_act > p2167 (n_off)
r0053.2 n_act <= p1080 (n_min)
r0053.3 I_act > p2170
r0053.4 n_act > p2155
r0053.5 n_act <= p2155
r0053.6 n_act >= n_set
r0053.10 Technology controller output at the lower limit
r0053.11 Technology controller output at the upper limit

**Notice:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

**Note:** DO: Digital Output

T: Terminal

Relay output: NO = normally open, NC = normally closed

## p0731 BI: CU signal source for terminal DO 1 / CU S_src DO 1

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2119, 2030, 2130 |
| **Min** | **Max** | **Factory setting** |
| - | - | 52.7 |

**Description:** Sets the signal source for terminal DO 1 (NO: T. 21).

**Recommend.:**
r0052.0 Ready for switching on
r0052.1 Ready for operation
r0052.2 Operation enabled

r0052.3 Fault present
r0052.4 Coast down active (OFF2)
r0052.5 Quick stop active (OFF3)
r0052.6 Switching on inhibited active
r0052.7 Alarm present
r0052.9 Control request
r0052.14 Motor rotates forwards
r0053.0 DC braking active
r0053.1 n_act > p2167 (n_off)
r0053.2 n_act <= p1080 (n_min)
r0053.3 I_act > p2170
r0053.4 n_act > p2155
r0053.5 n_act <= p2155
r0053.6 n_act >= n_set
r0053.10 Technology controller output at the lower limit
r0053.11 Technology controller output at the upper limit

**Notice:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

**Note:** DO: Digital Output
T: Terminal
Relay output: NO = normally open, NC = normally closed

## p0732 BI: CU signal source for terminal DO 2 / CU S_src DO 2

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2119, 2030, 2130 |
| **Min** | **Max** | **Factory setting** |
| - | - | 52.2 |

**Description:** Sets the signal source for terminal DO 2 (NO: T. 24 / NC: T. 23).

**Recommend.:** r0052.0 Ready for switching on
r0052.1 Ready for operation
r0052.2 Operation enabled
r0052.3 Fault present
r0052.4 Coast down active (OFF2)
r0052.5 Quick stop active (OFF3)
r0052.6 Switching on inhibited active
r0052.7 Alarm present
r0052.9 Control request
r0052.14 Motor rotates forwards
r0053.0 DC braking active
r0053.1 n_act > p2167 (n_off)
r0053.2 n_act <= p1080 (n_min)
r0053.3 I_act > p2170
r0053.4 n_act > p2155
r0053.5 n_act <= p2155
r0053.6 n_act >= n_set
r0053.10 Technology controller output at the lower limit
r0053.11 Technology controller output at the upper limit

**Notice:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

**Note:** DO: Digital Output
T: Terminal
Relay output: NO = normally open, NC = normally closed

## r0747 CU digital outputs status / CU DO status

**Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32
**Can be changed:** - | **Scaling:** - | **Dyn. index:** -
**Units group:** - | **Unit selection:** - | **Func. diagram:** 2130, 2131, 2132, 2133

| Min | Max | Factory setting |
|---|---|---|
| - | - | - |

**Description:** Displays the status of digital outputs.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | DO 0 (NO: T. 19 / NC: T. 18) | High | Low | - |
| 01 | DO 1 (NO: T. 21) | High | Low | - |
| 02 | DO 2 (NO: T. 24 / NC: T. 23) | High | Low | - |

**Note:** DO: Digital Output

T: Terminal

Relay output: NO = normally open, NC = normally closed

Inversion using p0748 has been taken into account.

## p0748 CU invert digital outputs / CU DO inv

**Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32
**Can be changed:** U, T | **Scaling:** - | **Dyn. index:** -
**Units group:** - | **Unit selection:** - | **Func. diagram:** 2201, 2242

| Min | Max | Factory setting |
|---|---|---|
| - | - | 0000 bin |

**Description:** Setting to invert the signals at the digital outputs.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | DO 0 (NO: T. 19 / NC: T. 18) | Inverted | Not inverted | - |
| 01 | DO 1 (NO: T. 21) | Inverted | Not inverted | - |
| 02 | DO 2 (NO: T. 24 / NC: T. 23) | Inverted | Not inverted | - |

**Note:** DO: Digital Output

T: Terminal

Relay output: NO = normally open, NC = normally closed

## r0751.0...10 BO: CU analog inputs status word / CU AI status word

**Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16
**Can be changed:** - | **Scaling:** - | **Dyn. index:** -
**Units group:** - | **Unit selection:** - | **Func. diagram:** 2251, 2252

| Min | Max | Factory setting |
|---|---|---|
| - | - | - |

**Description:** Display and binector output for the status of the analog inputs.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Analog input AI0 wire breakage | Yes | No | - |
| 01 | Analog input AI1 wire breakage | Yes | No | - |
| 02 | Analog input AI2 wire breakage | Yes | No | - |
| 08 | Analog input AI0 no wire breakage | Yes | No | - |
| 09 | Analog input AI1 no wire breakage | Yes | No | - |
| 10 | Analog input AI2 no wire breakage | Yes | No | - |

**Note:** AI: Analog Input

## r0752[0...3] CO: CU analog inputs input voltage/current actual / CU AI U/I_inp act

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9566, 9568, 9576 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the actual input voltage in V when set as voltage input.

Displays the actual input current in mA when set as current input and with the load resistor switched in.

Displays the actual temperature in °C when set as temperature sensor and the voltage divider is switched in.

**Index:** [0] = AI0 (T. 3/4)
[1] = AI1 (T. 10/11)
[2] = AI2 (T. 50/51)
[3] = AI3 (T. 52/53)

**Dependency:** The type of analog input AIx (voltage, current or temperature input) is set using p0756.

Refer to: p0756

**Note:** AI: Analog Input

T: Terminal

## p0753[0...3] CU analog inputs smoothing time constant / CU AI T_smooth

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9566, 9568, 9576 |
| **Min** | **Max** | **Factory setting** |
| 0.0 [ms] | 1000.0 [ms] | 0.0 [ms] |

**Description:** Sets the smoothing time constant of the 1st-order low pass filter for the analog inputs.

**Index:** [0] = AI0 (T. 3/4)
[1] = AI1 (T. 10/11)
[2] = AI2 (T. 50/51)
[3] = AI3 (T. 52/53)

**Note:** AI: Analog Input

T: Terminal

## r0755[0...3] CO: CU analog inputs actual value in percent / CU AI value in %

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9566, 9568, 9576 |
| **Min** | **Max** | **Factory setting** |
| - [%] | - [%] | - [%] |

**Description:** Displays the currently referred input value of the analog inputs.

When interconnected, the signals are referred to the reference quantities p200x and p205x.

**Index:** [0] = AI0 (T. 3/4)
[1] = AI1 (T. 10/11)
[2] = AI2 (T. 50/51)
[3] = AI3 (T. 52/53)

**Note:** AI: Analog Input

T: Terminal

## p0756[0...3] CU analog inputs type / CU AI type

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9566, 9568, 9576 |
| **Min** | **Max** | **Factory setting** |
| 0 | 8 | [0] 4<br>[1] 4<br>[2] 2<br>[3] 8 |

**Description:** Sets the type of analog inputs.

p0756[0...1] = 0, 1, 4 corresponds to a voltage input (r0752, p0757, p0759 are displayed in V).

p0756[0...2] = 2, 3 corresponds to a current input (r0752, p0757, p0759 are displayed in mA).

p0756[2...3] = 6, 7 corresponds to a resistor input for temperature measurement (r0752, p0757, p0759 are displayed in °C).

p0756[2...3] = 8 No temperature sensor connected. Mode for de-activating sensor monitoring (alarm A03520).

In addition, the associated DIP switch must be set.

For the voltage input, DIP switch AI0/1 must be set to "U".

For the current input, DIP switch AI0/1 or AI2 must be set to "I".

For the temperature input, DIP switch AI2 must be set to "TEMP".

**Value:**
0: Unipolar voltage input (0 V ... +10 V)
1: Unipolar voltage input monitored (+2 V ... +10 V)
2: Unipolar current input (0 mA ... +20 mA)
3: Unipolar current input monitored (+4 mA to +20 mA)
4: Bipolar voltage input (-10 V ... +10 V)
6: Temperature sensor LG-Ni1000
7: Temperature sensor PT1000
8: No sensor connected

**Index:**
[0] = AI0 (T. 3/4)
[1] = AI1 (T. 10/11)
[2] = AI2 (T. 50/51)
[3] = AI3 (T. 52/53)

**Warning:** The maximum voltage difference between analog input terminals AI+, AI-, and the ground must not exceed 35 V.

If the system is operated when the load resistor is switched on (DIP switch set to "I"), the voltage between differential inputs AI+ and AI- must not exceed 10 V or the injected 80 mA current otherwise the input will be damaged.

**Note:** When changing p0756 , the parameters of the scaling characteristic (p0757, p0758, p0759, p0760) are overwritten with the following default values:

For p0756 = 0, 4, p0757 is set to 0.0 V, p0758 = 0.0 %, p0759 = 10.0 V and p0760 = 100.0 %.

For p0756 = 1, p0757 is set to 2.0 V, p0758 = 0.0 %, p0759 = 10.0 V and p0760 = 100.0 %.

For p0756 = 2, p0757 is set to 0.0 mA, p0758 = 0.0 %, p0759 = 20.0 mA and p0760 = 100.0 %.

For p0756 = 3, p0757 is set to 4.0 mA, p0758 = 0.0 %, p0759 = 20.0 mA and p0760 = 100.0 %.

For p0756 = 6, 7, p0757 is set to 0 °C, p0758 = 0.0 %, p0759 = 100 °C and p0760 = 100.0 %.

## p0757[0...3] CU analog inputs characteristic value x1 / CU AI char x1

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9566, 9568, 9576 |
| **Min** | **Max** | **Factory setting** |
| -50.000 | 160.000 | 0.000 |

**Description:** Sets the scaling characteristic for the analog inputs.

The scaling characteristic for the analog inputs is defined using 2 points.

This parameter specifies the x coordinate (V, mA, °C) of the 1st value pair of the characteristic.

**Index:**
[0] = AI0 (T. 3/4)
[1] = AI1 (T. 10/11)
[2] = AI2 (T. 50/51)
[3] = AI3 (T. 52/53)

**Note:** The parameters for the characteristic do not have a limiting effect.

## p0758[0...3] CU analog inputs characteristic value y1 / CU AI char y1

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9566, 9568, 9576 |
| **Min** | **Max** | **Factory setting** |
| -1000.00 [%] | 1000.00 [%] | 0.00 [%] |

**Description:** Sets the scaling characteristic for the analog inputs.

The scaling characteristic for the analog inputs is defined using 2 points.

This parameter specifies the y coordinate (percentage) of the 1st value pair of the characteristic.

**Index:**
[0] = AI0 (T. 3/4)
[1] = AI1 (T. 10/11)
[2] = AI2 (T. 50/51)
[3] = AI3 (T. 52/53)

**Note:** The parameters for the characteristic do not have a limiting effect.

## p0759[0...3] CU analog inputs characteristic value x2 / CU AI char x2

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9566, 9568, 9576 |
| **Min** | **Max** | **Factory setting** |
| -50.000 | 160.000 | [0] 10.000<br>[1] 10.000<br>[2] 20.000<br>[3] 100.000 |

**Description:** Sets the scaling characteristic for the analog inputs.

The scaling characteristic for the analog inputs is defined using 2 points.

This parameter specifies the x coordinate (V, mA, °C) of the 2nd value pair of the characteristic.

**Index:**
[0] = AI0 (T. 3/4)
[1] = AI1 (T. 10/11)
[2] = AI2 (T. 50/51)
[3] = AI3 (T. 52/53)

**Note:** The parameters for the characteristic do not have a limiting effect.

## p0760[0...3] CU analog inputs characteristic value y2 / CU AI char y2

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9566, 9568, 9576 |
| **Min** | **Max** | **Factory setting** |
| -1000.00 [%] | 1000.00 [%] | 100.00 [%] |

**Description:** Sets the scaling characteristic for the analog inputs.

The scaling characteristic for the analog inputs is defined using 2 points.

This parameter specifies the y coordinate (percentage) of the 2nd value pair of the characteristic.

**Index:**
[0] = AI0 (T. 3/4)
[1] = AI1 (T. 10/11)
[2] = AI2 (T. 50/51)
[3] = AI3 (T. 52/53)

**Note:** The parameters for the characteristic do not have a limiting effect.

## p0761[0...3] CU analog inputs wire breakage monitoring response threshold / CU WireBrkThresh

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9566, 9568 |
| **Min** | **Max** | **Factory setting** |
| 0.00 | 20.00 | 2.00 |

**Description:** Sets the response threshold for the wire breakage monitoring of the analog inputs.

The unit for the parameter value depends on the set analog input type.

**Index:** [0] = AI0 (T. 3/4)
[1] = AI1 (T. 10/11)
[2] = AI2 (T. 50/51)
[3] = AI3 (T. 52/53)

**Dependency:** For the following analog input type, the wire breakage monitoring is active:

p0756[0...1] = 1 (unipolar voltage input monitored (+2 V ... +10 V)), unit [V]

p0756[0...2] = 3 (unipolar current input monitored (+4 mA ... +20 mA)), unit [mA]

p0756[3]: Wire breakage monitoring is not supported for this analog input.

Refer to: p0756

**Note:** AI: Analog Input

When p0761 = 0, wire breakage monitoring is not carried out.

## p0762[0...3] CU analog inputs wire breakage monitoring delay time / CU wire brk t_del

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9566, 9568 |
| **Min** | **Max** | **Factory setting** |
| 0 [ms] | 1000 [ms] | 100 [ms] |

**Description:** Sets the delay time for the wire breakage monitoring of the analog inputs.

**Index:** [0] = AI0 (T. 3/4)
[1] = AI1 (T. 10/11)
[2] = AI2 (T. 50/51)
[3] = AI3 (T. 52/53)

**Note:** AI: Analog Input

## p0764[0...3] CU analog inputs dead zone / CU AI dead zone

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2251 |
| **Min** | **Max** | **Factory setting** |
| 0.000 [V] | 20.000 [V] | 0.000 [V] |

**Description:** Determines the width of the dead zone at the analog input.

Analog input type unipolar (e.g. 0 ... +10 V):

The dead zone starts with the characteristic value x1/y1 (p0757/p0758).

Analog input type bipolar (e.g. -10 V ... +10 V):

The dead zone is located at the symmetrical center between characteristic value x1/y1 (p0757/p0758) and x2/y2 (p0759/p0760). The set value doubles the dead zone.

**Index:** [0] = AI0 (T. 3/4)
[1] = AI1 (T. 10/11)
[2] = AI2 (T. 50/51)
[3] = AI3 (T. 52/53)

**Note:** AI: Analog Input

T: Terminal

## p0771[0...1] CI: CU analog outputs signal source / CU AO S_src

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2261 |
| **Min** | **Max** | **Factory setting** |
| - | - | [0] 21[0]<br>[1] 27[0] |

**Description:** Sets the signal source for the analog outputs.

**Index:** [0] = AO0 (T 12/13)
[1] = AO1 (T 26/27)

**Note:** AO: Analog Output
T: Terminal

## r0772[0...1] CU analog outputs output value currently referred / CU AO outp act ref

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9572 |
| **Min** | **Max** | **Factory setting** |
| - [%] | - [%] | - [%] |

**Description:** Displays the actual referred output value of the analog outputs.

**Index:** [0] = AO0 (T 12/13)
[1] = AO1 (T 26/27)

**Note:** AO: Analog Output
T: Terminal

## p0773[0...1] CU analog outputs smoothing time constant / CU AO T_smooth

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9572 |
| **Min** | **Max** | **Factory setting** |
| 0.0 [ms] | 1000.0 [ms] | 0.0 [ms] |

**Description:** Sets the smoothing time constant of the 1st-order low pass filter for the analog outputs.

**Index:** [0] = AO0 (T 12/13)
[1] = AO1 (T 26/27)

**Note:** AO: Analog Output
T: Terminal

## r0774[0...1] CU analog outputs output voltage/current actual / CU AO U/I_outp

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2001 | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9572 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the actual output voltage or output current at the analog outputs.

**Index:** [0] = AO0 (T 12/13)
[1] = AO1 (T 26/27)

**Dependency:** Refer to: p0776

**Note:** AO: Analog Output
T: Terminal

## p0775[0...1] CU analog outputs activate absolute value generation / CU AO absVal act

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9572 |
| **Min** | **Max** | **Factory setting** |
| 0 | 1 | 0 |

**Description:** Activates the absolute value generation for the analog outputs.

**Value:**
0: No absolute value generation
1: Absolute value generation switched in

**Index:**
[0] = AO0 (T 12/13)
[1] = AO1 (T 26/27)

**Note:** AO: Analog Output

T: Terminal

## p0776[0...1] CU analog outputs type / CU AO type

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9572 |
| **Min** | **Max** | **Factory setting** |
| 0 | 2 | 0 |

**Description:** Sets the analog output type.

p0776[x] = 1 corresponds to a voltage output (p0774, p0778, p0780 are displayed in V).

p0776[x] = 0, 2 corresponds to a current output (p0774, p0778, p0780 are displayed in mA).

**Value:**
0: Current output (0 mA ... +20 mA)
1: Voltage output (0 V ... +10 V)
2: Current output (+4 mA ... +20 mA)

**Index:**
[0] = AO0 (T 12/13)
[1] = AO1 (T 26/27)

**Note:** When changing p0776, the parameters of the scaling characteristic (p0777, p0778, p0779, p0780) are overwritten with the following default values:

For p0776 = 0, p0777 is set to 0.0 %, p0778 = 0.0 mA, p0779 = 100.0 % and p0780 to 20.0 mA.

For p0776 = 1, p0777 is set to 0.0 %, p0778 = 0.0 V, p0779 = 100.0 % and p0780 to 10.0 V.

For p0776 = 2, p0777 is set to 0.0 %, p0778 = 4.0 mA, p0779 = 100.0 % and p0780 to 20.0 mA.

## p0777[0...1] CU analog outputs characteristic value x1 / CU AO char x1

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9572 |
| **Min** | **Max** | **Factory setting** |
| -1000.00 [%] | 1000.00 [%] | 0.00 [%] |

**Description:** Sets the scaling characteristic for the analog outputs.

The scaling characteristic for the analog outputs is defined using 2 points.

This parameter specifies the x coordinate (percentage) of the 1st value pair of the characteristic.

**Index:**
[0] = AO0 (T 12/13)
[1] = AO1 (T 26/27)

**Dependency:** Refer to: p0776

**Notice:** This parameter is automatically overwritten when changing p0776 (type of analog outputs).

**Note:** The parameters for the characteristic do not have a limiting effect.

## p0778[0...1] CU analog outputs characteristic value y1 / CU AO char y1

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9572 |
| **Min** | **Max** | **Factory setting** |
| -20.000 [V] | 20.000 [V] | 0.000 [V] |

**Description:** Sets the scaling characteristic for the analog outputs.

The scaling characteristic for the analog outputs is defined using 2 points.

This parameter specifies the y coordinate (output voltage in V or output current in mA) of the 1st value pair of the characteristic.

**Index:** [0] = AO0 (T 12/13)
[1] = AO1 (T 26/27)

**Dependency:** The unit of this parameter (V or mA) depends on the analog output type.

Refer to: p0776

**Notice:** This parameter is automatically overwritten when changing p0776 (type of analog outputs).

**Note:** The parameters for the characteristic do not have a limiting effect.

## p0779[0...1] CU analog outputs characteristic value x2 / CU AO char x2

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9572 |
| **Min** | **Max** | **Factory setting** |
| -1000.00 [%] | 1000.00 [%] | 100.00 [%] |

**Description:** Sets the scaling characteristic for the analog outputs.

The scaling characteristic for the analog outputs is defined using 2 points.

This parameter specifies the x coordinate (percentage) of the 2nd value pair of the characteristic.

**Index:** [0] = AO0 (T 12/13)
[1] = AO1 (T 26/27)

**Dependency:** Refer to: p0776

**Notice:** This parameter is automatically overwritten when changing p0776 (type of analog outputs).

**Note:** The parameters for the characteristic do not have a limiting effect.

## p0780[0...1] CU analog outputs characteristic value y2 / CU AO char y2

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9572 |
| **Min** | **Max** | **Factory setting** |
| -20.000 [V] | 20.000 [V] | 20.000 [V] |

**Description:** Sets the scaling characteristic for the analog outputs.

The scaling characteristic for the analog outputs is defined using 2 points.

This parameter specifies the y coordinate (output voltage in V or output current in mA) of the 2nd value pair of the characteristic.

**Index:** [0] = AO0 (T 12/13)
[1] = AO1 (T 26/27)

**Dependency:** The unit of this parameter (V or mA) depends on the analog output type.

Refer to: p0776

**Notice:** This parameter is automatically overwritten when changing p0776 (type of analog outputs).

**Note:** The parameters for the characteristic do not have a limiting effect.

## p0782[0...1] BI: CU analog outputs invert signal source / CU AO inv S_src

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9572 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source to invert the analog output signals.

**Index:**
[0] = AO0 (T 12/13)
[1] = AO1 (T 26/27)

**Note:** AO: Analog Output
T: Terminal

## r0785.0...1 BO: CU analog outputs status word / CU AO ZSW

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9572 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the status of analog outputs.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | AO 0 negative | Yes | No | - |
| 01 | AO 1 negative | Yes | No | - |

**Note:** AO: Analog Output

## p0791[0...1] CO: Fieldbus analog outputs / Fieldbus AO

CU230P-2_BT
CU230P-2_HVAC

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| -200.000 [%] | 200.000 [%] | 0.000 [%] |

**Description:** Setting and connector output to control the analog outputs via fieldbus.

**Index:**
[0] = AO0 (T 12/13)
[1] = AO1 (T 26/27)

**Dependency:** Refer to: p0771

**Note:** AO: Analog Output
The following interconnections must be established to control the analog outputs via fieldbus:
- AO 0: p0771[0] with p0791[0]
- AO 1: p0771[1] with p0791[1]

## p0795 CU digital inputs simulation mode / CU DI simulation

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2201, 2221, 2256 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0000 0000 0000 0000 bin |

**Description:** Sets the simulation mode for digital inputs.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | DI 0 (T. 5) | Simulation | Terminal eval | - |
| 01 | DI 1 (T. 6) | Simulation | Terminal eval | - |
| 02 | DI 2 (T. 7) | Simulation | Terminal eval | - |
| 03 | DI 3 (T. 8) | Simulation | Terminal eval | - |
| 04 | DI 4 (T. 16) | Simulation | Terminal eval | - |
| 05 | DI 5 (T. 17) | Simulation | Terminal eval | - |

| | | | | |
|---|---|---|---|---|
| 11 | DI 11 (T. 3, 4) AI 0 | Simulation | Terminal eval | - |
| 12 | DI 12 (T.10, 11) AI 1 | Simulation | Terminal eval | - |

**Dependency:** The setpoint for the input signals is specified using p0796.

Refer to: p0796

**Note:** This parameter is not saved when data is backed up (p0971).

AI: Analog Input

DI: Digital Input

T: Terminal

## p0796 CU digital inputs simulation mode setpoint / CU DI simul setp

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2201, 2221, 2256 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0000 0000 0000 0000 bin |

**Description:** Sets the setpoint for the input signals in the digital input simulation mode.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | DI 0 (T. 5) | High | Low | - |
| 01 | DI 1 (T. 6) | High | Low | - |
| 02 | DI 2 (T. 7) | High | Low | - |
| 03 | DI 3 (T. 8) | High | Low | - |
| 04 | DI 4 (T. 16) | High | Low | - |
| 05 | DI 5 (T. 17) | High | Low | - |
| 11 | DI 11 (T. 3, 4) AI 0 | High | Low | - |
| 12 | DI 12 (T. 10, 11) AI 1 | High | Low | - |

**Dependency:** The simulation of a digital input is selected using p0795.

Refer to: p0795

**Note:** This parameter is not saved when data is backed up (p0971).

AI: Analog Input

DI: Digital Input

T: Terminal

## p0797[0...3] CU analog inputs simulation mode / CU AI sim_mode

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 1 | 0 |

**Description:** Sets the simulation mode for the analog inputs.

**Value:**
0: Terminal evaluation for analog input x
1: Simulation for analog input x

**Index:**
[0] = AI0 (T. 3/4)
[1] = AI1 (T. 10/11)
[2] = AI2 (T. 50/51)
[3] = AI3 (T. 52/53)

**Dependency:** The setpoint for the input voltage is specified via p0798.

Refer to: p0798

**Note:** This parameter is not saved when data is backed up (p0971).

AI: Analog Input

## p0798[0...3] CU analog inputs simulation mode setpoint / CU AI sim setp

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| -50.000 | 2000.000 | 0.000 |

**Description:** Sets the setpoint for the input value in the simulation mode of the analog inputs.

**Index:**
[0] = AI0 (T. 3/4)
[1] = AI1 (T. 10/11)
[2] = AI2 (T. 50/51)
[3] = AI3 (T. 52/53)

**Dependency:** The simulation of an analog input is selected using p0797.

If AI x is parameterized as a voltage input (p0756), the setpoint is a voltage in V.

If AI x is parameterized as a current input (p0756), the setpoint is a current in mA.

Refer to: p0756, p0797

**Note:** This parameter is not saved when data is backed up (p0971).

AI: Analog Input

## p0802 Data transfer: memory card as source/target / mem_card src/targ

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 100 | 0 |

**Description:** Sets the number for data transfer of a parameter backup from/to memory card.

Transfer from memory card to device memory (p0804 = 1):

- Sets the source of parameter backup (e.g. p0802 = 48 --> PS048xxx.ACX is the source).

Transfer from non-volatile device memory to memory card (p0804 = 2):

- Sets the target of parameter backup (e.g. p0802 = 23 --> PS023xxx.ACX is the target).

**Dependency:** Refer to: p0803, p0804

**Notice:** If the data between the volatile and non-volatile device memories differ, then it may be necessary to save the data on the memory card in a non-volatile fashion prior to the transfer (e.g. p0971 = 1).

## p0803 Data transfer: device memory as source/target / Dev_mem src/targ

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 12 | 0 |

**Description:** Sets the number for data transfer of a parameter backup from/to device memory.

Transfer from memory card to device memory (p0804 = 1):

- Sets the target of the parameter backup (e.g. p0803 = 10 --> PS010xxx.ACX is the target).

Transfer from non-volatile device memory to memory card (p0804 = 2):

- Sets the source of the parameter backup (e.g. p0803 = 11 --> PS011xxx.ACX is the source).

**Value:**
0: Source/target standard
10: Source/target with setting 10
11: Source/target with setting 11
12: Source/target with setting 12

**Dependency:** Refer to: p0802, p0804

**Notice:** If the data between the volatile and non-volatile device memories differ, then it may be necessary to save the data on the memory card in a non-volatile fashion prior to the transfer (e.g. p0971 = 1).

## p0804 Data transfer start / Data transf start

| | | | |
|---|---|---|---|
| CU230P-2_BT<br>CU230P-2_CAN<br>CU230P-2_HVAC | **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | 0 | 1100 | 0 |

**Description:** Sets the transfer direction and start of data transfer between the memory card and non-volatile device memory.

Example 1:

The parameter backup is to be transferred from the device memory to the memory card with setting 0. The parameter backup is to be stored on the memory card with setting 22.

p0802 = 22 (parameter backup stored on memory card as target with setting 22)

p0803 = 0 (parameter backup stored in device memory as source with setting 0)

p0804 = 2 (start data transfer from device memory to memory card)

--> PS000xxx.ACX is transferred from device memory to memory card and stored as PS022xxx.ACX.

Example 2:

The parameter backup is to be transferred from the memory card to the device memory with setting 22. The parameter backup is to be stored in the device memory as setting 0.

p0802 = 22 (parameter backup stored on memory card as source with setting 22)

p0803 = 0 (parameter backup stored in device memory as target with setting 0)

p0804 = 1 (start data transfer from memory card to device memory)

--> PS022xxx.ACX is transferred from memory card to device memory and stored as PS000xxx.ACX.

Example 3 (only supported for PROFIBUS/PROFINET):

The PROFIBUS or PROFINET device master data (GSD) should be transferred from the device memory to the memory card.

p0802 = (not relevant)

p0803 = (not relevant)

p0804 = 12 (start transferring the GSD files to the memory card)

--> The GSD files are transferred from the device memory to the memory card and stored in the /SIEMENS/SINAMICS/DATA/CFG directory.

**Value:**
0: Inactive
1: Memory card to device memory
2: Device memory to memory card
1001: File on memory card cannot be opened
1002: File in device memory cannot be opened
1003: Memory card not found
1100: File cannot be transferred

**Dependency:** Refer to: p0802, p0803

**Notice:** The memory card must not be removed while data is being transferred.

For p0014 = 1, the following applies:

After the value has been modified, no further parameter modifications can be made and the status is shown in r3996. Modifications can be made again when r3996 = 0.

**Note:** If a parameter backup with setting 0 is detected on the memory card when the Control Unit is switched on (PS000xxx.ACX), this is transferred automatically to the device memory.

When the memory card is inserted, a parameter backup with setting 0 (PS000xxx.ACX) is automatically written to the memory card when the parameters are saved in a non-volatile memory (e.g. by means of "Copy RAM to ROM").

Once the data has been successfully transferred, this parameter is automatically reset to 0. If an error occurs, the parameter is set to a value > 1000. Possible fault causes:

p0804 = 1001:

The parameter backup set in p0802 as the source on the memory card does not exist or there is not sufficient memory space available on the memory card.

p0804 = 1002:

The parameter backup set in p0803 as the source in the device memory does not exist or there is not sufficient memory space available in the device memory.

p0804 = 1003:

No memory card has been inserted.

## p0804 Data transfer start / Data transf start

| | | | |
|---|---|---|---|
| CU230P-2_DP | **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| CU230P-2_PN | **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | 0 | 1100 | 0 |

**Description:** Sets the transfer direction and start of data transfer between the memory card and non-volatile device memory.

Example 1:

The parameter backup is to be transferred from the device memory to the memory card with setting 0. The parameter backup is to be stored on the memory card with setting 22.

p0802 = 22 (parameter backup stored on memory card as target with setting 22)

p0803 = 0 (parameter backup stored in device memory as source with setting 0)

p0804 = 2 (start data transfer from device memory to memory card)

--> PS000xxx.ACX is transferred from device memory to memory card and stored as PS022xxx.ACX.

Example 2:

The parameter backup is to be transferred from the memory card to the device memory with setting 22. The parameter backup is to be stored in the device memory as setting 0.

p0802 = 22 (parameter backup stored on memory card as source with setting 22)

p0803 = 0 (parameter backup stored in device memory as target with setting 0)

p0804 = 1 (start data transfer from memory card to device memory)

--> PS022xxx.ACX is transferred from memory card to device memory and stored as PS000xxx.ACX.

Example 3 (only supported for PROFIBUS/PROFINET):

The PROFIBUS or PROFINET device master data (GSD) should be transferred from the device memory to the memory card.

p0802 = (not relevant)

p0803 = (not relevant)

p0804 = 12 (start transferring the GSD files to the memory card)

--> The GSD files are transferred from the device memory to the memory card and stored in the /SIEMENS/SINAMICS/DATA/CFG directory.

**Value:**
0: Inactive
1: Memory card to device memory
2: Device memory to memory card
12: Device memory (GSD files) to memory card
1001: File on memory card cannot be opened
1002: File in device memory cannot be opened
1003: Memory card not found
1100: File cannot be transferred

**Dependency:** Refer to: p0802, p0803

**Notice:** The memory card must not be removed while data is being transferred.

For p0014 = 1, the following applies:

After the value has been modified, no further parameter modifications can be made and the status is shown in r3996. Modifications can be made again when r3996 = 0.

**Note:** If a parameter backup with setting 0 is detected on the memory card when the Control Unit is switched on (PS000xxx.ACX), this is transferred automatically to the device memory.

When the memory card is inserted, a parameter backup with setting 0 (PS000xxx.ACX) is automatically written to the memory card when the parameters are saved in a non-volatile memory (e.g. by means of "Copy RAM to ROM").

Once the data has been successfully transferred, this parameter is automatically reset to 0. If an error occurs, the parameter is set to a value > 1000. Possible fault causes:

p0804 = 1001:

The parameter backup set in p0802 as the source on the memory card does not exist or there is not sufficient memory space available on the memory card.

p0804 = 1002:

The parameter backup set in p0803 as the source in the device memory does not exist or there is not sufficient memory space available in the device memory.

p0804 = 1003:

No memory card has been inserted.

## p0806 BI: Inhibit master control / PcCtrl inhibit

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source to block the master control.

**Dependency:** Refer to: r0807

**Note:** The commissioning software (drive control panel) uses the master control, for example.

## r0807.0 BO: Master control active / PcCtrl active

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned8 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays what has the master control.

The drive can be controlled via the BICO interconnection or from external (e.g. the commissioning software).

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Master control active | Yes | No | 3030 |

**Dependency:** Refer to: p0806

**Notice:** The master control only influences control word 1 and speed setpoint 1. Other control words/setpoints can be transferred from another automation device.

**Note:** Bit 0 = 0: BICO interconnection active

Bit 0 = 1: Master control for PC/AOP

The commissioning software (drive control panel) uses the master control, for example.

## p0809[0...2] Copy Command Data Set CDS / Copy CDS

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Unsigned8 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8560 |
| **Min** | **Max** | **Factory setting** |
| 0 | 3 | 0 |

**Description:** Copies one Command Data Set (CDS) into another.

**Index:**
[0] = Source Command Data Set
[1] = Target Command Data Set
[2] = Start copying procedure

**Dependency:** Refer to: r3996

**Notice:** When the command data sets are copied, short-term communication interruptions may occur.

**Note:** Procedure:

1. In Index 0, enter which command data set should be copied.
2. In Index 1, enter the command data set that is to be copied into.
3. Start copying: Set index 2 from 0 to 1.

p0809[2] is automatically set to 0 when copying is completed.

## p0810 BI: Command data set selection CDS bit 0 / CDS select., bit 0

CU230P-2_BT
CU230P-2_CAN
CU230P-2_HVAC

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8560 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source to select the Command Data Set bit 0 (CDS bit 0).

**Dependency:** Refer to: r0050, p0811, r0836

**Notice:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

**Note:** The Command Data Set selected using the binector inputs is displayed in r0836.
The currently effective command data set is displayed in r0050.
A Command Data Set can be copied using p0809.

## p0810 BI: Command data set selection CDS bit 0 / CDS select., bit 0

CU230P-2_DP
CU230P-2_PN

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8560 |
| **Min** | **Max** | **Factory setting** |
| - | - | 722.3 |

**Description:** Sets the signal source to select the Command Data Set bit 0 (CDS bit 0).

**Dependency:** Refer to: r0050, p0811, r0836

**Notice:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

**Note:** The Command Data Set selected using the binector inputs is displayed in r0836.
The currently effective command data set is displayed in r0050.
A Command Data Set can be copied using p0809.

## p0811 BI: Command data set selection CDS bit 1 / CDS select., bit 1

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8560 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source to select the Command Data Set bit 1 (CDS bit 1).

**Dependency:** Refer to: r0050, p0810, r0836

**Note:** The Command Data Set selected using the binector inputs is displayed in r0836.
The currently effective command data set is displayed in r0050.
A Command Data Set can be copied using p0809.

## p0819[0...2] Copy Drive Data Set DDS / Copy DDS

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Unsigned8 |
| **Can be changed:** C(15) | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8565 |
| **Min** | **Max** | **Factory setting** |
| 0 | 3 | 0 |

**Description:** Copies one Drive Data Set (DDS) into another.

**Index:** [0] = Source Drive Data Set
[1] = Target Drive Data Set
[2] = Start copying procedure

**Dependency:** Refer to: r3996

**Notice:** When the drive data sets are copied, short-term communication interruptions may occur.

**Note:** Procedure:
1. In Index 0, enter which drive data set is to be copied.
2. In Index 1, enter the drive data set data that is to be copied into.
3. Start copying: Set index 2 from 0 to 1.
p0819[2] is automatically set to 0 when copying is completed.

## p0820[0...n] BI: Drive Data Set selection DDS bit 0 / DDS select., bit 0

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** C(15), T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8565 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source to select the Drive Data Set, bit 0 (DDS, bit 0).

**Dependency:** Refer to: r0051, p0826, r0837

**Notice:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

## p0821[0...n] BI: Drive Data Set selection DDS bit 1 / DDS select., bit 1

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** C(15), T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8565, 8570 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source to select the Drive Data Set, bit 1 (DDS, bit 1).

**Dependency:** Refer to: r0051, r0837

**Notice:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

## p0826[0...n] Motor changeover motor number / Mot_chng mot No.

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** C(3), T | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 3 | 0 |

**Description:** Sets the freely-assignable motor number for the drive data set changeover.

If the same motor is driven by different drive data sets, the same motor number must also be entered in these data sets.

If the motor is also switched with the drive data set, different motor numbers must be used. In this case, the data set can only be switched when the pulse inhibit is set.

**Note:** If the motor numbers are identical, the same thermal motor model is used for calculation after data set changeover. If different motor numbers are used, different models are also used for calculating (the inactive motor cools down in each case).

For the same motor number, the correction values of the Rs, Lh or kT adaptation are applied for the data set changeover (refer to r1782, r1787, r1797).

## r0835.2...8 CO/BO: Data set changeover status word / DDS_ZSW

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8575 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the status word for the drive data set changeover.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 02 | Internal parameter calculation active | Yes | No | - |
| 04 | Armature short circuit active | Yes | No | - |
| 05 | Identification running | Yes | No | - |
| 07 | Rotating measurement running | Yes | No | - |
| 08 | Motor data identification running | Yes | No | - |

**Note:** Re bit 02:

A data set changeover is delayed by the time required for the internal parameter calculation.

Re bit 04:

A data set changeover is only carried out when the armature short circuit is not activated.

Re bit 05:
A data set changeover is only carried out when pole position identification is not running.
Re bit 07:
A data set changeover is only carried out when rotating measurement is not running.
Re bit 08:
A data set changeover is only carried out when motor data identification is not running.

## r0836.0...1 CO/BO: Command Data Set CDS selected / CDS selected

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned8 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8560 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the command data set (CDS) selected via the binector input.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | CDS select. bit 0 | ON | OFF | - |
| 01 | CDS select. bit 1 | ON | OFF | - |

**Dependency:** Refer to: r0050, p0810, p0811

**Note:** Command data sets are selected via binector input p0810 and following.
The currently effective command data set is displayed in r0050.

## r0837.0...1 CO/BO: Drive Data Set DDS selected / DDS selected

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned8 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8565 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the drive data set (DDS) selected via the binector input.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | DDS select. bit 0 | ON | OFF | - |
| 01 | DDS select. bit 1 | ON | OFF | - |

**Dependency:** Refer to: r0051, p0820, p0821

**Note:** Drive data sets are selected via binector input p0820 and following.
The currently effective drive data set is displayed in r0051.
If there is only one data set, then a value of 0 is displayed in this parameter and not the selection via binector inputs.

## p0840[0...n] BI: ON / OFF (OFF1) / ON / OFF (OFF1)

CU230P-2_BT
CU230P-2_CAN
CU230P-2_HVAC

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2501, 2610, 8720, 8820, 8920 |
| **Min** | **Max** | **Factory setting** |
| - | - | [0] 722.0<br>[1] 0<br>[2] 0<br>[3] 0 |

**Description:** Sets the signal source for the command "ON/OFF (OFF1)".
For the PROFIdrive profile, this command corresponds to control word 1 bit 0 (STW1.0).

**Recommend.:** When the setting for this binector input is changed, the motor can only be switched on by means of an appropriate signal change of the source.

**Dependency:** Refer to: p1055, p1056

**Caution:** When "master control from PC" is activated, this binector input is ineffective.

**Notice:** For binector input p0840 = 0 signal, the motor can be moved, jogging using binector input p1055 or p1056.

The command "ON/OFF (OFF1)" can be issued using binector input p0840 or p1055/p1056.

For binector input p0840 = 0 signal, the switch-on inhibit is acknowledged.

Only the signal source that originally powered up can also power down again.

The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

**Note:** For drives with closed-loop speed control (p1300 = 20), the following applies:

- BI: p0840 = 0 signal: OFF1 (braking with the ramp-function generator, then pulse suppression and switch-on inhibit)

For drives with closed-loop torque control (p1300 = 22), the following applies:

- BI: p0840 = 0 signal: immediate pulse suppression

For drives with closed-loop torque control (activated using p1501), the following applies:

- BI: p0840 = 0 signal: No dedicated braking response, but pulse cancelation when standstill is detected (p1226, p1227)

For drives with closed-loop speed/torque control, the following applies:

- BI: p0840 = 0/1 signal: ON (pulses can be enabled)

## p0840[0...n] BI: ON / OFF (OFF1) / ON / OFF (OFF1)

| | | | |
|---|---|---|---|
| CU230P-2_DP | **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| CU230P-2_PN | **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 2501, 2610, 8720, 8820, 8920 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | [0] 2090.0<br>[1] 0<br>[2] 0<br>[3] 0 |

**Description:** Sets the signal source for the command "ON/OFF (OFF1)".

For the PROFIdrive profile, this command corresponds to control word 1 bit 0 (STW1.0).

**Recommend.:** When the setting for this binector input is changed, the motor can only be switched on by means of an appropriate signal change of the source.

**Dependency:** Refer to: p1055, p1056

**Caution:** When "master control from PC" is activated, this binector input is ineffective.

**Notice:** For binector input p0840 = 0 signal, the motor can be moved, jogging using binector input p1055 or p1056.

The command "ON/OFF (OFF1)" can be issued using binector input p0840 or p1055/p1056.

For binector input p0840 = 0 signal, the switch-on inhibit is acknowledged.

Only the signal source that originally powered up can also power down again.

The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

**Note:** For drives with closed-loop speed control (p1300 = 20), the following applies:

- BI: p0840 = 0 signal: OFF1 (braking with the ramp-function generator, then pulse suppression and switch-on inhibit)

For drives with closed-loop torque control (p1300 = 22), the following applies:

- BI: p0840 = 0 signal: immediate pulse suppression

For drives with closed-loop torque control (activated using p1501), the following applies:

- BI: p0840 = 0 signal: No dedicated braking response, but pulse cancelation when standstill is detected (p1226, p1227)

For drives with closed-loop speed/torque control, the following applies:

- BI: p0840 = 0/1 signal: ON (pulses can be enabled)

| p0844[0...n] | BI: No coast-down / coast-down (OFF2) signal source 1 / OFF2 S_src 1 | | |
|---|---|---|---|
| CU230P-2_BT<br>CU230P-2_CAN<br>CU230P-2_HVAC | **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 2501, 8720, 8820, 8920 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | 1 |

**Description:** Sets the first signal source for the command "No coast down/coast down (OFF2)".

The following signals are AND'ed:

- BI: p0844 "No coast-down / coast-down (OFF2) signal source 1"
- BI: p0845 "No coast-down / coast-down (OFF2) signal source 2"

For the PROFIdrive profile, the result of the AND logic operation corresponds to control word 1 bit 1 (STW1.1).

BI: p0844 = 0 signal or BI: p0845 = 0 signal

- OFF2 (immediate pulse suppression and switch on inhibit)

BI: p0844 = 1 signal and BI: p0845 = 1 signal

- No OFF2 (enable is possible)

**Caution:** When "master control from PC" is activated, this binector input is ineffective.

**Notice:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

| p0844[0...n] | BI: No coast-down / coast-down (OFF2) signal source 1 / OFF2 S_src 1 | | |
|---|---|---|---|
| CU230P-2_DP<br>CU230P-2_PN | **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 2501, 8720, 8820, 8920 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | [0] 2090.1<br>[1] 1<br>[2] 2090.1<br>[3] 2090.1 |

**Description:** Sets the first signal source for the command "No coast down/coast down (OFF2)".

The following signals are AND'ed:

- BI: p0844 "No coast-down / coast-down (OFF2) signal source 1"
- BI: p0845 "No coast-down / coast-down (OFF2) signal source 2"

For the PROFIdrive profile, the result of the AND logic operation corresponds to control word 1 bit 1 (STW1.1).

BI: p0844 = 0 signal or BI: p0845 = 0 signal

- OFF2 (immediate pulse suppression and switch on inhibit)

BI: p0844 = 1 signal and BI: p0845 = 1 signal

- No OFF2 (enable is possible)

**Caution:** When "master control from PC" is activated, this binector input is ineffective.

**Notice:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

## p0845[0...n] BI: No coast-down / coast-down (OFF2) signal source 2 / OFF2 S_src 2

| | | | |
|---|---|---|---|
| PM230 | **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| PM240 | **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| PM250, PM260 | **Units group:** - | **Unit selection:** - | **Func. diagram:** 2501, 8720, 8820, 8920 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | 1 |

**Description:** Sets the second signal source for the command "No coast down/coast down (OFF2)".

The following signals are AND'ed:

- BI: p0844 "No coast-down / coast-down (OFF2) signal source 1"
- BI: p0845 "No coast-down / coast-down (OFF2) signal source 2"

For the PROFIdrive profile, the result of the AND logic operation corresponds to control word 1 bit 1 (STW1.1).

BI: p0844 = 0 signal or BI: p0845 = 0 signal

- OFF2 (immediate pulse suppression and switch on inhibit)

BI: p0844 = 1 signal and BI: p0845 = 1 signal

- No OFF2 (enable is possible)

**Caution:** When "master control from PC" is activated, this binector input is effective.

## p0845[0...n] BI: No coast-down / coast-down (OFF2) signal source 2 / OFF2 S_src 2

| | | | |
|---|---|---|---|
| PM330 | **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 2501, 8720, 8820, 8920 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | 4022.3 |

**Description:** Sets the second signal source for the command "No coast down/coast down (OFF2)".

The following signals are AND'ed:

- BI: p0844 "No coast-down / coast-down (OFF2) signal source 1"
- BI: p0845 "No coast-down / coast-down (OFF2) signal source 2"

For the PROFIdrive profile, the result of the AND logic operation corresponds to control word 1 bit 1 (STW1.1).

BI: p0844 = 0 signal or BI: p0845 = 0 signal

- OFF2 (immediate pulse suppression and switch on inhibit)

BI: p0844 = 1 signal and BI: p0845 = 1 signal

- No OFF2 (enable is possible)

**Caution:** When "master control from PC" is activated, this binector input is effective.

## p0848[0...n] BI: No Quick Stop / Quick Stop (OFF3) signal source 1 / OFF3 S_src 1

| | | | |
|---|---|---|---|
| CU230P-2_BT | **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| CU230P-2_CAN | **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| CU230P-2_HVAC | **Units group:** - | **Unit selection:** - | **Func. diagram:** 2501 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | 1 |

**Description:** Sets the first signal source for the command "No quick stop/quick stop (OFF3)".

The following signals are AND'ed:

- BI: p0848 "No quick stop / quick stop (OFF3) signal source 1"
- BI: p0849 "No quick stop / quick stop (OFF3) signal source 2"

For the PROFIdrive profile, the result of the AND logic operation corresponds to control word 1 bit 2 (STW1.2).

BI: p0848 = 0 signal or BI: p0849 = 0 signal

- OFF3 (braking along the OFF3 ramp (p1135), then pulse suppression and switch on inhibit)

BI: p0848 = 1 signal and BI: p0849 = 1 signal
- No OFF3 (enable is possible)

**Caution:** When "master control from PC" is activated, this binector input is ineffective.

**Notice:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

**Note:** For drives with closed-loop torque control (activated using p1501), the following applies:
BI: p0848 = 0 signal:
- No dedicated braking response, but pulse suppression when standstill is detected (p1226, p1227).

## p0848[0...n] BI: No Quick Stop / Quick Stop (OFF3) signal source 1 / OFF3 S_src 1

| CU230P-2_DP<br>CU230P-2_PN | | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 2501 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | [0] 2090.2<br>[1] 1<br>[2] 2090.2<br>[3] 2090.2 |

**Description:** Sets the first signal source for the command "No quick stop/quick stop (OFF3)".
The following signals are AND'ed:
- BI: p0848 "No quick stop / quick stop (OFF3) signal source 1"
- BI: p0849 "No quick stop / quick stop (OFF3) signal source 2"
For the PROFIdrive profile, the result of the AND logic operation corresponds to control word 1 bit 2 (STW1.2).
BI: p0848 = 0 signal or BI: p0849 = 0 signal
- OFF3 (braking along the OFF3 ramp (p1135), then pulse suppression and switch on inhibit)
BI: p0848 = 1 signal and BI: p0849 = 1 signal
- No OFF3 (enable is possible)

**Caution:** When "master control from PC" is activated, this binector input is ineffective.

**Notice:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

**Note:** For drives with closed-loop torque control (activated using p1501), the following applies:
BI: p0848 = 0 signal:
- No dedicated braking response, but pulse suppression when standstill is detected (p1226, p1227).

## p0849[0...n] BI: No Quick Stop / Quick Stop (OFF3) signal source 2 / OFF3 S_src 2

| PM230<br>PM240<br>PM250, PM260 | | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 2501 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | 1 |

**Description:** Sets the second signal source for the command "No quick stop/quick stop (OFF3)".
The following signals are AND'ed:
- BI: p0848 "No quick stop / quick stop (OFF3) signal source 1"
- BI: p0849 "No quick stop / quick stop (OFF3) signal source 2"
For the PROFIdrive profile, the result of the AND logic operation corresponds to control word 1 bit 2 (STW1.2).
BI: p0848 = 0 signal or BI: p0849 = 0 signal
- OFF3 (braking along the OFF3 ramp (p1135), then pulse suppression and switch on inhibit)
BI: p0848 = 1 signal and BI: p0849 = 1 signal
- No OFF3 (enable is possible)

**Caution:** When "master control from PC" is activated, this binector input is effective.

**Note:** For drives with closed-loop torque control (activated using p1501), the following applies:
BI: p0849 = 0 signal:
- No dedicated braking response, but pulse suppression when standstill is detected (p1226, p1227).

## p0849[0...n] BI: No Quick Stop / Quick Stop (OFF3) signal source 2 / OFF3 S_src 2

| | | | |
|---|---|---|---|
| PM330 | **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 2501 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | 4022.2 |

**Description:** Sets the second signal source for the command "No quick stop/quick stop (OFF3)".
The following signals are AND'ed:
- BI: p0848 "No quick stop / quick stop (OFF3) signal source 1"
- BI: p0849 "No quick stop / quick stop (OFF3) signal source 2"
For the PROFIdrive profile, the result of the AND logic operation corresponds to control word 1 bit 2 (STW1.2).
BI: p0848 = 0 signal or BI: p0849 = 0 signal
- OFF3 (braking along the OFF3 ramp (p1135), then pulse suppression and switch on inhibit)
BI: p0848 = 1 signal and BI: p0849 = 1 signal
- No OFF3 (enable is possible)

**Caution:** When "master control from PC" is activated, this binector input is effective.

**Note:** For drives with closed-loop torque control (activated using p1501), the following applies:
BI: p0849 = 0 signal:
- No dedicated braking response, but pulse suppression when standstill is detected (p1226, p1227).

## p0852[0...n] BI: Enable operation/inhibit operation / Operation enable

| | | | |
|---|---|---|---|
| CU230P-2_BT | **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| CU230P-2_CAN | **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| CU230P-2_HVAC | **Units group:** - | **Unit selection:** - | **Func. diagram:** 2501 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | 1 |

**Description:** Sets the signal source for the command "enable operation/inhibit operation".
For the PROFIdrive profile, this command corresponds to control word 1 bit 3 (STW1.3).
BI: p0852 = 0 signal
Inhibit operation (suppress pulses).
BI: p0852 = 1 signal
Enable operation (pulses can be enabled).

**Caution:** When "master control from PC" is activated, this binector input is ineffective.

**Notice:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

## p0852[0...n] BI: Enable operation/inhibit operation / Operation enable

| | | | |
|---|---|---|---|
| CU230P-2_DP | **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| CU230P-2_PN | **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 2501 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | [0] 2090.3<br>[1] 1<br>[2] 2090.3<br>[3] 2090.3 |

**Description:** Sets the signal source for the command "enable operation/inhibit operation".
For the PROFIdrive profile, this command corresponds to control word 1 bit 3 (STW1.3).

BI: p0852 = 0 signal
Inhibit operation (suppress pulses).
BI: p0852 = 1 signal
Enable operation (pulses can be enabled).

**Caution:** When "master control from PC" is activated, this binector input is ineffective.

**Notice:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

## p0854[0...n] BI: Control by PLC/no control by PLC / Master ctrl by PLC

CU230P-2_BT
CU230P-2_CAN
CU230P-2_HVAC

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2501 |
| **Min** | **Max** | **Factory setting** |
| - | - | 1 |

**Description:** Sets the signal source for the command "control by PLC/no control by PLC".
For the PROFIdrive profile, this command corresponds to control word 1 bit 10 (STW1.10).
BI: p0854 = 0 signal
No control by PLC
BI: p0854 = 1 signal
Master control by PLC.

**Caution:** When "master control from PC" is activated, this binector input is ineffective.

**Notice:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

**Note:** This bit is used to initiate a response for the drives when the control fails (F07220). If there is no control available, then binector input p0854 should be set to 1.
If a control is available, then STW1.10 must be set to 1 (PZD1) so that the received data is updated. This applies regardless of the setting in p0854 and even in the case of free telegram configuration (p0922 = 999).

## p0854[0...n] BI: Control by PLC/no control by PLC / Master ctrl by PLC

CU230P-2_DP
CU230P-2_PN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2501 |
| **Min** | **Max** | **Factory setting** |
| - | - | [0] 2090.10<br>[1] 1<br>[2] 2090.10<br>[3] 2090.10 |

**Description:** Sets the signal source for the command "control by PLC/no control by PLC".
For the PROFIdrive profile, this command corresponds to control word 1 bit 10 (STW1.10).
BI: p0854 = 0 signal
No control by PLC
BI: p0854 = 1 signal
Master control by PLC.

**Caution:** When "master control from PC" is activated, this binector input is ineffective.

**Notice:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

**Note:** This bit is used to initiate a response for the drives when the control fails (F07220). If there is no control available, then binector input p0854 should be set to 1.
If a control is available, then STW1.10 must be set to 1 (PZD1) so that the received data is updated. This applies regardless of the setting in p0854 and even in the case of free telegram configuration (p0922 = 999).

## p0857 Power unit monitoring time / PU t_monit

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8760, 8864, 8964 |
| **Min** | **Max** | **Factory setting** |
| 100.0 [ms] | 60000.0 [ms] | 10000.0 [ms] |

**Description:** Sets the monitoring time for the power unit.

The monitoring time is started after an 0/1 edge of the ON/OFF1 command. If the power unit does not return a READY signal within the monitoring time, fault F07802 is output.

**Notice:** The maximum time to pre-charge the DC link is monitored in the power unit and cannot be changed. The maximum pre-charging duration depends on the power unit.

The monitoring time for the pre-charging is started after the ON command (BI: p0840 = 0/1 signal). Fault F30027 is output when the maximum pre-charging duration is exceeded.

**Note:** The factory setting for p0857 depends on the power unit.

The monitoring time for the ready signal of the power unit includes the time to pre-charge the DC link and, if relevant, the de-bounce time of the contactors.

If an excessively low value is entered into p0857, then after enable, this results in the corresponding fault.

## p0860 BI: Line contactor feedback signal / Line contact feedb

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | 863.1 |

**Description:** Sets the signal source for the feedback signal from the line contactor.

**Recommend.:** When the monitoring is activated (BI: p0860 not equal to r0863.1), then to control the line contactor, signal BO: r0863.1 of its own drive object should be used.

**Dependency:** Refer to: p0861, r0863

**Notice:** The line contactor monitoring is de-activated if the control signal of the particular drive object is set as the signal source for the feedback signal of the line contactor (BI: p0860 = r0863.1).

**Note:** The state of the line contactor is monitored depending on signal BO: r0863.1.

When the monitoring is activated (BI: p0860 not equal to r0863.1), fault F07300 is then also output if the contactor is closed before it is controlled using r0863.1.

## p0861 Line contactor monitoring time / LineContact t_mon

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 [ms] | 5000 [ms] | 100 [ms] |

**Description:** Sets the monitoring time of the line contactor.

This time starts each time that the line contactor switches (r0863.1). If a feedback signal is not received from the line contactor within the time, a message is output.

**Dependency:** Refer to: p0860, r0863

**Note:** The monitoring function is disabled for the factory setting of p0860.

## r0863.1 CO/BO: Drive coupling status word/control word / CoupleZSW/STW

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display and BICO output for the status word and control word of the drive coupling.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 01 | Energize contactor | Yes | No | - |

**Note:** Re bit 01:

Bit 1 is used to control an external line contactor.

## p0867 Power unit main contactor holding time after OFF1 / PU t_MC after OFF1

**Access level:** 3 **Calculated:** - **Data type:** FloatingPoint32

**Can be changed:** T **Scaling:** - **Dyn. index:** -

**Units group:** - **Unit selection:** - **Func. diagram:** -

| Min | Max | Factory setting |
|---|---|---|
| 0.0 [ms] | 500.0 [ms] | 50.0 [ms] |

**Description:** Sets the main contactor holding time after OFF1

**Dependency:** Refer to: p0869

**Note:** After withdrawing the OFF1 enable (source of p0840), the main contactor is opened after the main contactor holding time has elapsed.

For p0869 = 1 (keep main contactor closed for STO), after withdrawing STO, the switch-on inhibit must be acknowledged via the source of p0840 = 0 (OFF1) – and before the main contactor holding time expires, should go back to 1, otherwise the main contactor will open.

When operating a drive connected to SINUMERIK, which only closes the main contactor with the OFF1 command (blocksize, chassis), p0867 should be set as a minimum to 50 ms.

## p0869 Sequence control configuration / Seq_ctrl config

**Access level:** 3 **Calculated:** - **Data type:** Unsigned16

**Can be changed:** T **Scaling:** - **Dyn. index:** -

**Units group:** - **Unit selection:** - **Func. diagram:** -

| Min | Max | Factory setting |
|---|---|---|
| - | - | 0000 bin |

**Description:** Sets the configuration for the sequence control.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Keep main contactor closed for STO | Yes | No | - |

**Dependency:** Refer to: p0867

**Note:** Re bit 00:

After withdrawing the OFF1 enable (source of p0840), the main contactor is opened after the main contactor holding time has elapsed.

For p0869.0 = 1, after withdrawing STO, the switch-on inhibit must be acknowledged via the source of p0840 = 0 (OFF1) – and before the main contactor holding time expires (p0867), should go back to 1, otherwise the main contactor will open.

## r0898.0...10 CO/BO: Control word sequence control / STW seq_ctrl

**Access level:** 2 **Calculated:** - **Data type:** Unsigned16

**Can be changed:** - **Scaling:** - **Dyn. index:** -

**Units group:** - **Unit selection:** - **Func. diagram:** 2501

| Min | Max | Factory setting |
|---|---|---|
| - | - | - |

**Description:** Display and connector output for the control word of the sequence control.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | ON/OFF1 | Yes | No | - |
| 01 | OC / OFF2 | Yes | No | - |
| 02 | OC / OFF3 | Yes | No | - |
| 03 | Operation enable | Yes | No | - |
| 04 | Ramp-function generator enable | Yes | No | - |
| 05 | Continue ramp-function generator | Yes | No | - |
| 06 | Speed setpoint enable | Yes | No | - |
| 08 | Jog 1 | Yes | No | 3001 |
| 09 | Jog 2 | Yes | No | 3001 |
| 10 | Master ctrl by PLC | Yes | No | - |

**Note:** OC: Operating condition

## r0899.0...11 CO/BO: Status word sequence control / ZSW seq_ctrl

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2503 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display and BICO output for the status word of the sequence control.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Rdy for switch on | Yes | No | - |
| 01 | Ready | Yes | No | - |
| 02 | Operation enabled | Yes | No | - |
| 03 | Jog active | Yes | No | - |
| 04 | No coasting active | OFF2 inactive | OFF2 active | - |
| 05 | No Quick Stop active | OFF3 inactive | OFF3 active | - |
| 06 | Switching on inhibited active | Yes | No | - |
| 07 | Drive ready | Yes | No | - |
| 08 | Controller enable | Yes | No | - |
| 09 | Control request | Yes | No | - |
| 11 | Pulses enabled | Yes | No | - |

**Note:** Re bits 00, 01, 02, 04, 05, 06, 09:

For PROFIdrive, these signals are used for status word 1.

## p0918 PROFIBUS address / PB address

CU230P-2_DP

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2401, 2410 |
| **Min** | **Max** | **Factory setting** |
| 1 | 126 | 126 |

**Description:** Displays or sets the PROFIBUS address for PROFIBUS interface on the Control Unit.

The address can be set as follows:

1) Using the DIP switch on the Control Unit.

--> p0918 can then only be read and displays the selected address.

--> A change only becomes effective after a POWER ON.

2) Using p0918

--> Only if all of the DIP switches are set to ON or OFF.

--> The address is saved in a non-volatile fashion using the function "copy from RAM to ROM".

--> A change only becomes effective after a POWER ON.

**Notice:** For p0014 = 1, the following applies:

After the value has been modified, no further parameter modifications can be made and the status is shown in r3996. Modifications can be made again when r3996 = 0.

For p0014 = 0, the following applies:

Before a changed setting becomes permanently effective, a non-volatile RAM to ROM data save is required. To do this, set p0971 = 1 or p0014 = 1.

**Note:** Permissible PROFIBUS addresses: 1 ... 126

Address 126 is used for commissioning.

Every PROFIBUS address change only becomes effective after a POWER ON.

## p0922 PROFIdrive PZD telegram selection / PZD telegr_sel

CU230P-2_DP
CU230P-2_PN

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** C(1), T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2401, 2420 |
| **Min** | **Max** | **Factory setting** |
| 1 | 999 | 1 |

**Description:** Sets the send and receive telegram.

**Value:**
1: Standard telegram 1, PZD-2/2
20: Standard telegram 20, PZD-2/6
350: SIEMENS telegram 350, PZD-4/4
352: SIEMENS telegram 352, PZD-6/6
353: SIEMENS telegram 353, PZD-2/2, PKW-4/4
354: SIEMENS telegram 354, PZD-6/6, PKW-4/4
999: Free telegram configuration with BICO

**Dependency:** Refer to: p2038

**Note:** For p0922 = 100 ... 199, p2038 is automatically set to 1 and p2038 can no longer be changed. This means that for these telegrams, the "SIMODRIVE 611 universal" interface mode is set and cannot be changed.

If a value is not equal to 999, a telegram is set and the automatically set interconnections in the telegram are inhibited.

The inhibited interconnections can only be changed again after setting value 999.

## r0944 CO: Counter for fault buffer changes / Fault buff change

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8060 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays fault buffer changes. This counter is incremented every time the fault buffer changes.

**Recommend.:** Used to check whether the fault buffer has been read out consistently.

**Dependency:** Refer to: r0945, r0947, r0948, r0949, r2109

## r0945[0...63] Fault code / Fault code

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8050, 8060 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the numbers of faults that have occurred.

**Dependency:** Refer to: r0947, r0948, r0949, r2109, r2130, r2133, r2136, r3120, r3122

**Notice:** The properties of the fault buffer should be taken from the corresponding product documentation.

**Note:** The buffer parameters are cyclically updated in the background (refer to status signal in r2139).

Fault buffer structure (general principle):

r0945[0], r0949[0], r0948[0], r2109[0] --> actual fault case, fault 1

. . .

r0945[7], r0949[7], r0948[7], r2109[7] --> actual fault case, fault 8

r0945[8], r0949[8], r0948[8], r2109[8] --> 1st acknowledged fault case, fault 1

. . .

r0945[15], r0949[15], r0948[15], r2109[15] --> 1st acknowledged fault case, fault 8

. . .

r0945[56], r0949[56], r0948[56], r2109[56] --> 7th acknowledged fault case, fault 1

. . .

r0945[63], r0949[63], r0948[63], r2109[63] --> 7th acknowledged fault case, fault 8

## r0946[0...65534] Fault code list / Fault code list

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8060 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Lists the fault codes stored in the drive unit.

The indices can only be accessed with a valid fault code.

**Dependency:** The parameter assigned to the fault code is entered in r0951 under the same index.

## r0947[0...63] Fault number / Fault number

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8050, 8060 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** This parameter is identical to r0945.

## r0948[0...63] Fault time received in milliseconds / t_fault recv ms

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8050, 8060 |
| **Min** | **Max** | **Factory setting** |
| - [ms] | - [ms] | - [ms] |

**Description:** Displays the system runtime in milliseconds when the fault occurred.

**Dependency:** Refer to: r0945, r0947, r0949, r2109, r2130, r2133, r2136, p8400

**Notice:** The time comprises r2130 (days) and r0948 (milliseconds).

**Note:** The buffer parameters are cyclically updated in the background (refer to status signal in r2139).

The structure of the fault buffer and the assignment of the indices is shown in r0945.

When the parameter is read via PROFIdrive, the TimeDifference data type applies.

## r0949[0...63] Fault value / Fault value

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8050, 8060 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays additional information about the fault that occurred (as integer number).

**Dependency:** Refer to: r0945, r0947, r0948, r2109, r2130, r2133, r2136, r3120, r3122

**Note:** The buffer parameters are cyclically updated in the background (refer to status signal in r2139).

The structure of the fault buffer and the assignment of the indices is shown in r0945.

## p0952 Fault cases counter / Fault cases qty

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6700, 8060 |
| **Min** | **Max** | **Factory setting** |
| 0 | 65535 | 0 |

**Description:** Number of fault situations that have occurred since the last reset.

**Dependency:** The fault buffer is deleted (cleared) by setting p0952 to 0.

Refer to: r0945, r0947, r0948, r0949, r2109, r2130, r2133, r2136

## r0963 PROFIBUS baud rate / PB baud rate

CU230P-2_DP

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 255 | - |

**Description:** Displays the corresponding value for the PROFIBUS baud rate.

**Value:**
0: 9.6 kbit/s
1: 19.2 kbit/s
2: 93.75 kbit/s

3: 187.5 kbit/s
4: 500 kbit/s
6: 1.5 Mbit/s
7: 3 Mbit/s
8: 6 Mbit/s
9: 12 Mbit/s
10: 31.25 kbit/s
11: 45.45 kbit/s
255: Unknown

## r0964[0...6] Device identification / Device ident

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the device identification.

**Index:**
[0] = Company (Siemens = 42)
[1] = Device type
[2] = Firmware version
[3] = Firmware date (year)
[4] = Firmware date (day/month)
[5] = Number of drive objects
[6] = Firmware patch/hot fix

**Note:** Example:

r0964[0] = 42 --> SIEMENS

r0964[1] = device type, see below

r0964[2] = 403 --> first part of the firmware version V04.03 (for second part, refer to index 6)

r0964[3] = 2010 --> year 2010

r0964[4] = 1705 --> 17th of May

r0964[5] = 2 --> 2 drive objects

r0964[6] = 200 --> second part, firmware version (complete version: V04.03.02.00)

Device type:

r0964[1] = 5700 --> SINAMICS G120 CU230P-2_DP

r0964[1] = 5701 --> SINAMICS G120 CU230P-2_PN

r0964[1] = 5702 --> SINAMICS G120 CU230P-2_CAN

r0964[1] = 5703 --> SINAMICS G120 CU230P-2_HVAC

r0964[1] = 5705 --> SINAMICS G120 CU230P-2_BT

## r0965 PROFIdrive profile number / PD profile number

CU230P-2_DP
CU230P-2_PN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the PROFIdrive profile number and profile version.

Constant value = 0329 hex.

Byte 1: Profile number = 03 hex = PROFIdrive profile

Byte 2: Profile version = 29 hex = Version 4.1

**Note:** When the parameter is read via PROFIdrive, the Octet String 2 data type applies.

## p0969 System runtime relative / t_System relative

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8050, 8060 |
| **Min** | **Max** | **Factory setting** |
| 0 [ms] | 4294967295 [ms] | 0 [ms] |

**Description:** Displays the system runtime in ms since the last POWER ON.

**Note:** The value in p0969 can only be reset to 0.

The value overflows after approx. 49 days.

When the parameter is read via PROFIdrive, the TimeDifference data type applies.

## p0970 Reset drive parameters / Drive par reset

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** C(1, 30) | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 300 | 0 |

**Description:** The parameter is used to initiate the reset of the drive parameters.

Parameters p0100, p0205 are not reset.

The following motor parameters are defined in accordance with the power unit: p0300 ... p0311.

When downloading settings 10, 11, 12, the buffer memory mode is automatically deactivated (p0014 = 0).

**Value:**
0: Inactive
1: Start a parameter reset
3: Start download of volatile parameters from RAM
10: Start loading the parameters saved with p0971=10
11: Start loading the parameters saved with p0971=11
12: Start loading the parameters saved with p0971=12
100: Start a BICO interconnection reset
300: Only Siemens int

**Notice:** After the value has been modified, no further parameter modifications can be made and the status is shown in r3996. Modifications can be made again when r3996 = 0.

When the buffer memory is active (see p0014), the actual parameters are backed up from RAM to ROM when a parameter set is loaded (p0970 = 10, 11, 12).

Peculiarities of communication via PROFIBUS DP:

- Communication with Class 1 masters (e.g. S7 controllers) is interrupted.
- Communication with Class 2 masters (e.g. STARTER) is retained.

**Note:** A factory setting run can only be started if p0010 was first set to 30 (parameter reset).

At the end of the calculations, p0970 is automatically set to 0.

Parameter reset is completed with p0970 = 0 and r3996[0] = 0.

The following generally applies:

One index of parameters p2100, p2101, p2118, p2119, p2126, p2127 is not reset, if a parameterized message is precisely active in this index.

## p0971 Save parameters / Save par

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 12 | 0 |

**Description:** Setting to save parameters in the non-volatile memory.

When saving, only the adjustable parameters intended to be saved are taken into account.

**Value:**
0: Inactive
1: Save drive object
10: Save in non-volatile memory as setting 10

11: Save in non-volatile memory as setting 11
12: Save in non-volatile memory as setting 12

**Dependency:** Refer to: p0970, p1960, r3996

**Caution:** If a memory card (optional) is inserted – and the USB interface is not used, the following applies:

The parameters are also saved on the card and therefore overwrite any existing data!

**Notice:** The Control Unit power supply may only be powered down after data has been saved (i.e. after data save has been started, wait until the parameter again has the value 0).

Writing to parameters is inhibited while saving.

The progress while saving is displayed in r3996.

**Note:** Parameters saved with p0971 = 10, 11, 12 can be loaded again with p0970 = 10, 11 or 12.

Identification and maintenance data (I&M data, p8806 and following) are only saved for p0971 = 1.

## p0972 Drive unit reset / Drv_unit reset

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 3 | 0 |

**Description:** Sets the required procedure to execute a hardware reset for the drive unit.

**Value:**
0: Inactive
1: Hardware-Reset immediate
2: Hardware reset preparation
3: Hardware reset after cyclic communication has failed

**Danger:** It must be absolutely ensured that the system is in a safe condition.

The memory card/device memory of the Control Unit must not be accessed.

**Note:** If value = 1:

Reset is immediately executed and communications interrupted.

After communications have been established, check the reset operation (refer below).

If value = 2:

Help to check the reset operation.

Firstly, set p0972 = 2 and then read back. Secondly, set p0972 = 1 (it is possible that this request is possibly no longer acknowledged). The communication is then interrupted.

After communications have been established, check the reset operation (refer below).

If value = 3:

The reset is executed after interrupting cyclic communication. This setting is used to implement a synchronized reset by a control for several drive units.

If cyclic communication is not active, then the reset is immediately executed.

After communications have been established, check the reset operation (refer below).

To check the reset operation:

After the drive unit has been restarted and communications have been established, read p0972 and check the following:

p0972 = 0? --> The reset was successfully executed.

p0972 > 0? --> The reset was not executed.

## r0980[0...299] List of existing parameters 1 / List avail par 1

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the parameters that exist for this drive.

**Dependency:** Refer to: r0981, r0989

**Note:** The existing parameters are displayed in indices 0 to 298. If an index contains the value 0, then the list ends here. In a long list, index 299 contains the parameter number at which position the list continues.

This list consists solely of the following parameters:

r0980[0...299], r0981[0...299] ... r0989[0...299]

The parameters in this list are not displayed in the expert list of the commissioning software. However, they can be read from a higher-level control system (e.g. PROFIBUS master).

## r0981[0...299] List of existing parameters 2 / List avail par 2

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the parameters that exist for this drive.

**Dependency:** Refer to: r0980, r0989

**Note:** The existing parameters are displayed in indices 0 to 298. If an index contains the value 0, then the list ends here. In a long list, index 299 contains the parameter number at which position the list continues.

This list consists solely of the following parameters:

r0980[0...299], r0981[0...299] ... r0989[0...299]

The parameters in this list are not displayed in the expert list of the commissioning software. However, they can be read from a higher-level control system (e.g. PROFIBUS master).

## r0989[0...299] List of existing parameters 10 / List avail par 10

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the parameters that exist for this drive.

**Dependency:** Refer to: r0980, r0981

**Note:** The existing parameters are displayed in indices 0 to 298. If an index contains the value 0, then the list ends here.

This list consists solely of the following parameters:

r0980[0...299], r0981[0...299] ... r0989[0...299]

The parameters in this list are not displayed in the expert list of the commissioning software. However, they can be read from a higher-level control system (e.g. PROFIBUS master).

## r0990[0...99] List of modified parameters 1 / List chang par 1

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays those parameters with a value other than the factory setting for this drive.

**Dependency:** Refer to: r0991, r0999

**Note:** Modified parameters are displayed in indices 0 to 98. If an index contains the value 0, then the list ends here. In a long list, index 99 contains the parameter number at which position the list continues.

This list consists solely of the following parameters:

r0990[0...99], r0991[0...99] ... r0999[0...99]

The parameters in this list are not displayed in the expert list of the commissioning software. However, they can be read from a higher-level control system (e.g. PROFIBUS master).

## r0991[0...99] List of modified parameters 2 / List chang par 2

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays those parameters with a value other than the factory setting for this drive.

**Dependency:** Refer to: r0990, r0999

**Note:** Modified parameters are displayed in indices 0 to 98. If an index contains the value 0, then the list ends here. In a long list, index 99 contains the parameter number at which position the list continues.

This list consists solely of the following parameters:

r0990[0...99], r0991[0...99] ... r0999[0...99]

The parameters in this list are not displayed in the expert list of the commissioning software. However, they can be read from a higher-level control system (e.g. PROFIBUS master).

## r0999[0...99] List of modified parameters 10 / List chang par 10

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays those parameters with a value other than the factory setting for this drive.

**Dependency:** Refer to: r0990, r0991

**Note:** Modified parameters are displayed in indices 0 to 98. If an index contains the value 0, then the list ends here.

This list consists solely of the following parameters:

r0990[0...99], r0991[0...99] ... r0999[0...99]

The parameters in this list are not displayed in the expert list of the commissioning software. However, they can be read from a higher-level control system (e.g. PROFIBUS master).

## p1000[0...n] Speed setpoint selection / n_set sel

CU230P-2_BT
CU230P-2_HVAC

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 200 | 2 |

**Description:** Sets the source for the speed setpoint.

For single-digit values, the following applies:

The value specifies the main setpoint.

For double-digit values, the following applies:

The left-hand digit specifies the supplementary setpoint, the right-hand digit the main setpoint.

Example:

Value = 26

--> The analog setpoint (2) supplies the supplementary setpoint.

--> The fieldbus (6) supplies the main setpoint.

**Value:**

0: No main setpoint
1: Motorized potentiometer
2: Analog setpoint
3: Fixed speed setpoint
6: Fieldbus
7: Analog setpoint 2
10: Motor potentiometer + no main setpoint
11: Motor potentiometer + motor potentiometer
12: Motor potentiometer + analog setpoint
13: Motor potentiometer + fixed speed setpoint
16: Motor potentiometer + fieldbus

17: Motor potentiometer + analog setpoint 2
20: Analog setpoint + no main setpoint
21: Analog setpoint + motor potentiometer
22: Analog setpoint + analog setpoint
23: Analog setpoint + fixed speed setpoint
26: Analog setpoint + fieldbus
27: Analog setpoint + analog setpoint 2
30: Fixed speed setpoint + no main setpoint
31: Fixed speed setpoint + motor potentiometer
32: Fixed speed setpoint + analog setpoint
33: Fixed speed setpoint + fixed speed setpoint
36: Fixed speed setpoint + fieldbus
37: Fixed speed setpoint + analog setpoint 2
60: Fieldbus + no main setpoint
61: Fieldbus + motor potentiometer
62: Fieldbus + analog setpoint
63: Fieldbus + fixed speed setpoint
66: Fieldbus+fieldbus
67: Fieldbus + analog setpoint 2
70: Analog setpoint 2 + no main setpoint
71: Analog setpoint 2 + motor potentiometer
72: Analog setpoint 2 + analog setpoint
73: Analog setpoint 2 + fixed speed setpoint
76: Analog setpoint 2 + fieldbus
77: Analog setpoint 2 + analog setpoint 2
200: Analog output connection

**Dependency:** When changing this parameter, the following settings are influenced:

Refer to: p1070, p1071, p1075, p1076

**Caution:** If p1000 is selected as the main setpoint of the fieldbus, the following BICO interconnection is set automatically:

p2051[1] = r0063

**Notice:** The parameter is possibly protected as a result of p0922.

For PROFIBUS/PROFINET Control Units, the following applies: The parameter can be freely set by setting p0922 = 999.

When executing a specific macro, the corresponding programmed settings are made and become active.

## p1000[0...n] Speed setpoint selection / n_set sel

CU230P-2_CAN

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 200 | 2 |

**Description:** Sets the source for the speed setpoint.

For single-digit values, the following applies:

The value specifies the main setpoint.

For double-digit values, the following applies:

The left-hand digit specifies the supplementary setpoint, the right-hand digit the main setpoint.

Example:

Value = 26

--> The analog setpoint (2) supplies the supplementary setpoint.

--> The fieldbus (6) supplies the main setpoint.

**Value:**
0: No main setpoint
1: Motorized potentiometer
2: Analog setpoint
3: Fixed speed setpoint
6: Fieldbus
7: Analog setpoint 2
10: Motor potentiometer + no main setpoint
11: Motor potentiometer + motor potentiometer
12: Motor potentiometer + analog setpoint
13: Motor potentiometer + fixed speed setpoint

17: Motor potentiometer + analog setpoint 2
20: Analog setpoint + no main setpoint
21: Analog setpoint + motor potentiometer
22: Analog setpoint + analog setpoint
23: Analog setpoint + fixed speed setpoint
27: Analog setpoint + analog setpoint 2
30: Fixed speed setpoint + no main setpoint
31: Fixed speed setpoint + motor potentiometer
32: Fixed speed setpoint + analog setpoint
33: Fixed speed setpoint + fixed speed setpoint
37: Fixed speed setpoint + analog setpoint 2
70: Analog setpoint 2 + no main setpoint
71: Analog setpoint 2 + motor potentiometer
72: Analog setpoint 2 + analog setpoint
73: Analog setpoint 2 + fixed speed setpoint
77: Analog setpoint 2 + analog setpoint 2
200: Analog output connection

**Dependency:** When changing this parameter, the following settings are influenced:

Refer to: p1070, p1071, p1075, p1076

**Caution:** If p1000 is selected as the main setpoint of the fieldbus, the following BICO interconnection is set automatically:

p2051[1] = r0063

**Notice:** The parameter is possibly protected as a result of p0922.

For PROFIBUS/PROFINET Control Units, the following applies: The parameter can be freely set by setting p0922 = 999.

When executing a specific macro, the corresponding programmed settings are made and become active.

## p1000[0...n] Speed setpoint selection / n_set sel

CU230P-2_DP
CU230P-2_PN

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 200 | 6 |

**Description:** Sets the source for the speed setpoint.

For single-digit values, the following applies:

The value specifies the main setpoint.

For double-digit values, the following applies:

The left-hand digit specifies the supplementary setpoint, the right-hand digit the main setpoint.

Example:

Value = 26

--> The analog setpoint (2) supplies the supplementary setpoint.

--> The fieldbus (6) supplies the main setpoint.

**Value:**

0: No main setpoint
1: Motorized potentiometer
2: Analog setpoint
3: Fixed speed setpoint
6: Fieldbus
7: Analog setpoint 2
10: Motor potentiometer + no main setpoint
11: Motor potentiometer + motor potentiometer
12: Motor potentiometer + analog setpoint
13: Motor potentiometer + fixed speed setpoint
16: Motor potentiometer + fieldbus
17: Motor potentiometer + analog setpoint 2
20: Analog setpoint + no main setpoint
21: Analog setpoint + motor potentiometer
22: Analog setpoint + analog setpoint
23: Analog setpoint + fixed speed setpoint
26: Analog setpoint + fieldbus
27: Analog setpoint + analog setpoint 2
30: Fixed speed setpoint + no main setpoint

31: Fixed speed setpoint + motor potentiometer
32: Fixed speed setpoint + analog setpoint
33: Fixed speed setpoint + fixed speed setpoint
36: Fixed speed setpoint + fieldbus
37: Fixed speed setpoint + analog setpoint 2
60: Fieldbus + no main setpoint
61: Fieldbus + motor potentiometer
62: Fieldbus + analog setpoint
63: Fieldbus + fixed speed setpoint
66: Fieldbus+fieldbus
67: Fieldbus + analog setpoint 2
70: Analog setpoint 2 + no main setpoint
71: Analog setpoint 2 + motor potentiometer
72: Analog setpoint 2 + analog setpoint
73: Analog setpoint 2 + fixed speed setpoint
76: Analog setpoint 2 + fieldbus
77: Analog setpoint 2 + analog setpoint 2
200: Analog output connection

**Dependency:** When changing this parameter, the following settings are influenced:
Refer to: p1070, p1071, p1075, p1076

**Caution:** If p1000 is selected as the main setpoint of the fieldbus, the following BICO interconnection is set automatically:
p2051[1] = r0063

**Notice:** The parameter is possibly protected as a result of p0922.
For PROFIBUS/PROFINET Control Units, the following applies: The parameter can be freely set by setting p0922 = 999.
When executing a specific macro, the corresponding programmed settings are made and become active.

## p1001[0...n] CO: Fixed speed setpoint 1 / n_set_fixed 1

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** p2000 | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 3010 |
| **Min** | **Max** | **Factory setting** |
| -210000.000 [rpm] | 210000.000 [rpm] | 0.000 [rpm] |

**Description:** Setting and connector output for fixed speed setpoint 1.
**Dependency:** Refer to: p1020, p1021, p1022, p1023, r1024, r1197
**Notice:** A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

## p1002[0...n] CO: Fixed speed setpoint 2 / n_set_fixed 2

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** p2000 | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 3010 |
| **Min** | **Max** | **Factory setting** |
| -210000.000 [rpm] | 210000.000 [rpm] | 0.000 [rpm] |

**Description:** Setting and connector output for fixed speed setpoint 2.
**Dependency:** Refer to: p1020, p1021, p1022, p1023, r1024, r1197
**Notice:** A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

## p1003[0...n] CO: Fixed speed setpoint 3 / n_set_fixed 3

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** p2000 | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 3010 |
| **Min** | **Max** | **Factory setting** |
| -210000.000 [rpm] | 210000.000 [rpm] | 0.000 [rpm] |

**Description:** Setting and connector output for fixed speed setpoint 3.
**Dependency:** Refer to: p1020, p1021, p1022, p1023, r1024, r1197
**Notice:** A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

## p1004[0...n] CO: Fixed speed setpoint 4 / n_set_fixed 4

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** p2000 | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 3010 |
| **Min** | **Max** | **Factory setting** |
| -210000.000 [rpm] | 210000.000 [rpm] | 0.000 [rpm] |

**Description:** Setting and connector output for fixed speed setpoint 4.

**Dependency:** Refer to: p1020, p1021, p1022, p1023, r1024, r1197

**Notice:** A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

## p1005[0...n] CO: Fixed speed setpoint 5 / n_set_fixed 5

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** p2000 | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 3010 |
| **Min** | **Max** | **Factory setting** |
| -210000.000 [rpm] | 210000.000 [rpm] | 0.000 [rpm] |

**Description:** Setting and connector output for fixed speed setpoint 5.

**Dependency:** Refer to: p1020, p1021, p1022, p1023, r1024, r1197

**Notice:** A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

## p1006[0...n] CO: Fixed speed setpoint 6 / n_set_fixed 6

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** p2000 | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 3010 |
| **Min** | **Max** | **Factory setting** |
| -210000.000 [rpm] | 210000.000 [rpm] | 0.000 [rpm] |

**Description:** Setting and connector output for fixed speed setpoint 6.

**Dependency:** Refer to: p1020, p1021, p1022, p1023, r1024, r1197

**Notice:** A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

## p1007[0...n] CO: Fixed speed setpoint 7 / n_set_fixed 7

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** p2000 | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 3010 |
| **Min** | **Max** | **Factory setting** |
| -210000.000 [rpm] | 210000.000 [rpm] | 0.000 [rpm] |

**Description:** Setting and connector output for fixed speed setpoint 7.

**Dependency:** Refer to: p1020, p1021, p1022, p1023, r1024, r1197

**Notice:** A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

## p1008[0...n] CO: Fixed speed setpoint 8 / n_set_fixed 8

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** p2000 | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 3010 |
| **Min** | **Max** | **Factory setting** |
| -210000.000 [rpm] | 210000.000 [rpm] | 0.000 [rpm] |

**Description:** Setting and connector output for fixed speed setpoint 8.

**Dependency:** Refer to: p1020, p1021, p1022, p1023, r1024, r1197

**Notice:** A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

## p1009[0...n] CO: Fixed speed setpoint 9 / n_set_fixed 9

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** p2000 | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 3010 |
| **Min** | **Max** | **Factory setting** |
| -210000.000 [rpm] | 210000.000 [rpm] | 0.000 [rpm] |

**Description:** Setting and connector output for fixed speed setpoint 9.

**Dependency:** Refer to: p1020, p1021, p1022, p1023, r1024, r1197

**Notice:** A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

## p1010[0...n] CO: Fixed speed setpoint 10 / n_set_fixed 10

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** p2000 | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 3010 |
| **Min** | **Max** | **Factory setting** |
| -210000.000 [rpm] | 210000.000 [rpm] | 0.000 [rpm] |

**Description:** Setting and connector output for fixed speed setpoint 10.

**Dependency:** Refer to: p1020, p1021, p1022, p1023, r1024, r1197

**Notice:** A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

## p1011[0...n] CO: Fixed speed setpoint 11 / n_set_fixed 11

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** p2000 | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 3010 |
| **Min** | **Max** | **Factory setting** |
| -210000.000 [rpm] | 210000.000 [rpm] | 0.000 [rpm] |

**Description:** Setting and connector output for fixed speed setpoint 11.

**Dependency:** Refer to: p1020, p1021, p1022, p1023, r1024, r1197

**Notice:** A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

## p1012[0...n] CO: Fixed speed setpoint 12 / n_set_fixed 12

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** p2000 | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 3010 |
| **Min** | **Max** | **Factory setting** |
| -210000.000 [rpm] | 210000.000 [rpm] | 0.000 [rpm] |

**Description:** Setting and connector output for fixed speed setpoint 12.

**Dependency:** Refer to: p1020, p1021, p1022, p1023, r1024, r1197

**Notice:** A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

## p1013[0...n] CO: Fixed speed setpoint 13 / n_set_fixed 13

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** p2000 | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 3010 |
| **Min** | **Max** | **Factory setting** |
| -210000.000 [rpm] | 210000.000 [rpm] | 0.000 [rpm] |

**Description:** Setting and connector output for fixed speed setpoint 13.

**Dependency:** Refer to: p1020, p1021, p1022, p1023, r1024, r1197

**Notice:** A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

## p1014[0...n] CO: Fixed speed setpoint 14 / n_set_fixed 14

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** p2000 | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 3010 |
| **Min** | **Max** | **Factory setting** |
| -210000.000 [rpm] | 210000.000 [rpm] | 0.000 [rpm] |

**Description:** Setting and connector output for fixed speed setpoint 14.

**Dependency:** Refer to: p1020, p1021, p1022, p1023, r1024, r1197

**Notice:** A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

## p1015[0...n] CO: Fixed speed setpoint 15 / n_set_fixed 15

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** p2000 | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 3010 |
| **Min** | **Max** | **Factory setting** |
| -210000.000 [rpm] | 210000.000 [rpm] | 0.000 [rpm] |

**Description:** Setting and connector output for fixed speed setpoint 15.

**Dependency:** Refer to: p1020, p1021, p1022, p1023, r1024, r1197

**Notice:** A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

## p1016 Fixed speed setpoint select mode / n_set_fix select

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 3010, 3011 |
| **Min** | **Max** | **Factory setting** |
| 1 | 2 | 1 |

**Description:** Sets the mode to select the fixed speed setpoint.

**Value:**
1: Direct
2: Binary

**Note:** Re p1016 = 1:

In this mode, the setpoint is entered via the fixed speed setpoints p1001 ... p1004.

Up to 16 different setpoints are obtained by adding the individual fixed speed setpoints.

Re p1016 = 2:

In this mode, the setpoint is entered via the fixed speed setpoints p1001 ... p1015.

## p1020[0...n] BI: Fixed speed setpoint selection Bit 0 / n_set_fixed Bit 0

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2505, 3010, 3011 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for selecting the fixed speed setpoint.

**Dependency:** Selects the required fixed speed setpoint using p1020 ... p1023.

Displays the number of the actual fixed speed setpoint in r1197.

Sets the values for the fixed speed setpoints 1 ... 15 using p1001 ... p1015.

Refer to: p1021, p1022, p1023, r1197

**Note:** If a fixed speed setpoint has not been selected (p1020 ... p1023 = 0, r1197 = 0), then r1024 = 0 (setpoint = 0).

## p1021[0...n] BI: Fixed speed setpoint selection Bit 1 / n_set_fixed Bit 1

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2505, 3010, 3011 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for selecting the fixed speed setpoint.

**Dependency:** Selects the required fixed speed setpoint using p1020 ... p1023.
Displays the number of the actual fixed speed setpoint in r1197.
Sets the values for the fixed speed setpoints 1 ... 15 using p1001 ... p1015.
Refer to: p1020, p1022, p1023, r1197

**Note:** If a fixed speed setpoint has not been selected (p1020 ... p1023 = 0, r1197 = 0), then r1024 = 0 (setpoint = 0).

## p1022[0...n] BI: Fixed speed setpoint selection Bit 2 / n_set_fixed Bit 2

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2505, 3010, 3011 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for selecting the fixed speed setpoint.

**Dependency:** Selects the required fixed speed setpoint using p1020 ... p1023.
Displays the number of the actual fixed speed setpoint in r1197.
Sets the values for the fixed speed setpoints 1 ... 15 using p1001 ... p1015.
Refer to: p1020, p1021, p1023, r1197

**Note:** If a fixed speed setpoint has not been selected (p1020 ... p1023 = 0, r1197 = 0), then r1024 = 0 (setpoint = 0).

## p1023[0...n] BI: Fixed speed setpoint selection Bit 3 / n_set_fixed Bit 3

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2505, 3010, 3011 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for selecting the fixed speed setpoint.

**Dependency:** Selects the required fixed speed setpoint using p1020 ... p1023.
Displays the number of the actual fixed speed setpoint in r1197.
Sets the values for the fixed speed setpoints 1 ... 15 using p1001 ... p1015.
Refer to: p1020, p1021, p1022, r1197

**Note:** If a fixed speed setpoint has not been selected (p1020 ... p1023 = 0, r1197 = 0), then r1024 = 0 (setpoint = 0).

## r1024 CO: Fixed speed setpoint effective / n_set_fixed eff

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2000 | **Dyn. index:** - |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 3001, 3010, 3011 |
| **Min** | **Max** | **Factory setting** |
| - [rpm] | - [rpm] | - [rpm] |

**Description:** Display and connector output for the selected and active fixed speed setpoint.
This setpoint is the output value for the fixed speed setpoints and must be appropriately interconnected (e.g. with the main setpoint).

**Recommend.:** Interconnect the signal with the main setpoint (CI: p1070 = r1024).

**Dependency:** Selects the required fixed speed setpoint using p1020 ... p1023.
Displays the number of the actual fixed speed setpoint in r1197.

Sets the values for the fixed speed setpoints 1 ... 15 using p1001 ... p1015.

Refer to: p1070, r1197

**Note:** If a fixed speed setpoint has not been selected (p1020 ... p1023 = 0, r1197 = 0), then r1024 = 0 (setpoint = 0).

## r1025.0 BO: Fixed speed setpoint status / n_setp_fix status

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned8 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display and binector output for the status when selecting the fixed speed setpoints.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Fixed speed setpoint selected | Yes | No | 3011 |

**Dependency:** Refer to: p1016

**Note:** Re bit 00:

When the fixed speed setpoints are directly selected (p1016 = 1), this bit is set if at least 1 fixed speed setpoint is selected.

## p1030[0...n] Motorized potentiometer configuration / Mop configuration

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 3020 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0000 0110 bin |

**Description:** Sets the configuration for the motorized potentiometer.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Data save active | Yes | No | - |
| 01 | Automatic mode ramp-function generator active | Yes | No | - |
| 02 | Initial rounding-off active | Yes | No | - |
| 03 | Save in NVRAM active | Yes | No | - |
| 04 | Ramp-function generator always active | Yes | No | - |

**Notice:** For p0014 = 1, the following applies:

After the value has been modified, no further parameter modifications can be made and the status is shown in r3996. Modifications can be made again when r3996 = 0.

**Note:** Re bit 00:

0: The setpoint for the motorized potentiometer is not saved and after ON is entered using p1040.

1: The setpoint for the motorized potentiometer is saved after OFF and after ON set to the saved value. In order to save in a non-volatile fashion, bit 03 should be set to 1.

Re bit 01:

0: Without ramp-function generator in the automatic mode (ramp-up/ramp-down time = 0).

1: With ramp-function generator in the automatic mode.

For manual operation (0 signal via BI: p1041), the ramp-function generator is always active.

Re bit 02:

0: Without initial rounding-off

1: With initial rounding-off. The selected ramp-up/down time is correspondingly exceeded. The initial rounding-off is a sensitive way of specifying small changes (progressive reaction when keys are pressed).

The jerk for the initial rounding-off is independent of the ramp-up time and only depends on the selected maximum speed (p1082). It is calculated as follows:

r = 0.01 % * p1082 [1/s] / 0.13^2 [s^2]

The jerk acts up until the maximum acceleration is reached (a_max = p1082 [1/s] / p1047 [s]), and then the drive continues to run linearly with a constant rate of acceleration. The higher the maximum acceleration (the lower that p1047 is), the longer the ramp-up time increases with respect to the set ramp-up time.

Re bit 03:

0: Non-volatile data save de-activated.

1: The setpoint for the motorized potentiometer is saved in a non-volatile fashion (for bit 00 = 1).

Re bit 04:

When the bit is set, the ramp-function generator is computed independent of the pulse enable. The actual output value of the motorized potentiometer is always in r1050.

## p1035[0...n] BI: Motorized potentiometer setpoint raise / Mop raise

| | | | |
|---|---|---|---|
| CU230P-2_BT | **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| CU230P-2_CAN | **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| CU230P-2_HVAC | **Units group:** - | **Unit selection:** - | **Func. diagram:** 2505, 3020 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | 0 |

**Description:** Sets the signal source to continually increase the setpoint for the motorized potentiometer.

The setpoint change (CO: r1050) depends on the set ramp-up time (p1047) and the duration of the signal that is present (BI: p1035).

**Dependency:** Refer to: p1036

**Notice:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

## p1035[0...n] BI: Motorized potentiometer setpoint raise / Mop raise

| | | | |
|---|---|---|---|
| CU230P-2_DP | **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| CU230P-2_PN | **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 2505, 3020 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | [0] 2090.13<br>[1] 0<br>[2] 0<br>[3] 0 |

**Description:** Sets the signal source to continually increase the setpoint for the motorized potentiometer.

The setpoint change (CO: r1050) depends on the set ramp-up time (p1047) and the duration of the signal that is present (BI: p1035).

**Dependency:** Refer to: p1036

**Notice:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

## p1036[0...n] BI: Motorized potentiometer lower setpoint / Mop lower

| | | | |
|---|---|---|---|
| CU230P-2_BT | **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| CU230P-2_CAN | **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| CU230P-2_HVAC | **Units group:** - | **Unit selection:** - | **Func. diagram:** 2505, 3020 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | 0 |

**Description:** Sets the signal source to continuously lower the setpoint for the motorized potentiometer.

The setpoint change (CO: r1050) depends on the set ramp-down time (p1048) and the duration of the signal that is present (BI: p1036).

**Dependency:** Refer to: p1035

**Notice:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

## p1036[0...n] BI: Motorized potentiometer lower setpoint / Mop lower

CU230P-2_DP
CU230P-2_PN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2505, 3020 |
| **Min** | **Max** | **Factory setting** |
| - | - | [0] 2090.14<br>[1] 0<br>[2] 0<br>[3] 0 |

**Description:** Sets the signal source to continuously lower the setpoint for the motorized potentiometer.

The setpoint change (CO: r1050) depends on the set ramp-down time (p1048) and the duration of the signal that is present (BI: p1036).

**Dependency:** Refer to: p1035

**Notice:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

## p1037[0...n] Motorized potentiometer maximum speed / MotP n_max

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,5 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 3020 |
| **Min** | **Max** | **Factory setting** |
| -210000.000 [rpm] | 210000.000 [rpm] | 0.000 [rpm] |

**Description:** Sets the maximum speed/velocity for the motorized potentiometer.

**Note:** This parameter is automatically pre-assigned in the commissioning phase.

The setpoint output from the motorized potentiometer is limited to this value (see function diagram 3020).

## p1038[0...n] Motorized potentiometer minimum speed / MotP n_min

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,5 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 3020 |
| **Min** | **Max** | **Factory setting** |
| -210000.000 [rpm] | 210000.000 [rpm] | 0.000 [rpm] |

**Description:** Sets the minimum speed/velocity for the motorized potentiometer.

**Note:** This parameter is automatically pre-assigned in the commissioning phase.

The setpoint output from the motorized potentiometer is limited to this value (see function diagram 3020).

## p1039[0...n] BI: Motorized potentiometer inversion / MotP inv

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 3020 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source to invert the minimum speed/velocity or the maximum speed/velocity for the motorized potentiometer.

**Dependency:** Refer to: p1037, p1038

**Note:** The inversion is only active during "motorized potentiometer raise" or "motorized potentiometer lower".

## p1040[0...n] Motorized potentiometer starting value / Mop start value

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 3020 |
| **Min** | **Max** | **Factory setting** |
| -210000.000 [rpm] | 210000.000 [rpm] | 0.000 [rpm] |

**Description:** Sets the starting value for the motorized potentiometer. This starting value becomes effective after the drive has been powered up.

**Dependency:** Only effective if p1030.0 = 0.

Refer to: p1030

## p1041[0...n] BI: Motorized potentiometer manual/automatic / Mop manual/auto

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 3020 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source to change over from manual to automatic when using a motorized potentiometer.

In the manual mode, the setpoint is changed using two signals - raise and lower. In the automatic mode, the setpoint must be interconnected via a connector input.

**Dependency:** Refer to: p1030, p1035, p1036, p1042

**Note:** The effectiveness of the internal ramp-function generator can be set in automatic mode.

## p1042[0...n] CI: Motorized potentiometer automatic setpoint / Mop auto setpoint

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** T | **Scaling:** p2000 | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 3020 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for the setpoint of the motorized potentiometer in the automatic mode.

**Dependency:** Refer to: p1041

## p1043[0...n] BI: Motorized potentiometer accept setting value / MotP acc set val

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 3020 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source to accept the setting value for the motorized potentiometer.

**Dependency:** Refer to: p1044

**Note:** The setting value (CI: p1044) becomes effective for a 0/1 edge of the setting command (BI: p1043).

## p1044[0...n] CI: Motorized potentiometer setting value / Mop set val

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** T | **Scaling:** p2000 | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 3020 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for the setting value for the motorized potentiometer.

**Dependency:** Refer to: p1043

**Note:** The setting value (CI: p1044) becomes effective for a 0/1 edge of the setting command (BI: p1043).

## r1045 CO: Mot. potentiometer speed setp. in front of ramp-fct. gen. / Mop n_set bef RFG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2000 | **Dyn. index:** - |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 3020 |
| **Min** | **Max** | **Factory setting** |
| - [rpm] | - [rpm] | - [rpm] |

**Description:** Sets the effective setpoint in front of the internal motorized potentiometer ramp-function generator.

## p1047[0...n] Motorized potentiometer ramp-up time / Mop ramp-up time

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 3020 |
| **Min** | **Max** | **Factory setting** |
| 0.000 [s] | 1000.000 [s] | 10.000 [s] |

**Description:** Sets the ramp-up time for the internal ramp-function generator for the motorized potentiometer.

The setpoint is changed from zero up to the speed/velocity limit (p1082) within this time (if no initial rounding-off has been activated).

**Dependency:** Refer to: p1030, p1048, p1082

**Note:** When the initial rounding-off is activated (p1030.2) the ramp-up time is correspondingly extended.

## p1048[0...n] Motorized potentiometer ramp-down time / Mop ramp-down time

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 3020 |
| **Min** | **Max** | **Factory setting** |
| 0.000 [s] | 1000.000 [s] | 10.000 [s] |

**Description:** Sets the ramp-down time for the internal ramp-function generator for the motorized potentiometer.

The setpoint is changed from the speed/velocity limit (p1082) to zero within this time (if no initial rounding-off has been activated).

**Dependency:** Refer to: p1030, p1047, p1082

**Note:** The deceleration time is extended corresponding to the activated initial rounding-off (p1030.2).

## r1050 CO: Motor. potentiometer setpoint after the ramp-function generator / Mop setp after RFG

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2000 | **Dyn. index:** - |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 3001, 3020 |
| **Min** | **Max** | **Factory setting** |
| - [rpm] | - [rpm] | - [rpm] |

**Description:** Sets the effective setpoint after the internal motorized potentiometer ramp-function generator.

This setpoint is the output value of the motorized potentiometer and must be appropriately interconnected onwards (e.g. with the main setpoint).

**Recommend.:** Interconnect the signal with main setpoint (p1070).

**Dependency:** Refer to: p1070

**Note:** For "With ramp-function generator", after an OFF1, OFF2, OFF3 or for a 0 signal via BI: p0852 (inhibit operation, suppress pulses) the ramp-function generator output (r1050) is set to the starting value (configuration via p1030.0).

## p1051[0...n] CI: Speed limit RFG positive direction of rotation / n_limit RFG pos

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** T | **Scaling:** p2000 | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 3050 |
| **Min** | **Max** | **Factory setting** |
| - | - | 1083[0] |

**Description:** Sets the signal source for the speed limit of the positive direction on the ramp-function generator input.

**Note:** The OFF3 ramp-down time (p1135) is effective when the limit is reduced.

## p1052[0...n] CI: Speed limit RFG negative direction of rotation / n_limit RFG neg

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** T | **Scaling:** p2000 | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 3050 |
| **Min** | **Max** | **Factory setting** |
| - | - | 1086[0] |

**Description:** Sets the signal source for the speed limit of the negative direction on the ramp-function generator input.

**Note:** The OFF3 ramp-down time (p1135) is effective when the limit is reduced.

## p1055[0...n] BI: Jog bit 0 / Jog bit 0

CU230P-2_BT
CU230P-2_CAN
CU230P-2_HVAC

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2501, 3030 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for jog 1.

**Recommend.:** When the setting for this binector input is changed, the motor can only be switched on by means of an appropriate signal change of the source.

**Dependency:** Refer to: p0840, p1058

**Notice:** The drive is enabled for jogging using BI: p1055 or BI: p1056.

The command "ON/OFF1" can be issued using BI: p0840 or using BI: p1055/p1056.

Only the signal source that was used to power up can also be used to power down again.

## p1055[0...n] BI: Jog bit 0 / Jog bit 0

CU230P-2_DP
CU230P-2_PN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2501, 3030 |
| **Min** | **Max** | **Factory setting** |
| - | - | [0] 0<br>[1] 722.0<br>[2] 0<br>[3] 0 |

**Description:** Sets the signal source for jog 1.

**Recommend.:** When the setting for this binector input is changed, the motor can only be switched on by means of an appropriate signal change of the source.

**Dependency:** Refer to: p0840, p1058

**Notice:** The drive is enabled for jogging using BI: p1055 or BI: p1056.

The command "ON/OFF1" can be issued using BI: p0840 or using BI: p1055/p1056.

Only the signal source that was used to power up can also be used to power down again.

## p1056[0...n] BI: Jog bit 1 / Jog bit 1

CU230P-2_BT
CU230P-2_CAN
CU230P-2_HVAC

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2501, 3030 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for jog 2.

**Recommend.:** When the setting for this binector input is changed, the motor can only be switched on by means of an appropriate signal change of the source.

**Dependency:** Refer to: p0840, p1059

**Notice:** The drive is enabled for jogging using BI: p1055 or BI: p1056.

The command "ON/OFF1" can be issued using BI: p0840 or using BI: p1055/p1056.

Only the signal source that was used to power up can also be used to power down again.

## p1056[0...n] BI: Jog bit 1 / Jog bit 1

CU230P-2_DP
CU230P-2_PN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2501, 3030 |
| **Min** | **Max** | **Factory setting** |
| - | - | [0] 0<br>[1] 722.1<br>[2] 0<br>[3] 0 |

**Description:** Sets the signal source for jog 2.

**Recommend.:** When the setting for this binector input is changed, the motor can only be switched on by means of an appropriate signal change of the source.

**Dependency:** Refer to: p0840, p1059

**Notice:** The drive is enabled for jogging using BI: p1055 or BI: p1056.

The command "ON/OFF1" can be issued using BI: p0840 or using BI: p1055/p1056.

Only the signal source that was used to power up can also be used to power down again.

## p1058[0...n] Jog 1 speed setpoint / Jog 1 n_set

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 3001, 3030 |
| **Min** | **Max** | **Factory setting** |
| -210000.000 [rpm] | 210000.000 [rpm] | 150.000 [rpm] |

**Description:** Sets the speed for jog 1.

Jogging (JOG) is level-triggered, and allows the motor to be incrementally traversed.

**Dependency:** Refer to: p1055, p1056

## p1059[0...n] Jog 2 speed setpoint / Jog 2 n_set

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 3001, 3030 |
| **Min** | **Max** | **Factory setting** |
| -210000.000 [rpm] | 210000.000 [rpm] | -150.000 [rpm] |

**Description:** Sets the speed for jog 2.

Jogging (JOG) is level-triggered, and allows the motor to be incrementally traversed.

**Dependency:** Refer to: p1055, p1056

## p1063[0...n] Speed limit setpoint channel / n_limit setp

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 3040 |
| **Min** | **Max** | **Factory setting** |
| 0.000 [rpm] | 210000.000 [rpm] | 210000.000 [rpm] |

**Description:** Sets the speed limit/velocity limit effective in the setpoint channel.

**Dependency:** Refer to: p1082, p1083, p1085, p1086, p1088

## p1070[0...n] CI: Main setpoint / Main setpoint

CU230P-2_BT
CU230P-2_CAN
CU230P-2_HVAC

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** T | **Scaling:** p2000 | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 3001, 3030 |
| **Min** | **Max** | **Factory setting** |
| - | - | [0] 755[0]<br>[1] 0<br>[2] 0<br>[3] 0 |

**Description:** Sets the signal source for the main setpoint.
Examples:
r1024: Fixed speed setpoint effective
r1050: Motor. potentiometer setpoint after the ramp-function generator

**Dependency:** Refer to: p1071, r1073, r1078

**Notice:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

## p1070[0...n] CI: Main setpoint / Main setpoint

CU230P-2_DP
CU230P-2_PN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** T | **Scaling:** p2000 | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 3001, 3030 |
| **Min** | **Max** | **Factory setting** |
| - | - | [0] 2050[1]<br>[1] 0<br>[2] 0<br>[3] 0 |

**Description:** Sets the signal source for the main setpoint.
Examples:
r1024: Fixed speed setpoint effective
r1050: Motor. potentiometer setpoint after the ramp-function generator

**Dependency:** Refer to: p1071, r1073, r1078

**Notice:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

## p1071[0...n] CI: Main setpoint scaling / Main setp scal

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** T | **Scaling:** PERCENT | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 3001, 3030 |
| **Min** | **Max** | **Factory setting** |
| - | - | 1 |

**Description:** Sets the signal source for scaling the main setpoint.

## r1073 CO: Main setpoint effective / Main setpoint eff

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2000 | **Dyn. index:** - |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 3030 |
| **Min** | **Max** | **Factory setting** |
| - [rpm] | - [rpm] | - [rpm] |

**Description:** Displays the effective main setpoint.
The value shown is the main setpoint after scaling.

## p1075[0...n] CI: Supplementary setpoint / Suppl setp

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** T | **Scaling:** p2000 | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 3001, 3030 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for the supplementary setpoint.
**Dependency:** Refer to: p1076, r1077, r1078

## p1076[0...n] CI: Supplementary setpoint scaling / Suppl setp scal

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** T | **Scaling:** PERCENT | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 3001, 3030 |
| **Min** | **Max** | **Factory setting** |
| - | - | 1 |

**Description:** Sets the signal source for scaling the supplementary setpoint.

## r1077 CO: Supplementary setpoint effective / Suppl setpoint eff

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2000 | **Dyn. index:** - |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 3030 |
| **Min** | **Max** | **Factory setting** |
| - [rpm] | - [rpm] | - [rpm] |

**Description:** Displays the effective supplementary setpoint. The value shown is the additional setpoint after scaling.

## r1078 CO: Total setpoint effective / Total setpoint eff

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2000 | **Dyn. index:** - |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 3030 |
| **Min** | **Max** | **Factory setting** |
| - [rpm] | - [rpm] | - [rpm] |

**Description:** Displays the total effective setpoint.
The value indicates the sum of the effective main setpoint and supplementary setpoint.
**Note:** If the fixed speed setpoint is the source for the speed setpoint, then when the extended service mode is activated (r3889.0 = 1) fixed speed setpoint 15 is displayed.

| p1080[0...n] | Minimum speed / n_min | | |
|---|---|---|---|
| | **Access level:** 1 | **Calculated:** - | **Data type:** FloatingPoint32 |
| | **Can be changed:** C(1), T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| | **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 3050, 8020 |
| | **Min** | **Max** | **Factory setting** |
| | 0.000 [rpm] | 19500.000 [rpm] | 0.000 [rpm] |

**Description:** Sets the lowest possible motor speed.

This value is not undershot in operation.

**Dependency:** Refer to: p1106

**Notice:** The effective minimum speed is formed from p1080 and p1106.

**Note:** The parameter value applies for both motor directions.

In exceptional cases, the motor can operate below this value (e.g. when reversing).

| p1081 | Maximum speed scaling / n_max scal | | |
|---|---|---|---|
| | **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| | **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 3050, 3095 |
| | **Min** | **Max** | **Factory setting** |
| | 100.00 [%] | 105.00 [%] | 100.00 [%] |

**Description:** Sets the scaling for the maximum speed (p1082).

For a higher-level speed control, this scaling allows the maximum speed to be briefly exceeded.

**Dependency:** Refer to: p1082

**Notice:** Continuous operation above a scaling of 100 % is not permitted.

| p1082[0...n] | Maximum speed / n_max | | |
|---|---|---|---|
| | **Access level:** 1 | **Calculated:** p0340 = 1 | **Data type:** FloatingPoint32 |
| | **Can be changed:** C(1), T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| | **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 3020, 3050, 3070 |
| | **Min** | **Max** | **Factory setting** |
| | 0.000 [rpm] | 210000.000 [rpm] | 1500.000 [rpm] |

**Description:** Sets the highest possible speed.

Example:

Induction motor p0310 = 50 / 60 Hz without output filter and Blocksize power unit

p1082 <= 60 x 240 Hz / r0313 (vector control)

p1082 <= 60 x 550 Hz / r0313 (U/f control)

**Dependency:** For vector control, the maximum speed is restricted to 60.0 / (8.333 x 500 µs x r0313). This can be identified by a reduction in r1084. p1082 is not changed in this process due to the fact that the operating mode p1300 can be changed over.

If a sine-wave filter (p0230 = 3) is parameterized as output filter, then the maximum speed is limited corresponding to the maximum permissible filter output frequency (refer to the filter data sheet). When using sine-wave filters (p0230 = 3, 4), the maximum speed r1084 is limited to 70% of the resonant frequency of the filter capacitance and the motor leakage inductance.

For reactors and dU/dt filters, it is limited to 120 Hz / r0313.

Refer to: p0230, r0313, p0322

**Notice:** After the value has been modified, no further parameter modifications can be made and the status is shown in r3996. Modifications can be made again when r3996 = 0.

**Note:** The parameter applies for both motor directions.

The parameter has a limiting effect and is the reference quantity for all ramp-up and ramp-down times (e.g. down ramps, ramp-function generator, motor potentiometer).

The parameter is part of the quick commissioning (p0010 = 1); this means that it is appropriately pre-assigned when changing p0310, p0311, p0322.

The following limits are always effective for p1082:

p1082 <= 60 x minimum (15 x p0310, 550 Hz) / r0313

p1082 <= 60 x maximum power unit pulse frequency / (k x r0313), with k = 12 (vector control), k = 6.5 (U/f control)

During automatic calculation (p0340 = 1, p3900 > 0), the parameter value is assigned the maximum motor speed (p0322). For p0322 = 0 the rated motor speed (p0311) is used as default (pre-assignment) value. For induction motors, the synchronous no-load speed is used as the default value (p0310 x 60 / r0313).

For synchronous motors, the following additionally applies:

During automatic calculation (p0340, p3900), p1082 is limited to speeds where the EMF does not exceed the DC link voltage.

p1082 is also available in the quick commissioning (p0010 = 1); this means that when exiting via p3900 > 0, the value is not changed.

## p1083[0...n] CO: Speed limit in positive direction of rotation / n_limit pos

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** p2000 | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 3050 |
| **Min** | **Max** | **Factory setting** |
| 0.000 [rpm] | 210000.000 [rpm] | 210000.000 [rpm] |

**Description:** Sets the maximum speed for the positive direction.

**Notice:** A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

## r1084 CO: Speed limit positive effective / n_limit pos eff

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2000 | **Dyn. index:** - |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 3050, 7958 |
| **Min** | **Max** | **Factory setting** |
| - [rpm] | - [rpm] | - [rpm] |

**Description:** Display and connector output for the active positive speed limit.

**Dependency:** Refer to: p1082, p1083, p1085

## p1085[0...n] CI: Speed limit in positive direction of rotation / n_limit pos

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** T | **Scaling:** p2000 | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 3050 |
| **Min** | **Max** | **Factory setting** |
| - | - | 1083[0] |

**Description:** Sets the signal source for the speed limit of the positive direction.

## p1086[0...n] CO: Speed limit in negative direction of rotation / n_limit neg

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** p2000 | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 3050 |
| **Min** | **Max** | **Factory setting** |
| -210000.000 [rpm] | 0.000 [rpm] | -210000.000 [rpm] |

**Description:** Sets the speed limit for the negative direction.

**Notice:** A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

## r1087 CO: Speed limit negative effective / n_limit neg eff

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2000 | **Dyn. index:** - |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 3050, 7958 |
| **Min** | **Max** | **Factory setting** |
| - [rpm] | - [rpm] | - [rpm] |

**Description:** Display and connector output for the active negative speed limit.

**Dependency:** Refer to: p1082, p1086, p1088

| | | | |
|---|---|---|---|
| **p1088[0...n]** | **CI: Speed limit in negative direction of rotation / n_limit neg** | | |
| | **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| | **Can be changed:** T | **Scaling:** p2000 | **Dyn. index:** CDS, p0170 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 3050 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | 1086[0] |
| **Description:** | Sets the signal source for the speed/velocity limit of the negative direction. | | |

| | | | |
|---|---|---|---|
| **p1091[0...n]** | **Skip speed 1 / n_skip 1** | | |
| | **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| | **Can be changed:** U, T | **Scaling:** p2000 | **Dyn. index:** DDS, p0180 |
| | **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 3050 |
| | **Min** | **Max** | **Factory setting** |
| | 0.000 [rpm] | 210000.000 [rpm] | 0.000 [rpm] |
| **Description:** | Sets skip speed 1. | | |
| **Dependency:** | Refer to: p1092, p1093, p1094, p1101 | | |
| **Notice:** | Skip bandwidths can also become ineffective as a result of the downstream limits in the setpoint channel. | | |
| **Note:** | The skip (suppression) speeds can be used to prevent the effects of mechanical resonance. | | |

| | | | |
|---|---|---|---|
| **p1092[0...n]** | **Skip speed 2 / n_skip 2** | | |
| | **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| | **Can be changed:** U, T | **Scaling:** p2000 | **Dyn. index:** DDS, p0180 |
| | **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 3050 |
| | **Min** | **Max** | **Factory setting** |
| | 0.000 [rpm] | 210000.000 [rpm] | 0.000 [rpm] |
| **Description:** | Sets skip speed 2. | | |
| **Dependency:** | Refer to: p1091, p1093, p1094, p1101 | | |
| **Notice:** | Skip bandwidths can also become ineffective as a result of the downstream limits in the setpoint channel. | | |

| | | | |
|---|---|---|---|
| **p1093[0...n]** | **Skip speed 3 / n_skip 3** | | |
| | **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| | **Can be changed:** U, T | **Scaling:** p2000 | **Dyn. index:** DDS, p0180 |
| | **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 3050 |
| | **Min** | **Max** | **Factory setting** |
| | 0.000 [rpm] | 210000.000 [rpm] | 0.000 [rpm] |
| **Description:** | Sets skip speed 3. | | |
| **Dependency:** | Refer to: p1091, p1092, p1094, p1101 | | |
| **Notice:** | Skip bandwidths can also become ineffective as a result of the downstream limits in the setpoint channel. | | |

| | | | |
|---|---|---|---|
| **p1094[0...n]** | **Skip speed 4 / n_skip 4** | | |
| | **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| | **Can be changed:** U, T | **Scaling:** p2000 | **Dyn. index:** DDS, p0180 |
| | **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 3050 |
| | **Min** | **Max** | **Factory setting** |
| | 0.000 [rpm] | 210000.000 [rpm] | 0.000 [rpm] |
| **Description:** | Sets skip speed 4. | | |
| **Dependency:** | Refer to: p1091, p1092, p1093, p1101 | | |
| **Notice:** | Skip bandwidths can also become ineffective as a result of the downstream limits in the setpoint channel. | | |

## p1098[0...n] CI: Skip speed scaling / n_skip scal

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** T | **Scaling:** PERCENT | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 3050 |
| **Min** | **Max** | **Factory setting** |
| - | - | 1 |

**Description:** Sets the signal source for scaling the skip speeds.

**Dependency:** Refer to: p1091, p1092, p1093, p1094

## r1099.0 CO/BO: Skip band status word / Skip band ZSW

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display and BICO output for the skip bands.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | r1170 within the skip band | Yes | No | 3050 |

**Dependency:** Refer to: r1170

**Note:** Re bit 00:

With the bit set, the setpoint speed is within the skip band after the ramp-function generator (r1170).

The signal can be used to switch over the drive data set (DDS).

## p1101[0...n] Skip speed bandwidth / n_skip bandwidth

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** p2000 | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 3050 |
| **Min** | **Max** | **Factory setting** |
| 0.000 [rpm] | 210000.000 [rpm] | 0.000 [rpm] |

**Description:** Sets the bandwidth for the skip speeds/velocities 1 to 4.

**Dependency:** Refer to: p1091, p1092, p1093, p1094

**Note:** The setpoint (reference) speeds are skipped (suppressed) in the range of the skip speed +/-p1101.

Steady-state operation is not possible in the skipped (suppressed) speed range. The skip (suppression) range is skipped.

Example:

p1091 = 600 and p1101 = 20

--> setpoint speeds between 580 and 620 [rpm] are skipped.

For the skip bandwidths, the following hysteresis behavior applies:

For a setpoint speed coming from below, the following applies:

r1170 < 580 [rpm] and 580 [rpm] <= r1114 <= 620 [rpm] --> r1119 = 580 [rpm]

For a setpoint speed coming from above, the following applies:

r1170 > 620 [rpm] and 580 [rpm] <= r1114 <= 620 [rpm] --> r1119 = 620 [rpm]

## p1106[0...n] CI: Minimum speed signal source / n_min s_src

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** T | **Scaling:** p2000 | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 3050 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for lowest possible motor speed.

**Dependency:** Refer to: p1080

**Notice:** The effective minimum speed is formed from p1080 and p1106.

## p1108[0...n] BI: Total setpoint selection / Total setp sel

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 3030 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source to select the total setpoint.

**Dependency:** The selection of the total speed setpoint is automatically interconnected to the status word of the technology controller (r2349.4) if the technology controller is selected (p2200 > 0) and operated in the mode p2251 = 0.

If the energy-saving mode function is activated (p2398 = 1), an interconnection is made to r2399.7.

Refer to: p1109

**Caution:** If the technology controller is to supply the total setpoint using p1109, then it is not permissible to disable the interconnection to its status word (r2349.4). If the energy-saving mode function is activated, then it is not permissible to disable the interconnection to status word r2399.

## p1109[0...n] CI: Total setpoint / Total setp

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** T | **Scaling:** p2000 | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 3030 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for the total setpoint.

For p1108 = 1 signal, the total setpoint is read in via p1109.

**Dependency:** The signal source of the total setpoint is automatically interconnected to the output of the technology controller (r2294) if the technology controller is selected (p2200 > 0) and operated in the mode p2251 = 0.

If the energy-saving mode function is activated (p2398 = 1), an interconnection is made to r2397[0].

Refer to: p1108

**Caution:** If the technology controller is to supply the total setpoint using p1109, then it is not permissible to disable the interconnection to its output (r2294).

If the energy-saving mode function is activated, then it is not permissible to withdraw the interconnection to setpoint r2398[0].

## p1110[0...n] BI: Inhibit negative direction / Inhib neg dir

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2505, 3040 |
| **Min** | **Max** | **Factory setting** |
| - | - | 1 |

**Description:** Sets the signal source to disable the negative direction.

**Dependency:** Refer to: p1111

## p1111[0...n] BI: Inhibit positive direction / Inhib pos dir

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2505, 3040 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source to disable the positive direction.

**Dependency:** Refer to: p1110

## r1112 CO: Speed setpoint after minimum limiting / n_set aft min_lim

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2000 | **Dyn. index:** - |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 3050 |
| **Min** | **Max** | **Factory setting** |
| - [rpm] | - [rpm] | - [rpm] |

**Description:** Displays the speed setpoint after the minimum limiting.

**Dependency:** Refer to: p1091, p1092, p1093, p1094, p1101

## p1113[0...n] BI: Setpoint inversion / Setp inv

CU230P-2_BT
CU230P-2_CAN
CU230P-2_HVAC

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2441, 2442, 2505, 3040 |
| **Min** | **Max** | **Factory setting** |
| - | - | [0] 722.1<br>[1] 0<br>[2] 0<br>[3] 0 |

**Description:** Sets the signal source to invert the setpoint.

**Dependency:** Refer to: r1198

**Caution:** If the technology controller is being used as the speed main setpoint (p2251 = 0), do not invert the setpoint using p1113 when the technology controller is enabled because this can cause the speed to change suddenly and lead to positive couplings in the control loop.

**Notice:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

## p1113[0...n] BI: Setpoint inversion / Setp inv

CU230P-2_DP
CU230P-2_PN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2441, 2442, 2505, 3040 |
| **Min** | **Max** | **Factory setting** |
| - | - | [0] 2090.11<br>[1] 0<br>[2] 0<br>[3] 0 |

**Description:** Sets the signal source to invert the setpoint.

**Dependency:** Refer to: r1198

**Caution:** If the technology controller is being used as the speed main setpoint (p2251 = 0), do not invert the setpoint using p1113 when the technology controller is enabled because this can cause the speed to change suddenly and lead to positive couplings in the control loop.

**Notice:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

## r1114 CO: Setpoint after the direction limiting / Setp after limit

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2000 | **Dyn. index:** - |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 3001, 3040, 3050 |
| **Min** | **Max** | **Factory setting** |
| - [rpm] | - [rpm] | - [rpm] |

**Description:** Displays the speed/velocity setpoint after the changeover and limiting the direction.

## r1119 CO: Ramp-function generator setpoint at the input / RFG setp at inp

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2000 | **Dyn. index:** - |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 3050, 3070, 6300 |
| **Min** | **Max** | **Factory setting** |
| - [rpm] | - [rpm] | - [rpm] |

**Description:** Displays the setpoint at the input of the ramp-function generator.

**Notice:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

**Note:** The setpoint is influenced by other functions, e.g. skip (suppressed) speeds, minimum and maximum limits.

## p1120[0...n] Ramp-function generator ramp-up time / RFG ramp-up time

PM230
PM240
PM250, PM260

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** C(1), U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 3070 |
| **Min** | **Max** | **Factory setting** |
| 0.000 [s] | 999999.000 [s] | 10.000 [s] |

**Description:** The ramp-function generator ramps-up the speed setpoint from standstill (setpoint = 0) up to the maximum speed (p1082) in this time.

**Dependency:** Refer to: p1082, p1123

**Note:** The ramp-up time can be scaled via connector input p1138.

The parameter is adapted during the rotating measurement (p1960 > 0). This is the reason that during the rotating measurement, the motor can accelerate faster than was originally parameterized.

For U/f control and sensorless vector control (see p1300), a ramp-up time of 0 s is not expedient. The setting should be based on the startup times (r0345) of the motor.

## p1120[0...n] Ramp-function generator ramp-up time / RFG ramp-up time

PM330

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** C(1), U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 3070 |
| **Min** | **Max** | **Factory setting** |
| 0.000 [s] | 999999.000 [s] | 20.000 [s] |

**Description:** The ramp-function generator ramps-up the speed setpoint from standstill (setpoint = 0) up to the maximum speed (p1082) in this time.

**Dependency:** Refer to: p1082, p1123

**Note:** The ramp-up time can be scaled via connector input p1138.

The parameter is adapted during the rotating measurement (p1960 > 0). This is the reason that during the rotating measurement, the motor can accelerate faster than was originally parameterized.

For U/f control and sensorless vector control (see p1300), a ramp-up time of 0 s is not expedient. The setting should be based on the startup times (r0345) of the motor.

## p1121[0...n] Ramp-function generator ramp-down time / RFG ramp-down time

PM230
PM330

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** C(1), U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 3070 |
| **Min** | **Max** | **Factory setting** |
| 0.000 [s] | 999999.000 [s] | 30.000 [s] |

**Description:** Sets the ramp-down time for the ramp-function generator.

The ramp-function generator ramps-down the speed setpoint from the maximum speed (p1082) down to standstill (setpoint = 0) in this time.

Further, the ramp-down time is always effective for OFF1.

**Dependency:** The parameter is pre-assigned depending on the size of the power unit.

Refer to: p1082, p1127

**Note:** For U/f control and sensorless vector control (see p1300), a ramp-down time of 0 s is not expedient. The setting should be based on the startup times (r0345) of the motor.

## p1121[0...n] Ramp-function generator ramp-down time / RFG ramp-down time

PM240
PM250, PM260

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** C(1), U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 3070 |
| **Min** | **Max** | **Factory setting** |
| 0.000 [s] | 999999.000 [s] | 10.000 [s] |

**Description:** Sets the ramp-down time for the ramp-function generator.

The ramp-function generator ramps-down the speed setpoint from the maximum speed (p1082) down to standstill (setpoint = 0) in this time.

Further, the ramp-down time is always effective for OFF1.

**Dependency:** Refer to: p1082, p1127

**Note:** For U/f control and sensorless vector control (see p1300), a ramp-down time of 0 s is not expedient. The setting should be based on the startup times (r0345) of the motor.

## p1122[0...n] BI: Bypass ramp-function generator / Bypass RFG

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2505 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for bypassing the ramp generator (ramp-up and ramp-down times = 0).

**Caution:** If the technology controller is operated in mode p2251 = 0 (technology controller as main speed setpoint), or the energy-saving mode function is activated, then it is not permissible to disable the interconnection to the relevant status word (r2349, r2399).

**Notice:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

**Note:** In the case of sensorless vector control, the ramp-function generator must not be bypassed, other than indirectly by means of interconnection with r2349 or r2399.

## p1123[0...n] Ramp-function generator minimum ramp-up time / RFG t_RU min

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** p0340 = 1 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.000 [s] | 999999.000 [s] | 0.000 [s] |

**Description:** Sets the minimum ramp-up time.

The ramp-up time (p1120) is limited internally to this minimum value.

**Dependency:** Refer to: p1082

**Note:** The setting should be based on the startup times (r0345) of the motor.

If the maximum speed p1082 changes, p1123 is re-calculated.

## p1127[0...n] Ramp-function generator minimum ramp-down time / RFG t_RD min

PM230
PM250, PM260

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** p0340 = 1 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.000 [s] | 999999.000 [s] | 0.000 [s] |

**Description:** Sets the minimum ramp-down time.

The ramp-down time (p1121) is limited internally to this minimum value.

**Dependency:** Refer to: p1082

**Note:** For U/f control and sensorless vector control (see p1300), a ramp-down time of 0 s is not expedient. The setting should be based on the startup times (r0345) of the motor.

If the maximum speed p1082 changes, p1127 is re-calculated.

## p1127[0...n] Ramp-function generator minimum ramp-down time / RFG t_RD min

| PM240<br>PM330 | **Access level:** 4 | **Calculated:** p0340 = 1 | **Data type:** FloatingPoint32 |
|---|---|---|---|
| | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | 0.000 [s] | 999999.000 [s] | 0.000 [s] |

**Description:** Sets the minimum ramp-down time.

The ramp-down time (p1121) is limited internally to this minimum value.

**Dependency:** Refer to: p1082

**Note:** For U/f control and sensorless vector control (see p1300), a ramp-down time of 0 s is not expedient. The setting should be based on the startup times (r0345) of the motor.

If the maximum speed p1082 changes, p1127 is re-calculated.

If a braking resistor is connected to the DC link (p0219 > 0), then the minimum ramp-down time is automatically adapted using p1127.

## p1130[0...n] Ramp-function generator initial rounding-off time / RFG t_start_round

| PM230<br>PM330 | **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
|---|---|---|---|
| | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 3070 |
| | **Min** | **Max** | **Factory setting** |
| | 0.000 [s] | 30.000 [s] | 2.000 [s] |

**Description:** Sets the initial rounding-off time for the extended ramp generator. The value applies to ramp-up and ramp-down.

**Note:** Rounding-off times avoid an abrupt response and prevent damage to the mechanical system.

## p1130[0...n] Ramp-function generator initial rounding-off time / RFG t_start_round

| PM240<br>PM250, PM260 | **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
|---|---|---|---|
| | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 3070 |
| | **Min** | **Max** | **Factory setting** |
| | 0.000 [s] | 30.000 [s] | 0.000 [s] |

**Description:** Sets the initial rounding-off time for the extended ramp generator. The value applies to ramp-up and ramp-down.

**Note:** Rounding-off times avoid an abrupt response and prevent damage to the mechanical system.

## p1131[0...n] Ramp-function generator final rounding-off time / RFG t_end_delay

| PM230 | **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
|---|---|---|---|
| | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 3070 |
| | **Min** | **Max** | **Factory setting** |
| | 0.000 [s] | 30.000 [s] | 2.000 [s] |

**Description:** Sets the final rounding-off time for the extended ramp generator.

The value applies to ramp-up and ramp-down.

**Note:** Rounding-off times avoid an abrupt response and prevent damage to the mechanical system.

## p1131[0...n] Ramp-function generator final rounding-off time / RFG t_end_delay

| PM240<br>PM250, PM260 | **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
|---|---|---|---|
| | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 3070 |
| | **Min** | **Max** | **Factory setting** |
| | 0.000 [s] | 30.000 [s] | 0.000 [s] |

**Description:** Sets the final rounding-off time for the extended ramp generator.

The value applies to ramp-up and ramp-down.

**Note:** Rounding-off times avoid an abrupt response and prevent damage to the mechanical system.

| p1131[0...n] | Ramp-function generator final rounding-off time / RFG t_end_delay | | |
|---|---|---|---|
| PM330 | **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 3070 |
| | **Min** | **Max** | **Factory setting** |
| | 0.000 [s] | 30.000 [s] | 3.000 [s] |

**Description:** Sets the final rounding-off time for the extended ramp generator.

The value applies to ramp-up and ramp-down.

**Note:** Rounding-off times avoid an abrupt response and prevent damage to the mechanical system.

| p1134[0...n] | Ramp-function generator rounding-off type / RFG round-off type | | |
|---|---|---|---|
| | **Access level:** 2 | **Calculated:** - | **Data type:** Integer16 |
| | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 3070 |
| | **Min** | **Max** | **Factory setting** |
| | 0 | 1 | 0 |

**Description:** Sets the smoothed response to the OFF1 command or the reduced setpoint for the extended ramp-function generator.

**Value:**
0: Cont smoothing
1: Discont smoothing

**Dependency:** No effect up to initial rounding-off time (p1130) > 0 s.

**Note:** p1134 = 0 (continuous smoothing)

If the setpoint is reduced while ramping-up, initially a final rounding-off is carried out and then the ramp-up completed. During the final rounding-off, the output of the ramp-function generator continues to go in the direction of the previous setpoint (overshoot). After the final rounding-off has been completed, the output goes toward the new setpoint.

p1134 = 1 (discontinuous smoothing)

If the setpoint is reduced while ramping-up, then the output goes immediately in the direction of the new setpoint. For the setpoint change there is no rounding-off.

| p1135[0...n] | OFF3 ramp-down time / OFF3 t_RD | | |
|---|---|---|---|
| PM230 | **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| | **Can be changed:** C(1), U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 3070 |
| | **Min** | **Max** | **Factory setting** |
| | 0.000 [s] | 5400.000 [s] | 30.000 [s] |

**Description:** Sets the ramp-down time from the maximum speed down to zero speed for the OFF3 command.

**Dependency:** The parameter is pre-assigned depending on the size of the power unit.

**Note:** This time can be exceeded if the DC link voltage reaches its maximum value.

| p1135[0...n] | OFF3 ramp-down time / OFF3 t_RD | | |
|---|---|---|---|
| PM240 | **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| PM250, PM260 | **Can be changed:** C(1), U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 3070 |
| | **Min** | **Max** | **Factory setting** |
| | 0.000 [s] | 5400.000 [s] | 0.000 [s] |

**Description:** Sets the ramp-down time from the maximum speed down to zero speed for the OFF3 command.

**Note:** This time can be exceeded if the DC link voltage reaches its maximum value.

## p1135[0...n] OFF3 ramp-down time / OFF3 t_RD

PM330

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** C(1), U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 3070 |
| **Min** | **Max** | **Factory setting** |
| 0.000 [s] | 5400.000 [s] | 3.000 [s] |

**Description:** Sets the ramp-down time from the maximum speed down to zero speed for the OFF3 command.

**Dependency:** The parameter is pre-assigned depending on the size of the power unit.

**Note:** This time can be exceeded if the DC link voltage reaches its maximum value.

## p1136[0...n] OFF3 initial rounding-off time / RFGOFF3 t_strt_rnd

PM230

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 3070 |
| **Min** | **Max** | **Factory setting** |
| 0.000 [s] | 30.000 [s] | 2.000 [s] |

**Description:** Sets the initial rounding-off time for OFF3 for the extended ramp generator.

## p1136[0...n] OFF3 initial rounding-off time / RFGOFF3 t_strt_rnd

PM240
PM250, PM260

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 3070 |
| **Min** | **Max** | **Factory setting** |
| 0.000 [s] | 30.000 [s] | 0.000 [s] |

**Description:** Sets the initial rounding-off time for OFF3 for the extended ramp generator.

## p1136[0...n] OFF3 initial rounding-off time / RFGOFF3 t_strt_rnd

PM330

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 3070 |
| **Min** | **Max** | **Factory setting** |
| 0.000 [s] | 30.000 [s] | 0.500 [s] |

**Description:** Sets the initial rounding-off time for OFF3 for the extended ramp generator.

## p1137[0...n] OFF3 final rounding-off time / RFG OFF3 t_end_del

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 3070 |
| **Min** | **Max** | **Factory setting** |
| 0.000 [s] | 30.000 [s] | 0.000 [s] |

**Description:** Sets the final rounding-off time for OFF3 for the extended ramp generator.

## p1138[0...n] CI: Ramp-function generator ramp-up time scaling / RFG t_RU scal

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** T | **Scaling:** PERCENT | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 3070 |
| **Min** | **Max** | **Factory setting** |
| - | - | 1 |

**Description:** Sets the signal source for scaling the ramp-up time of the ramp-function generator.

**Dependency:** Refer to: p1120

**Note:** The ramp-up time is set in p1120.

## p1139[0...n] CI: Ramp-function generator ramp-down time scaling / RFG t_RD scal

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** T | **Scaling:** PERCENT | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 3070 |
| **Min** | **Max** | **Factory setting** |
| - | - | 1 |

**Description:** Sets the signal source for scaling the ramp-down time of the ramp-function generator.

**Dependency:** Refer to: p1121

**Note:** The ramp-down time is set in p1121.

## p1140[0...n] BI: Enable ramp-function generator/inhibit ramp-function generator / RFG enable

CU230P-2_BT
CU230P-2_CAN
CU230P-2_HVAC

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2501 |
| **Min** | **Max** | **Factory setting** |
| - | - | 1 |

**Description:** Sets the signal source for the command "enable ramp-function generator/inhibit ramp-function generator".
For the PROFIdrive profile, this command corresponds to control word 1 bit 4 (STW1.4).
BI: p1140 = 0 signal:
Inhibits the ramp-function generator (the ramp-function generator output is set to zero).
BI: p1140 = 1 signal:
Ramp-function generator enable.

**Dependency:** Refer to: r0054, p1141, p1142

**Caution:** When "master control from PC" is activated, this binector input is ineffective.

**Notice:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

## p1140[0...n] BI: Enable ramp-function generator/inhibit ramp-function generator / RFG enable

CU230P-2_DP
CU230P-2_PN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2501 |
| **Min** | **Max** | **Factory setting** |
| - | - | [0] 2090.4<br>[1] 1<br>[2] 2090.4<br>[3] 2090.4 |

**Description:** Sets the signal source for the command "enable ramp-function generator/inhibit ramp-function generator".
For the PROFIdrive profile, this command corresponds to control word 1 bit 4 (STW1.4).
BI: p1140 = 0 signal:
Inhibits the ramp-function generator (the ramp-function generator output is set to zero).
BI: p1140 = 1 signal:
Ramp-function generator enable.

**Dependency:** Refer to: r0054, p1141, p1142

**Caution:** When "master control from PC" is activated, this binector input is ineffective.

**Notice:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

## p1141[0...n] BI: Continue ramp-function generator/freeze ramp-function generator / Continue RFG

| | | | |
|---|---|---|---|
| CU230P-2_BT | **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| CU230P-2_CAN | **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| CU230P-2_HVAC | **Units group:** - | **Unit selection:** - | **Func. diagram:** 2501 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | 1 |

**Description:** Sets the signal source for the command "continue ramp-function generator/freeze ramp-function generator".
For the PROFIdrive profile, this command corresponds to control word 1 bit 5 (STW1.5).
BI: p1141 = 0 signal:
Freezes the ramp-function generator.
BI: p1141 = 1 signal:
Continue ramp-function generator.

**Dependency:** Refer to: r0054, p1140, p1142

**Caution:** When "master control from PC" is activated, this binector input is ineffective.

**Notice:** The ramp-function generator is, independent of the state of the signal source, active in the following cases:
- OFF1/OFF3.
- ramp-function generator output within the suppression bandwidth.
- ramp-function generator output below the minimum speed.

## p1141[0...n] BI: Continue ramp-function generator/freeze ramp-function generator / Continue RFG

| | | | |
|---|---|---|---|
| CU230P-2_DP | **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| CU230P-2_PN | **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 2501 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | [0] 2090.5<br>[1] 1<br>[2] 2090.5<br>[3] 2090.5 |

**Description:** Sets the signal source for the command "continue ramp-function generator/freeze ramp-function generator".
For the PROFIdrive profile, this command corresponds to control word 1 bit 5 (STW1.5).
BI: p1141 = 0 signal:
Freezes the ramp-function generator.
BI: p1141 = 1 signal:
Continue ramp-function generator.

**Dependency:** Refer to: r0054, p1140, p1142

**Caution:** When "master control from PC" is activated, this binector input is ineffective.

**Notice:** The ramp-function generator is, independent of the state of the signal source, active in the following cases:
- OFF1/OFF3.
- ramp-function generator output within the suppression bandwidth.
- ramp-function generator output below the minimum speed.

## p1142[0...n] BI: Enable setpoint/inhibit setpoint / Setpoint enable

| | | | |
|---|---|---|---|
| CU230P-2_BT | **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| CU230P-2_CAN | **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| CU230P-2_HVAC | **Units group:** - | **Unit selection:** - | **Func. diagram:** 2501 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | 1 |

**Description:** Sets the signal source for the command "enable setpoint/inhibit setpoint".

For the PROFIdrive profile, this command corresponds to control word 1 bit 6 (STW1.6).

BI: p1142 = 0 signal

Inhibits the setpoint (the ramp-function generator input is set to zero).

BI: p1142 = 1 signal

Setpoint enable.

**Dependency:** Refer to: p1140, p1141

**Caution:** When "master control from PC" is activated, this binector input is ineffective.

**Notice:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

**Note:** When the function module "position control" (r0108.3 = 1) is activated, this binector input is interconnected as follows as standard:

BI: p1142 = 0 signal

## p1142[0...n] BI: Enable setpoint/inhibit setpoint / Setpoint enable

| | | | |
|---|---|---|---|
| CU230P-2_DP | **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| CU230P-2_PN | **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 2501 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | [0] 2090.6<br>[1] 1<br>[2] 2090.6<br>[3] 2090.6 |

**Description:** Sets the signal source for the command "enable setpoint/inhibit setpoint".

For the PROFIdrive profile, this command corresponds to control word 1 bit 6 (STW1.6).

BI: p1142 = 0 signal

Inhibits the setpoint (the ramp-function generator input is set to zero).

BI: p1142 = 1 signal

Setpoint enable.

**Dependency:** Refer to: p1140, p1141

**Caution:** When "master control from PC" is activated, this binector input is ineffective.

**Notice:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

**Note:** When the function module "position control" (r0108.3 = 1) is activated, this binector input is interconnected as follows as standard:

BI: p1142 = 0 signal

## p1143[0...n] BI: Ramp-function generator, accept setting value / RFG accept set v

| | | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 3070 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | 0 |

**Description:** Sets the signal source for accepting the setting value of the ramp-function generator.

**Dependency:** The signal source for the ramp-function generator setting value is set using parameters.

Refer to: p1144

**Note:** 0/1 signal:

The ramp-function generator output is immediately (without delay) set to the setting value of the ramp-function generator.

1 signal:

The setting value of the ramp-function generator is effective.

1/0 signal:

The input value of the ramp-function generator is effective. The ramp-function generator output is adapted to the input value using the ramp-up time or the ramp-down time.

0 signal:

The input value of the ramp-function generator is effective.

## p1144[0...n] CI: Ramp-function generator setting value / RFG setting value

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** p2000 | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 3070 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for the ramp-function generator setting value.

**Dependency:** The signal source for accepting the setting value is set using parameters.

Refer to: p1143

## p1145[0...n] Ramp-function generator tracking intensity. / RFG track intens

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 3080 |
| **Min** | **Max** | **Factory setting** |
| 0.0 | 50.0 | 0.0 |

**Description:** Sets the ramp-function generator tracking.

The output value of the ramp-function generator is tracked (corrected) corresponding to the maximum possible drive acceleration.

The reference value is the deviation at the speed/velocity controller input that is necessary to ensure that the motor accelerates at the torque/force limit.

**Recommend.:** If at least one speed setpoint filter/velocity setpoint filter is activated (p1414), then the ramp-function generator tracking should be deactivated (p1145 = 0.0). When the speed setpoint filter is activated, the output value of the ramp-function generator can no longer be tracked (corrected) corresponding to the maximum possible drive acceleration.

Re p1145 = 0.0:

This value de-activates the ramp-function generator tracking.

Re p1145 = 0.0 ... 1.0:

Generally, these values are not practical. They cause the motor to accelerate below its torque limit. The lower the selected value, the greater the margin between the controller and torque limit when accelerating.

Re p1145 > 1.0:

The greater the value, the higher the permissible deviation between the speed setpoint and speed actual value.

**Notice:** If ramp-function generator tracking is activated and the ramp time is set too short, this can cause unsteady acceleration.

Remedy:

- switch off ramp-function generator tracking (p1145 = 0).
- increase the ramp-up/ramp-down time (p1120, p1121).

**Note:** In the U/f mode, ramp-function generator tracking is not active.

## p1148[0...n] Ramp-function gen. tolerance for ramp-up and ramp-down active / RFG tol HL/RL act

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 3070 |
| **Min** | **Max** | **Factory setting** |
| 0.000 [rpm] | 1000.000 [rpm] | 19.800 [rpm] |

**Description:** Sets the tolerance value for the status of the ramp-function generator (ramp-up active, ramp-down active).

If the input of the ramp-function generator does not change in comparison to the output by more than the entered tolerance time, then the status bits "ramp-up active" and "ramp-down active" are not influenced.

**Dependency:** Refer to: r1199

## r1149 CO: Ramp-function generator acceleration / RFG acceleration

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2007 | **Dyn. index:** - |
| **Units group:** 39_1 | **Unit selection:** p0505 | **Func. diagram:** 3070 |
| **Min** | **Max** | **Factory setting** |
| - [rev/s²] | - [rev/s²] | - [rev/s²] |

**Description:** Displays the acceleration of the ramp-function generator.

**Dependency:** Refer to: p1145

## r1170 CO: Speed controller setpoint sum / n_ctrl setp sum

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2000 | **Dyn. index:** - |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 3001, 3080, 6300 |
| **Min** | **Max** | **Factory setting** |
| - [rpm] | - [rpm] | - [rpm] |

**Description:** Display and connector output for the speed setpoint after selecting the ramp-function generator.

The value is the sum of speed setpoint 1 (p1155) and speed setpoint 2 (p1160).

## r1197 Fixed speed setpoint number actual / n_set_fixed No act

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 3010 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the number of the selected fixed speed/velocity setpoint.

**Dependency:** Refer to: p1020, p1021, p1022, p1023

**Note:** If a fixed speed setpoint has not been selected (p1020 ... p1023 = 0, r1197 = 0), then r1024 = 0 (setpoint = 0).

## r1198.0...15 CO/BO: Control word setpoint channel / STW setpoint chan

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2505 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display and BICO output for the control word of the setpoint channel.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Fixed setp bit 0 | Yes | No | 3010 |
| 01 | Fixed setp bit 1 | Yes | No | 3010 |
| 02 | Fixed setp bit 2 | Yes | No | 3010 |
| 03 | Fixed setp bit 3 | Yes | No | 3010 |
| 05 | Inhibit negative direction | Yes | No | 3040 |
| 06 | Inhibit positive direction | Yes | No | 3040 |

| | | | | |
|---|---|---|---|---|
| 11 | Setpoint inversion | Yes | No | 3040 |
| 13 | Motorized potentiometer raise | Yes | No | 3020 |
| 14 | Motorized potentiometer lower | Yes | No | 3020 |
| 15 | Bypass ramp-function generator | Yes | No | 3070 |

## r1199.0...8 CO/BO: Ramp-function generator status word / RFG ZSW

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 3001, 3080 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the status word for the ramp-function generator (RFG).

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Ramp-up active | Yes | No | - |
| 01 | Ramp-down active | Yes | No | - |
| 02 | RFG active | Yes | No | - |
| 03 | Ramp-function generator set | Yes | No | - |
| 04 | Ramp-function generator held | Yes | No | - |
| 05 | Ramp-function generator tracking active | Yes | No | - |
| 06 | Maximum limit active | Yes | No | - |
| 07 | Ramp-function generator acceleration positive | Yes | No | - |
| 08 | Ramp-function generator acceleration negative | Yes | No | - |

**Note:** Re bit 02:

The bit is the result of the OR logic operation - bit 00 and bit 01.

## p1200[0...n] Flying restart operating mode / FlyRest op_mode

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6300 |
| **Min** | **Max** | **Factory setting** |
| 0 | 4 | 0 |

**Description:** Sets the operating mode for flying restart.

The flying restart allows the drive converter to be powered up while the motor is still rotating. In so doing, the drive converter output frequency is changed until the actual motor speed/velocity is found. The motor then accelerates up to the setpoint at the ramp-function generator setting.

**Value:**
0: Flying restart inactive
1: Flying restart always active (start in setpoint direction)
4: Flying restart always active (start only in setpoint direction)

**Dependency:** A differentiation is made between flying restart for U/f control and for vector control (p1300).

Flying restart, U/f control: p1202, p1203, r1204

Flying restart, vector control: p1202, p1203, r1205

For synchronous motors, flying restart cannot be activated.

Refer to: p1201

**Notice:** The "flying restart" function must be used in cases where the motor may still be running (e.g. after a brief line supply interruption) or is being driven by the load. The system might otherwise shut down as a result of overcurrent.

**Note:** For p1200 = 1, 4, the following applies:

Flying restart is active after faults, OFF1, OFF2, OFF3.

For p1200 = 1, the following applies:

The search is made in both directions.

For p1200 = 4, the following applies:

The search is only made in the setpoint direction.

For U/f control (p1300 < 20), the following applies:

The speed can only be sensed for values above approx. 5 % of the rated motor speed. For lower speeds, it is assumed that the motor is at a standstill.

If p1200 is changed during commissioning (p0010 > 0), then it is possible that the old value will no longer be able to be set. The reason for this is that the dynamic limits of p1200 have been changed by a parameter that was set when the drive was commissioned (e.g. p0300).

## p1201[0...n] BI: Flying restart enable signal source / Fly_res enab S_src

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | 1 |

**Description:** Sets the signal source to enable the "flying restart" function.

**Dependency:** Refer to: p1200

**Note:** Withdrawing the enable signal has the same effect as setting p1200 = 0.

## p1202[0...n] Flying restart search current / FlyRest I_srch

PM230

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 10 [%] | 400 [%] | 90 [%] |

**Description:** Sets the search current for the "flying restart" function.

The value is referred to the motor magnetizing current.

**Dependency:** The parameter is pre-assigned depending on the size of the power unit.

Refer to: r0331

**Caution:** An unfavorable parameter value can result in the motor behaving in an uncontrollable fashion.

**Note:** In U/f control mode, the parameter serves as a threshold value for establishing the current at the beginning of the flying restart function. When the threshold value is reached, the prevailing search current is set dependent upon the frequency on the basis of voltage inputs.

Reducing the search current can also improve flying restart performance (if the system moment of inertia is not very high, for example).

## p1202[0...n] Flying restart search current / FlyRest I_srch

PM240
PM250
PM260, PM330

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 10 [%] | 400 [%] | 100 [%] |

**Description:** Sets the search current for the "flying restart" function.

The value is referred to the motor magnetizing current.

**Dependency:** Refer to: r0331

**Caution:** An unfavorable parameter value can result in the motor behaving in an uncontrollable fashion.

**Note:** In U/f control mode, the parameter serves as a threshold value for establishing the current at the beginning of the flying restart function. When the threshold value is reached, the prevailing search current is set dependent upon the frequency on the basis of voltage inputs.

Reducing the search current can also improve flying restart performance (if the system moment of inertia is not very high, for example).

## p1203[0...n] Flying restart search rate factor / FlyRst v_Srch Fact

| PM230 | | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | 10 [%] | 4000 [%] | 150 [%] |

**Description:** Sets the factor for the search speed for flying restart.

The value influences the rate at which the output frequency is changed during a flying restart . A higher value results in a longer search time.

**Recommend.:** For encoderless vector control and motor cables longer than 200 m, set the factor p1203 >= 300 %.

**Caution:** An unfavorable parameter value can result in the motor behaving in an uncontrollable fashion.

For vector control, a value that is too low or too high can cause flying restart to become unstable.

**Note:** The parameter factory setting is selected so that standard induction motors that are rotating can be found and restarted as quickly as possible (fast flying restart).

With this pre-setting, if the motor is not found (e.g. for motors that are accelerated as a result of active loads or with U/f control and low speeds), we recommend that the search rate is reduced (by increasing p1203).

## p1203[0...n] Flying restart search rate factor / FlyRst v_Srch Fact

| | | | |
|---|---|---|---|
| PM240 | **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| PM250 | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| PM260, PM330 | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | 10 [%] | 4000 [%] | 100 [%] |

**Description:** Sets the factor for the search speed for flying restart.

The value influences the rate at which the output frequency is changed during a flying restart . A higher value results in a longer search time.

**Recommend.:** For encoderless vector control and motor cables longer than 200 m, set the factor p1203 >= 300 %.

**Caution:** An unfavorable parameter value can result in the motor behaving in an uncontrollable fashion.

For vector control, a value that is too low or too high can cause flying restart to become unstable.

**Note:** The parameter factory setting is selected so that standard induction motors that are rotating can be found and restarted as quickly as possible (fast flying restart).

With this pre-setting, if the motor is not found (e.g. for motors that are accelerated as a result of active loads or with U/f control and low speeds), we recommend that the search rate is reduced (by increasing p1203).

## r1204.0...13 CO/BO: Flying restart U/f control status / FlyRest Uf st

| | | | |
|---|---|---|---|
| PM230 | **Access level:** 4 | **Calculated:** - | **Data type:** Unsigned16 |
| PM240 | **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| PM250, PM260 | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | - | - | - |

**Description:** Displays the status for checking and monitoring flying restart states in the U/f control mode.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Current impressed | Yes | No | - |
| 01 | No current flow | Yes | No | - |
| 02 | Voltage input | Yes | No | - |
| 03 | Voltage reduced | Yes | No | - |
| 04 | Start ramp-function generator | Yes | No | - |
| 05 | Wait for execution | Yes | No | - |
| 06 | Slope filter act | Yes | No | - |
| 07 | Positive gradient | Yes | No | - |
| 08 | Current < thresh | Yes | No | - |
| 09 | Current minimum | Yes | No | - |
| 10 | Search in the positive direction | Yes | No | - |

| | | | | |
|---|---|---|---|---|
| 11 | Stop after positive direction | Yes | No | - |
| 12 | Stop after negative direction | Yes | No | - |
| 13 | No result | Yes | No | - |

## r1204.0...15 CO/BO: Flying restart U/f control status / FlyRest Uf st

PM330

**Access level:** 4 | **Calculated:** - | **Data type:** Unsigned16

**Can be changed:** - | **Scaling:** - | **Dyn. index:** -

**Units group:** - | **Unit selection:** - | **Func. diagram:** -

| Min | Max | Factory setting |
|---|---|---|
| - | - | - |

**Description:** Displays the status for checking and monitoring flying restart states in the U/f control mode.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Current impressed | Yes | No | - |
| 01 | No current flow | Yes | No | - |
| 02 | Voltage input | Yes | No | - |
| 03 | Voltage reduced | Yes | No | - |
| 04 | Start ramp-function generator | Yes | No | - |
| 05 | Wait for execution | Yes | No | - |
| 06 | Slope filter act | Yes | No | - |
| 07 | Positive gradient | Yes | No | - |
| 08 | Current < thresh | Yes | No | - |
| 09 | Current minimum | Yes | No | - |
| 10 | Search in the positive direction | Yes | No | - |
| 11 | Stop after positive direction | Yes | No | - |
| 12 | Stop after negative direction | Yes | No | - |
| 13 | No result | Yes | No | - |
| 14 | Fast flying restart w/ voltage model for induction motor activ. | Yes | No | - |
| 15 | Flying restart with VSM active | Yes | No | - |

## r1205.0...15 CO/BO: Flying restart vector control status / FlyRest vector st

PM230
PM240
PM250, PM260

**Access level:** 4 | **Calculated:** - | **Data type:** Unsigned32

**Can be changed:** - | **Scaling:** - | **Dyn. index:** -

**Units group:** - | **Unit selection:** - | **Func. diagram:** -

| Min | Max | Factory setting |
|---|---|---|
| - | - | - |

**Description:** Display and connector output for the status for checking and monitoring flying restart states in the vector control mode.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Speed adaptation circuit record angle | Yes | No | - |
| 01 | Speed adaptation circuit set gain to 0 | Yes | No | - |
| 02 | Isd channel enable | Yes | No | - |
| 03 | Speed control switched out | Yes | No | - |
| 04 | Quadrature arm switched in | Yes | No | - |
| 05 | Special transformation active | Yes | No | - |
| 06 | Speed adaptation circuit set I comp to 0 | Yes | No | - |
| 07 | Current control on | Yes | No | - |
| 08 | Isd_set = 0 A | Yes | No | - |
| 09 | Frequency held | Yes | No | - |
| 10 | Search in the positive direction | Yes | No | - |
| 11 | Search Started | Yes | No | - |
| 12 | Current impressed | Yes | No | - |
| 13 | Search interrupted | Yes | No | - |
| 14 | Speed adaptation circuit deviation = 0 | Yes | No | - |
| 15 | Speed control activated | Yes | No | - |

**Note:** Re bit 00 ... 09:

Used to control internal sequences during the flying restart.

Depending on the motor type (p0300), the number of active bits differs.

Re bits 10 ... 15:

Are used to monitor the flying restart sequence.

## r1205.0...20 CO/BO: Flying restart vector control status / FlyRest vector st

PM330

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display and connector output for the status for checking and monitoring flying restart states in the vector control mode.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Speed adaptation circuit record angle | Yes | No | - |
| 01 | Speed adaptation circuit set gain to 0 | Yes | No | - |
| 02 | Isd channel enable | Yes | No | - |
| 03 | Speed control switched out | Yes | No | - |
| 04 | Quadrature arm switched in | Yes | No | - |
| 05 | Special transformation active | Yes | No | - |
| 06 | Speed adaptation circuit set I comp to 0 | Yes | No | - |
| 07 | Current control on | Yes | No | - |
| 08 | Isd_set = 0 A | Yes | No | - |
| 09 | Frequency held | Yes | No | - |
| 10 | Search in the positive direction | Yes | No | - |
| 11 | Search Started | Yes | No | - |
| 12 | Current impressed | Yes | No | - |
| 13 | Search interrupted | Yes | No | - |
| 14 | Speed adaptation circuit deviation = 0 | Yes | No | - |
| 15 | Speed control activated | Yes | No | - |
| 16 | Fast flying restart w/ voltage model for induction motor activ. | Yes | No | - |
| 17 | Fast flying restart w/ voltage model for induction motor exited | Yes | No | - |
| 18 | Apply VSM voltage to the monitor | Yes | No | - |
| 19 | Preassign flux ramp | Yes | No | - |
| 20 | Adaptation current controller and speed adapt. controller gain | Yes | No | - |

**Note:** Re bit 00 ... 09:

Used to control internal sequences during the flying restart.

Depending on the motor type (p0300), the number of active bits differs.

Re bits 10 ... 15:

Are used to monitor the flying restart sequence.

## p1206[0...9] Faults without automatic restart / F w/out auto AR

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 65535 | 0 |

**Description:** Sets faults for which automatic restart should not be effective.

**Dependency:** The setting is only effective for p1210 = 6, 16, 26.

Refer to: p1210

## p1210 Automatic restart mode / AR mode

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 26 | 0 |

**Description:** Sets the automatic restart mode (AR).

The parameters must be saved in the non-volatile memory p0971 = 1 in order that the setting becomes effective.

| | | |
|---|---|---|
| **Value:** | 0: | Inhibit automatic restart |
| | 1: | Acknowledge all faults without restarting |
| | 4: | Restart after line supply failure w/o additional start attempts |
| | 6: | Restart after fault with additional start attempts |
| | 14: | Restart after line supply failure following man. acknowledgment |
| | 16: | Restart after fault following manual acknowledgment |
| | 26: | Acknowledging all faults and reclosing for an ON command |

**Recommend.:** For brief line supply failures, the motor shaft may still be rotating when restarting. The "flying restart" function (p1200) might need to be activated to restart while the motor shaft is still rotating.

**Dependency:** The automatic restart requires an active ON command (e.g., via a digital input). If, for p1210 > 1, there is no active ON command, then the automatic restart is interrupted.

When using an Operator Panel in the LOCAL mode, then there is no automatic start.

For p1210 = 14, 16, a manual acknowledgement is required for an automatic restart.

Refer to: p0840, p0857, p1267

**Danger:** If the automatic restart is activated (p1210 > 1) if there is an ON command (refer to p0840), the drive is powered up as soon as any fault messages that are present can be acknowledged. This also occurs after the line supply returns or the Control Unit boots if the DC link voltage is present again. This automatic power-up sequence can only be interrupted by withdrawing the ON command.

**Notice:** A change is only accepted and made in the state "initialization" (r1214.0) and "wait for alarm" (r1214.1). When faults are present, therefore, the parameter cannot be changed.

For p1210 > 1, the motor is automatically started.

**Note:** Re p1210 = 1:

Faults that are present are automatically acknowledged. If new faults occur after a successful fault acknowledgment, then these are also automatically acknowledged again. p1211 has no influence on the number of acknowledgment attempts.

Re p1210 = 4:

An automatic restart is only performed if fault F30003 has occurred on the power unit. If additional faults are present, then these faults are also acknowledged and when successful, starting continues.

Re p1210 = 6:

An automatic restart is carried out if any fault has occurred.

Re p1210 = 14:

As for p1210 = 4. However, faults that are present must be manually acknowledged.

Re p1210 = 16:

As for p1210 = 6. However, faults that are present must be manually acknowledged.

Re p1210 = 26:

The same as for p1210 = 6. For this mode, the switch-on command can be entered with a delay. The restart is interrupted with either OFF2 or OFF3. Alarm A07321 is only displayed if the cause of the fault has been removed and the drive is restarted by setting the switch-on command.

## p1211 Automatic restart start attempts / AR start attempts

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 10 | 3 |

**Description:** Sets the start attempts of the automatic restart function for p1210 = 4, 6, 14, 16, 26.

**Dependency:** A change is only accepted and made in the state "initialization" (r1214.0) and "wait for alarm" (r1214.1).

Refer to: p1210, r1214

**Notice:** After fault F07320 occurs, the power-on command must be withdrawn and all of the faults acknowledged so that the automatic restart function is re-activated.

After a complete power failure the start counter always starts with the counter value that applied before the power failure, and decrements this start attempt by 1. If a further attempt to acknowledge is started by the automatic restart function prior to power failure, e.g. when the CU remains active on power failure longer than the time p1212 / 2, the fault counter will already have been decremented once. In this case, the start counter is thus decreased by the value 2.

**Note:** A start attempt starts immediately when a fault occurs. The start attempt is considered to been completed if the motor was magnetized (r0056.4 = 1) and an additional delay time of 1 s has expired.

As long as a fault is present, an acknowledge command is generated in the time intervals of p1212 / 2. When successfully acknowledged, the start counter is decremented. If, after this, a fault re-occurs before a restart has been completed, then acknowledgement starts again from the beginning.

Fault F07320 is output if, after several faults occur, the number of parameterized start attempts has been reached. After a successful start attempt, i.e. a fault/error has no longer occurred up to the end of the magnetizing phase, the start counter is again reset to the parameter value after 1 s. If a fault re-occurs - the parameterized number of start attempts is again available.

At least one start attempt is always carried out.

After a line supply failure, acknowledgement is immediate and when the line supply returns, the system is powered up. If, between successfully acknowledging the line fault and the line supply returning, another fault occurs, then its acknowledgement also causes the start counter to be decremented.

Re p1210 = 26:

The start counter is decremented if after a successful fault acknowledgement, the on command is present.

## p1212 Automatic restart delay time start attempts / AR t_wait start

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.1 [s] | 1000.0 [s] | 1.0 [s] |

**Description:** Sets the delay time up to restart.

**Dependency:** This parameter setting is active for p1210 = 4, 6, 26.

For p1210 = 1, the following applies:

Faults are only automatically acknowledged in half of the waiting time, no restart.

Refer to: p1210, r1214

**Notice:** A change is only accepted and made in the state "initialization" (r1214.0) and "wait for alarm" (r1214.1).

**Note:** The faults are automatically acknowledged after half of the delay time has expired and the full delay time.

If the cause of a fault is not removed in the first half of the delay time, then it is no longer possible to acknowledge in the delay time.

## p1213[0...1] Automatic restart monitoring time / AR t_monit

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.0 [s] | 10000.0 [s] | [0] 60.0 [s]<br>[1] 0.0 [s] |

**Description:** Sets the monitoring time of the automatic restart (AR).

**Index:** [0] = Restart
[1] = Reset start counter

**Dependency:** Refer to: p1210, r1214

**Notice:** A change is only accepted and made in the state "initialization" (r1214.0) and "wait for alarm" (r1214.1).

After fault F07320 occurs, the power-on command must be withdrawn and all of the faults acknowledged so that the automatic restart function is re-activated.

**Note:** Re index 0:

The monitoring time starts when the faults are detected. If the automatic acknowledgements are not successful, the monitoring time runs again. If, after the monitoring time has expired, the drive has still not successfully started again (flying restart and magnetizing of the motor must have been completed: r0056.4 = 1), then fault F07320 is output.

The monitoring is de-activated with p1213 = 0. If p1213 is set lower than the sum of p1212, the magnetizing time p0346 and the additional delay time due to the flying restart, then fault F07320 is generated at each restart. If, for p1210 = 1, the time in p1213 is set lower than in p1212, then fault F07320 is also generated at each restart.

The monitoring time must be extended if the faults that occur cannot be immediately and successfully acknowledged (e.g. for faults that are permanently present).

In the case of p1210 = 14, 16, the faults which are present must be acknowledged manually within the time in p1213[0]. Otherwise, fault F07320 is generated after the set time.

Re index 1:

The start counter (refer to r1214) is only set back to the starting value p1211 if, after successful restart, the time in p1213[1] has expired. The delay time is not effective for fault acknowledgement without automatic restart (p1210 = 1). After a power failure (blackout) the delay time only starts after the line supply returns and the Control Unit boots. The start counter is set to p1211, if F07320 occurred, the power-on command is withdrawn and the fault is acknowledged.

The start counter is immediately updated if the starting value p1211 or the mode p1210 is changed.

For p1210 = 26, the fault must have been successfully acknowledged and the switch-on command issued within the time in p1213[0]. Otherwise, fault F07320 is generated after the set time.

## r1214.0...15 CO/BO: Automatic restart status / AR status

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the status of the automatic restart (AR).

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Initialization | Yes | No | - |
| 01 | Wait for alarm | Yes | No | - |
| 02 | Auto restart act | Yes | No | - |
| 03 | Setting the acknowledgement command | Yes | No | - |
| 04 | Acknowledge alarms | Yes | No | - |
| 05 | Restart | Yes | No | - |
| 06 | Delay time running after automatic power-up | Yes | No | - |
| 07 | Fault | Yes | No | - |
| 10 | Effective fault | Yes | No | - |
| 12 | Start count. bit 0 | ON | OFF | - |
| 13 | Start count. bit 1 | ON | OFF | - |
| 14 | Start count. bit 2 | ON | OFF | - |
| 15 | Start count. bit 3 | ON | OFF | - |

**Note:** Re bit 00:

State to display the single initialization after POWER ON.

Re bit 01:

State in which the automatic restart function waits for faults (initial state).

Re bit 02:

General display that a fault has been identified and that the restart or acknowledgement has been initiated.

Re bit 03:

Displays the acknowledge command within the "acknowledge alarms" state (bit 4 = 1). For bit 5 = 1 or bit 6 = 1, the acknowledge command is continually displayed.

Re bit 04:

State in which the faults that are present are acknowledged. The state is exited again after successful acknowledgement. A change is only made into the next state if it is signaled that a fault is no longer present after an acknowledgement command (bit 3 = 1).

Re bit 05:

State in which the drive is automatically powered up (only for p1210 = 4, 6).

Re bit 06:

State in which the system waits after having been powered up, to the end of the start attempt (to the end of the magnetizing process).

For p1210 = 1, this signal is directly set after the faults have been successfully acknowledged.

Re bit 07:

State which is assumed after a fault occurs within the automatic restart function. This is only reset after acknowledging the fault and withdrawing the power-on command.

Re bit 10:

When the automatic restart function is active, r1214.7 is displayed, otherwise the active fault r2139.3.

Re bits 12 ... 15:

Actual state of the start counter (binary coded).

Re bit 04 in addition:

For p1210 = 26, the system waits in this state until the switch-on command is available.

## p1226[0...n] Threshold for zero speed detection / n_standst n_thresh

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 8020 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [rpm] | 210000.00 [rpm] | 20.00 [rpm] |

**Description:** Sets the speed threshold for the standstill identification.

Acts on the actual value and setpoint monitoring.

When braking with OFF1 or OFF3, when the threshold is undershot, standstill is identified.

**Dependency:** Refer to: p1227

**Caution:** For closed-loop speed and torque control without encoder, the following applies:

If p1226 is set to values under approx. 1 % of the rated motor speed, then the model switchover limits of the vector control must be increased in order to guarantee reliable shutdown (see p1755, p1750 bit 7).

**Notice:** For reasons relating to the compatibility to earlier firmware versions, a parameter value of zero in indices 1 to 31 is overwritten with the parameter value in index 0 when the Control Unit boots.

**Note:** Standstill is identified in the following cases:

- the speed actual value falls below the speed threshold in p1226 and the time started after this in p1228 has expired.
- the speed setpoint falls below the speed threshold in p1226 and the time started after this in p1227 has expired.

The actual value sensing is subject to measuring noise. For this reason, standstill cannot be detected if the speed threshold is too low.

## p1227 Zero speed detection monitoring time / n_standst t_monit

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.000 [s] | 300.000 [s] | 300.000 [s] |

**Description:** Sets the monitoring time for the standstill identification.

When braking with OFF1 or OFF3, standstill is identified after this time has expired, after the setpoint speed has fallen below p1226 (also refer to p1145).

**Dependency:** The parameter is pre-assigned depending on the size of the power unit.

Refer to: p1226

**Notice:** For p1145 > 0.0 (RFG tracking) the setpoint is not equal to zero dependent on the selected value. This can therefore cause the monitoring time in p1227 to be exceeded. In this case, for a driven motor, the pulses are not suppressed.

**Note:** Standstill is identified in the following cases:

- the speed actual value falls below the speed threshold in p1226 and the time started after this in p1228 has expired.
- the speed setpoint falls below the speed threshold in p1226 and the time started after this in p1227 has expired.

For p1227 = 300.000 s, the following applies:

Monitoring is de-activated.

For p1227 = 0.000 s, the following applies:

With OFF1 or OFF3 and a ramp-down time = 0, the pulses are immediately suppressed and the motor "coasts" down.

Once the Control Unit has been booted up for the first time or if the factory settings have been defined accordingly, the parameter is defined in accordance with the power unit.

## p1228 Pulse suppression delay time / Pulse suppr t_del

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8020 |
| **Min** | **Max** | **Factory setting** |
| 0.000 [s] | 299.000 [s] | 0.010 [s] |

**Description:** Sets the delay time for pulse suppression.

After OFF1 or OFF3, the pulses are canceled, if at least one of the following conditions is fulfilled:

- the speed actual value falls below the threshold in p1226 and the time started after this in p1228 has expired.

- the speed setpoint falls below the threshold in p1226 and the time started after this in p1227 has expired.

**Dependency:** Refer to: p1226, p1227

## p1230[0...n] BI: DC braking activation / DC brake act

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7017 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source to activate DC braking.

**Dependency:** Refer to: p1231, p1232, p1233, p1234, r1239

**Note:** 1 signal: DC braking activated.

0 signal: DC braking de-activated.

## p1231[0...n] DC braking configuration / DCBRK config

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** MDS, p0130 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7014, 7016, 7017 |
| **Min** | **Max** | **Factory setting** |
| 0 | 14 | 0 |

**Description:** Setting to activate DC braking.

**Value:**

0: No function
4: DC braking
5: DC braking for OFF1/OFF3
14: DC braking below starting speed

**Dependency:** Refer to: p0300, p1232, p1233, p1234, r1239

**Note:** DCBRK: DC Braking

Re p1231 = 4:

The function is activated as soon as the activation criterion is fulfilled.

- the function can be superseded by an OFF2 response.

Activation criterion (one of the following criteria is fulfilled):

- binector input p1230 = 1 signal (DC braking activation, depending on the operating mode).

- the drive is not in the state "S4: Operation" or in "S5x".

- the internal pulse enable is missing (r0046.19 = 0).

DC braking can only be withdrawn (p1231 = 0) if it is not being used as a fault response in p2101.

Re p1231 = 5:

DC braking is activated if the OFF1 or OFF3 command is present. Binector input p1230 is ineffective. If the drive speed still lies above the speed threshold p1234, then initially, the drive is ramped-down to this threshold, demagnetized (see p0347) and is then switched into DC braking for the time set in p1233. After this, the drive is switched-off. If, at OFF1, the drive speed is below p1234, then it is immediately demagnetized and switched into DC braking. A change is made into normal operation if the OFF1 command is withdrawn prematurely. Flying restart must be activated if the motor is still rotating.

DC braking by means of fault response continues to be possible.

Re p1231 = 14:

In addition to the function for p1231 = 5, binector input p1230 is evaluated.

DC braking is only automatically activated when the speed threshold p1234 is fallen below if binector input p1230 = 1 signal. This is also the case, if no OFF command is present.

After demagnetization and after the time in p1233 has expired, the drive changes back into normal operation or is switched-off (for OFF1/OFF3).

If a 0 signal is applied to binector input p1230, for OFF1 and OFF3 no DC braking is executed.

## p1232[0...n] DC braking braking current / DCBRK I_brake

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** p0340 = 1 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** MDS, p0130 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7017 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [Arms] | 10000.00 [Arms] | 0.00 [Arms] |

**Description:** Sets the braking current for DC braking.

**Dependency:** Refer to: p1230, p1231, p1233, p1234, r1239, p1345, p1346

**Note:** A change to the braking current becomes effective the next time that DC braking is switched on.

The value for p1232 is specified as an rms value in the 3-phase system. The magnitude of the braking current is the same as that of an identical output current at frequency zero (see r0067, r0068, p0640). The braking current is internally limited to r0067.

For the current controller, the settings of parameters p1345 and p1346 (I_max limiting controller) are used.

## p1233[0...n] DC braking time / DCBRK time

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** MDS, p0130 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7017 |
| **Min** | **Max** | **Factory setting** |
| 0.0 [s] | 3600.0 [s] | 1.0 [s] |

**Description:** Sets the DC braking time (as fault response).

**Dependency:** Refer to: p1230, p1231, p1232, p1234, r1239

## p1234[0...n] Speed at the start of DC braking / DCBRK n_start

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** MDS, p0130 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7017 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [rpm] | 210000.00 [rpm] | 210000.00 [rpm] |

**Description:** Sets the starting speed for DC braking.

If the actual speed falls below this threshold, then DC braking is activated.

**Dependency:** Refer to: p1230, p1231, p1232, p1233, r1239

## r1239.8...13 CO/BO: DC braking status word / DCBRK ZSW

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Status word of the DC braking.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 08 | DC braking active | Yes | No | 7017 |
| 10 | DC braking ready | Yes | No | 7017 |
| 11 | DC braking selected | Yes | No | - |
| 12 | DC braking selection internally inhibited | Yes | No | - |
| 13 | DC braking for OFF1/OFF3 | Yes | No | - |

**Dependency:** Refer to: p1231, p1232, p1233, p1234

**Note:** Re bit 12, 13:
Only effective for p1231 = 14.

## p1240[0...n] Vdc controller configuration (vector control) / Vdc ctr config vec

PM230

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6220 |
| **Min** | **Max** | **Factory setting** |
| 0 | 3 | 1 |

**Description:** Sets the controller configuration of the DC link voltage (Vdc controller) in the closed-loop control mode. For U/f control: see p1280.

**Value:**
0: Inhib Vdc ctrl
1: Enable Vdc_max controller
3: Enable Vdc_min controller and Vdc_max controller

**Dependency:** Refer to: p1245

**Notice:** An excessively high value in p1245 can possibly negatively influence the normal operation of the drive.

**Note:** p1240 = 1, 3:

When the DC link voltage limit specified for the power unit is reached the following applies:

- the Vdc_max controller limits the regenerative energy in order that the DC link voltage is kept below the maximum DC link voltage when braking.

- the ramp-down times are automatically increased. If overvoltage faults occur in spite of the Vdc_max controller being active, the ramp-down time in p1121 might need to be increased.

- set the input voltage p0210 as low as possible in line with the supply voltage (in so doing avoid A07401).

p1240 = 3:

When the switch-in threshold of the Vdc_min controller is reached (p1245), the following applies:

- the Vdc_min controller limits the energy taken from the DC link in order to keep the DC link voltage above the minimum DC link voltage when accelerating.

- the motor is braked in order to use its kinetic energy to buffer the DC link.

- the Vdc_min controller cannot be used when the line voltage is permanently below 380 V (if required, p1247 should be reduced).

## p1240[0...n] Vdc controller configuration (vector control) / Vdc ctr config vec

PM240
PM330

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6220 |
| **Min** | **Max** | **Factory setting** |
| 0 | 3 | 1 |

**Description:** Sets the controller configuration of the DC link voltage (Vdc controller) in the closed-loop control mode. For U/f control: see p1280.

**Value:**
0: Inhib Vdc ctrl
1: Enable Vdc_max controller
2: Enable Vdc_min controller (kinetic buffering)
3: Enable Vdc_min controller and Vdc_max controller

**Dependency:** Refer to: p1245

**Notice:** An excessively high value in p1245 can possibly negatively influence the normal operation of the drive.

**Note:** If a braking resistor is connected to the DC link (p0219 > 0), then the Vdc_max control is automatically deactivated.

p1240 = 1, 3:

When the DC link voltage limit specified for the power unit is reached the following applies:

- the Vdc_max controller limits the regenerative energy in order that the DC link voltage is kept below the maximum DC link voltage when braking.

- the ramp-down times are automatically increased.

p1240 = 2, 3:

When the switch-in threshold of the Vdc_min controller is reached (p1245), the following applies:

- the Vdc_min controller limits the energy taken from the DC link in order to keep the DC link voltage above the minimum DC link voltage when accelerating.

- the motor is braked in order to use its kinetic energy to buffer the DC link.

## r1242 Vdc_max controller switch-in level / Vdc_max on_level

| | | | |
|---|---|---|---|
| PM230 | **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| PM240, PM330 | **Can be changed:** - | **Scaling:** p2001 | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 6220 |
| | **Min** | **Max** | **Factory setting** |
| | - [V] | - [V] | - [V] |

**Description:** Displays the switch-in level for the Vdc_max controller.

If p1254 = 0 (automatic sensing of the switch-in level = off), then the following applies:

r1242 = 1.15 * sqrt(2) * p0210 (supply voltage)

PM230: r1242 is limited to Vdc_max - 50.0 V.

If p1254 = 1 (automatic sensing of the switch-in level = on), then the following applies:

r1242 = Vdc_max - 50.0 V (Vdc_max: Overvoltage threshold of the power unit)

r1242 = Vdc_max - 25.0 V (for 230 V power units)

**Notice:** If the activation level of the Vdc_max controller is already exceeded in the deactivated state (pulse inhibit) by the DC link voltage, then the controller can be automatically deactivated (see F07401), so that the drive is not accelerated the next time that it is activated.

**Note:** The Vdc_max controller is not switched back off until the DC-link voltage falls below the threshold 0.95 * r1242 and the controller output is zero.

## p1243[0...n] Vdc_max controller dynamic factor / Vdc_max dyn_factor

| | | | |
|---|---|---|---|
| PM230 | **Access level:** 3 | **Calculated:** p0340 = 1,3,4 | **Data type:** FloatingPoint32 |
| PM240, PM330 | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 6220 |
| | **Min** | **Max** | **Factory setting** |
| | 1 [%] | 10000 [%] | 100 [%] |

**Description:** Sets the dynamic factor for the DC link voltage controller (Vdc_max controller).

100% means that p1250, p1251, and p1252 (gain, integral time, and rate time) are used corresponding to their basic settings and based on a theoretical controller optimization.

If subsequent optimization is required, this can be carried out using the dynamic factor. In this case p1250, p1251, p1252 are weighted with the dynamic factor p1243.

## p1245[0...n] Vdc_min controller switch-in level (kinetic buffering) / Vdc_min on_level

| | | | |
|---|---|---|---|
| PM230 | **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | 65 [%] | 150 [%] | 73 [%] |

**Description:** Sets the switch-in level for the Vdc-min controller (kinetic buffering).

The value is obtained as follows:

r1246[V] = p1245[%] * sqrt(2) * p0210

**Dependency:** Refer to: p0210

**Warning:** An excessively high value may adversely affect normal drive operation.

## p1245[0...n] Vdc_min controller switch-in level (kinetic buffering) / Vdc_min on_level

| | | | |
|---|---|---|---|
| PM240 | **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| PM330 | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | 65 [%] | 150 [%] | 76 [%] |

**Description:** Sets the switch-in level for the Vdc-min controller (kinetic buffering).

The value is obtained as follows:

r1246[V] = p1245[%] * sqrt(2) * p0210

| | |
|---|---|
| **Dependency:** | Refer to: p0210 |
| **Warning:** | An excessively high value may adversely affect normal drive operation. |

## r1246 Vdc_min controller switch-in level (kinetic buffering) / Vdc_min on_level

| PM230<br>PM240, PM330 | | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| | **Can be changed:** - | **Scaling:** p2001 | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 6220 |
| | **Min** | **Max** | **Factory setting** |
| | - [V] | - [V] | - [V] |

**Description:** Displays the switch-in level for the Vdc_min controller (kinetic buffering).

**Note:** The Vdc_min controller is not switched back off until the DC-link voltage rises above the threshold 1.05 * p1246 and the controller output is zero.

## p1247[0...n] Vdc_min controller dynamic factor (kinetic buffering) / Vdc_min dyn_factor

| PM230<br>PM240, PM330 | | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** p0340 = 1,3,4 | **Data type:** FloatingPoint32 |
| | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 6220 |
| | **Min** | **Max** | **Factory setting** |
| | 1 [%] | 10000 [%] | 300 [%] |

**Description:** Sets the dynamic factor for the Vdc_min controller (kinetic buffering).

100% means that p1250, p1251, and p1252 (gain, integral time, and rate time) are used corresponding to their basic settings and based on a theoretical controller optimization.

If subsequent optimization is required, this can be carried out using the dynamic factor. In this case p1250, p1251, p1252 are weighted with the dynamic factor p1247.

## p1249[0...n] Vdc_max controller speed threshold / Vdc_max n_thresh

| PM230<br>PM240, PM330 | | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** p0340 = 1 | **Data type:** FloatingPoint32 |
| | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| | **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | 0.00 [rpm] | 210000.00 [rpm] | 10.00 [rpm] |

**Description:** Sets the lower speed threshold for the Vdc_max controller.

When this speed threshold is undershot, the Vdc_max control is switched out and the speed is controlled using the ramp-function generator.

**Note:** For fast braking where the ramp-function generator tracking was active, it is possible to prevent the drive rotating in the opposite direction by increasing the speed threshold and setting a final rounding-off time in the ramp-function generator (p1131). This is supported using a dynamic setting of the speed controller.

## p1249[0...n] Vdc_max controller speed threshold / Vdc_max n_thresh

| PM250<br>PM260 | | | |
|---|---|---|---|
| | **Access level:** 4 | **Calculated:** p0340 = 1 | **Data type:** FloatingPoint32 |
| | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| | **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | 0.00 [rpm] | 210000.00 [rpm] | 10.00 [rpm] |

**Description:** Sets the lower speed threshold for the Vdc_max controller.

When this speed threshold is undershot, the Vdc_max control is switched out and the speed is controlled using the ramp-function generator.

**Note:** For fast braking where the ramp-function generator tracking was active, it is possible to prevent the drive rotating in the opposite direction by increasing the speed threshold and setting a final rounding-off time in the ramp-function generator (p1131). This is supported using a dynamic setting of the speed controller.

## p1250[0...n] Vdc controller proportional gain / Vdc_ctrl Kp

| | | | |
|---|---|---|---|
| PM230<br>PM240, PM330 | **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | 0.00 | 100.00 | 1.00 |

**Description:** Sets the proportional gain for the DC-link voltage controller (Vdc_min controller, Vdc_max controller).

**Dependency:** The effective proportional gain is obtained taking into account p1243 (Vdc_max controller dynamic factor) and the DC link capacitance of the power unit.

## p1251[0...n] Vdc controller integral time / Vdc_ctrl Tn

| | | | |
|---|---|---|---|
| PM230<br>PM240, PM330 | **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 6220 |
| | **Min** | **Max** | **Factory setting** |
| | 0 [ms] | 10000 [ms] | 0 [ms] |

**Description:** Sets the integral time for the DC-link voltage controller (Vdc_min controller, Vdc_max controller).

**Dependency:** The effective integral time is obtained taking into account p1243 (Vdc_max controller dynamic factor).

**Note:** p1251 = 0: The integral component is de-activated.

## p1252[0...n] Vdc controller rate time / Vdc_ctrl t_rate

| | | | |
|---|---|---|---|
| PM230<br>PM240, PM330 | **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 6220 |
| | **Min** | **Max** | **Factory setting** |
| | 0 [ms] | 1000 [ms] | 0 [ms] |

**Description:** Sets the rate time constant for the DC-link voltage controller (Vdc_min controller, Vdc_max controller).

**Dependency:** The effective rate time is obtained taking into account p1243 (Vdc_max controller dynamic factor).

## p1254 Vdc_max controller automatic ON level detection / Vdc_max SenseOnLev

| | | | |
|---|---|---|---|
| PM230 | **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | 0 | 1 | 0 |

**Description:** Activates/de-activates the automatic sensing of the switch-in level for the Vdc_max controller.

**Value:**
0: Automatic detection inhibited
1: Automatic detection enabled

## p1254 Vdc_max controller automatic ON level detection / Vdc_max SenseOnLev

| | | | |
|---|---|---|---|
| PM240<br>PM330 | **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | 0 | 1 | 1 |

**Description:** Activates/de-activates the automatic sensing of the switch-in level for the Vdc_max controller.

**Value:**
0: Automatic detection inhibited
1: Automatic detection enabled

## p1255[0...n] Vdc_min controller time threshold / Vdc_min t_thresh

PM230
PM240, PM330

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.000 [s] | 1800.000 [s] | 0.000 [s] |

**Description:** Sets the time threshold for the Vdc_min controller (kinetic buffering).

If this value is exceeded a fault is output; the required response can be parameterized.

Prerequisite: p1256 = 1

**Notice:** If a time threshold has been parameterized, the Vdc_max controller should also be activated (p1240 = 3) so that the drive does not shut down with overvoltage when Vdc_min control is exited (due to the time violation) and in the event of fault response OFF3. It is also possible to increase the OFF3 ramp-down time p1135.

## p1256[0...n] Vdc_min controller response (kinetic buffering) / Vdc_min response

PM230
PM240, PM330

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 1 | 0 |

**Description:** Sets the response for the Vdc_min controller (kinetic buffering).

**Value:**
0: Buffer Vdc until undervoltage, n<p1257 -> F07405
1: Buff. Vdc until undervolt., n<p1257 -> F07405, t>p1255 -> F07406

## p1257[0...n] Vdc_min controller speed threshold / Vdc_min n_thresh

PM230
PM240, PM330

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.00 [rpm] | 210000.00 [rpm] | 50.00 [rpm] |

**Description:** Sets the speed threshold for the Vdc-min controller (kinetic buffering).

If this value is exceeded a fault is output; the required response can be parameterized .

Kinetic buffering is not started below the speed threshold.

**Note:** Exiting the Vdc_min control before reaching motor standstill prevents the regenerative braking current from increasing significantly at low speeds, and after a pulse inhibit, means that the motor coasts down.

However, the maximum braking torque can be set via the appropriate torque limiting.

## r1258 CO: Vdc controller output / Vdc_ctrl output

PM230
PM240, PM330

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2002 | **Dyn. index:** - |
| **Units group:** 6_2 | **Unit selection:** p0505 | **Func. diagram:** 6220 |
| **Min** | **Max** | **Factory setting** |
| - [Arms] | - [Arms] | - [Arms] |

**Description:** Displays the actual output of the Vdc controller (DC link voltage controller)

**Note:** The regenerative power limit p1531 is used for vector control to pre-control the Vdc_max controller. The lower the power limit is set, the lower the correction signals of the controller when the voltage limit is reached.

## p1260 Bypass configuration / Bypass config

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 3 | 0 |

**Description:** Sets the configuration for the bypass function.

**Value:** 0: Bypass de-activated
3: Bypass without synchronization

**Note:** When the converter is switched on, the state of the bridging contactor is evaluated. If the automatic restart is active (p1210 = 4) and both an ON command (r0054.0 = 1) and the bypass signal (p1266 = 1, configuration p1267.0 = 1) are still present during power-up, the converter goes into "ready for operation and bypass" state (r0899.0 = 1 and r0046.25 = 1) after power-up, and the motor continues to run directly on the line.

The "bypass" function can only be switched off again (p1260 = 0) if the bypass is not active or the bypass function has a fault.

The flying restart function must be activated (p1200).

## r1261.0...11 CO/BO: Bypass control/status word / Bypass STW / ZSW

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Control and feedback signals of the bypass switch.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Command switch motor - power unit | Close | Open | - |
| 01 | Command switch motor - line supply | Close | Open | - |
| 05 | Feedback signal switch motor - power unit | Closed | Opened | - |
| 06 | Feedback signal switch motor - line supply | Closed | Opened | - |
| 07 | Bypass command (from p1266) | Yes | No | - |
| 10 | Bypass in process sequence | Yes | No | - |
| 11 | Bypass enabled | Yes | No | - |

**Note:** Control bits 0 and 1 should be interconnected to the signal outputs via which the switches in the motor feeder cables should be controlled. These should be selected/dimensioned for switching under load.

## p1262[0...n] Bypass dead time / Bypass t_dead

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** p0340 = 1,3 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.000 [s] | 20.000 [s] | 1.000 [s] |

**Description:** Sets the dead time for non-synchronized bypass.

**Note:** This parameter is used to define the changeover time of the contactors. It should not be shorter than the de-magnetizing time of the motor (p0347).

The total changeover time for the bypass is based on the total of p1262 plus the OFF time for the relevant switch (p1274[x]).

## p1263 Debypass delay time / Debypass t_del

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.000 [s] | 300.000 [s] | 1.000 [s] |

**Description:** Sets the delay time to switch back to converter operation for a non-synchronized bypass.

## p1264 Bypass delay time / Bypass t_del

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.000 [s] | 300.000 [s] | 1.000 [s] |

**Description:** Sets the delay time for switching to line operation for a non-synchronized bypass.

## p1265 Bypass speed threshold / Bypass n_thresh

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** p2000 | **Dyn. index:** - |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.00 [rpm] | 210000.00 [rpm] | 1480.00 [rpm] |

**Description:** Sets the speed threshold to activate the bypass.

**Note:** When selecting p1260 = 3 and p1267.1 = 1, the bypass is automatically activated when this speed is reached.

## p1266 BI: Bypass control command / Bypass command

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for the control command to the bypass.

## p1267 Bypass changeover source configuration / Chngov_src config

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Unsigned8 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | 0000 bin |

**Description:** Sets the cause that should initiate the bypass.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Bypass via signal (BI: p1266) | Yes | No | - |
| 01 | Bypass via reaching the speed threshold | Yes | No | - |

**Note:** The parameter only has an effect for a non-synchronized bypass.

p1267.0 = 1:

The bypass is initiated by setting a binary signal. When the command is reset, after the debypass delay time (p1263) has expired, operation at the power unit is re-selected.

p1267.1 = 1:

When the speed threshold entered in p1265 is reached, the bypass is switched in. The system only switches back when the speed setpoint again falls below the threshold value.

## p1269[0...1] BI: Bypass switch feedback signal / Bypass FS

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | [0] 1261.0<br>[1] 1261.1 |

**Description:** Sets the signal source for the feedback signal of the bypass switch.

**Index:**
[0] = Switch motor/drive
[1] = Switch motor/line supply

**Note:** In the case of switches without a feedback signal, interconnect the corresponding control bit as the signal source:

BI: p1269[0] = r1261.0

BI: p1269[1] = r1261.1

Entering p1269 = 0 sets this interconnection automatically for switches without a feedback signal.

## p1271[0...n] Flying restart maximum frequency for the inhibited direction / FlyRes f_max dir

PM230
PM240
PM250, PM260

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 [Hz] | 650 [Hz] | 0 [Hz] |

**Description:** Sets the maximum search frequency for a flying restart in an inhibited setpoint direction (p1110, p1111).

**Note:** The parameter has no effect for an operating mode, which only searches in the setpoint direction (p1200 > 3).

## p1271[0...n] Flying restart maximum frequency for the inhibited direction / FlyRes f_max dir

PM330

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 [Hz] | 650 [Hz] | 5 [Hz] |

**Description:** Sets the maximum search frequency for a flying restart in an inhibited setpoint direction (p1110, p1111).

**Note:** The parameter has no effect for an operating mode, which only searches in the setpoint direction (p1200 > 3).

## p1274[0...1] Bypass switch monitoring time / Switch t_monit

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 [ms] | 5000 [ms] | 1000 [ms] |

**Description:** Sets the monitoring time for the bypass switch.

**Index:**
[0] = Switch motor/drive
[1] = Switch motor/line supply

**Note:** The monitoring is de-activated with p1274 = 0 ms.

The changeover time for the bypass (p1262) is extended by the value in this parameter.

## p1280[0...n] Vdc controller configuration (U/f) / Vdc_ctr config U/f

PM230

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6300, 6320 |
| **Min** | **Max** | **Factory setting** |
| 0 | 1 | 1 |

**Description:** Sets the configuration of the controller for the DC link voltage (Vdc controller) in the U/f operating mode.

**Value:**
0: Inhib Vdc ctrl
1: Enable Vdc_max controller

**Note:** For high input voltages (p0210), the following settings can improve the degree of ruggedness of the Vdc_max controller:

- Set the input voltage as low as possible, and in so doing, avoid A07401 (p0210).
- set the rounding times (p1130, p1136).
- Increase the ramp-down times (p1121).
- Reduce the integral time of the controller (p1291), factor 0.5.
- Activate the Vdc correction in the current controller (p1810.1 = 1) or reduce the derivative action time of the controller (p1292, factor 0.5).

In this case, we generally recommend to use vector control (p1300 = 20) (Vdc controller, see p1240).

## p1280[0...n] Vdc controller configuration (U/f) / Vdc_ctr config U/f

| | | | |
|---|---|---|---|
| PM240 | **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| PM330 | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 6300, 6320 |
| | **Min** | **Max** | **Factory setting** |
| | 0 | 3 | 1 |

**Description:** Sets the configuration of the controller for the DC link voltage (Vdc controller) in the U/f operating mode.

**Value:**
0: Inhib Vdc ctrl
1: Enable Vdc_max controller
2: Enable Vdc_min controller (kinetic buffering)
3: Enable Vdc_min controller and Vdc_max controller

**Note:** For high input voltages (p0210), the following settings can improve the degree of ruggedness of the Vdc_max controller:

- Set the input voltage as low as possible, and in so doing, avoid A07401 (p0210).
- set the rounding times (p1130, p1136).
- Increase the ramp-down times (p1121).
- Reduce the integral time of the controller (p1291), factor 0.5.
- Activate the Vdc correction in the current controller (p1810.1 = 1) or reduce the derivative action time of the controller (p1292, factor 0.5).

In this case, we generally recommend to use vector control (p1300 = 20) (Vdc controller, see p1240).

The following measures are suitable to improve the Vdc_min controller:

- Optimize the Vdc_min controller (see p1287).
- Activate the Vdc correction in the current controller (p1810.1 = 1).

If a braking resistor is connected to the DC link (p0219 > 0), then the Vdc_max control is automatically deactivated.

## r1282 Vdc_max controller switch-in level (U/f) / Vdc_max on_level

| | | | |
|---|---|---|---|
| PM230 | **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| PM240, PM330 | **Can be changed:** - | **Scaling:** p2001 | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 6320 |
| | **Min** | **Max** | **Factory setting** |
| | - [V] | - [V] | - [V] |

**Description:** Displays the switch-in level for the Vdc_max controller.

If p1294 = 0 (automatic sensing of the switch-in level = off), then the following applies:

r1282 = 1.15 * sqrt(2) * p0210 (supply voltage)

If p1294 = 1 (automatic sensing of the switch-in level = on), then the following applies:

r1282 = Vdc_max - 50.0 V (Vdc_max: Overvoltage threshold of the power unit)

r1282 = Vdc_max - 25.0 V (for 230 V power units)

**Notice:** If the activation level of the Vdc_max controller is already exceeded in the deactivated state (pulse inhibit) by the DC link voltage, then the controller can be automatically deactivated (see F07401), so that the drive is not accelerated the next time that it is activated.

**Note:** The Vdc_max controller is not switched back off until the DC-link voltage falls below the threshold 0.95 * r1282 and the controller output is zero.

## p1283[0...n] Vdc_max controller dynamic factor (U/f) / Vdc_max dyn_factor

| | | | |
|---|---|---|---|
| PM230 | **Access level:** 3 | **Calculated:** p0340 = 1,3,4 | **Data type:** FloatingPoint32 |
| PM240, PM330 | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 6320 |
| | **Min** | **Max** | **Factory setting** |
| | 1 [%] | 10000 [%] | 100 [%] |

**Description:** Sets the dynamic factor for the DC link voltage controller (Vdc_max controller).

100% means that p1290, p1291, and p1292 (gain, integral time, and rate time) are used in accordance with their basic settings and on the basis of a theoretical controller optimization.

If subsequent optimization is required, this can be carried out using the dynamic factor. In this case, p1290, p1291, and p1292 are weighted with the dynamic factor p1283.

## p1284[0...n] Vdc_max controller time threshold (U/f) / Vdc_max t_thresh

| | | | |
|---|---|---|---|
| PM230<br>PM240, PM330 | **Access level:** 3 | **Calculated:** p0340 = 1 | **Data type:** FloatingPoint32 |
| | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | 0.000 [s] | 300.000 [s] | 4.000 [s] |

**Description:** Sets the monitoring time for the Vdc_max controller.

If the down ramp of the speed setpoint is held for longer than the time set in p1284, then fault F07404 is output.

## p1285[0...n] Vdc_min controller switch-in level (kinetic buffering) (U/f) / Vdc_min on_level

| | | | |
|---|---|---|---|
| PM240<br>PM330 | **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | 65 [%] | 150 [%] | 76 [%] |

**Description:** Sets the switch-in level for the Vdc-min controller (kinetic buffering).

The value is obtained as follows:

p1286[V] = p1285[%] * sqrt(2) * p0210

**Warning:** An excessively high value may adversely affect normal drive operation.

## r1286 Vdc_min controller switch-in level (kinetic buffering) (U/f) / Vdc_min on_level

| | | | |
|---|---|---|---|
| PM240<br>PM330 | **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| | **Can be changed:** - | **Scaling:** p2001 | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 6320 |
| | **Min** | **Max** | **Factory setting** |
| | - [V] | - [V] | - [V] |

**Description:** Displays the switch-in level for the Vdc_min controller (kinetic buffering).

**Note:** The Vdc_min controller is not switched back off until the DC-link voltage rises above the threshold 1.05 * p1286 and the controller output is zero.

## p1287[0...n] Vdc_min controller dynamic factor (kinetic buffering) (U/f) / Vdc_min dyn_factor

| | | | |
|---|---|---|---|
| PM240<br>PM330 | **Access level:** 3 | **Calculated:** p0340 = 1,3,4 | **Data type:** FloatingPoint32 |
| | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 6320 |
| | **Min** | **Max** | **Factory setting** |
| | 1 [%] | 10000 [%] | 100 [%] |

**Description:** Sets the dynamic factor for the Vdc_min controller (kinetic buffering).

100% means that p1290, p1291, and p1292 (gain, integral time, and rate time) are used corresponding to their basic settings and based on a theoretical controller optimization.

If subsequent optimization is required, this can be carried out using the dynamic factor. In this case, p1290, p1291, and p1292 are weighted with the dynamic factor p1287.

## p1290[0...n] Vdc controller proportional gain (U/f) / Vdc_ctrl Kp

| | | | |
|---|---|---|---|
| PM230<br>PM240, PM330 | **Access level:** 3 | **Calculated:** p0340 = 1,3,4 | **Data type:** FloatingPoint32 |
| | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 6320 |
| | **Min** | **Max** | **Factory setting** |
| | 0.00 | 100.00 | 1.00 |

**Description:** Sets the proportional gain for the Vdc controller (DC link voltage controller).

**Note:** The gain factor is proportional to the capacitance of the DC link.

The parameter is pre-set to a value that is optimally adapted to the capacitance of the power unit.

## p1291[0...n] Vdc controller integral time (U/f) / Vdc_ctrl Tn

| | | | |
|---|---|---|---|
| PM230 | **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| PM240, PM330 | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 6320 |
| | **Min** | **Max** | **Factory setting** |
| | 0 [ms] | 10000 [ms] | 40 [ms] |

**Description:** Sets the integral time for the Vdc controller (DC link voltage controller).

## p1292[0...n] Vdc controller rate time (U/f) / Vdc_ctrl t_rate

| | | | |
|---|---|---|---|
| PM230 | **Access level:** 3 | **Calculated:** p0340 = 1,3,4 | **Data type:** FloatingPoint32 |
| PM240, PM330 | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 6320 |
| | **Min** | **Max** | **Factory setting** |
| | 0 [ms] | 1000 [ms] | 10 [ms] |

**Description:** Sets the rate time constant for the Vdc controller (DC link voltage controller).

## p1294 Vdc_max controller automatic detection ON signal level (U/f) / Vdc_max SenseOnLev

| | | | |
|---|---|---|---|
| PM230 | **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| PM240, PM330 | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | 0 | 1 | 0 |

**Description:** Activates/de-activates the automatic sensing of the switch-in level for the Vdc_max controller. When the sensing function is de-activated, the activation threshold r1282 for the Vdc_max controller is determined from the parameterized connection voltage p0210.

**Value:**
0: Automatic detection inhibited
1: Automatic detection enabled

## p1295[0...n] Vdc_min controller time threshold (U/f) / Vdc_min t_thresh

| | | | |
|---|---|---|---|
| PM240 | **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| PM330 | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | 0.000 [s] | 10000.000 [s] | 0.000 [s] |

**Description:** Sets the time threshold for the Vdc_min controller (kinetic buffering).

If this value is exceeded a fault is output; the required response can be parameterized.

Prerequisite: p1296 = 1

**Notice:** If a time threshold has been parameterized, the Vdc_max controller should also be activated (p1280 = 3) so that the drive does not shut down with overvoltage when Vdc_min control is exited (due to the time violation) and in the event of fault response OFF3. It is also possible to increase the OFF3 ramp-down time p1135.

## p1296[0...n] Vdc_min controller response (kinetic buffering) (U/f / Vdc_min response

| | | | |
|---|---|---|---|
| PM240 | **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| PM330 | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | 0 | 1 | 0 |

**Description:** Sets the response for the Vdc_min controller (kinetic buffering).

**Value:**
0: Buffer Vdc until undervoltage, n<p1297 -> F07405
1: Buff. Vdc until undervolt., n<p1297 -> F07405, t>p1295 -> F07406

**Note:** Re p1296 = 1:

The quick stop ramp entered in p1135 must not be equal to zero, to prevent overcurrent shutdown if F07406 is triggered.

## p1297[0...n] Vdc_min controller speed threshold (U/f) / Vdc_min n_thresh

| | | | |
|---|---|---|---|
| PM240 | **Access level:** 3 | **Calculated:** p0340 = 1 | **Data type:** FloatingPoint32 |
| PM330 | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| | **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | 0.00 [rpm] | 210000.00 [rpm] | 50.00 [rpm] |

**Description:** Sets the speed threshold for the Vdc-min controller (kinetic buffering).

If this value is exceeded a fault is output; the required response can be parameterized .

**Note:** Exiting the Vdc_min control before reaching motor standstill prevents the regenerative braking current from increasing significantly at low speeds, and after a pulse inhibit, means that the motor coasts down.

## r1298 CO: Vdc controller output (U/f) / Vdc_ctrl output

| | | | |
|---|---|---|---|
| PM230 | **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| PM240, PM330 | **Can be changed:** - | **Scaling:** p2000 | **Dyn. index:** - |
| | **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 6320 |
| | **Min** | **Max** | **Factory setting** |
| | - [rpm] | - [rpm] | - [rpm] |

**Description:** Displays the actual output of the Vdc controller (DC link voltage controller)

## p1300[0...n] Open-loop/closed-loop control operating mode / Op/cl-lp ctrl_mode

| | | | |
|---|---|---|---|
| PM230 | **Access level:** 2 | **Calculated:** - | **Data type:** Integer16 |
| | **Can be changed:** C(1), T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 6300, 6301, 8012 |
| | **Min** | **Max** | **Factory setting** |
| | 0 | 20 | 2 |

**Description:** Sets the open and closed-loop control mode of a drive.

**Value:**
- 0: U/f control with linear characteristic
- 1: U/f control with linear characteristic and FCC
- 2: U/f control with parabolic characteristic
- 4: U/f control with linear characteristic and ECO
- 7: U/f control for a parabolic characteristic and ECO
- 20: Speed control (encoderless)

**Dependency:** Only operation with U/f characteristic is possible if the rated motor speed is not entered (p0311).

The output voltage is used for efficiency optimization for all U/f control types, load-dependent (see p0500 = 3).

Refer to: p0300, p0311, p0500

**Notice:** Active slip compensation is required in the U/f control types with Eco mode (p1300 = 4, 7). The scaling of the slip compensation (p1335) should be set so that the slip is completely compensated (generally 100%).

The Eco mode is only effective in steady-state operation and when the ramp-function generator is not bypassed. In the case of analog setpoints, if required the tolerance for ramp-up and ramp-down should be actively increased for the ramp-function generator using p1148 in order to reliably signal a steady-state condition.

**Note:** The closed-loop torque control can only be changed over in operation (p1300 = 20, 21) by selecting the closed-loop speed control (p1501). At the changeover, the setting of p1300 does not change. In this case, the actual state is displayed in r1407, bit 2 and bit 3.

## p1300[0...n] Open-loop/closed-loop control operating mode / Op/cl-lp ctrl_mode

| | | | |
|---|---|---|---|
| PM240 | **Access level:** 2 | **Calculated:** - | **Data type:** Integer16 |
| PM250, PM260 | **Can be changed:** C(1), T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 6300, 6301, 8012 |
| | **Min** | **Max** | **Factory setting** |
| | 0 | 20 | 0 |

**Description:** Sets the open and closed-loop control mode of a drive.

**Value:**
- 0: U/f control with linear characteristic
- 1: U/f control with linear characteristic and FCC
- 2: U/f control with parabolic characteristic
- 4: U/f control with linear characteristic and ECO

7: U/f control for a parabolic characteristic and ECO
20: Speed control (encoderless)

**Dependency:** Only operation with U/f characteristic is possible if the rated motor speed is not entered (p0311).

Refer to: p0300, p0311, p0500

**Notice:** Active slip compensation is required in the U/f control types with Eco mode (p1300 = 4, 7). The scaling of the slip compensation (p1335) should be set so that the slip is completely compensated (generally 100%).

The Eco mode is only effective in steady-state operation and when the ramp-function generator is not bypassed. In the case of analog setpoints, if required the tolerance for ramp-up and ramp-down should be actively increased for the ramp-function generator using p1148 in order to reliably signal a steady-state condition.

**Note:** The closed-loop torque control can only be changed over in operation (p1300 = 20, 21) by selecting the closed-loop speed control (p1501). At the changeover, the setting of p1300 does not change. In this case, the actual state is displayed in r1407, bit 2 and bit 3.

For motors, type p0300 = 6 and 6xx, operation with U/f control is only recommended for diagnostic purposes.

## p1300[0...n] Open-loop/closed-loop control operating mode / Op/cl-lp ctrl_mode

PM330

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** C(1), T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6300, 6301, 8012 |
| **Min** | **Max** | **Factory setting** |
| 0 | 20 | 20 |

**Description:** Sets the open and closed-loop control mode of a drive.

**Value:**
0: U/f control with linear characteristic
1: U/f control with linear characteristic and FCC
2: U/f control with parabolic characteristic
4: U/f control with linear characteristic and ECO
7: U/f control for a parabolic characteristic and ECO
20: Speed control (encoderless)

**Dependency:** Only operation with U/f characteristic is possible if the rated motor speed is not entered (p0311).

Refer to: p0300, p0311, p0500

**Notice:** Active slip compensation is required in the U/f control types with Eco mode (p1300 = 4, 7). The scaling of the slip compensation (p1335) should be set so that the slip is completely compensated (generally 100%).

The Eco mode is only effective in steady-state operation and when the ramp-function generator is not bypassed. In the case of analog setpoints, if required the tolerance for ramp-up and ramp-down should be actively increased for the ramp-function generator using p1148 in order to reliably signal a steady-state condition.

**Note:** The closed-loop torque control can only be changed over in operation (p1300 = 20, 21) by selecting the closed-loop speed control (p1501). At the changeover, the setting of p1300 does not change. In this case, the actual state is displayed in r1407, bit 2 and bit 3.

For motors, type p0300 = 14, operation with U/f control is only recommended for diagnostic purposes.

## p1310[0...n] Starting current (voltage boost) permanent / I_start (Ua) perm

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** p0340 = 1 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6300, 6301 |
| **Min** | **Max** | **Factory setting** |
| 0.0 [%] | 250.0 [%] | 50.0 [%] |

**Description:** Defines the voltage boost as a [%] referred to the rated motor current (p0305).

The magnitude of the permanent voltage boost is reduced with increasing frequency so that at the rated motor frequency, the rated motor voltage is present.

The magnitude of the boost in Volt at a frequency of zero is defined as follows:

Voltage boost [V] = 1.732 x p0305 (rated motor current [A]) x r0395 (stator/primary section resistance [ohm]) x p1310 (permanent voltage boost [%]) / 100 %

At low output frequencies, there is only a low output voltage in order to maintain the motor flux. However, the output voltage can be too low in order to achieve the following:

- magnetize the induction motor.
- hold the load.
- compensate for losses in the system.

This is the reason that the output voltage can be increased using p1310.

The voltage boost can be used for both linear as well as square-law U/f characteristics.

Not for power units PM230, PM250, PM260:

For field orientation (p1302.4 = 1, default setting for p0096 = 1), in the vicinity of low output frequencies, a minimum current is impressed with the magnitude of the rated magnetizing current.

For p1310 = 0%, a current setpoint is calculated that corresponds to the no-load case. For p1610 = 100 %, a current setpoint is calculated that corresponds to the rated motor current.

**Dependency:** The starting current (voltage boost) is limited by the current limit p0640.

The accuracy of the starting current depends on the setting of the stator and feeder cable resistance (p0350, p0352).

Refer to: p1300, p1311, p1312, r1315

**Notice:** The starting current (voltage boost) increases the motor temperature (particularly at zero speed).

**Note:** The starting current as a result of the voltage boost is only effective for U/f control (p1300).

The boost values are combined with one another if the permanent voltage boost (p1310) is used in conjunction with other boost parameters (acceleration boost (p1311), voltage boost for starting (p1312)).

However, these parameters are assigned the following priorities: p1310 > p1311, p1312

For field orientation (p1302.4 = 1, not PM230, PM250, PM260), p1311 and p1312 of the voltage boost are also added in the direction of the load current (non-linear).

## p1311[0...n] Starting current (voltage boost) when accelerating / I_start accel

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6300, 6301 |
| **Min** | **Max** | **Factory setting** |
| 0.0 [%] | 250.0 [%] | 0.0 [%] |

**Description:** p1311 only results in a voltage boost when accelerating and generates a supplementary torque to accelerate the load.

The voltage boost becomes effective for a positive setpoint increase and disappears as soon as the setpoint has been reached. The build-up and withdrawal of the voltage boost are smoothed.

The magnitude of the boost in Volt at a frequency of zero is defined as follows (not for field orientation):

Voltage boost [V] = 1.732 * p0305 (rated motor current [A]) x r0395 (stator/primary section resistance [ohm]) x p1311 (voltage boost when accelerating [%]) / 100 %

**Dependency:** The current limit p0640 limits the boost.

For field orientation (p1302 bit 4 = 1, not PM230, PM250, PM260), p1311 is preassigned by the automatic calculation.

Refer to: p1300, p1310, p1312, r1315

**Notice:** The voltage boost results in a higher motor temperature increase.

**Note:** The voltage boost when accelerating can improve the response to small, positive setpoint changes.

Assigning priorities for the voltage boosts: refer to p1310

For field orientation (p1302 bit 4 = 1, not PM230, PM250, PM260), p1311 of the voltage boost are also added in the direction of the load current (non-linear).

## p1312[0...n] Starting current (voltage boost) when starting / I_start start

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6300, 6301 |
| **Min** | **Max** | **Factory setting** |
| 0.0 [%] | 250.0 [%] | 0.0 [%] |

**Description:** Setting for an additional voltage boost when powering-up, however, only for the first acceleration phase.

The voltage boost becomes effective for a positive setpoint increase and disappears as soon as the setpoint has been reached. The build-up and withdrawal of the voltage boost are smoothed.

**Dependency:** The current limit p0640 limits the boost.

Refer to: p1300, p1310, p1311, r1315

**Notice:** The voltage boost results in a higher motor temperature increase.

**Note:** The voltage boost when accelerating can improve the response to small, positive setpoint changes.

Assigning priorities for the voltage boosts: refer to p1310

For field orientation (p1302.4 = 1, not PM230, PM250, PM260), p1312 of the voltage boost are also added in the direction of the load current (non-linear).

## r1315 Voltage boost total / U_boost total

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2001 | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6301 |
| **Min** | **Max** | **Factory setting** |
| - [Vrms] | - [Vrms] | - [Vrms] |

**Description:** Displays the total resulting voltage boost in volt.

r1315 = p1310 + p1311 + p1312

For field orientation (p1302.4 = 1, not for PM230, PM250, PM260):

r1315 = p1310

**Dependency:** Refer to: p1310, p1311, p1312

## p1331[0...n] Voltage limiting / U_lim

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** 5_1 | **Unit selection:** p0505 | **Func. diagram:** 6300 |
| **Min** | **Max** | **Factory setting** |
| 50.00 [Vrms] | 2000.00 [Vrms] | 1000.00 [Vrms] |

**Description:** Limiting the voltage setpoint.

This means that the output voltage can be reduced with respect to the calculated maximum voltage r0071 and the start of field weakening.

**Note:** The output voltage is only limited if, as a result of p1331, the maximum output voltage (r0071) is fallen below.

## p1333[0...n] U/f control FCC starting frequency / U/f FCC f_start

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6301 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [Hz] | 3000.00 [Hz] | 0.00 [Hz] |

**Description:** Sets the starting frequency at which FCC (Flux Current Control) is activated.

**Dependency:** The correct operating mode must be set (p1300 = 1, 6).

**Warning:** An excessively low value can result in instability.

**Note:** For p1333 = 0 Hz, the FCC starting frequency is automatically set to 6 % of the rated motor frequency.

## p1334[0...n] U/f control slip compensation starting frequency / Slip comp start

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6310 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [Hz] | 3000.00 [Hz] | 0.00 [Hz] |

**Description:** Sets the starting frequency of the slip compensation.

**Note:** For p1334 = 0, the starting frequency of the slip compensation is automatically set to 6 % of the rated motor frequency.

## p1335[0...n] Slip compensation scaling / Slip comp scal

PM230
PM240
PM250, PM260

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6300, 6310 |
| **Min** | **Max** | **Factory setting** |
| 0.0 [%] | 600.0 [%] | 0.0 [%] |

**Description:** Sets the setpoint for slip compensation in [%] referred to r0330 (motor rated slip).

p1335 = 0.0 %: Slip compensation de-activated.

p1335 = 100.0 %: The slip is completely compensated.

**Dependency:** Prerequisite for a precise slip compensation for p1335 = 100 % are the precise motor parameters (p0350 ... p0360).

If the parameters are not precisely known, a precise compensation can be achieved by varying p1335.

For U/f control types with Eco optimization (4 and 7), the slip compensation must be activated in order to guarantee correct operation.

**Note:** The purpose of slip compensation is to maintain a constant motor speed regardless of the applied load. The fact that the motor speed decreases with increasing load is a typical characteristic of induction motors.

For synchronous motors, this effect does not occur and the parameter has no effect in this case.

For the open-loop control modes p1300 = 5 and 6 (textile sector), the slip compensation is internally disabled in order to be able to precisely set the output frequency.

If p1335 is changed during commissioning (p0010 > 0), then it is possible that the old value will no longer be able to be set. The reason for this is that the dynamic limits of p1335 have been changed by a parameter that was set when the drive was commissioned (e.g. p0300).

## p1335[0...n] Slip compensation scaling / Slip comp scal

PM330

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6300, 6310 |
| **Min** | **Max** | **Factory setting** |
| 0.0 [%] | 600.0 [%] | 100.0 [%] |

**Description:** Sets the setpoint for slip compensation in [%] referred to r0330 (motor rated slip).

p1335 = 0.0 %: Slip compensation de-activated.

p1335 = 100.0 %: The slip is completely compensated.

**Dependency:** Prerequisite for a precise slip compensation for p1335 = 100 % are the precise motor parameters (p0350 ... p0360).

If the parameters are not precisely known, a precise compensation can be achieved by varying p1335.

For U/f control types with Eco optimization (4 and 7), the slip compensation must be activated in order to guarantee correct operation.

**Note:** The purpose of slip compensation is to maintain a constant motor speed regardless of the applied load. The fact that the motor speed decreases with increasing load is a typical characteristic of induction motors.

For synchronous motors, this effect does not occur and the parameter has no effect in this case.

For the open-loop control modes p1300 = 5 and 6 (textile sector), the slip compensation is internally disabled in order to be able to precisely set the output frequency.

If p1335 is changed during commissioning (p0010 > 0), then it is possible that the old value will no longer be able to be set. The reason for this is that the dynamic limits of p1335 have been changed by a parameter that was set when the drive was commissioned (e.g. p0300).

## p1336[0...n] Slip compensation limit value / Slip comp lim val

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6310 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [%] | 600.00 [%] | 250.00 [%] |

**Description:** Sets the limit value for slip compensation in [%] referred to r0330 (motor rated slip).

## r1337 CO: Actual slip compensation / Slip comp act val

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6310 |
| **Min** | **Max** | **Factory setting** |
| - [%] | - [%] | - [%] |

**Description:** Displays the actual compensated slip [%] referred to r0330 (rated motor slip).

**Dependency:** p1335 > 0 %: Slip compensation active.

Refer to: p1335

## p1338[0...n] U/f mode resonance damping gain / Uf Res_damp gain

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,4 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6300, 6310 |
| **Min** | **Max** | **Factory setting** |
| 0.00 | 100.00 | 0.00 |

**Description:** Sets the gain for resonance damping for U/f control.

**Dependency:** Refer to: p1300, p1339, p1349

**Note:** The resonance damping function dampens active current oscillations that frequency occur under no-load conditions.

The resonance damping is active in a range from approximately 6 % of the rated motor frequency (p0310). The shutoff frequency is determined by p1349.

For the open-loop control modes p1300 = 5 and 6 (textile sectors), the resonance damping is internally disabled in order that the output frequency can be precisely set.

## p1339[0...n] U/f mode resonance damping filter time constant / Uf Res_damp T

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** p0340 = 1,3,4 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6310 |
| **Min** | **Max** | **Factory setting** |
| 1.00 [ms] | 1000.00 [ms] | 20.00 [ms] |

**Description:** Sets the filter time constant for resonance damping for U/f control.

**Dependency:** Refer to: p1300, p1338, p1349

## p1340[0...n] I_max frequency controller proportional gain / I_max_ctrl Kp

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,4 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6300 |
| **Min** | **Max** | **Factory setting** |
| 0.000 | 0.500 | 0.000 |

**Description:** Sets the proportional gain of the I_max frequency controller.

The I_max controller reduces the drive converter output current if the maximum current (r0067) is exceeded.

In the U/f operating modes (p1300) for the I_max control, one controller is used that acts on the output frequency and one controller that acts on the output voltage. The frequency controller reduces the current by decreasing the converter output frequency. The frequency is reduced down to a minimum value (equaling twice rated slip). If the overcurrent condition cannot be successfully resolved using this measure, then the drive converter output voltage is reduced using the I_max voltage controller. Once the overcurrent condition has been resolved, the drive is accelerated along the ramp set in p1120 (ramp-up time).

**Dependency:** In the U/f modes (p1300) for textile applications and for external voltage setpoints, only the I_max voltage controller is used.

**Notice:** When de-activating the I_max controller, the following must be carefully observed:

When the maximum current (r0067) is exceeded, the output current is no longer reduced. The drive is switched off when the overcurrent limits are exceeded.

**Note:** The I_max limiting controller becomes ineffective if the ramp-function generator is de-activated with p1122 = 1.

p1341 = 0: I_max frequency controller de-activated and I_max voltage controller activated over the complete speed range.

## p1341[0...n] I_max frequency controller integral time / I_max_ctrl Tn

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,4 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6300 |
| **Min** | **Max** | **Factory setting** |
| 0.000 [s] | 50.000 [s] | 0.300 [s] |

**Description:** Sets the integral time for the I_max frequency controller.

**Dependency:** Refer to: p1340

**Note:** When p1341 = 0, the current limiting controller influencing the frequency is de-activated and only the current limiting controller influencing the output voltage remains active (p1345, p1346).

In the case of power units with regenerative feedback (PM250, PM260), current limitation control for a regenerative load is always implemented by influencing the frequency. This current limiting function is de-activated with p1340 = p1341 = 0.

## r1343 CO: I_max controller frequency output / I_max_ctrl f_outp

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2000 | **Dyn. index:** - |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 6300 |
| **Min** | **Max** | **Factory setting** |
| - [rpm] | - [rpm] | - [rpm] |

**Description:** Displays the effective frequency limit.

**Dependency:** Refer to: p1340

## r1344 I_max controller voltage output / I_max_ctrl U_outp

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2001 | **Dyn. index:** - |
| **Units group:** 5_1 | **Unit selection:** p0505 | **Func. diagram:** 6300 |
| **Min** | **Max** | **Factory setting** |
| - [Vrms] | - [Vrms] | - [Vrms] |

**Description:** Displays the amount by which the converter output voltage is reduced.

**Dependency:** Refer to: p1340

## p1345[0...n] I_max voltage controller proportional gain / I_max_U_ctrl Kp

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,4 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6300, 7017 |
| **Min** | **Max** | **Factory setting** |
| 0.000 | 100000.000 | 0.000 |

**Description:** Sets the proportional gain for the I_max voltage controller.

**Dependency:** Refer to: p1340

**Note:** The controller settings are also used in the current controller of the DC braking (refer to p1232).

## p1346[0...n] I_max voltage controller integral time / I_max_U_ctrl Tn

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,4 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6300, 7017 |
| **Min** | **Max** | **Factory setting** |
| 0.000 [s] | 50.000 [s] | 0.030 [s] |

**Description:** Sets the integral time for the I_max voltage controller.

**Dependency:** Refer to: p1340

**Note:** The controller settings are also used in the current controller of the DC braking (refer to p1232).
For p1346 = 0, the following applies:
The integral time of the I_max voltage controller is de-activated.

## r1348 CO: U/f control Eco factor actual value / U/f Eco fac act v

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6300, 6301 |
| **Min** | **Max** | **Factory setting** |
| - [%] | - [%] | - [%] |

**Description:** Displays the economic factor determined for optimizing motor consumption.
**Dependency:** Refer to: p1335
**Note:** The value is only determined for operating modes with Economic (p1300 = 4, 7).

## p1349[0...n] U/f mode resonance damping maximum frequency / Uf res_damp f_max

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6310 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [Hz] | 3000.00 [Hz] | 0.00 [Hz] |

**Description:** Sets the maximum output frequency for resonance damping for U/f control.
Resonance damping is inactive above this output frequency.
**Dependency:** Refer to: p1338, p1339
**Note:** For p1349 = 0, the changeover limit is automatically set to 95 % of the rated motor frequency - however, to a max. of 45 Hz.

## p1400[0...n] Speed control configuration / n_ctrl config

PM230

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6490 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0000 0000 0000 0000 1000 0000 0010 0001 bin |

**Description:** Sets the configuration for the closed-loop speed control.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Automatic Kp/Tn adaptation active | Yes | No | 6040 |
| 05 | Kp/Tn adaptation active | Yes | No | 6040 |
| 15 | Sensorless vector control speed pre-control | Yes | No | 6030 |
| 19 | Anti-windup for integral component | Yes | No | 6030 |
| 20 | Acceleration model | ON | OFF | 6031 |

**Note:** Re bit 19, 20:
When this bit is set, speed overshoots when accelerating along the torque limit and for load surges are reduced.
Re bit 20:
The acceleration model for the speed setpoint is only active if p1496 is not zero.

## p1400[0...n] Speed control configuration / n_ctrl config

PM240
PM250, PM260

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6490 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0000 0000 0000 0000 1000 0000 0010 0001 bin |

**Description:** Sets the configuration for the closed-loop speed control.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Automatic Kp/Tn adaptation active | Yes | No | 6040 |
| 05 | Kp/Tn adaptation active | Yes | No | 6040 |
| 15 | Sensorless vector control speed pre-control | Yes | No | 6030 |
| 18 | Moment of inertia estimator active | Yes | No | 6030 |
| 19 | Anti-windup for integral component | Yes | No | 6030 |
| 20 | Acceleration model | ON | OFF | 6031 |
| 22 | Obtain moment of inertia estimator value for pulse inhibit | Yes | No | 6030 |

**Note:** Re bit 19, 20:

When this bit is set, speed overshoots when accelerating along the torque limit and for load surges are reduced.

Re bit 20:

The acceleration model for the speed setpoint is only active if p1496 is not zero.

## p1400[0...n] Speed control configuration / n_ctrl config

PM330

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6490 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0000 0000 0011 1000 1000 0000 0010 0001 bin |

**Description:** Sets the configuration for the closed-loop speed control.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Automatic Kp/Tn adaptation active | Yes | No | 6040 |
| 05 | Kp/Tn adaptation active | Yes | No | 6040 |
| 15 | Sensorless vector control speed pre-control | Yes | No | 6030 |
| 18 | Moment of inertia estimator active | Yes | No | 6030 |
| 19 | Anti-windup for integral component | Yes | No | 6030 |
| 20 | Acceleration model | ON | OFF | 6031 |
| 21 | Free Tn reduction active | Yes | No | 6030 |
| 22 | Obtain moment of inertia estimator value for pulse inhibit | Yes | No | 6030 |

**Note:** Re bit 19, 20:

When this bit is set, speed overshoots when accelerating along the torque limit and for load surges are reduced.

Re bit 20:

The acceleration model for the speed setpoint is only active if p1496 is not zero.

## p1401[0...n] Flux control configuration / Flux ctrl config

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6491 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0000 0000 0000 1110 bin |

**Description:** Sets the configuration for flux setpoint control

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 01 | Flux setpoint differentiation active | Yes | No | 6723 |
| 02 | Flux build-up control active | Yes | No | 6722, 6723 |
| 03 | Flux characteristic load-dependent | Yes | No | 6725 |
| 06 | Quick magnetizing | Yes | No | 6722 |
| 09 | Flux boost when establishing torque | Yes | No | - |
| 10 | Flux boost at low speed | Yes | No | - |

**Note:** Re bit 01:

Initially, the flux is only established with a low rate of rise when magnetizing the induction motor. The flux setpoint p1570 is reached again at the end of the magnetizing time p0346.

The flux differentiation can be switched out if a significant ripple occurs in the field-generating current setpoint (r0075) when entering the field weakening range. However, this is not suitable for fast acceleration operations because then, the flux decays more slowly and the voltage limiting responds.

Re bit 02:

The flux build-up control operates during the magnetizing phase p0346 of the induction motor. If it is switched out, a constant current setpoint is injected and the flux is built up corresponding to the rotor time constant.

Re bit 03:

Activating the load-dependent calculation of the direct axis flux setpoint using the optimum flow characteristic (see p2970 and the following) for the controlled reluctance motor.

Re bit 06:

Magnetizing is performed with maximum current (0.9 * r0067). With active identification of the stator resistance (see p0621) quick magnetizing is internally de-activated and alarm A07416 is displayed. During a flying restart of a rotating motor (see p1200) no quick magnetizing takes place.

Re bit 10:

When the load-dependent optimum flux characteristic is active (p1401.3 = 1) for the controlled reluctance motor, at low speeds, the flux setpoint is increased above the value of the flux characteristic.

## p1402[0...n] Closed-loop current control and motor model configuration / I_ctrl config

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** p0340 = 1,3 | **Data type:** Unsigned16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | 0000 bin |

**Description:** Sets the configuration for the closed-loop control and the motor model.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 02 | Current controller adaptation active | Yes | No | - |

## r1407.0...23 CO/BO: Status word speed controller / ZSW n_ctrl

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2522 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display and BICO output for the status word of the speed controller.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | U/f control active | Yes | No | - |
| 01 | Encoderless operation active | Yes | No | - |
| 02 | Torque control active | Yes | No | 6030, 6060, 8011 |
| 03 | Speed control active | Yes | No | 6040 |
| 05 | Speed controller I component frozen | Yes | No | 6040 |
| 06 | Speed controller I component set | Yes | No | 6040 |
| 07 | Torque limit reached | Yes | No | 6060 |
| 08 | Upper torque limit active | Yes | No | 6060 |
| 09 | Lower torque limit active | Yes | No | 6060 |
| 10 | Droop enabled | Yes | No | - |
| 11 | Speed setpoint limited | Yes | No | 6030 |
| 12 | Ramp-function generator set | Yes | No | - |
| 13 | Encoderless operation due to a fault | Yes | No | - |
| 14 | I/f control active | Yes | No | - |
| 15 | Torque limit reached (without pre-control) | Yes | No | 6060 |
| 17 | Speed limiting control active | Yes | No | 6640 |
| 23 | Acceleration model activated | Yes | No | - |

## r1408.0...14 CO/BO: Status word current controller / ZSW I_ctrl

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2530 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display and BICO output for the status word of the current controller.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Current controller act | Active | Not active | - |
| 01 | Id control I component limiting | Active | Not active | 6714 |
| 03 | Voltage limiting | Active | Not active | 6714 |
| 10 | Speed adaptation limiting | Active | Not active | - |
| 12 | Motor stalled | Yes | No | - |
| 13 | Separately excited synchronous motor is excited | Yes | No | - |
| 14 | Current model FEM: magnetizing excitation current limited to 0 | Yes | No | - |

## p1416[0...n] Speed setpoint filter 1 time constant / n_set_filt 1 T

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6020, 6030 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [ms] | 5000.00 [ms] | 0.00 [ms] |

**Description:** Sets the time constant for the speed setpoint filter 1 (PT1).

## r1438 CO: Speed controller speed setpoint / n_ctrl n_set

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2000 | **Dyn. index:** - |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 3001, 6020, 6031 |
| **Min** | **Max** | **Factory setting** |
| - [rpm] | - [rpm] | - [rpm] |

**Description:** Display and connector output of the speed setpoint after setpoint limiting for the P component of the speed controller.

For U/f operation, the value that is displayed is of no relevance.

**Note:** In the standard state (the reference model is de-activated), r1438 = r1439.

## r1445 CO: Actual speed smoothed / n_act smooth

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2000 | **Dyn. index:** - |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 6040 |
| **Min** | **Max** | **Factory setting** |
| - [rpm] | - [rpm] | - [rpm] |

**Description:** Display and connector output for the actual smoothed speed actual value of the speed control.

## p1452[0...n] Speed controller speed actual value smoothing time (sensorless) / n_C n_act T_s SL

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6020, 6040 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [ms] | 32000.00 [ms] | 10.00 [ms] |

**Description:** Sets the smoothing time for the actual speed of the speed controller for encoderless closed-loop speed control.

**Note:** The smoothing must be increased if there is gear backlash. For longer smoothing times, the integral time of the speed controller must also be increased (e.g. using p0340 = 4).

## p1461[0...n] Speed controller Kp adaptation speed upper scaling / n_ctr Kp n up scal

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,4 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6050 |
| **Min** | **Max** | **Factory setting** |
| 0.0 [%] | 200000.0 [%] | 100.0 [%] |

**Description:** Sets the P gain of the speed controller for the upper adaptation speed range (> p1465).

The entry is made referred to the P gain for the lower adaptation speed range of the speed controller (% referred to p1470).

**Dependency:** Refer to: p1464, p1465

**Note:** If the upper transition point p1465 of the speed controller adaptation is set to lower values than the lower transition p1464, then the controller gain below p1465 is adapted with p1461. This means that an adaptation can be implemented for low speeds without having to change the controller parameters.

## p1463[0...n] Speed controller Tn adaptation speed upper scaling / n_ctr Tn n up scal

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,4 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6050 |
| **Min** | **Max** | **Factory setting** |
| 0.0 [%] | 200000.0 [%] | 100.0 [%] |

**Description:** Sets the integral time of the speed controller after the adaptation speed range (> p1465).

The entry is made referred to the integral time for the lower adaptation speed range of the speed controller (% referred to p1472).

**Dependency:** Refer to: p1464, p1465

**Note:** If the upper transition point p1465 of the speed controller adaptation is set to lower values than the lower transition point p1464, then the controller integral time below p1465 is adapted with p1463. This means that an adaptation can be implemented for low speeds without having to change the controller parameters.

## p1464[0...n] Speed controller adaptation speed lower / n_ctrl n lower

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,4 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 6050 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [rpm] | 210000.00 [rpm] | 0.00 [rpm] |

**Description:** Sets the lower adaptation speed of the speed controller.

No adaptation is effective below this speed.

**Dependency:** Refer to: p1461, p1463, p1465

**Note:** If the upper transition point p1465 of the speed controller adaptation is set to lower values than the lower transition point p1464, then the controller below p1465 is adapted with p1461 or p1463. This means that an adaptation can be implemented for low speeds without having to change the controller parameters.

## p1465[0...n] Speed controller adaptation speed upper / n_ctrl n upper

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,4 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 6050 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [rpm] | 210000.00 [rpm] | 210000.00 [rpm] |

**Description:** Sets the upper adaptation speed of the speed controller.

No adaptation is effective above this speed.

For the proportional gain, p1470 x p1461 is effective.

For the integral time, p1472 x p1463 is effective.

**Dependency:** Refer to: p1461, p1463, p1464

**Note:** If the upper transition point p1465 of the speed controller adaptation is set to lower values than the lower transition point p1464, then the controller below p1465 is adapted with p1461 or p1463. This means that an adaptation can be implemented for low speeds without having to change the controller parameters.

## r1468 CO: Speed controller P-gain effective / n_ctr Kp eff

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6040 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the effective P gain of the speed controller.

**Dependency:** The connector output signal r1468 is increased by a factor of 100 in order to improve the resolution.

## r1469 Speed controller integral time effective / n_ctr Tn eff

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 5040, 5042, 6040 |
| **Min** | **Max** | **Factory setting** |
| - [ms] | - [ms] | - [ms] |

**Description:** Displays the effective integral time of the speed controller.

## p1470[0...n] Speed controller encoderless operation P-gain / n_ctrl SL Kp

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** p0340 = 1,3,4 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6040, 6050 |
| **Min** | **Max** | **Factory setting** |
| 0.000 | 999999.000 | 0.300 |

**Description:** Sets the P gain for encoderless operation for the speed controller.

**Note:** The product p0341 x p0342 is taken into account when automatically calculating the speed controller (p0340 = 1, 3, 4).

## p1472[0...n] Speed controller encoderless operation integral time / n_ctrl SL Tn

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** p0340 = 1,3,4 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6040, 6050 |
| **Min** | **Max** | **Factory setting** |
| 0.0 [ms] | 100000.0 [ms] | 20.0 [ms] |

**Description:** Set the integral time for encoderless operation for the speed controller.

**Note:** The integral component is stopped if the complete controller output or the sum of controller output and torque pre-control reach the torque limit.

## r1482 CO: Speed controller I torque output / n_ctrl I-M_outp

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2003 | **Dyn. index:** - |
| **Units group:** 7_1 | **Unit selection:** p0505 | **Func. diagram:** 5040, 5042, 5210, 6030, 6040 |
| **Min** | **Max** | **Factory setting** |
| - [Nm] | - [Nm] | - [Nm] |

**Description:** Display and connector output for the torque setpoint at the output of the I speed controller.

## r1493 CO: Moment of inertia total, scaled / M_mom inert tot_sc

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** 25_1 | **Unit selection:** p0100 | **Func. diagram:** 6031 |
| **Min** | **Max** | **Factory setting** |
| - [kgm²] | - [kgm²] | - [kgm²] |

**Description:** Display and connector output for the parameterized total moment of inertia.

The value is calculated with ((p0341 * p0342) * p1496).

## p1496[0...n] Acceleration pre-control scaling / a_prectrl scal

PM230
PM240
PM250, PM260

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6020, 6031 |
| **Min** | **Max** | **Factory setting** |
| 0.0 [%] | 10000.0 [%] | 0.0 [%] |

**Description:** Sets the scaling for the acceleration pre-control of the speed/velocity controller.

**Dependency:** Refer to: p0341, p0342

**Warning:** The acceleration precontrol r1518 is kept at the old value if the ramp-function generator tracking (r1199.5) is active or the ramp-function generator output is set (r1199.3). This is used to avoid torque peaks. Depending on the application, it may therefore be necessary to disable the ramp-function generator tracking (p1145 = 0) or the acceleration precontrol (p1496 = 0).

The acceleration precontrol is set to zero, if the Vdc control is active (r0056.14/15).

**Note:** The parameter is set to 100% by the rotating measurement (refer to p1960).

The acceleration pre-control may not be used if the speed setpoint manifests significant ripple (e.g. analog setpoint) and the rounding-off in the speed ramp-function generator is disabled.

We also recommend that the pre-control mode is not used if there is gearbox backlash.

## p1496[0...n] Acceleration pre-control scaling / a_prectrl scal

PM330

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6020, 6031 |
| **Min** | **Max** | **Factory setting** |
| 0.0 [%] | 10000.0 [%] | 100.0 [%] |

**Description:** Sets the scaling for the acceleration pre-control of the speed/velocity controller.

**Dependency:** Refer to: p0341, p0342

**Warning:** The acceleration precontrol r1518 is kept at the old value if the ramp-function generator tracking (r1199.5) is active or the ramp-function generator output is set (r1199.3). This is used to avoid torque peaks. Depending on the application, it may therefore be necessary to disable the ramp-function generator tracking (p1145 = 0) or the acceleration precontrol (p1496 = 0).

The acceleration precontrol is set to zero, if the Vdc control is active (r0056.14/15).

**Note:** The parameter is set to 100% by the rotating measurement (refer to p1960).

The acceleration pre-control may not be used if the speed setpoint manifests significant ripple (e.g. analog setpoint) and the rounding-off in the speed ramp-function generator is disabled.

We also recommend that the pre-control mode is not used if there is gearbox backlash.

## r1508 CO: Torque setpoint before supplementary torque / M_set bef. M_suppl

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2003 | **Dyn. index:** - |
| **Units group:** 7_1 | **Unit selection:** p0505 | **Func. diagram:** 6030, 6060, 6722 |
| **Min** | **Max** | **Factory setting** |
| - [Nm] | - [Nm] | - [Nm] |

**Description:** Displays the torque setpoint before entering the supplementary torque.

For closed-loop speed control, r1508 corresponds to the speed controller output; for closed-loop torque control, r1508 corresponds to the torque setpoint of the signal source assigned in p1503.

## p1517[0...n] Accelerating torque smoothing time constant / M_accel T_smooth

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6060 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [ms] | 100.00 [ms] | 4.00 [ms] |

**Description:** Sets the smoothing time constant of the accelerating torque.

**Note:** The acceleration pre-control is inhibited if the smoothing is set to the maximum value.

## r1518[0...1] CO: Accelerating torque / M_accel

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2003 | **Dyn. index:** - |
| **Units group:** 7_1 | **Unit selection:** p0505 | **Func. diagram:** 6060 |
| **Min** | **Max** | **Factory setting** |
| - [Nm] | - [Nm] | - [Nm] |

**Description:** Displays the accelerating torque for pre-control of the speed controller.

**Index:** [0] = Unsmoothed
[1] = Smoothed

**Dependency:** Refer to: p0341, p0342, p1496

## p1520[0...n] CO: Torque limit upper / M_max upper

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** p0340 = 1,3,5 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** p2003 | **Dyn. index:** DDS, p0180 |
| **Units group:** 7_1 | **Unit selection:** p0505 | **Func. diagram:** 6020, 6630 |
| **Min** | **Max** | **Factory setting** |
| -1000000.00 [Nm] | 20000000.00 [Nm] | 0.00 [Nm] |

**Description:** Sets the fixed, upper torque limit.

**Dependency:** Refer to: p1521, r1538, r1539

**Danger:** Negative values when setting the upper torque limit (p1520 < 0) can result in the motor accelerating in an uncontrollable fashion.

**Notice:** A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

**Note:** The torque limit is limited to 400% of the rated motor torque. When automatically calculating the motor/closed-loop control parameters (p0340), the torque limit is set to match the current limit (p0640).

## p1521[0...n] CO: Torque limit lower / M_max lower

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** p0340 = 1,3,5 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** p2003 | **Dyn. index:** DDS, p0180 |
| **Units group:** 7_1 | **Unit selection:** p0505 | **Func. diagram:** 6020, 6630 |
| **Min** | **Max** | **Factory setting** |
| -20000000.00 [Nm] | 1000000.00 [Nm] | 0.00 [Nm] |

**Description:** Sets the fixed, lower torque limit.

**Dependency:** Refer to: p1520

**Danger:** Positive values when setting the lower torque limit (p1521 > 0) can result in the motor accelerating in an uncontrollable fashion.

**Notice:** A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

**Note:** The torque limit is limited to 400% of the rated motor torque. When automatically calculating the motor/closed-loop control parameters (p0340), the torque limit is set to match the current limit (p0640).

## p1530[0...n] Power limit motoring / P_max mot

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** p0340 = 1,3,5 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** 14_5 | **Unit selection:** p0505 | **Func. diagram:** 6640 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [kW] | 100000.00 [kW] | 0.00 [kW] |

**Description:** Sets the power limit when motoring.

**Dependency:** Refer to: p0500, p1531

**Note:** The power limit is limited to 300% of the rated motor power.

## p1531[0...n] Power limit regenerative / P_max gen

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** p0340 = 1,3,5 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** 14_5 | **Unit selection:** p0505 | **Func. diagram:** 6640 |
| **Min** | **Max** | **Factory setting** |
| -100000.00 [kW] | -0.01 [kW] | -0.01 [kW] |

**Description:** Sets the regenerative power limit.

**Dependency:** Refer to: r0206, p0500, p1530

**Note:** The power limit is limited to 300% of the rated motor power.

For power units without energy recovery capability, the regenerative power limit is preset to 30 % of the power r0206[0]. For a braking resistor connected to the DC link (p0219 > 0), the power limit when generating is automatically adapted.

For power units with energy recovery, the parameter is limited to the negative value of r0206[2].

## r1533 Current limit torque-generating total / Iq_max total

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2002 | **Dyn. index:** - |
| **Units group:** 6_2 | **Unit selection:** p0505 | **Func. diagram:** 6640 |
| **Min** | **Max** | **Factory setting** |
| - [Arms] | - [Arms] | - [Arms] |

**Description:** Displays the maximum torque/force generating current as a result if all current limits.

## r1536[0...1] Current limit maximum torque-generating current / Isq_max

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2002 | **Dyn. index:** - |
| **Units group:** 6_2 | **Unit selection:** p0505 | **Func. diagram:** 6640, 6710 |
| **Min** | **Max** | **Factory setting** |
| - [Arms] | - [Arms] | - [Arms] |

**Description:** Displays the maximum limit for the torque-generating current component.

Index 0 indicates the signal limited by the Vdc controller.

**Index:**
[0] = Limited
[1] = Unlimited

## r1537[0...1] Current limit minimum torque-generating current / Isq_min

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2002 | **Dyn. index:** - |
| **Units group:** 6_2 | **Unit selection:** p0505 | **Func. diagram:** 6640, 6710 |
| **Min** | **Max** | **Factory setting** |
| - [Arms] | - [Arms] | - [Arms] |

**Description:** Displays the minimum limit for the torque-generating current component.

Index 0 indicates the signal limited by the Vdc controller.

**Index:**
[0] = Limited
[1] = Unlimited

## r1538 CO: Upper effective torque limit / M_max upper eff

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2003 | **Dyn. index:** - |
| **Units group:** 7_1 | **Unit selection:** p0505 | **Func. diagram:** 6020, 6640 |
| **Min** | **Max** | **Factory setting** |
| - [Nm] | - [Nm] | - [Nm] |

**Description:** Display and connector output for the actual effective upper torque limit.

**Note:** The effective upper torque limit is reduced with respect to the selected upper torque limit p1520, if the current limit p0640 is reduced or the rated magnetizing current of the induction motor p0320 is increased.

This may be the case for rotating measurements (see p1960).

The torque limit p1520 can be re-calculated using p0340 = 1, 3 or 5.

## r1539 CO: Lower effective torque limit / M_max lower eff

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2003 | **Dyn. index:** - |
| **Units group:** 7_1 | **Unit selection:** p0505 | **Func. diagram:** 6020, 6640 |
| **Min** | **Max** | **Factory setting** |
| - [Nm] | - [Nm] | - [Nm] |

**Description:** Display and connector output for the actual effective lower torque limit.

**Note:** The effective lower torque limit is reduced with respect to the selected lower torque limit p1521, if the current limit p0640 is reduced or the rated magnetizing current of the induction motor p0320 is increased.

This may be the case for rotating measurements (see p1960).

The torque limit p1520 can be re-calculated using p0340 = 1, 3 or 5.

## r1548[0...1] CO: Stall current limit torque-generating maximum / Isq_max stall

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2002 | **Dyn. index:** - |
| **Units group:** 6_2 | **Unit selection:** p0505 | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - [Arms] | - [Arms] | - [Arms] |

**Description:** Displays the limit for the torque-generating current component using the stall calculation, the current limit of the power unit as well as the parameterization in p0640.

**Index:**
[0] = Upper limit
[1] = Lower limit

## p1553[0...n] Stall limit scaling / Stall limit scal

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 80.0 [%] | 130.0 [%] | 100.0 [%] |

**Description:** Sets the scaling of the stall limit for the start of field weakening.

**Danger:** If the stall current limit is increased, then the q current setpoint can exceed the stall limit; as a consequence, a hysteresis effect can occur when loading and unloading.

## r1566[0...n] Flux reduction factor torque / Flux red fact torq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - [%] | - [%] | - [%] |

**Description:** Controlled reluctance motor:
Display of the lower torque limit to evaluate the optimum flux characteristic.
Above the optimum flux characteristic p2970ff, the value corresponds with the lower flux limit p1581, and is referred to the rated motor torque.

## p1567[0...n] Magnetization scaling / Mag scale

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** p0340 = 1,3,4 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 10 [%] | 1000 [%] | 100 [%] |

**Description:** Controlled reluctance motor:
Scaling of the gradient limit of the flux when increasing up to the available residual voltage.

**Note:** The possible steepness (gradient) of the flux increase when torque is demanded is limited by the available residual voltage. This parameter allows this limit to be scaled.

## r1568[0...5] CO: Open-loop flux control closed-loop controlled reluctance motor / Flux ctrl SRM

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - [%] | - [%] | - [%] |

**Description:** Displays signals of the open-loop flux control of the closed-loop controlled reluctance motor.

**Index:**
[0] = Setpoint before filter
[1] = Output MTPC characteristic
[2] = Lower limit at low torque
[3] = Lower limit at low speed
[4] = Upper limit from field weakening controller total
[5] = Upper limit from field weakening controller precontrol

## p1570[0...n] CO: Flux setpoint / Flex setp

PM230
PM240
PM250, PM260

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,5 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6722 |
| **Min** | **Max** | **Factory setting** |
| 50.0 [%] | 200.0 [%] | 100.0 [%] |

**Description:** Sets the flux setpoint referred to rated motor flux.

**Notice:** A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

**Note:** For p1570 > 100%, the flux setpoint increases as a function of the load from 100% (no-load operation) to the setting in p1570 (above rated motor torque), if p1580 > 0% has been set.

## p1570[0...n] CO: Flux setpoint / Flex setp

| | | | |
|---|---|---|---|
| PM330 | **Access level:** 3 | **Calculated:** p0340 = 1,3,5 | **Data type:** FloatingPoint32 |
| | **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** DDS, p0180 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 6722 |
| | **Min** | **Max** | **Factory setting** |
| | 50.0 [%] | 200.0 [%] | 103.0 [%] |

**Description:** Sets the flux setpoint referred to rated motor flux.

**Dependency:** Refer to: p0500

**Notice:** A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

**Note:** For p1570 > 100%, the flux setpoint increases as a function of the load from 100% (no-load operation) to the setting in p1570 (above rated motor torque), if p1580 > 0% has been set.

## p1574[0...n] Voltage reserve dynamic / U_reserve dyn

| | | | |
|---|---|---|---|
| PM230 | **Access level:** 3 | **Calculated:** p0340 = 1,3,5 | **Data type:** FloatingPoint32 |
| PM330 | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| | **Units group:** 5_1 | **Unit selection:** p0505 | **Func. diagram:** 6723, 6724 |
| | **Min** | **Max** | **Factory setting** |
| | 0.0 [Vrms] | 150.0 [Vrms] | 2.0 [Vrms] |

**Description:** Sets a dynamic voltage reserve.

**Dependency:** Refer to: p0500

**Note:** In the field weakening range, it must be expected that the control dynamic performance is somewhat restricted due to the limited possibilities of controlling/adjusting the voltage. This can be improved by increasing the voltage reserve. Increasing the reserve reduces the steady-state maximum output voltage (r0071).

## p1574[0...n] Voltage reserve dynamic / U_reserve dyn

| | | | |
|---|---|---|---|
| PM240 | **Access level:** 3 | **Calculated:** p0340 = 1,3,5 | **Data type:** FloatingPoint32 |
| PM250, PM260 | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| | **Units group:** 5_1 | **Unit selection:** p0505 | **Func. diagram:** 6723, 6724 |
| | **Min** | **Max** | **Factory setting** |
| | 0.0 [Vrms] | 150.0 [Vrms] | 10.0 [Vrms] |

**Description:** Sets a dynamic voltage reserve.

**Dependency:** Refer to: p0500

**Note:** In the field weakening range, it must be expected that the control dynamic performance is somewhat restricted due to the limited possibilities of controlling/adjusting the voltage. This can be improved by increasing the voltage reserve. Increasing the reserve reduces the steady-state maximum output voltage (r0071).

## p1578[0...n] Flux reduction flux decrease smoothing time / Flux red T_red

| | | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** p0340 = 1,3,4 | **Data type:** FloatingPoint32 |
| | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | 20 [ms] | 5000 [ms] | 200 [ms] |

**Description:** Controlled reluctance motor:
Sets the time constant for reducing the flux setpoint

**Dependency:** Refer to: p1579

## p1579[0...n] Flux reduction flux build-up smoothing time / Flux red T_incr

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,4 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 [ms] | 5000 [ms] | 4 [ms] |

**Description:** Controlled reluctance motor:
Sets the time constant for establishing the flux setpoint

**Dependency:** Refer to: p1578

## p1580[0...n] Efficiency optimization / Efficiency opt.

PM230

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,5 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6722 |
| **Min** | **Max** | **Factory setting** |
| 0 [%] | 100 [%] | 80 [%] |

**Description:** Sets the efficiency optimization.
When optimizing the efficiency, the flux setpoint of the closed-loop control is adapted as a function of the load.
For p1580 = 100 %, under no-load operating conditions, the flux setpoint is reduced to 50 % of the rated motor flux.

**Dependency:** Refer to: p0500

**Note:** It only makes sense to activate this function if the dynamic response requirements of the speed controller are low.
In order to avoid oscillations, if required, the speed controller parameters should be adapted (increase Tn, reduce Kp).
Further, the smoothing time of the flux setpoint filter (p1582) should be increased.

## p1580[0...n] Efficiency optimization / Efficiency opt.

PM240
PM250, PM260

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,5 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6722 |
| **Min** | **Max** | **Factory setting** |
| 0 [%] | 100 [%] | 0 [%] |

**Description:** Sets the efficiency optimization.
When optimizing the efficiency, the flux setpoint of the closed-loop control is adapted as a function of the load.
For p1580 = 100 %, under no-load operating conditions, the flux setpoint is reduced to 50 % of the rated motor flux.

**Note:** It only makes sense to activate this function if the dynamic response requirements of the speed controller are low.
In order to avoid oscillations, if required, the speed controller parameters should be adapted (increase Tn, reduce Kp).
Further, the smoothing time of the flux setpoint filter (p1582) should be increased.

## p1580[0...n] Efficiency optimization / Efficiency opt.

PM330

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,5 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6722 |
| **Min** | **Max** | **Factory setting** |
| 0 [%] | 100 [%] | 100 [%] |

**Description:** Sets the efficiency optimization.
When optimizing the efficiency, the flux setpoint of the closed-loop control is adapted as a function of the load.
For p1580 = 100 %, under no-load operating conditions, the flux setpoint is reduced to 50 % of the rated motor flux.

**Dependency:** Refer to: p0500

**Note:** It only makes sense to activate this function if the dynamic response requirements of the speed controller are low.
In order to avoid oscillations, if required, the speed controller parameters should be adapted (increase Tn, reduce Kp).
Further, the smoothing time of the flux setpoint filter (p1582) should be increased.

## p1581[0...n] Flux reduction factor / Flux red factor

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 [%] | 100 [%] | 100 [%] |

**Description:** Controlled reluctance motor:

Sets the lower flux limit to evaluate the optimum flux characteristic p2970ff.

The value is referred to the rated motor flux (p0357 * r0331).

## p1582[0...n] Flux setpoint smoothing time / Flux setp T_smth

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6722, 6724 |
| **Min** | **Max** | **Factory setting** |
| 4 [ms] | 5000 [ms] | 15 [ms] |

**Description:** Sets the smoothing time for the flux setpoint.

## p1584[0...n] Field weakening operation flux setpoint smoothing time / Field weak T_smth

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** p0340 = 1,3 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6722 |
| **Min** | **Max** | **Factory setting** |
| 0 [ms] | 20000 [ms] | 0 [ms] |

**Description:** Sets the smoothing time for the flux setpoint in the field-weakening range

**Recommend.:** Smoothing should be especially used if there is no regenerative feedback into the line supply. This means that the DC link voltage can quickly increase in regenerative operation

**Note:** Only the flux setpoint rise is smoothed

## p1586[0...n] Field weakening characteristic scaling / Field weak scal

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 80.0 [%] | 120.0 [%] | 100.0 [%] |

**Description:** Sets the scaling of the pre-control characteristic for the start of field weakening.

For values above 100 % and for partial load situations, the field weakening starts at higher speeds.

**Note:** If the start of field weakening is shifted to lower speeds, then the voltage reserve is increased for partial load situations.

If the start of field weakening is shifted to higher speeds, the voltage reserve is appropriately reduced so that for fast load changes, it can be expected that this will have a negative impact on the dynamic performance.

## p1590[0...n] Flux controller P gain / Flux controller Kp

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** p0340 = 1,3,4 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6723 |
| **Min** | **Max** | **Factory setting** |
| 0.0 | 999999.0 | 10.0 |

**Description:** Sets the proportional gain for the flux controller.

**Note:** The value is automatically pre-assigned dependent on the motor when the drive system is first commissioned.

When calculating controller parameters (p0340 = 4), this value is re-calculated.

## p1592[0...n] Flux controller integral time / Flux controller Tn

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** p0340 = 1,3,4 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6723 |
| **Min** | **Max** | **Factory setting** |
| 0 [ms] | 10000 [ms] | 30 [ms] |

**Description:** Sets the integral time for the flux controller.

**Note:** The value is automatically pre-assigned dependent on the motor when the drive system is first commissioned.

When calculating controller parameters (p0340 = 4), this value is re-calculated.

## r1593[0...1] CO: Field weakening controller / flux controller output / Field/Fl_ctrl outp

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2002 | **Dyn. index:** - |
| **Units group:** 6_2 | **Unit selection:** p0505 | **Func. diagram:** 6724 |
| **Min** | **Max** | **Factory setting** |
| - [Arms] | - [Arms] | - [Arms] |

**Description:** Display and connector output for the output of the field weakening controller (synchronous motor).

**Index:**
[0] = PI output
[1] = I output

## p1596[0...n] Field weakening controller integral-action time / Field_ctrl Tn

PM230
PM240
PM250, PM260

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,4 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6723, 6724 |
| **Min** | **Max** | **Factory setting** |
| 10 [ms] | 10000 [ms] | 300 [ms] |

**Description:** Sets the integral-action time of the field-weakening controller.

## r1597 CO: Field weakening controller output / Field_ctrl outp

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6723 |
| **Min** | **Max** | **Factory setting** |
| - [%] | - [%] | - [%] |

**Description:** Displays the output of the field weakening controller.

The value is referred to the rated motor flux.

## r1598 CO: Total flux setpoint / Flux setp total

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6714, 6723, 6724, 6725, 6726, 8018 |
| **Min** | **Max** | **Factory setting** |
| - [%] | - [%] | - [%] |

**Description:** Displays the effective flux setpoint.

The value is referred to the rated motor flux.

## p1601[0...n] Current injection ramp time / I_inject t_ramp

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 1 [ms] | 10000 [ms] | 20 [ms] |

**Description:** Sets the ramp time to inject the current setpoint for changing into open-loop controlled operation.

The current setpoint is generated from p1610 and p1611.

**Note:** The parameter is only applicable for closed-loop controlled reluctance motors.

## p1610[0...n] Torque setpoint static (sensorless) / M_set static

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6700, 6721, 6722, 6726 |
| **Min** | **Max** | **Factory setting** |
| -200.0 [%] | 200.0 [%] | 50.0 [%] |

**Description:** Sets the static torque setpoint for sensorless vector control.

This parameter is entered as a percentage referred to the rated motor torque (r0333).

For sensorless vector control, when the motor model is shut down, an absolute current is impressed. p1610 represents the maximum load that occurs at a constant setpoint speed.

**Notice:** p1610 should always be set to at least 10 % higher than the maximum steady-state load that can occur.

**Note:** For p1610 = 0%, a current setpoint is calculated that corresponds to the no-load case (ASM: rated magnetizing current).

For p1610 = 100 %, a current setpoint is calculated that corresponds to the rated motor torque.

Negative values are converted into positive setpoints in the case of induction and permanent-magnet synchronous motors.

## p1611[0...n] Additional acceleration torque (sensorless) / M_suppl_accel

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** p0340 = 1 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6700, 6721, 6722, 6726 |
| **Min** | **Max** | **Factory setting** |
| 0.0 [%] | 200.0 [%] | 30.0 [%] |

**Description:** Enters the dynamic torque setpoint for the low-speed range for sensorless vector control.

This parameter is entered as a percentage referred to the rated motor torque (r0333).

**Note:** When accelerating and braking p1611 is added to p1610 and the resulting total torque is converted into an appropriate current setpoint and controlled.

For pure accelerating torques, it is always favorable to use the torque pre-control of the speed controller (p1496).

## r1614 EMF maximum / EMF max

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2001 | **Dyn. index:** - |
| **Units group:** 5_1 | **Unit selection:** p0505 | **Func. diagram:** 6725 |
| **Min** | **Max** | **Factory setting** |
| - [Vrms] | - [Vrms] | - [Vrms] |

**Description:** Displays the actual maximum possible electromotive force (EMF) of the separately-excited synchronous motor.

**Dependency:** The value is the basis for the flux setpoint.

The maximum possible EMF depends on the following factors:

- Actual DC link voltage (r0070).
- Maximum modulation depth (p1803).
- Field-generating and torque-generating current setpoint.

| p1616[0...n] | Current setpoint smoothing time / I_set T_smooth | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** p0340 = 1,3 | **Data type:** FloatingPoint32 |
| | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 6721, 6722 |
| | **Min** | **Max** | **Factory setting** |
| | 4 [ms] | 10000 [ms] | 40 [ms] |

**Description:** Sets the smoothing time for the current setpoint.
The current setpoint is generated from p1610 and p1611.

**Note:** This parameter is only effective in the range where current is injected for sensorless vector control.

| r1623[0...1] | Field-generating current setpoint (steady-state) / Id_set stationary | | |
|---|---|---|---|
| | **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| | **Can be changed:** - | **Scaling:** p2002 | **Dyn. index:** - |
| | **Units group:** 6_2 | **Unit selection:** p0505 | **Func. diagram:** 6723 |
| | **Min** | **Max** | **Factory setting** |
| | - [Arms] | - [Arms] | - [Arms] |

**Description:** Displays the steady-state field generating current setpoint (Id_set).

**Note:** Re index 1:
Reserved.

| r1624 | Field-generating current setpoint total / Id_setp total | | |
|---|---|---|---|
| | **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| | **Can be changed:** - | **Scaling:** p2002 | **Dyn. index:** - |
| | **Units group:** 6_2 | **Unit selection:** p0505 | **Func. diagram:** 6640, 6721, 6723, 6727 |
| | **Min** | **Max** | **Factory setting** |
| | - [Arms] | - [Arms] | - [Arms] |

**Description:** Displays the limited field-generating current setpoint (Id_set).
This value comprises the steady-state field-generating current setpoint r1623 and a dynamic component that is only set when changes are made to the flux setpoint.

| p1654[0...n] | Curr. setpoint torque-gen. smoothing time field weakening range / Isq_s T_smth FW | | |
|---|---|---|---|
| | **Access level:** 4 | **Calculated:** p0340 = 1 | **Data type:** FloatingPoint32 |
| | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 6710 |
| | **Min** | **Max** | **Factory setting** |
| | 0.1 [ms] | 50.0 [ms] | 4.8 [ms] |

**Description:** Sets the smoothing time constant for the setpoint of the torque-generating current components.

**Note:** The smoothing time does not become effective until the field-weakening range is reached.

| p1703[0...n] | Isq current controller pre-control scaling / Isq_ctr_prectrScal | | |
|---|---|---|---|
| | **Access level:** 4 | **Calculated:** p0340 = 1,3,4 | **Data type:** FloatingPoint32 |
| | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 6714 |
| | **Min** | **Max** | **Factory setting** |
| | 0.0 [%] | 200.0 [%] | 60.0 [%] |

**Description:** Sets the scaling of the dynamic current controller pre-control for the torque/force-generating current component Isq.

**p1710[0...n]** **Current controller adaptation d axis starting point KP / Id_adapt pt KP**

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3 | **Data type:** FloatingPoint32 |
| **Can be changed:** C(3), U, T | **Scaling:** - | **Dyn. index:** MDS, p0130 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.00 [Arms] | 6000.00 [Arms] | 0.00 [Arms] |

**Description:** Sets the starting point of the current-dependent current controller adaptation where the current controller gain p1720 is effective.

**Dependency:** Refer to: p1720

**Notice:** When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

**Note:** For p1712 = 100 % or p1402.2 = 0, the current controller adaptation is disabled and p1720 is effective over the entire range.

**p1711[0...n]** **Current controller adaptation d axis starting point KP adapted / Id_adap pt KP adap**

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3 | **Data type:** FloatingPoint32 |
| **Can be changed:** C(3), U, T | **Scaling:** - | **Dyn. index:** MDS, p0130 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.00 [Arms] | 6000.00 [Arms] | 0.00 [Arms] |

**Description:** Sets the starting point of the current-dependent current controller adaptation where the adapted current controller gain p1720 x p1712 is effective.

**Dependency:** Refer to: p1710, p1712, p1720

**Notice:** When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

**Note:** For p1712 = 100 % or p1402.2 = 0, the current controller adaptation is disabled and p1720 is effective over the entire range.

**p1712[0...n]** **Current controller adaptation d axis p gain adaptation / Id_ctrl Kp adapt**

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3 | **Data type:** FloatingPoint32 |
| **Can be changed:** C(3), U, T | **Scaling:** - | **Dyn. index:** MDS, p0130 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.00 [%] | 1000.00 [%] | 100.00 [%] |

**Description:** Sets the factor for the current controller P gain in the adaptation range (d-current > p1711).

The value is referred to p1720.

**Dependency:** Refer to: p1710, p1711, p1720

**Notice:** When selecting a catalog motor (p0301), this parameter is automatically pre-assigned and is write protected. Information in p0300 should be carefully observed when removing write protection.

**Note:** For p1712 = 100 % or p1402.2 = 0, the current controller adaptation is disabled and p1720 is effective over the entire range.

**p1715[0...n]** **Current controller P gain / I_ctrl Kp**

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** p0340 = 1,3,4 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6714 |
| **Min** | **Max** | **Factory setting** |
| 0.000 | 100000.000 | 0.000 |

**Description:** Sets the proportional gain of the current controller.

This value is automatically pre-set using p3900 or p0340 when commissioning has been completed.

## p1717[0...n] Current controller integral-action time / I_ctrl Tn

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** p0340 = 1,3,4 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 5714, 6700, 6714, 7017 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [ms] | 1000.00 [ms] | 2.00 [ms] |

**Description:** Sets the integral-action time of the current controller.

**Dependency:** Refer to: p1715

## p1720[0...n] Current controller d axis p gain / Id_ctrl Kp

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,4 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.000 | 100000.000 | 0.000 |

**Description:** Sets the proportional gain of the d-current controller for the lower adaptation current range.

This value is automatically pre-set using p3900 or p0340 when commissioning has been completed.

**Note:** For p0393 = 100 %, the current controller adaptation is disabled and p1715 is effective over the entire range.

## p1722[0...n] Current controller d axis integral time / I_ctrl d-axis Tn

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,4 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.00 [ms] | 1000.00 [ms] | 2.00 [ms] |

**Description:** Sets the integral time of the d-current controller.

## p1730[0...n] Isd controller integral component shutdown threshold / Isd ctrl Tn shutd

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** p0340 = 1,3,4 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 30 [%] | 150 [%] | 30 [%] |

**Description:** Sets the speed threshold for deactivating the integral component of the Isd controller.

The d current controller is only effective as P controller for speeds greater than the threshold value. Instead of the integral component, the quadrature arm decoupling is effective.

**Warning:** For settings above 80%, the d current controller is active up to the field weakening limit. When operated at the voltage limit, this can result in an unstable behavior. In order to avoid this, the dynamic voltage reserve p1574 should be increased.

**Note:** The parameter value is referred to the synchronous rated motor speed.

## p1731[0...n] Isd controller combination current time component / Isd ctr I_combi T1

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** p0340 = 1,3,4 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.00 [ms] | 10000.00 [ms] | 0.00 [ms] |

**Description:** Sets the time constant to calculate the d current DC component difference (combination current) to add to the d current controller actual value.

**Note:** It is not added for p1731 = 0.

## r1732[0...1] CO: Direct-axis voltage setpoint / Direct U set

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2001 | **Dyn. index:** - |
| **Units group:** 5_1 | **Unit selection:** p0505 | **Func. diagram:** 5700, 5714, 6714, 5718 |
| **Min** | **Max** | **Factory setting** |
| - [Vrms] | - [Vrms] | - [Vrms] |

**Description:** Display and connector output for the direct axis voltage setpoint Ud.

**Index:** [0] = Unsmoothed
[1] = Smoothed with p0045

## r1733[0...1] CO: Quadrature-axis voltage setpoint / Quad U set

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2001 | **Dyn. index:** - |
| **Units group:** 5_1 | **Unit selection:** p0505 | **Func. diagram:** 5700, 5714, 5718, 6714, 6719 |
| **Min** | **Max** | **Factory setting** |
| - [Vrms] | - [Vrms] | - [Vrms] |

**Description:** Display and connector output for the quadrature axis voltage setpoint Uq.

**Index:** [0] = Unsmoothed
[1] = Smoothed with p0045

## p1740[0...n] Gain resonance damping for encoderless closed-loop control / Gain res_damp

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** p0340 = 1,3,4 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.000 | 10.000 | 0.025 |

**Description:** Defines the gain of the controller for resonance damping for operation with sensorless vector control in the range that current is injected.

## p1745[0...n] Motor model error threshold stall detection / MotMod ThreshStall

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.0 [%] | 1000.0 [%] | 5.0 [%] |

**Description:** Sets the fault threshold in order to detect a motor that has stalled.
If the error signal (r1746) exceeds the parameterized error threshold, then status signal r1408.12 is set to 1.

**Dependency:** If a stalled drive is detected (r1408.12 = 1), fault F07902 is output after the delay time set in p2178.
Refer to: p2178

**Note:** Monitoring is only effective in the low-speed range (below p1755 * (100% - p1756)).

## r1746 Motor model error signal stall detection / MotMod sig stall

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - [%] | - [%] | - [%] |

**Description:** Signal to initiate stall detection

**Note:** The signal is not calculated while magnetizing and only in the low speed range (below p1755 * (100 % - p1756)).

## p1749[0...n] Motor model increase changeover speed encoderless operation / Incr n_chng no enc

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** p0340 = 1,3 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.0 [%] | 99.0 [%] | 50.0 [%] |

**Description:** Minimum operating frequency for rugged operation.

If the minimum value is greater than the lower changeover limit parameterized with p1755 * (1 - 2 * p1756), then the difference is displayed using p1749 * p1755. The parameter value cannot be changed.

**Dependency:** Refer to: p1755, p1756

## p1750[0...n] Motor model configuration / MotMod config

PM230

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,5 | **Data type:** Unsigned8 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | 0000 1100 bin |

**Description:** Sets the configuration for the motor model.

Bit 0 = 1: Forces open-loop speed-controlled starting (ASM).

Bit 1 = 1: Forces the system to pass through frequency zero, open-loop-controlled (ASM).

Bit 2 = 1: Drive remains in full closed-loop control mode, even at zero frequency (ASM).

Bit 3 = 1: Motor model evaluates the saturation characteristic (ASM).

Bit 6 = 1: If the motor is blocked, sensorless vector control remains speed-controlled (ASM).

Bit 7 = 1: Use rugged switchover limits to switchover the model (open-loop/closed-loop controlled) for regenerative operation (ASM).

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Controlled start | Yes | No | - |
| 01 | Controlled through 0 Hz | Yes | No | - |
| 02 | Closed-loop ctrl oper. down to zero freq. for passive loads | Yes | No | - |
| 03 | Motor model Lh_pre = f(PsiEst) | Yes | No | - |
| 06 | Closed-loop/open-loop controlled (PEM) for blocked motor | Yes | No | - |
| 07 | Use rugged changeover limits | Yes | No | - |

**Dependency:** Refer to: p0500

**Caution:** Do not use bit 6 = 1 if the motor can be slowly reversed by the load at the torque limit. Long delay times due to blocking (p2177 > p1758) can cause the motor to stall. In this case you should de-activate the function or use closed-loop control throughout the speed range (note the information re bit 2 = 1).

**Note:** Bits 0 ... 2 only have an influence for encoderless vector control, bit 2 is pre-assigned depending on p0500.

Re bit 2 = 1:

The sensorless vector control is effective down to zero frequency. A change is not made into the open-loop speed controlled mode.

This operating mode is possible for passive loads. These include applications where the load itself does not generate any active torque and therefore only acts reactively to the drive torque of the induction motor.

If bit 2 = 1, then bit 3 is automatically set to 1. Manual de-selection is possible and may be sensible if the saturation characteristic (p1960) was not measured for third-party motors. Generally, for standard SIEMENS motors, the already pre-assigned (default value) saturation characteristic is adequate.

When the bit is set, the selection of bits 0 and 1 is ignored.

Re bit 2 = 0:

Bit 3 is also automatically deactivated.

Re bit 6 = 1:

The following applies for encoderless vector control of induction motors:

For a blocked motor (see p2175, p2177) the time condition in p1758 is bypassed and a change is not made into open-loop controlled operation.

Re bit 7 = 1:

The following applies for encoderless vector control of induction motors:

If the changeover limits are parameterized too low (p1755, p1756), then they are automatically increased to rugged values by the absolute amount p1749 * p1755.

The effective time condition for changing over into open-controlled operation is given by Min(p1758, 0.5 * r0384).

Activation can make sense for applications that demand a high torque at low frequencies and therefore low speed gradients.

Adequate parameterization must be ensured (p1610, p1611).

## p1750[0...n] Motor model configuration / MotMod config

PM240
PM250, PM260

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,5 | **Data type:** Unsigned8 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | 0000 0000 bin |

**Description:** Sets the configuration for the motor model.

Bit 0 = 1: Forces open-loop speed-controlled starting (ASM).

Bit 1 = 1: Forces the system to pass through frequency zero, open-loop-controlled (ASM).

Bit 2 = 1: Drive remains in full closed-loop control mode, even at zero frequency (ASM).

Bit 3 = 1: Motor model evaluates the saturation characteristic (ASM).

Bit 6 = 1: If the motor is blocked, sensorless vector control remains speed-controlled (ASM).

Bit 7 = 1: Use rugged switchover limits to switchover the model (open-loop/closed-loop controlled) for regenerative operation (ASM).

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Controlled start | Yes | No | - |
| 01 | Controlled through 0 Hz | Yes | No | - |
| 02 | Closed-loop ctrl oper. down to zero freq. for passive loads | Yes | No | - |
| 03 | Motor model Lh_pre = f(PsiEst) | Yes | No | - |
| 06 | Closed-loop/open-loop controlled (PEM) for blocked motor | Yes | No | - |
| 07 | Use rugged changeover limits | Yes | No | - |

**Dependency:** Refer to: p0500

**Caution:** Do not use bit 6 = 1 if the motor can be slowly reversed by the load at the torque limit. Long delay times due to blocking (p2177 > p1758) can cause the motor to stall. In this case you should de-activate the function or use closed-loop control throughout the speed range (note the information re bit 2 = 1).

**Note:** Bits 0 ... 2 only have an influence for encoderless vector control, bit 2 is pre-assigned depending on p0500.

Re bit 2 = 1:

The sensorless vector control is effective down to zero frequency. A change is not made into the open-loop speed controlled mode.

This operating mode is possible for passive loads. These include applications where the load itself does not generate any active torque and therefore only acts reactively to the drive torque of the induction motor.

If bit 2 = 1, then bit 3 is automatically set to 1. Manual de-selection is possible and may be sensible if the saturation characteristic (p1960) was not measured for third-party motors. Generally, for standard SIEMENS motors, the already pre-assigned (default value) saturation characteristic is adequate.

When the bit is set, the selection of bits 0 and 1 is ignored.

Re bit 2 = 0:

Bit 3 is also automatically deactivated.

Re bit 6 = 1:

The following applies for encoderless vector control of induction motors:

For a blocked motor (see p2175, p2177) the time condition in p1758 is bypassed and a change is not made into open-loop controlled operation.

Re bit 7 = 1:

The following applies for encoderless vector control of induction motors:

If the changeover limits are parameterized too low (p1755, p1756), then they are automatically increased to rugged values by the absolute amount p1749 * p1755.

The effective time condition for changing over into open-controlled operation is given by Min(p1758, 0.5 * r0384).

Activation can make sense for applications that demand a high torque at low frequencies and therefore low speed gradients.

Adequate parameterization must be ensured (p1610, p1611).

## p1750[0...n] Motor model configuration / MotMod config

| | | | |
|---|---|---|---|
| PM330 | **Access level:** 4 | **Calculated:** p0340 = 1,3,5 | **Data type:** Unsigned8 |
| | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | - | - | 0100 1100 bin |

**Description:** Sets the configuration for the motor model.

Bit 0 = 1: Forces open-loop speed-controlled starting (ASM).

Bit 1 = 1: Forces the system to pass through frequency zero, open-loop-controlled (ASM).

Bit 2 = 1: Drive remains in full closed-loop control mode, even at zero frequency (ASM).

Bit 3 = 1: Motor model evaluates the saturation characteristic (ASM).

Bit 6 = 1: If the motor is blocked, sensorless vector control remains speed-controlled (ASM).

Bit 7 = 1: Use rugged switchover limits to switchover the model (open-loop/closed-loop controlled) for regenerative operation (ASM).

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Controlled start | Yes | No | - |
| 01 | Controlled through 0 Hz | Yes | No | - |
| 02 | Closed-loop ctrl oper. down to zero freq. for passive loads | Yes | No | - |
| 03 | Motor model Lh_pre = f(PsiEst) | Yes | No | - |
| 06 | Closed-loop/open-loop controlled (PEM) for blocked motor | Yes | No | - |
| 07 | Use rugged changeover limits | Yes | No | - |

**Dependency:** Refer to: p0500

**Caution:** Do not use bit 6 = 1 if the motor can be slowly reversed by the load at the torque limit. Long delay times due to blocking (p2177 > p1758) can cause the motor to stall. In this case you should de-activate the function or use closed-loop control throughout the speed range (note the information re bit 2 = 1).

**Note:** Bits 0 ... 2 only have an influence for encoderless vector control, bit 2 is pre-assigned depending on p0500.

Re bit 2 = 1:

The sensorless vector control is effective down to zero frequency. A change is not made into the open-loop speed controlled mode.

This operating mode is possible for passive loads. These include applications where the load itself does not generate any active torque and therefore only acts reactively to the drive torque of the induction motor.

If bit 2 = 1, then bit 3 is automatically set to 1. Manual de-selection is possible and may be sensible if the saturation characteristic (p1960) was not measured for third-party motors. Generally, for standard SIEMENS motors, the already pre-assigned (default value) saturation characteristic is adequate.

When the bit is set, the selection of bits 0 and 1 is ignored.

Re bit 2 = 0:

Bit 3 is also automatically deactivated.

Re bit 6 = 1:

The following applies for encoderless vector control of induction motors:

For a blocked motor (see p2175, p2177) the time condition in p1758 is bypassed and a change is not made into open-loop controlled operation.

Re bit 7 = 1:

The following applies for encoderless vector control of induction motors:

If the changeover limits are parameterized too low (p1755, p1756), then they are automatically increased to rugged values by the absolute amount p1749 * p1755.

The effective time condition for changing over into open-controlled operation is given by Min(p1758, 0.5 * r0384).

Activation can make sense for applications that demand a high torque at low frequencies and therefore low speed gradients.

Adequate parameterization must be ensured (p1610, p1611).

## r1751 Motor model status / MotMod status

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the status of the motor model.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Controlled operation | Active | Inactive | 6721 |
| 01 | Set ramp-function generator | Active | Inactive | - |
| 02 | Stop RsLh adaptation | Yes | No | - |
| 03 | Feedback | Active | Inactive | - |
| 05 | Holding angle | Yes | No | - |
| 06 | Acceleration criterion | Active | Inactive | - |
| 11 | Speed controller output cannot be set to zero | Yes | No | - |
| 12 | Rs adapt waits | Yes | No | - |
| 13 | Motor operation | Yes | No | - |
| 14 | Stator frequency sign | Positive | Negative | - |
| 15 | Torque sign | Motor mode | Regenerative mode | - |
| 17 | Operation with rugged model feedback | Enabled | Inhibited | - |
| 18 | Operation of the current model with current feedback | Enabled | Inhibited | - |
| 19 | Current feedback in the current model | Active | Inactive | - |
| 20 | Rugged increase of the changeover limits | Active | Inactive | - |

**Note:** Re bit 17:

Displays the status when enabling the rugged model feedback (p1784) for operation with and without encoder.

The feedback is used to increase the parameter ruggedness of the motor model and is effective in the operating range of the two-component closed loop current control.

Re bit 18:

Displays the status when enabling the differential current feedback in the current model for operation with encoder.

The function is automatically enabled with p1784 > 0 or p1731 > 0. The feedback is used for a rugged change between the current model and complete machine model with active rugged model feedback and combination current.

Re bit 19:

Displays the currently active stator circuit feedback in current model operation.

Re bit 20:

Displays the currently effective increase of the changeover limits by the value p1749 * p1755.

Re bit 21:

For a blocked synchronous motor, the speed ramp-function generator is held in the open-loop speed controlled operating range if the torque setpoint reaches the torque limit and the speed is less than the threshold value in p2175.

## p1755[0...n] Motor model changeover speed encoderless operation / MotMod n_chgSnsorl

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.00 [rpm] | 210000.00 [rpm] | 210000.00 [rpm] |

**Description:** Sets the speed to change over the motor model to encoderless operation.

**Dependency:** Refer to: p1749, p1756

**Notice:** The changeover speed represents the steady-state minimum speed up to which the motor model can be used in sensorless steady-state operation.

If the stability is not adequate close to the changeover speed, it may make sense to increase the parameter value. On the other hand, very low changeover speeds can negatively impact the stability.

**Note:** The changeover speed applies for the changeover between open-loop and closed-loop control mode.

## p1756 Motor model changeover speed hysteresis encoderless operation / MotMod n_chgov hys

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6730, 6731 |
| **Min** | **Max** | **Factory setting** |
| 0.0 [%] | 95.0 [%] | 50.0 [%] |

**Description:** Sets the hysteresis for the changeover speed of the motor model for encoderless operation.

**Dependency:** Refer to: p1755

**Note:** The parameter value refers to p1755.

Extremely small hystereses can have a negative impact on the stability in the changeover speed range, and very high hystereses in the standstill range.

## p1758[0...n] Motor model changeover delay time closed/open-loop control / MotMod t cl_op

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 100 [ms] | 10000 [ms] | 500 [ms] |

**Description:** Sets the minimum time for falling below the changeover speed when changing from closed-loop controlled operation to open-loop controlled operation.

**Dependency:** The wait time has no significance if the setpoint speed before the ramp-function generator lies in the open-loop speed controlled operating range. In this case, the change is made without any delay.

Refer to: p1755, p1756

**Note:** If p1758 is changed, commissioning must be selected in order to validate the value for the blocking monitoring.

## p1759[0...n] Motor model changeover delay time open/closed-loop control / MotMod t op_cl

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 [ms] | 2000 [ms] | 0 [ms] |

**Description:** Sets the minimum time for a transition from open-loop controlled to closed-loop controlled operation after the lower changeover speed p1755 * (1 - p1756 / 100 %) has been exceeded.

**Dependency:** Refer to: p1755, p1756

**Note:** With p1759 = 2000 ms, the delay time becomes ineffective and the model changeover is determined by the output frequency only (changeover for p1755).

## p1764[0...n] Motor model without encoder speed adaptation Kp / MotMod woE n_adaKp

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** p0340 = 1,3,4 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6730 |
| **Min** | **Max** | **Factory setting** |
| 0.000 | 100000.000 | 1000.000 |

**Description:** Sets the proportional gain of the controller for speed adaptation without encoder.

## p1767[0...n] Motor model without encoder speed adaptation Tn / MotMod woE n_adaTn

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** p0340 = 1,3,4 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6730 |
| **Min** | **Max** | **Factory setting** |
| 1 [ms] | 200 [ms] | 4 [ms] |

**Description:** Sets the integral time of the controller for speed adaptation without encoder

## r1770 CO: Motor model speed adaptation proportional component / MotMod n_adapt Kp

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2000 | **Dyn. index:** - |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 6730 |
| **Min** | **Max** | **Factory setting** |
| - [rpm] | - [rpm] | - [rpm] |

**Description:** Displays the P component of the controller for speed adaptation.

## r1771 CO: Motor model speed adaptation I comp. / MotMod n_adapt Tn

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2000 | **Dyn. index:** - |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 6730 |
| **Min** | **Max** | **Factory setting** |
| - [rpm] | - [rpm] | - [rpm] |

**Description:** Displays the I component of the controller for speed adaptation.

## p1774[0...n] Motor model offset voltage compensation alpha / MotMod offs comp A

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| -5.000 [V] | 5.000 [V] | 0.000 [V] |

**Description:** Sets the offset voltage in the alpha direction; this compensates the offset voltages of the drive converter/inverter at low speeds. The value is valid for the rated (nominal) pulse frequency of the power unit.

**Note:** The value is pre-set during the rotating measurement.

## p1775[0...n] Motor model offset voltage compensation beta / MotMod offs comp B

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| -5.000 [V] | 5.000 [V] | 0.000 [V] |

**Description:** Sets the offset voltage in the beta direction; this compensates the offset voltages of the drive converter/inverter at low speeds. The value is valid for the rated (nominal) pulse frequency of the power unit.

**Note:** The value is pre-set during the rotating measurement.

## r1776[0...6] Motor model status signals / MotMod status sig

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the internal status signals of the motor model:

Index 0: Changeover ramp between current and voltage models

Index 1: Changeover ramp for model tracking (encoderless induction motors only)

Index 2: Changeover ramp for zero frequency range (encoderless induction motors only)

**Index:**
[0] = Changeover ramp motor model
[1] = Changeover ramp model tracking
[2] = Changeover ramp zero frequency encoderless ASM
[3...6] = Reserved

## p1780[0...n] Motor model adaptation configuration / MotMod adapt conf

PM230
PM240
PM250, PM260

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** p0340 = 1,3,4 | **Data type:** Unsigned16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | 0000 0000 0001 0100 bin |

**Description:** Sets the configuration for the adaptation circuit of the motor model.

Induction motor (ASM): Rs, Lh, and offset compensation.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 01 | Select motor model ASM Rs adaptation | Yes | No | - |
| 02 | Select motor model ASM Lh adaptation | Yes | No | - |
| 04 | Select motor model offset adaptation | Yes | No | - |
| 07 | Select T(valve) with Rs adaptation | Yes | No | - |
| 10 | Filter time combination current like current ctrl integral time | Yes | No | - |
| 14 | Delay of the precontrol speed to the motor model | Yes | No | - |
| 15 | RESM: Linear Q flux model | active | not active | - |

**Dependency:** In U/f characteristic operating mode only bit 7 is relevant.

For active motor model feedback (see p1784), the Lh adaptation is internally deactivated automatically.

**Note:** ASM: Induction motor

When selecting the compensation of the valve interlocking via Rs (bit 7), the compensation in the gating unit is deactivated and is instead taken into account in the motor model.

In order that the correction values of the Rs and Lh adaptation (selected using bit 0 ... bit 1) are correctly accepted when changing over the drive data set, a dedicated motor number must be entered into p0826 for each different motor.

## p1780[0...n] Motor model adaptation configuration / MotMod adapt conf

PM330

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,4 | **Data type:** Unsigned16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | 0000 1000 0001 0100 bin |

**Description:** Sets the configuration for the adaptation circuit of the motor model.

Induction motor (ASM): Rs, Lh, and offset compensation.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 01 | Select motor model ASM Rs adaptation | Yes | No | - |
| 02 | Select motor model ASM Lh adaptation | Yes | No | - |
| 04 | Select motor model offset adaptation | Yes | No | - |
| 07 | Select T(valve) with Rs adaptation | Yes | No | - |
| 10 | Filter time combination current like current ctrl integral time | Yes | No | - |
| 11 | Fast flying restart with voltage model for induction motor | Yes | No | - |

**Dependency:** In U/f characteristic operating mode, only bit 7 and bit 11 are relevant.

For active motor model feedback (see p1784), the Lh adaptation is internally deactivated automatically.

**Note:** ASM: Induction motor

When selecting the compensation of the valve interlocking via Rs (bit 7), the compensation in the gating unit is deactivated and is instead taken into account in the motor model.

In order that the correction values of the Rs and Lh adaptation (selected using bit 0 ... bit 1) are correctly accepted when changing over the drive data set, a dedicated motor number must be entered into p0826 for each different motor.

## p1784[0...n] Motor model feedback scaling / MotMod fdbk scal

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** p0340 = 1,3,4 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.0 [%] | 1000.0 [%] | 0.0 [%] |

**Description:** Sets the scaling for model fault feedback.

**Note:** Feeding back the measured model fault to the model states increases the control stability and makes the motor model rugged against parameter errors.

When feedback is selected (p1784 > 0), Lh adaptation is not effective.

## p1785[0...n] Motor model Lh adaptation Kp / MotMod Lh Kp

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** p0340 = 1,3,4 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.000 | 10.000 | 0.100 |

**Description:** Sets the proportional gain for the Lh adaptation of the motor model for an induction motor (ASM).

## p1786[0...n] Motor model Lh adaptation integral time / MotMod Lh Tn

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** p0340 = 1,3,4 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 10 [ms] | 10000 [ms] | 100 [ms] |

**Description:** Sets the integral time for the Lh adaptation of the motor model for an induction motor (ASM).

## r1787[0...n] Motor model Lh adaptation corrective value / MotMod Lh corr

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - [mH] | - [mH] | - [mH] |

**Description:** Displays the corrective value for the Lh adaptation of the motor model for an induction motor (ASM).

**Dependency:** Refer to: p0826, p1780

**Note:** The adaptation result is reset if the magnetizing inductance of the induction motor is changed (p0360, r0382). This also happens when changing over the data set if a different motor is not being used (p0826).

The display of the inactive data sets is only updated when changing over the data set.

## p1800[0...n] Pulse frequency setpoint / Pulse freq setp

PM230
PM240
PM250, PM260

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8014 |
| **Min** | **Max** | **Factory setting** |
| 0.500 [kHz] | 16.000 [kHz] | 4.000 [kHz] |

**Description:** Sets the pulse frequency for the converter.

This parameter is pre-set to the rated converter value when the drive is first commissioned.

**Dependency:** Refer to: p0230

**Note:** The maximum and minimum possible pulse frequency is also determined by the power unit being used (minimum pulse frequency: 2 kHz or 4 kHz).

When the pulse frequency is increased, depending on the particular power unit, the maximum output current can be reduced (derating, refer to r0067).

If a sine-wave filter is parameterized as output filter (p0230 = 3), then the pulse frequency cannot be set below the minimum value required for the filter.

For operation with output reactors, the pulse frequency is limited to 4 kHz (see p0230).

If p1800 is changed during commissioning (p0010 > 0), then it is possible that the old value will no longer be able to be set. The reason for this is that the dynamic limits of p1800 have been changed by a parameter that was set when the drive was commissioned (e.g. p1082).

## p1800[0...n] Pulse frequency setpoint / Pulse freq setp

PM330

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8014 |
| **Min** | **Max** | **Factory setting** |
| 0.500 [kHz] | 4.000 [kHz] | 4.000 [kHz] |

**Description:** Sets the drive converter switching frequency.

This parameter is pre-set to twice the rated converter value when the drive is first commissioned.

**Dependency:** Refer to: p0230

**Note:** The maximum and minimum possible pulse frequency is also determined by the power unit being used (minimum pulse frequency: 2 kHz or 4 kHz).

When the pulse frequency is increased, depending on the particular power unit, the maximum output current can be reduced (derating, refer to r0067).

If a sine-wave filter is parameterized as output filter (p0230 = 3), then the pulse frequency cannot be set below the minimum value required for the filter.

For operation with output reactors, the pulse frequency is limited to 4 kHz (see p0230).

If p1800 is changed during commissioning (p0010 > 0), then it is possible that the old value will no longer be able to be set. The reason for this is that the dynamic limits of p1800 have been changed by a parameter that was set when the drive was commissioned (e.g. p1082).

## r1801[0...1] CO: Pulse frequency / Pulse frequency

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2000 | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - [kHz] | - [kHz] | - [kHz] |

**Description:** Display and connector output for the actual converter switching frequency.

**Index:** [0] = Actual
[1] = Modulator minimum value

**Note:** The selected pulse frequency (p1800) may be reduced if the drive converter has an overload condition (p0290).

## p1802[0...n] Modulator mode / Modulator mode

PM230

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,5 | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 10 | 10 |

**Description:** Sets the modulator mode.

**Value:**
0: Automatic changeover SVM/FLB
2: Space vector modulation (SVM)
3: SVM without overcontrol
4: SVM/FLB without overcontrol
10: SVM/FLB with modulation depth reduction

**Dependency:** If a sine-wave filter is parameterized as output filter (p0230 = 3, 4), then only space vector modulation without overcontrol can be selected as modulation type (p1802 = 3). This does not apply to power units PM260.

p1802 = 10 can only be set for power units PM230 and PM240 and for r0204.15 = 0.

Refer to: p0230, p0500

**Note:** When modulation modes are enabled that could lead to overmodulation (p1802 = 0, 2, 10), the modulation depth must be limited using p1803 (default, p1803 = 98%). The higher the overmodulation, the greater the current ripple and torque ripple. With p1802 = 10, the modulation depth limit is automatically reduced to 100% in the critical output frequency range (over approx. 57 Hz).

When changing p1802[x], the values for all of the other existing indices are also changed.

## p1802[0...n] Modulator mode / Modulator mode

PM240

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,5 | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 10 | 0 |

**Description:** Sets the modulator mode.

**Value:**
0: Automatic changeover SVM/FLB
2: Space vector modulation (SVM)
3: SVM without overcontrol
4: SVM/FLB without overcontrol
10: SVM/FLB with modulation depth reduction

**Dependency:** If a sine-wave filter is parameterized as output filter (p0230 = 3, 4), then only space vector modulation without overcontrol can be selected as modulation type (p1802 = 3). This does not apply to power units PM260.

p1802 = 10 can only be set for power units PM230 and PM240 and for r0204.15 = 0.

Refer to: p0230, p0500

**Note:** When modulation modes are enabled that could lead to overmodulation (p1802 = 0, 2, 10), the modulation depth must be limited using p1803 (default, p1803 < 100 %). The higher the overmodulation, the greater the current ripple and torque ripple.

When changing p1802[x], the values for all of the other existing indices are also changed.

## p1802[0...n] Modulator mode / Modulator mode

PM250
PM260

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,5 | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 4 | 4 |

**Description:** Sets the modulator mode.

**Value:**
0: Automatic changeover SVM/FLB
2: Space vector modulation (SVM)
3: SVM without overcontrol
4: SVM/FLB without overcontrol

**Dependency:** If a sine-wave filter is parameterized as output filter (p0230 = 3, 4), then only space vector modulation without overcontrol can be selected as modulation type (p1802 = 3). This does not apply to power units PM260.

Refer to: p0230, p0500

**Note:** When modulation modes are enabled that could lead to overmodulation (p1802 = 0, 2, 10), the modulation depth must be limited using p1803 (default, p1803 < 100 %). The higher the overmodulation, the greater the current ripple and torque ripple.

When changing p1802[x], the values for all of the other existing indices are also changed.

## p1802[0...n] Modulator mode / Modulator mode

PM330

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** p0340 = 1,3,5 | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 19 | 9 |

**Description:** Sets the modulator mode.

**Value:**
0: Automatic changeover SVM/FLB
2: Space vector modulation (SVM)
9: Edge modulation
19: Optimized pulse pattern

**Dependency:** If a sine-wave filter is parameterized as output filter (p0230 = 3, 4), then only space vector modulation without overcontrol can be selected as modulation type (p1802 = 3). This does not apply to power units PM260.

p1802 = 10 can only be set for power units PM230 and PM240 and for r0204.15 = 0.

Refer to: p0500

**Notice:** When modulation modes are enabled that could lead to overmodulation (p1802 = 0, 2), the modulation depth must be limited using p1803 (default p1803 < 100 %). The higher the overmodulation, the greater the current ripple and torque ripple.

When changing p1802[x], the values for all of the other existing indices are also changed.

**Note:** The setting p1802 = 19 is only released for chassis power units and SIMOTICS FD motors.

## p1803[0...n] Maximum modulation depth / Modulat depth max

PM230

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** p0340 = 1,3,5 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6723 |
| **Min** | **Max** | **Factory setting** |
| 20.0 [%] | 120.0 [%] | 115.0 [%] |

**Description:** Defines the maximum modulation depth.

**Dependency:** Refer to: p0500

**Note:** p1803 = 100% is the overcontrol limit for space vector modulation (for an ideal drive converter without any switching delay).

## p1803[0...n] Maximum modulation depth / Modulat depth max

PM240

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,5 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6723 |
| **Min** | **Max** | **Factory setting** |
| 20.0 [%] | 150.0 [%] | 106.0 [%] |

**Description:** Defines the maximum modulation depth.

**Dependency:** Refer to: p0500

**Note:** p1803 = 100% is the overcontrol limit for space vector modulation (for an ideal drive converter without any switching delay).

## p1803[0...n] Maximum modulation depth / Modulat depth max

PM250
PM260

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,5 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6723 |
| **Min** | **Max** | **Factory setting** |
| 20.0 [%] | 150.0 [%] | 106.0 [%] |

**Description:** Defines the maximum modulation depth.

**Dependency:** Default setting PM260: 103 %.

Refer to: p0500

**Note:** p1803 = 100% is the overcontrol limit for space vector modulation (for an ideal drive converter without any switching delay).

## p1803[0...n] Maximum modulation depth / Modulat depth max

PM330

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** p0340 = 1,3,5 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6723 |
| **Min** | **Max** | **Factory setting** |
| 20.0 [%] | 150.0 [%] | 106.0 [%] |

**Description:** Defines the maximum modulation depth.

**Dependency:** Refer to: p0500

**Note:** p1803 = 100% is the overcontrol limit for space vector modulation (for an ideal drive converter without any switching delay).

## p1806[0...n] Filter time constant Vdc correction / T_filt Vdc_corr

PM230
PM250, PM260

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** p0340 = 1,3 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.0 [ms] | 10000.0 [ms] | 0.0 [ms] |

**Description:** Sets the filter time constant of the DC link voltage used to calculate the modulation depth.

## p1806[0...n] Filter time constant Vdc correction / T_filt Vdc_corr

PM240
PM330

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.0 [ms] | 10000.0 [ms] | 0.0 [ms] |

**Description:** Sets the filter time constant of the DC link voltage used to calculate the modulation depth.

## r1809 CO: Modulator mode actual / Modulator mode act

PM230
PM240
PM250, PM260

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 1 | 9 | - |

**Description:** Displays the effective modulator mode.

**Value:**
1: Flat top modulation (FLB)
2: Space vector modulation (SVM)
9: Optimized pulse pattern

## r1809 CO: Modulator mode actual / Modulator mode act

PM330

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 1 | 9 | - |

**Description:** Displays the effective modulator mode.

**Value:**
1: Flat top modulation (FLB)
2: Space vector modulation (SVM)
3: Edge modulation from 28 Hz; 23:3
4: Edge modulation from 28 Hz; 19:1
5: Edge modulation from 60 Hz; 17:3
6: Edge modulation from 60 Hz; 17:1
7: Edge modulation from 100 Hz; 9:2
8: Edge modulation from 100 Hz; 9:1
9: Optimized pulse pattern

## p1810 Modulator configuration / Modulator config

PM230
PM250, PM260

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | 0000 bin |

**Description:** Sets the configuration for the modulator.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Avg value filter for U_lim (only for Vdc_comp. in modulator) | Yes | No | - |
| 01 | DC link voltage compensation in the current control | Yes | No | - |

**Notice:** Bit 1 = 1 can only be set under a pulse inhibit and for r0192.14 = 1.

**Note:** Re bit 00 = 0:

Voltage limitation from the minimum of the DC link voltage (lower ripple in the output current, reduced output voltage).

Re bit 00 = 1:

Voltage limitation from averaged DC link voltage (higher output voltage with increased ripple in the output current).

The selection is only valid if the DC link compensation is not performed in the Control Unit (bit 1 = 0).

Re bit 01 = 0:

DC link voltage compensation in the modulator.

Re bit 01 = 1:

DC link voltage compensation in the current control.

## p1810 Modulator configuration / Modulator config

PM240

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | 0000 bin |

**Description:** Sets the configuration for the modulator.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Avg value filter for U_lim (only for Vdc_comp. in modulator) | Yes | No | - |
| 01 | DC link voltage compensation in the current control | Yes | No | - |

**Notice:** Bit 1 = 1 can only be set under a pulse inhibit and for r0192.14 = 1.

**Note:** Re bit 00 = 0:

Voltage limitation from the minimum of the DC link voltage (lower ripple in the output current, reduced output voltage).

Re bit 00 = 1:

Voltage limitation from averaged DC link voltage (higher output voltage with increased ripple in the output current).

The selection is only valid if the DC link compensation is not performed in the Control Unit (bit 1 = 0).

Re bit 01 = 0:

DC link voltage compensation in the modulator.

Re bit 01 = 1:

DC link voltage compensation in the current control.

## p1820[0...n] Reverse the output phase sequence / Outp_ph_seq rev

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** C(2), T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 1 | 0 |

**Description:** Sets the phase sequence reversal for the motor without setpoint change.

If the motor does not rotate in the required direction, then the output phase sequence can be reversed using this parameter. This means that the direction of the motor is reversed without the setpoint being changed.

**Value:**
0: OFF
1: ON

**Note:** This setting can only be changed when the pulses are inhibited.

## p1822 Power unit line phases monitoring tolerance time / PU ph monit t_tol

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 500 [ms] | 540000 [ms] | 1000 [ms] |

**Description:** Sets the tolerance time for line phase monitoring for blocksize power units.

If a line phase fault is present for longer than this tolerance time, then a corresponding fault is output.

**Notice:** When operating with a failed line phase, depending on the active power, values higher than the default value can either immediately damage the power unit or damage it over the long term.

**Note:** For the setting p1822 = maximum value, line phase monitoring is deactivated.

## p1825 Converter valve threshold voltage / Threshold voltage

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** p0340 = 1 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.0 [Vrms] | 100.0 [Vrms] | 0.6 [Vrms] |

**Description:** Sets the threshold voltage drop of the valves (power semiconductor devices) to be compensated.

**Note:** The value is automatically calculated in the motor data identification routine.

## p1828 Compensation valve lockout time phase U / Comp t_lock ph U

PM230
PM240
PM250, PM260

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** p0340 = 1 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.00 [µs] | 3.99 [µs] | 0.00 [µs] |

**Description:** Sets the valve lockout time to compensate for phase U.

**Note:** The value is automatically calculated in the motor data identification routine.

## p1828 Compensation valve lockout time phase U / Comp t_lock ph U

PM330

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** p0340 = 1 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.00 [µs] | 7.80 [µs] | 0.00 [µs] |

**Description:** Sets the valve lockout time to compensate for phase U.

**Note:** The value is automatically calculated in the motor data identification routine.

## p1829 Compensation valve lockout time phase V / Comp t_lock ph V

PM230
PM240
PM250, PM260

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** p0340 = 1 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.00 [µs] | 3.99 [µs] | 0.00 [µs] |

**Description:** Sets the valve lockout time to compensate for phase V.

## p1829 Compensation valve lockout time phase V / Comp t_lock ph V

PM330

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** p0340 = 1 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.00 [µs] | 7.80 [µs] | 0.00 [µs] |

**Description:** Sets the valve lockout time to compensate for phase V.

## p1830 Compensation valve lockout time phase W / Comp t_lock ph W

PM230
PM240
PM250, PM260

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** p0340 = 1 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.00 [µs] | 3.99 [µs] | 0.00 [µs] |

**Description:** Sets the valve lockout time to compensate for phase W.

## p1830 Compensation valve lockout time phase W / Comp t_lock ph W

PM330

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** p0340 = 1 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.00 [µs] | 7.80 [µs] | 0.00 [µs] |

**Description:** Sets the valve lockout time to compensate for phase W.

## p1832 Dead time compensation current level / t_dead_comp I_lev

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** p0340 = 1 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.0 [Arms] | 10000.0 [Arms] | 0.0 [Arms] |

**Description:** Sets the current level for the dead time compensation.

Above the current level, the dead time - resulting from the converter switching delays - is compensated by a previously calculated constant value. If the relevant phase current setpoint falls below the absolute value defined by p1832, the corrective value for this phase is continuously reduced.

**Dependency:** The factory setting of p1832 is automatically set to 0.02 * rated drive converter current (r0207).

## r1838.0...15 CO/BO: Gating unit status word 1 / Gating unit ZSW1

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays status word 1 of the power unit.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Fault time-critical | ON | OFF | - |
| 01 | Gating unit mode bit 0 | ON | OFF | - |
| 02 | Pulse enable | ON | OFF | - |
| 03 | Upper shutdown path | Inactive | Active | - |
| 04 | Lower shutdown path | Inactive | Active | - |
| 05 | Gating unit mode bit 1 | ON | OFF | - |
| 06 | Gating unit mode bit 2 | ON | OFF | - |
| 07 | Brake state | ON | OFF | - |
| 08 | Brake diagnostics | ON | OFF | - |
| 09 | Armature short-circuit braking | Active | Not active | - |

| | | | | |
|---|---|---|---|---|
| 10 | Gating unit state bit 0 | ON | OFF | - |
| 11 | Gating unit state bit 1 | ON | OFF | - |
| 12 | Gating unit state bit 2 | ON | OFF | - |
| 13 | Alarm status bit 0 | ON | OFF | - |
| 14 | Alarm status bit 1 | ON | OFF | - |
| 15 | Diagnostics 24 V | ON | OFF | - |

## p1900 Motor data identification and rotating measurement / MotID and rot meas

PM230
PM240
PM250, PM260

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** C(1), T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 3 | 0 |

**Description:** Sets the motor data identification and speed controller optimization.

The motor identification should first be performed with the motor stationary (p1900 = 1, 2; also refer to p1910). Based on this, additional motor and control parameters can be determined using the motor data identification with the motor rotating (p1900 = 1, 3; also refer to p1960; not for p1300 < 20).

p1900 = 0:

Function inhibited.

p1900 = 1:

Sets p1910 = 1 and p1960 = 0, 1 depending on p1300

When the drive enable signals are present, a motor data identification routine is carried out at standstill with the next power-on command. Current flows through the motor which means that it can align itself by up to a quarter of a revolution.

With the following power-on command, a rotating motor data identification routine is carried out - and in addition, a speed controller optimization by making measurements at different motor speeds.

p1900 = 2:

Sets p1910 = 1 and p1960 = 0

When the drive enable signals are present, a motor data identification routine is carried out at standstill with the next power-on command. Current flows through the motor which means that it can align itself by up to a quarter of a revolution.

p1900 = 3:

Sets p1960 = 0, 1 depending on p1300

This setting should only be selected if the motor data identification was already carried out at standstill.

When the drive enable signals are present, with the next power-on command, a rotating motor data identification routine is carried out - and in addition, speed controller optimization by taking measurements at different motor speeds.

**Value:**
0: Inhibited
1: Identifying motor data and optimizing speed control
2: Identifying motor data (at standstill)
3: Optimizing speed control (in the rotating mode)

**Dependency:** Refer to: p1300, p1910, p1960

**Notice:** p1900 = 3:

This setting should only be selected if the motor data identification was already carried out at standstill.

To permanently accept the determined settings they must be saved in a non-volatile fashion (p0971).

During the rotating measurement it is not possible to save the parameter (p0971).

For p0014 = 1, the following applies:

After the value has been modified, no further parameter modifications can be made and the status is shown in r3996. Modifications can be made again when r3996 = 0.

**Note:** The motor and control parameters of the vector control are only optimally set when both measurements are carried out (initially at standstill, and then with the motor rotating). The measurement with rotating motor is not performed for p1300 < 20 (U/f controls).

An appropriate alarm is output when the parameter is set.

The power-on command must remain set during a measurement and after the measurement has been completed, the drive automatically resets it.

The duration of the measurements can lie between 0.3 s and several minutes. This time is, for example, influenced by the motor size and the mechanical conditions.

p1900 is automatically set to 0 after the motor data identification routine has been completed.

## p1900 Motor data identification and rotating measurement / MotID and rot meas

| | | | |
|---|---|---|---|
| PM330 | **Access level:** 2 | **Calculated:** - | **Data type:** Integer16 |
| | **Can be changed:** C(1), T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | 0 | 3 | 2 |

**Description:** Sets the motor data identification and speed controller optimization.

The motor identification should first be performed with the motor stationary (p1900 = 1, 2; also refer to p1910). Based on this, additional motor and control parameters can be determined using the motor data identification with the motor rotating (p1900 = 1, 3; also refer to p1960).

p1900 = 0:

Function inhibited.

p1900 = 1:

Sets p1910 = 1 and p1960 = 0, 1 depending on p1300

When the drive enable signals are present, a motor data identification routine is carried out at standstill with the next power-on command. Current flows through the motor which means that it can align itself by up to a quarter of a revolution.

With the following power-on command, a rotating motor data identification routine is carried out - and in addition, a speed controller optimization by making measurements at different motor speeds.

p1900 = 2:

Sets p1910 = 1 and p1960 = 0

When the drive enable signals are present, a motor data identification routine is carried out at standstill with the next power-on command. Current flows through the motor which means that it can align itself by up to a quarter of a revolution.

p1900 = 3:

Sets p1960 = 0, 1 depending on p1300

This setting should only be selected if the motor data identification was already carried out at standstill.

When the drive enable signals are present, with the next power-on command, a rotating motor data identification routine is carried out - and in addition, speed controller optimization by taking measurements at different motor speeds.

**Value:**
0: Inhibited
1: Identifying motor data and optimizing speed control
2: Identifying motor data (at standstill)
3: Optimizing speed control (in the rotating mode)

**Dependency:** Refer to: p1300, p1910, p1960

**Notice:** p1900 = 3:

This setting should only be selected if the motor data identification was already carried out at standstill.

To permanently accept the determined settings they must be saved in a non-volatile fashion (p0971).

During the rotating measurement it is not possible to save the parameter (p0971).

For p0014 = 1, the following applies:

After the value has been modified, no further parameter modifications can be made and the status is shown in r3996. Modifications can be made again when r3996 = 0.

**Note:** The motor and control parameters of the vector control are only optimally set when both measurements are carried out (initially at standstill, and then with the motor rotating). The measurement with rotating motor is not performed for p1300 < 20 (U/f controls).

An appropriate alarm is output when the parameter is set.

The power-on command must remain set during a measurement and after the measurement has been completed, the drive automatically resets it.

The duration of the measurements can lie between 0.3 s and several minutes. This time is, for example, influenced by the motor size and the mechanical conditions.

p1900 is automatically set to 0 after the motor data identification routine has been completed.

## p1901 Test pulse evaluation configuration / Test puls config

PM230
PM240
PM250, PM260

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1 | **Data type:** Unsigned32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | 0000 bin |

**Description:** Sets the configuration for the test pulse evaluation.

Bit 00: Check for conductor-to-conductor short circuit once/always when the pulses are enabled.

Bit 01: Check for ground fault once/always when the pulses are enabled.

Bit 02: Activation of the tests selected using bit 00 and/or bit 01 each time the pulses are enabled

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Phase short-circuit test pulse active | Yes | No | - |
| 01 | Ground fault detection test pulse active | Yes | No | - |
| 02 | Test pulse at each pulse enable | Yes | No | - |

**Dependency:** Refer to: p0287

**Note:** If a conductor-to-conductor short-circuit is detected during the test, this is displayed in r1902.1.

If a ground fault is detected during the test, this is displayed in r1902.2.

Re bit 02 = 0:

If the test was successful once after POWER ON (see r1902.0), it is not repeated.

Re bit 02 = 1:

The test is not only performed after POWER ON, but also each time the pulses are enabled.

## p1901 Test pulse evaluation configuration / Test puls config

PM330

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1 | **Data type:** Unsigned32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | 0000 bin |

**Description:** Sets the configuration for the test pulse evaluation.

Bit 00: Check for conductor-to-conductor short circuit once/always when the pulses are enabled.

Bit 01: Check for ground fault once/always when the pulses are enabled.

Bit 02: Activation of the tests selected using bit 00 and/or bit 01 each time the pulses are enabled

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Phase short-circuit test pulse active | Yes | No | - |
| 01 | Ground fault detection test pulse active | Yes | No | - |
| 02 | Test pulse at each pulse enable | Yes | No | - |

**Dependency:** Refer to: p0287

**Note:** If a conductor-to-conductor short-circuit is detected during the test, this is displayed in r1902.1.

If a ground fault is detected during the test, this is displayed in r1902.2.

Re bit 02 = 0:

If the test was successful once after POWER ON (see r1902.0), it is not repeated.

Re bit 02 = 1:

The test is not only performed after POWER ON, but also each time the pulses are enabled.

For chassis power units, the ground fault is also determined using the summed output current (see p0287).

## r1902 Test pulse evaluation status / Test puls ev stat

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the status of the test pulse evaluation.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Short-circuit test successfully performed | Yes | No | - |
| 01 | Phase short-circuit detected | Yes | No | - |
| 02 | Ground fault test successfully performed | Yes | No | - |
| 03 | Ground fault detected | Yes | No | - |
| 04 | Identification pulse width greater than the minimum pulse width | Yes | No | - |

**Note:** If the ground fault test was selected, but not successfully performed, then sufficient current will not be able to be established during the test pulses.

Re bit 04:

A test pulse longer than one sampling time has occurred

## p1909[0...n] Motor data identification control word / MotID STW

PM230
PM240
PM250, PM260

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1 | **Data type:** Unsigned32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** MDS, p0130 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | 0000 0000 0000 0000 0000 0000 0000 0000 bin |

**Description:** Sets the configuration for the motor data identification.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Stator inductance estimate no measurement | Yes | No | - |
| 02 | Rotor time constant estimate no measurement | Yes | No | - |
| 03 | Leakage inductance estimate no measurement | Yes | No | - |
| 05 | Determine Tr and Lsig evaluation in the time range | Yes | No | - |
| 06 | Activate vibration damping | Yes | No | - |
| 07 | De-activate vibration detection | Yes | No | - |
| 11 | De-activate pulse measurement Lq Ld | Yes | No | - |
| 12 | De-activate rotor resistance Rr measurement | Yes | No | - |
| 14 | De-activate valve interlocking time measurement | Yes | No | - |
| 15 | Determine only stator resistance, valve voltage fault, dead time | Yes | No | - |
| 16 | Short motor identification (lower quality) | Yes | No | - |
| 17 | Measurement without control parameter calculation | Yes | No | - |
| 18 | After motID direct transition into operation | Yes | No | - |
| 19 | After MotID automatically save results | Yes | No | - |
| 20 | Estimate cable resistance | Yes | No | - |

**Note:** The following applies to permanent-magnet synchronous motors:

Without de-selection in bit 11, in the closed-loop control mode, the direct inductance LD and the quadrature inductance Lq are measured at a low current.

When de-selecting with bit 11 or in the U/f mode, the stator inductance is measured at half the rated motor current.

If the stator is inductance is not measured but is to be estimated, then bit 0 should be set and bit 11 should be de-selected.

Bit 19 = 1:

All parameters are automatically saved after a successful motor data identification.

If a speed controller optimization run is then selected, the parameters are only saved after this measurement has been completed.

## p1909[0...n] Motor data identification control word / MotID STW

PM330

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1 | **Data type:** Unsigned32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** MDS, p0130 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | 0000 0000 0000 0000 0000 0000 0000 0000 bin |

**Description:** Sets the configuration for the motor data identification.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Stator inductance estimate no measurement | Yes | No | - |
| 02 | Rotor time constant estimate no measurement | Yes | No | - |
| 03 | Leakage inductance estimate no measurement | Yes | No | - |
| 05 | Determine Tr and Lsig evaluation in the time range | Yes | No | - |
| 06 | Activate vibration damping | Yes | No | - |
| 07 | De-activate vibration detection | Yes | No | - |
| 11 | De-activate pulse measurement Lq Ld | Yes | No | - |
| 12 | De-activate rotor resistance Rr measurement | Yes | No | - |
| 14 | De-activate valve interlocking time measurement | Yes | No | - |
| 15 | Determine only stator resistance, valve voltage fault, dead time | Yes | No | - |
| 16 | Short motor identification (lower quality) | Yes | No | - |
| 17 | Measurement without control parameter calculation | Yes | No | - |
| 18 | After motID direct transition into operation | Yes | No | - |
| 19 | After MotID automatically save results | Yes | No | - |
| 20 | Estimate cable resistance | Yes | No | - |
| 21 | Calibrating the output voltage measurement | Yes | No | - |

**Note:** The following applies to permanent-magnet synchronous motors:

Without de-selection in bit 11, in the closed-loop control mode, the direct inductance LD and the quadrature inductance Lq are measured at a low current.

When de-selecting with bit 11 or in the U/f mode, the stator inductance is measured at half the rated motor current.

If the stator is inductance is not measured but is to be estimated, then bit 0 should be set and bit 11 should be de-selected.

Re bit 19 = 1:

All parameters are automatically saved after a successful motor data identification.

If a speed controller optimization run is then selected, the parameters are only saved after this measurement has been completed.

Re bit 21 = 1:

The converter output voltage measurement is calibrated at the start of the motor data identification.

## p1910 Motor data identification selection / MotID selection

PM230
PM240
PM250, PM260

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 28 | 0 |

**Description:** Sets the motor data identification routine.

The motor data identification routine is carried out after the next power-on command.

p1910 = 1:

All motor data and the drive converter characteristics are identified and then transferred to the following parameters:

p0350, p0354, p0356, p0357, p0358, p0360, p1825, p1828, p1829, p1830

After this, the control parameter p0340 = 3 is automatically calculated.

p1910 = 20:

Only for internal SIEMENS use.

**Value:**
0: Inhibited
1: Complete identification (ID) and acceptance of motor data
2: Complete identification (ID) of motor data without acceptance
20: Voltage vector input
21: Voltage vector input without filter
22: Rectangular voltage vector input without filter
23: Triangular voltage vector input without filter
24: Rectangular voltage vector input with filter
25: Triangular voltage vector input with filter
26: Enter voltage vector with DTC correction
27: Enter voltage vector with AVC
28: Enter voltage vector with DTC + AVC correction

**Dependency:** "Quick commissioning" must be carried out (p0010 = 1, p3900 > 0) before executing the motor data identification routine!

When selecting the motor data identification routine, the drive data set changeover is suppressed.

Refer to: p1900

**Notice:** After the motor data identification (p1910 > 0) has been selected, alarm A07991 is output and a motor data identification routine is carried out as follows at the next power-on command:

- current flows through the motor and a voltage is present at the drive converter output terminals.
- during the identification routine, the motor shaft can rotate through a maximum of half a revolution.
- however, no torque torque is generated.

**Note:** To permanently accept the determined settings they must be saved in a non-volatile fashion (p0971).

When setting p1910, the following should be observed:

1. "With acceptance" means:

The parameters specified in the description are overwritten with the identified values and therefore have an influence on the controller setting.

2. "Without acceptance" means:

The identified parameters are only displayed in the range r1912 ... r1926 (service parameters). The controller settings remain unchanged.

3. For settings 27 and 28, the AVC configuration set using p1840 is active.

The power-on command must remain set during a measurement and after the measurement has been completed, the drive automatically resets it. The duration of the measurements can lie between 0.3 s and several minutes. This time is mainly influenced by the motor size. At the end of the motor data identification, p1910 is automatically set to 0, if only the stationary measurement is selected, then p1900 is also reset to 0, otherwise, the rotating measurement is activated.

## p1910 Motor data identification selection / MotID selection

PM330

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 28 | 1 |

**Description:** Sets the motor data identification routine.

The motor data identification routine is carried out after the next power-on command.

p1910 = 1:

All motor data and the drive converter characteristics are identified and then transferred to the following parameters:

p0350, p0354, p0356, p0357, p0358, p0360, p1825, p1828, p1829, p1830

After this, the control parameter p0340 = 3 is automatically calculated.

p1910 = 20:

Only for internal SIEMENS use.

**Value:**
0: Inhibited
1: Complete identification (ID) and acceptance of motor data
2: Complete identification (ID) of motor data without acceptance
20: Voltage vector input
21: Voltage vector input without filter
22: Rectangular voltage vector input without filter
23: Triangular voltage vector input without filter

24: Rectangular voltage vector input with filter
25: Triangular voltage vector input with filter
26: Enter voltage vector with DTC correction
27: Enter voltage vector with AVC
28: Enter voltage vector with DTC + AVC correction

**Dependency:** "Quick commissioning" must be carried out (p0010 = 1, p3900 > 0) before executing the motor data identification routine!

When selecting the motor data identification routine, the drive data set changeover is suppressed.

Refer to: p1900

**Notice:** After the motor data identification (p1910 > 0) has been selected, alarm A07991 is output and a motor data identification routine is carried out as follows at the next power-on command:

- current flows through the motor and a voltage is present at the drive converter output terminals.
- during the identification routine, the motor shaft can rotate through a maximum of half a revolution.
- however, no torque torque is generated.

**Note:** To permanently accept the determined settings they must be saved in a non-volatile fashion (p0971).

When setting p1910, the following should be observed:

1. "With acceptance" means:

The parameters specified in the description are overwritten with the identified values and therefore have an influence on the controller setting.

2. "Without acceptance" means:

The identified parameters are only displayed in the range r1912 ... r1926 (service parameters). The controller settings remain unchanged.

3. For settings 27 and 28, the AVC configuration set using p1840 is active.

The power-on command must remain set during a measurement and after the measurement has been completed, the drive automatically resets it. The duration of the measurements can lie between 0.3 s and several minutes. This time is mainly influenced by the motor size. At the end of the motor data identification, p1910 is automatically set to 0, if only the stationary measurement is selected, then p1900 is also reset to 0, otherwise, the rotating measurement is activated.

## r1912[0...2] Identified stator resistance / R_stator ident

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - [ohm] | - [ohm] | - [ohm] |

**Description:** Displays the identified stator resistance.

**Index:**
[0] = Phase U
[1] = Phase V
[2] = Phase W

## r1913[0...2] Identified rotor time constant / T_rotor ident

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - [ms] | - [ms] | - [ms] |

**Description:** Displays the identified rotor time constant.

**Index:**
[0] = Phase U
[1] = Phase V
[2] = Phase W

## r1914[0...2] Identified total leakage inductance / L_total_leak ident

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - [mH] | - [mH] | - [mH] |

**Description:** Displays the identified total leakage inductance.

**Index:**
[0] = Phase U
[1] = Phase V
[2] = Phase W

## r1915[0...2] Identified nominal stator inductance / L_stator ident

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - [mH] | - [mH] | - [mH] |

**Description:** Displays the nominal stator inductance identified.

**Index:**
[0] = Phase U
[1] = Phase V
[2] = Phase W

## r1925[0...2] Identified threshold voltage / U_threshold ident

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - [Vrms] | - [Vrms] | - [Vrms] |

**Description:** Displays the identified IGBT threshold voltage.

**Index:**
[0] = Phase U
[1] = Phase V
[2] = Phase W

## r1926[0...2] Identified effective valve lockout time / t_lock_valve id

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - [µs] | - [µs] | - [µs] |

**Description:** Displays the identified effective valve lockout time.

**Index:**
[0] = Phase U
[1] = Phase V
[2] = Phase W

## r1927[0...2] Identified rotor resistance / R_rotor ident

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - [ohm] | - [ohm] | - [ohm] |

**Description:** Displays identified rotor resistance (on separately excited synchronous motors: damping resistance).

**Index:**
[0] = Phase U
[1] = Phase V
[2] = Phase W

## p1959[0...n] Rotating measurement configuration / Rot meas config

PM230
PM250, PM260

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1 | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | 0001 1110 bin |

**Description:** Sets the configuration of the rotating measurement.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 01 | Saturation characteristic identification | Yes | No | - |
| 02 | Moment of inertia identification | Yes | No | - |
| 03 | Re-calculates the speed controller parameters | Yes | No | - |
| 04 | Speed controller optimization (vibration test) | Yes | No | - |

**Note:** The following parameters are influenced for the individual optimization steps:

Bit 01: p0320, p0360, p0362 ... p0369

Bit 02: p0341, p0342

Bit 03: p1400.0, p1458, p1459, p1463, p1470, p1472, p1496

Bit 04: Dependent on p1960

p1960 = 1, 3: p1400.0, p1458, p1459, p1470, p1472, p1496

## p1959[0...n] Rotating measurement configuration / Rot meas config

PM240

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1 | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | 0000 0000 0001 1110 bin |

**Description:** Sets the configuration of the rotating measurement.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 01 | Saturation characteristic identification | Yes | No | - |
| 02 | Moment of inertia identification | Yes | No | - |
| 03 | Re-calculates the speed controller parameters | Yes | No | - |
| 04 | Speed controller optimization (vibration test) | Yes | No | - |
| 12 | Measurement shortened | Yes | No | - |
| 13 | After measurement direct transition into operation | Yes | No | - |

**Note:** The following parameters are influenced for the individual optimization steps:

Bit 01: p0320, p0360, p0362 ... p0369

Bit 02: p0341, p0342

Bit 03: p1400.0, p1458, p1459, p1463, p1470, p1472, p1496

Bit 04: Dependent on p1960

p1960 = 1, 3: p1400.0, p1458, p1459, p1470, p1472, p1496

## p1959[0...n] Rotating measurement configuration / Rot meas config

PM330

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1 | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | 0001 0000 0001 1110 bin |

**Description:** Sets the configuration of the rotating measurement.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 01 | Saturation characteristic identification | Yes | No | - |
| 02 | Moment of inertia identification | Yes | No | - |
| 03 | Re-calculates the speed controller parameters | Yes | No | - |

| | | | | |
|---|---|---|---|---|
| 04 | Speed controller optimization (vibration test) | Yes | No | - |
| 12 | Measurement shortened | Yes | No | - |
| 13 | After measurement direct transition into operation | Yes | No | - |

**Note:** The following parameters are influenced for the individual optimization steps:

Bit 01: p0320, p0360, p0362 ... p0369

Bit 02: p0341, p0342

Bit 03: p1400.0, p1458, p1459, p1463, p1470, p1472, p1496

Bit 04: Dependent on p1960

p1960 = 1, 3: p1400.0, p1458, p1459, p1470, p1472, p1496

Re bit 12 = 1:

The selection only has an effect on the measurement p1960 = 1. For the shortened measurement, the magnetizing current and moment of inertia are determined with a somewhat lower accuracy.

## p1960 Rotating measurement selection / Rot meas sel

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 3 | 0 |

**Description:** Sets the rotating measurement.

The rotating measurement is carried out after the next power-on command.

The setting possibilities of the parameter depend on the open-loop/closed-loop control mode (p1300).

p1300 < 20 (U/f open-loop control):

It is not possible to select rotating measurement or speed controller optimization.

p1300 = 20, 22 (encoderless operation):

Only rotating measurement or speed controller optimization can be selected in the encoderless mode.

**Value:**
0: Inhibited
1: Rotating measurement in encoderless operation
3: Speed controller optimization in encoderless operation

**Dependency:** Before the rotating measurement is carried out, the motor data identification routine (p1900, p1910, r3925) should have already been done.

When selecting the rotating measurement, the drive data set changeover is suppressed.

Refer to: p1300, p1900, p1959, p1967, r1968

**Danger:** For drives with a mechanical system that limits the distance moved, it must be ensured that this is not reached during the rotating measurement. If this is not the case, then it is not permissible that the measurement is carried out.

**Notice:** To permanently accept the determined settings they must be saved in a non-volatile fashion (p0971).

During the rotating measurement it is not possible to save the parameter (p0971).

**Note:** When the rotating measurement is activated, it is not possible to save the parameters (p0971).

Parameter changes are automatically made for the rotating measurement (e.g. p1120); this is the reason that up to the end of the measurement, and if no faults are present, no manual changes should be made.

The ramp-up and ramp-down times (p1120, p1121) are limited, for the rotating measurement, to 900 s.

## p1961 Saturation characteristic speed to determine / Sat_char n determ

PM230
PM240
PM250, PM260

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 26 [%] | 75 [%] | 40 [%] |

**Description:** Sets the speed to determine the saturation characteristic.

The percentage value is referred to p0310 (rated motor frequency).

**Dependency:** Refer to: p0310, p1959

**Note:** The saturation characteristics should be determined at an operating point with the lowest possible load.

## p1961 Saturation characteristic speed to determine / Sat_char n determ

PM330

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 26 [%] | 75 [%] | 30 [%] |

**Description:** Sets the speed to determine the saturation characteristic.

The percentage value is referred to p0310 (rated motor frequency).

**Dependency:** Refer to: p0310, p1959

**Note:** The saturation characteristics should be determined at an operating point with the lowest possible load.

## p1965 Speed_ctrl_opt speed / n_opt speed

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 10 [%] | 75 [%] | 40 [%] |

**Description:** Sets the speed for the identification of the moment of inertia and the vibration test.

Induction motor:

The percentage value is referred to p0310 (rated motor frequency).

Synchronous motor:

The percentage value is referred to the minimum from p0310 (rated motor frequency) and p1082 (maximum speed).

**Dependency:** Refer to: p0310, p1959

**Note:** In order to calculate the inertia, sudden speed changes are carried out - the specified value corresponds to the lower speed setpoint. This value is increased by 20 % for the upper speed value.

The q leakage inductance (refer to p1959.5) is determined at zero speed and at 50 % of p1965 - however, with a maximum output frequency of 15 Hz and at a minimum of 10% of the rated motor speed.

## p1967 Speed_ctrl_opt dynamic factor / n_opt dyn_factor

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 1 [%] | 400 [%] | 100 [%] |

**Description:** Sets the dynamic response factor for speed controller optimization.

After optimization, the dynamic response achieved is displayed in r1968.

**Dependency:** Refer to: p1959, r1968

**Note:** For a rotating measurement, this parameter can be used to optimize the speed controller.

p1967 = 100 % --> speed controller optimization according to a symmetric optimum.

p1967 > 100 % --> optimization with a higher dynamic response (Kp higher, Tn lower).

If the actual dynamic response (see r1968) is significantly reduced with respect to the required dynamic response (p1967), then this can be as a result of mechanical load oscillations. If, in spite of this load behavior, a higher dynamic response is required, then the oscillation test (p1959.4 = 0) should be deactivated and the measurement repeated.

## r1968 Speed_ctrl_opt dynamic factor actual / n_opt dyn_fact act

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - [%] | - [%] | - [%] |

**Description:** Displays the dynamic factor which is actually achieved for the vibration test

**Dependency:** Refer to: p1959, p1967

**Note:** This dynamic factor only refers to the control mode of the speed controller set in p1960.

## r1969 Speed_ctrl_opt moment of inertia determined / n_opt M_inert det

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** 25_1 | **Unit selection:** p0100 | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - [kgm²] | - [kgm²] | - [kgm²] |

**Description:** Displays the determined moment of inertia of the drive.
After it has been determined, the value is transferred to p0341, p0342.

**Dependency:** IEC drives (p0100 = 0): unit kg m^2
NEMA drives (p0100 = 1): unit lb ft^2
Refer to: p0341, p0342, p1959

## r1970[0...1] Speed_ctrl_opt vibration test vibration frequency determined / n_opt f_vib det

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - [Hz] | - [Hz] | - [Hz] |

**Description:** Displays the vibration frequencies determined by the vibration test.

**Index:** [0] = Frequency low
[1] = Frequency high

**Dependency:** Refer to: p1959

## p1974 Speed_ctrl_opt saturation characteristic rotor flux maximum / n_opt rot_fl max

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** p0340 = 1 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 104 [%] | 120 [%] | 120 [%] |

**Description:** Sets the maximum flux setpoint to measure the saturation characteristic.

## p1980[0...n] PolID technique / PolID technique

PM230
PM240
PM250, PM260

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3 | **Data type:** Integer16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** MDS, p0130 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 1 | 10 | 4 |

**Description:** Sets the pole position identification technique.
p1980 = 1, 8: The current magnitude is set using p0329.
p1980 = 4, 6: The current magnitude of the first measurement section is set using p0325, the second using p0329.
p1980 = 10: The rated motor current is impressed to align.
The current magnitudes are limited to the rated power unit values.

**Value:**
1: Voltage pulsing 1st harmonics
4: Voltage pulsing 2-stage
6: Voltage pulsing 2-stage inverse
8: Voltage pulsing 2nd harmonic, inverse
10: DC current injection

**Dependency:** Refer to: p1780

**Note:** Voltage pulse technique (p1980 = 1, 4, 8) cannot be applied to operation with sine-wave output filters (p0230).

## p2000 Reference speed reference frequency / n_ref f_ref

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** p0340 = 1 | **Data type:** FloatingPoint32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 6.00 [rpm] | 210000.00 [rpm] | 1500.00 [rpm] |

**Description:** Sets the reference quantity for speed and frequency.

All speeds or frequencies specified as relative value are referred to this reference quantity.

The reference quantity corresponds to 100% or 4000 hex (word) or 4000 0000 hex (double word).

The following applies: Reference frequency (in Hz) = reference speed (in ((rpm) / 60) x pole pair number)

**Dependency:** This parameter is only updated during the automatic calculation (p0340 = 1, p3900 > 0) if motor commissioning was carried out beforehand for drive data set zero. This means that the parameter is not locked against overwriting using p0573 = 1.

Refer to: p2001, p2002, p2003, r2004, r3996

**Notice:** When the reference speed / reference frequency is changed, short-term communication interruptions may occur.

**Note:** If a BICO interconnection is established between different physical quantities, then the particular reference quantities are used as internal conversion factor.

Example 1:

The signal of an analog input (e.g. r0755[0]) is connected to a speed setpoint (e.g. p1070[0]). The actual percentage input value is cyclically converted into the absolute speed setpoint using the reference speed (p2000).

Example 2:

The setpoint from PROFIBUS (r2050[1]) is connected to a speed setpoint (e.g. p1070[0]). The actual input value is cyclically converted into a percentage value via the pre-specified scaling 4000 hex. This percentage value is converted to the absolute speed setpoint via reference speed (p2000).

## p2001 Reference voltage / Reference voltage

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1 | **Data type:** FloatingPoint32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 10 [Vrms] | 100000 [Vrms] | 1000 [Vrms] |

**Description:** Sets the reference quantity for voltages.

All voltages specified as relative value are referred to this reference quantity. This also applies for direct voltage values (= rms value) like the DC-link voltage.

The reference quantity corresponds to 100% or 4000 hex (word) or 4000 0000 hex (double word).

Note:

This reference quantity also applies to direct voltage values. It is not interpreted as rms value, but as DC voltage value.

**Dependency:** p2001 is only updated during automatic calculation (p0340 = 1, p3900 > 0) if motor commissioning has been carried out first for drive data set zero and as a result overwriting of the parameter has not been blocked by setting p0573 = 1.

Refer to: r3996

## p2002 Reference current / I_ref

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1 | **Data type:** FloatingPoint32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.10 [Arms] | 100000.00 [Arms] | 100.00 [Arms] |

**Description:** Sets the reference quantity for currents.

All currents specified as relative value are referred to this reference quantity.

The reference quantity corresponds to 100% or 4000 hex (word) or 4000 0000 hex (double word).

**Dependency:** This parameter is only updated during the automatic calculation (p0340 = 1, p3900 > 0) if motor commissioning was carried out beforehand for drive data set zero. This means that the parameter is not locked against overwriting using p0573 = 1.

Refer to: r3996

**Notice:** If various DDS are used with different motor data, then the reference quantities remain the same as these are not changed over with the DDS. The resulting conversion factor must be taken into account.

Example:

p2002 = 100 A

Reference quantity 100 A corresponds to 100 %

p0305[0] = 100 A

Rated motor current 100 A for MDS0 in DDS0 --> 100 % corresponds to 100 % of the rated motor current

p0305[1] = 50 A

Rated motor current 50 A for MDS1 in DDS1 --> 100 % corresponds to 200 % of the rated motor current

When the reference current is changed, short-term communication interruptions may occur.

**Note:** Preassigned value is p0640.

If a BICO interconnection is established between different physical quantities, then the particular reference quantities are used as internal conversion factor.

For infeed units, the rated line current, which is obtained from the rated power and parameterized rated line supply voltage (p2002 = r0206 / p0210 / 1.73) is pre-assigned as the reference quantity.

Example:

The actual value of a phase current (r0069[0]) is connected to a test socket (e.g. p0771[0]). The actual current value is cyclically converted into a percentage of the reference current (p2002) and output according to the parameterized scaling.

## p2003 Reference torque / M_ref

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1 | **Data type:** FloatingPoint32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** 7_2 | **Unit selection:** p0505 | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.01 [Nm] | 20000000.00 [Nm] | 1.00 [Nm] |

**Description:** Sets the reference quantity for torque.

All torques specified as relative value are referred to this reference quantity.

The reference quantity corresponds to 100% or 4000 hex (word) or 4000 0000 hex (double word).

**Dependency:** This parameter is only updated during the automatic calculation (p0340 = 1, p3900 > 0) if motor commissioning was carried out beforehand for drive data set zero. This means that the parameter is not locked against overwriting using p0573 = 1.

Refer to: r3996

**Notice:** When the reference torque is changed, short-term communication interruptions may occur.

**Note:** Preassigned value is 2 * p0333.

If a BICO interconnection is established between different physical quantities, then the particular reference quantities are used as internal conversion factor.

Example:

The actual value of the total torque (r0079) is connected to a test socket (e.g. p0771[0]). The actual torque is cyclically converted into a percentage of the reference torque (p2003) and output according to the parameterized scaling.

## r2004 Reference power / P_ref

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** 14_10 | **Unit selection:** p0505 | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - [kW] | - [kW] | - [kW] |

**Description:** Displays the reference quantity for power.

All power ratings specified as relative value are referred to this reference quantity.

The reference quantity corresponds to 100% or 4000 hex (word) or 4000 0000 hex (double word).

**Dependency:** This value is calculated as follows:

Infeed: Calculated from voltage times current.

Closed-loop control: Calculated from torque times speed.

Refer to: p2000, p2001, p2002, p2003

**Note:** If a BICO interconnection is established between different physical quantities, then the particular reference quantities are used as internal conversion factor.

The reference power is calculated as follows:

- 2 * Pi * reference speed / 60 * reference torque (motor)
- reference voltage * reference current * root(3) (infeed)

## p2006 Reference temp / Ref temp

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1 | **Data type:** FloatingPoint32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 50.00 [°C] | 300.00 [°C] | 100.00 [°C] |

**Description:** Sets the reference quantity for temperature.

All temperatures specified as relative value are referred to this reference quantity.

The reference quantity corresponds to 100% or 4000 hex (word) or 4000 0000 hex (double word).

## p2010 Comm IF baud rate / Comm baud

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 6 | 12 | 12 |

**Description:** Sets the baud rate for the commissioning interface (USS, RS232).

**Value:**
6: 9600 baud
7: 19200 baud
8: 38400 baud
9: 57600 baud
10: 76800 baud
11: 93750 baud
12: 115200 baud

**Note:** COMM-IF: Commissioning interface

The parameter is not influenced by setting the factory setting.

## p2011 Comm IF address / Comm add

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 31 | 2 |

**Description:** Sets the address for the commissioning interface (USS, RS232).

**Note:** The parameter is not influenced by setting the factory setting.

## p2016[0...3] CI: Comm IF USS PZD send word / Comm USS send word

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Integer16 |
| **Can be changed:** U, T | **Scaling:** 4000H | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Selects the PZD (actual values) to be sent via the commissioning interface USS.

The actual values are displayed on an intelligent operator panel (IOP).

**Index:** [0] = PZD 1
[1] = PZD 2
[2] = PZD 3
[3] = PZD 4

## r2019[0...7] Comm IF error statistics / Comm err

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the receive errors at the commissioning interface (USS, RS232).

**Index:**
[0] = Number of error-free telegrams
[1] = Number of rejected telegrams
[2] = Number of framing errors
[3] = Number of overrun errors
[4] = Number of parity errors
[5] = Number of starting character errors
[6] = Number of checksum errors
[7] = Number of length errors

## p2020 Field bus interface baud rate / Field bus baud

CU230P-2_BT
CU230P-2_HVAC

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9310 |
| **Min** | **Max** | **Factory setting** |
| 4 | 13 | 8 |

**Description:** Sets the baud rate for the field bus interface (RS485).

**Value:**
4: 2400 baud
5: 4800 baud
6: 9600 baud
7: 19200 baud
8: 38400 baud
9: 57600 baud
10: 76800 baud
11: 93750 baud
12: 115200 baud
13: 187500 baud

**Notice:** For p0014 = 1, the following applies:

After the value has been modified, no further parameter modifications can be made and the status is shown in r3996. Modifications can be made again when r3996 = 0.

For p0014 = 0, the following applies:

Before a changed setting becomes permanently effective, a non-volatile RAM to ROM data save is required. To do this, set p0971 = 1 or p0014 = 1.

**Note:** Fieldbus IF: Fieldbus interface

Changes only become effective after POWER ON.

The parameter is not influenced by setting the factory setting.

The parameter is set to the factory setting when the protocol is reselected.

When p2030 = 1 (USS), the following applies:

Min./max./factory setting: 4/13/8

When p2030 = 2 (MODBUS), the following applies:

Min./max./factory setting: 5/13/7

If p2030 = 5 (BACnet), the following applies:

Possible values/factory setting: (6, 7, 8, 10) / 6

If p2030 = 8 (P1), the following applies:

Min./max./factory setting: 5/7/5

## p2021 Field bus interface address / Field bus address

CU230P-2_BT
CU230P-2_HVAC

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9310 |
| **Min** | **Max** | **Factory setting** |
| 0 | 255 | 0 |

**Description:** Displays or sets the address for the fieldbus interface (RS485).

The address can be set as follows:

1) Using the address switch on the Control Unit.

--> p2021 displays the address setting.

--> A change only becomes effective after a POWER ON.

2) Using p2021

--> Only if an address of 0 or an address that is invalid for the fieldbus selected in p2030 has been set using the address switch.

--> The address is saved in a non-volatile fashion using the function "copy from RAM to ROM".

--> A change only becomes effective after a POWER ON.

**Dependency:** Refer to: p2030

**Notice:** For p0014 = 1, the following applies:

After the value has been modified, no further parameter modifications can be made and the status is shown in r3996. Modifications can be made again when r3996 = 0.

For p0014 = 0, the following applies:

Before a changed setting becomes permanently effective, a non-volatile RAM to ROM data save is required. To do this, set p0971 = 1 or p0014 = 1.

**Note:** Changes only become effective after POWER ON.

The parameter is not influenced by setting the factory setting.

The parameter is set to the factory setting when the protocol is reselected.

When p2030 = 1 (USS), the following applies:

Min./max./factory setting: 0/30/0

When p2030 = 2 (MODBUS), the following applies:

Min./max./factory setting: 1/247/1

If p2030 = 5 (BACnet), the following applies:

Min./max./factory setting: 0/127/1

If p2030 = 8 (P1), the following applies:

Min./max./factory setting: 1/99/99

## p2022 Field bus int USS PZD no. / Field bus USS PZD

CU230P-2_BT
CU230P-2_HVAC

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9310 |
| **Min** | **Max** | **Factory setting** |
| 0 | 8 | 2 |

**Description:** Sets the number of 16-bit words in the PZD part of the USS telegram for the field bus interface.

**Dependency:** Refer to: p2030

**Note:** The parameter is not influenced by setting the factory setting.

## p2023 Field bus int USS PKW no. / Field bus USS PKW

CU230P-2_BT
CU230P-2_HVAC

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9310 |
| **Min** | **Max** | **Factory setting** |
| 0 | 127 | 127 |

**Description:** Sets the number of 16-bit words in the PKW part of the USS telegram for the field bus interface.

**Value:**
0: PKW 0 words
3: PKW 3 words
4: PKW 4 words
127: PKW variable

**Dependency:** Refer to: p2030

**Note:** The parameter is not influenced by setting the factory setting.

## p2024[0...2] Fieldbus interface times / Fieldbus times

CU230P-2_BT
CU230P-2_HVAC

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9310 |
| **Min** | **Max** | **Factory setting** |
| 0 [ms] | 10000 [ms] | [0] 1000 [ms]<br>[1] 0 [ms]<br>[2] 0 [ms] |

**Description:** Sets the time values for the fieldbus interface.

The following applies for MODBUS:

p2024[0]: Maximum permissible telegram processing time of the MODBUS slave in which a reply is sent back to the MODBUS master.

p2024[1]: Not relevant.

p2024[2]: Telegram pause time (pause time between two telegrams).

The following applies for BACnet:

p2024[0]: APDU timeout.

p2024[1, 2]: Not relevant.

**Index:**
[0] = Max. processing time
[1] = Character delay time
[2] = Telegram pause time

**Dependency:** Refer to: p2020, p2030

**Note:** Re p2024[2] (MODBUS):

If the field bus baud rate is changed (p2020), the default time setting is restored.

The default setting corresponds to a time of 3.5 characters (dependent on the baud rate that has been set).

## p2025[0...3] Fieldbus interface BACnet settings / BACnet setting

CU230P-2_BT
CU230P-2_HVAC

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9310 |
| **Min** | **Max** | **Factory setting** |
| 0 | 4194303 | [0] 1<br>[1] 1<br>[2] 3<br>[3] 127 |

**Description:** Sets the communication parameters for BACnet.

p2025[0]:

Device object instance number (0 ... 4194303).

p2025[1]:

Maximum number of info frames (1 ... 10).

p2025[2]:

Number of APDU retries (0 ... 39).

p2025[3]:

Maximum master address (1 ... 127).

**Index:**
[0] = Device object instance number
[1] = Maximum number of info frames
[2] = Number of APDU retries
[3] = Maximum master address

**Dependency:** Refer to: p2030

## p2026[0...74] Fieldbus interface BACnet COV increment / BACnet COV incr

CU230P-2_BT
CU230P-2_HVAC

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9310 |
| **Min** | **Max** | **Factory setting** |
| 0 | 4194303 | 1 |

**Description:** Sets BACnet COV (change of value) increment values.

**Index:**
[0] = Analog input 0
[1] = Analog input 1
[2] = Analog input 2
[3] = Analog input 3
[4] = Analog input 4
[5] = Analog input 5
[6] = Analog input 6
[7] = Analog input 7
[8] = Analog Output 0

**Dependency:** Refer to: p2030

## p2027 Fieldbus interface BACnet language selection / BACnet language

CU230P-2_BT
CU230P-2_HVAC

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9310 |
| **Min** | **Max** | **Factory setting** |
| 0 | 1 | 0 |

**Description:** Sets the language for the BACnet object properties.

**Value:**
0: German
1: English

**Note:** Changes only become effective after POWER ON.

## r2029[0...7] Field bus int error statistics / Field bus error

CU230P-2_BT
CU230P-2_HVAC

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9310 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the receive errors on the field bus interface (RS485).

**Index:**
[0] = Number of error-free telegrams
[1] = Number of rejected telegrams
[2] = Number of framing errors
[3] = Number of overrun errors
[4] = Number of parity errors
[5] = Number of starting character errors
[6] = Number of checksum errors
[7] = Number of length errors

## p2030 Field bus int protocol selection / Field bus protocol

CU230P-2_BT
CU230P-2_HVAC

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9310 |
| **Min** | **Max** | **Factory setting** |
| 0 | 8 | 0 |

**Description:** Sets the communication protocol for the field bus interface.

**Value:** 0: No protocol
1: USS
2: MODBUS
5: BACnet
8: P1

**Notice:** For p0014 = 1, the following applies:
After the value has been modified, no further parameter modifications can be made and the status is shown in r3996. Modifications can be made again when r3996 = 0.

**Note:** Changes only become effective after POWER ON.
The parameter is not influenced by setting the factory setting.

## p2030 Field bus int protocol selection / Field bus protocol

CU230P-2_CAN

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9310 |
| **Min** | **Max** | **Factory setting** |
| 0 | 4 | 4 |

**Description:** Sets the communication protocol for the field bus interface.

**Value:** 0: No protocol
4: CAN

**Notice:** For p0014 = 1, the following applies:
After the value has been modified, no further parameter modifications can be made and the status is shown in r3996. Modifications can be made again when r3996 = 0.

**Note:** Changes only become effective after POWER ON.
The parameter is not influenced by setting the factory setting.

## p2030 Field bus int protocol selection / Field bus protocol

CU230P-2_DP

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9310 |
| **Min** | **Max** | **Factory setting** |
| 0 | 3 | 3 |

**Description:** Sets the communication protocol for the field bus interface.

**Value:** 0: No protocol
3: PROFIBUS

**Notice:** For p0014 = 1, the following applies:
After the value has been modified, no further parameter modifications can be made and the status is shown in r3996. Modifications can be made again when r3996 = 0.

**Note:** Changes only become effective after POWER ON.
The parameter is not influenced by setting the factory setting.

## p2030 Field bus int protocol selection / Field bus protocol

CU230P-2_PN

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9310 |
| **Min** | **Max** | **Factory setting** |
| 0 | 10 | 7 |

**Description:** Sets the communication protocol for the field bus interface.

**Value:** 0: No protocol
7: PROFINET
10: Ethernet/IP

**Notice:** For p0014 = 1, the following applies:
After the value has been modified, no further parameter modifications can be made and the status is shown in r3996. Modifications can be made again when r3996 = 0.

**Note:** Changes only become effective after POWER ON.
The parameter is not influenced by setting the factory setting.

## r2032 Master control control word effective / PcCtrl STW eff

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the effective control word 1 (STW1) of the drive for the master control.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | ON/OFF1 | Yes | No | - |
| 01 | OC / OFF2 | Yes | No | - |
| 02 | OC / OFF3 | Yes | No | - |
| 03 | Operation enable | Yes | No | - |
| 04 | Ramp-function generator enable | Yes | No | - |
| 05 | Start ramp-function generator | Yes | No | - |
| 06 | Speed setpoint enable | Yes | No | - |
| 07 | Acknowledge fault | Yes | No | - |
| 08 | Jog bit 0 | Yes | No | 3030 |
| 09 | Jog bit 1 | Yes | No | 3030 |
| 10 | Master ctrl by PLC | Yes | No | - |

**Notice:** The master control only influences control word 1 and speed setpoint 1. Other control words/setpoints can be transferred from another automation device.

**Note:** OC: Operating condition

## p2037 PROFIdrive STW1.10 = 0 mode / PD STW1.10=0

CU230P-2_DP
CU230P-2_PN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 2 | 0 |

**Description:** Sets the processing mode for PROFIdrive STW1.10 "master control by PLC".

Generally, control world 1 is received with the first receive word (PZD1) (this is in conformance to the PROFIdrive profile). The behavior of STW1.10 = 0 corresponds to that of the PROFIdrive profile. For other applications that deviate from this, the behavior can be adapted using this particular parameter.

**Value:**
0: Freeze setpoints and continue to process sign-of-life
1: Freeze setpoints and sign-of-life
2: Do not freeze setpoints

**Recommend.:** Do not change the setting p2037 = 0.

**Note:** If the STW1 is not transferred according to the PROFIdrive with PZD1 (with bit 10 "master control by PLC"), then p2037 should be set to 2.

## p2038 PROFIdrive STW/ZSW interface mode / PD STW/ZSW IF mode

CU230P-2_DP
CU230P-2_PN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 2 | 0 |

**Description:** Sets the interface mode of the PROFIdrive control words and status words.

When selecting a telegram via p0922 (p2079), this parameter influences the device-specific assignment of the bits in the control and status words.

**Value:**
0: SINAMICS
2: VIK-NAMUR

**Dependency:** Refer to: p0922, p2079

**Notice:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

**Note:** - For p0922 (p2079) = 1, 350 ... 999, p2038 is automatically set to 0.

- For p0922 (p2079) = 20, p2038 is automatically set to 2.

It is not then possible to change p2038.

| p2039 | Select debug monitor interface / Debug monit select | | |
|---|---|---|---|
| | **Access level:** 4 | **Calculated:** - | **Data type:** Unsigned16 |
| | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | 0 | 3 | 0 |

**Description:** The serial interface for the debug monitor is COM1 (commissioning interface, RS232) or COM2 (fieldbus interface, RS485).

Value = 0: De-activated

Value = 1: COM1, commissioning protocol is de-activated

Value = 2: COM2, field bus is de-activated

Value = 3: Reserved

**Note:** Value = 2 is only possible for Control Units with RS485 as a field bus interface.

| p2040 | Fieldbus interface monitoring time / Fieldbus t_monit | | |
|---|---|---|---|
| CU230P-2_BT | **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| CU230P-2_HVAC | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| CU230P-2_PN | **Units group:** - | **Unit selection:** - | **Func. diagram:** 9310 |
| | **Min** | **Max** | **Factory setting** |
| | 0 [ms] | 1999999 [ms] | 100 [ms] |

**Description:** Sets the monitoring time to monitor the process data received via the fieldbus interface.

If no process data is received within this time, then an appropriate message is output.

**Note:** p2040 = 0:

Monitoring is de-activated.

| p2042 | PROFIBUS Ident Number / PB Ident No. | | |
|---|---|---|---|
| CU230P-2_DP | **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | 0 | 1 | 0 |

**Description:** Sets the PROFIBUS Ident Number (PNO-ID).

SINAMICS can be operated with various identities on PROFIBUS. This allows the use of a PROFIBUS GSD that is independent of the device (e.g. PROFIdrive VIK-NAMUR with Ident Number 3AA0 hex).

**Value:**
0: SINAMICS
1: VIK-NAMUR

**Notice:** For p0014 = 1, the following applies:

After the value has been modified, no further parameter modifications can be made and the status is shown in r3996. Modifications can be made again when r3996 = 0.

**Note:** Every change only becomes effective after a POWER ON.

| r2043.0...2 | BO: PROFIdrive PZD state / PD PZD state | | |
|---|---|---|---|
| CU230P-2_DP | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned8 |
| CU230P-2_PN | **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 2410 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | - |

**Description:** Displays the PROFIdrive PZD state.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Setpoint failure | Yes | No | - |
| 02 | Fieldbus oper | Yes | No | - |

**Dependency:** Refer to: p2044

**Note:** When using the "setpoint failure" signal, the bus can be monitored and an application-specific response triggered when the setpoint fails.

## p2044 PROFIdrive fault delay / PD fault delay

CU230P-2_DP
CU230P-2_PN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2410 |
| **Min** | **Max** | **Factory setting** |
| 0 [s] | 100 [s] | 0 [s] |

**Description:** Sets the delay time to initiate fault F01910 after a setpoint failure.

The time until the fault is initiated can be used by the application. This means that is is possible to respond to the failure while the drive is still operational (e.g. emergency retraction).

**Dependency:** Refer to: r2043

## p2047 PROFIBUS additional monitoring time / PB suppl t_monit

CU230P-2_DP

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2410 |
| **Min** | **Max** | **Factory setting** |
| 0 [ms] | 20000 [ms] | 0 [ms] |

**Description:** Sets the additional monitoring time to monitor the process data received via PROFIBUS.

Enables short bus faults to be compensated.

If no process data is received within this time, then an appropriate message is output.

**Note:** For controller STOP, the additional monitoring time is not effective.

## r2050[0...11] CO: PROFIBUS PZD receive word / PZD recv word

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** - | **Scaling:** 4000H | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2440, 2468, 9360 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Connector output to interconnect PZD (setpoints) with word format received from the fieldbus controller.

**Index:**
[0] = PZD 1
[1] = PZD 2
[2] = PZD 3
[3] = PZD 4
[4] = PZD 5
[5] = PZD 6
[6] = PZD 7
[7] = PZD 8
[8] = PZD 9
[9] = PZD 10
[10] = PZD 11
[11] = PZD 12

**Notice:** Where there is a multiple interconnection of a connector output, all the connector inputs must either have Integer or FloatingPoint data types. A BICO interconnection for a single PZD can only take place either on r2050 or r2060.

## p2051[0...13] CI: PROFIdrive PZD send word / PZD send word

CU230P-2_BT
CU230P-2_CAN
CU230P-2_HVAC

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Integer16 |
| **Can be changed:** U, T | **Scaling:** 4000H | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2450, 2470, 9370 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Selects the PZD (actual values) with word format to be sent to the fieldbus controller.

**Index:**
[0] = PZD 1
[1] = PZD 2

[2] = PZD 3
[3] = PZD 4
[4] = PZD 5
[5] = PZD 6
[6] = PZD 7
[7] = PZD 8
[8] = PZD 9
[9] = PZD 10
[10] = PZD 11
[11] = PZD 12
[12] = PZD 13
[13] = PZD 14

**Notice:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

## p2051[0...13] CI: PROFIdrive PZD send word / PZD send word

CU230P-2_DP
CU230P-2_PN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Integer16 |
| **Can be changed:** U, T | **Scaling:** 4000H | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2450, 2470, 9370 |
| **Min** | **Max** | **Factory setting** |
| - | - | [0] 2089[0]<br>[1] 63[0]<br>[2...13] 0 |

**Description:** Selects the PZD (actual values) with word format to be sent to the fieldbus controller.

**Index:**
[0] = PZD 1
[1] = PZD 2
[2] = PZD 3
[3] = PZD 4
[4] = PZD 5
[5] = PZD 6
[6] = PZD 7
[7] = PZD 8
[8] = PZD 9
[9] = PZD 10
[10] = PZD 11
[11] = PZD 12
[12] = PZD 13
[13] = PZD 14

**Notice:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

## r2053[0...13] PROFIdrive diagnostics send PZD word / Diag send word

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2450, 2470, 9370 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the PZD (actual values) with word format sent to the fieldbus controller.

**Index:**
[0] = PZD 1
[1] = PZD 2
[2] = PZD 3
[3] = PZD 4
[4] = PZD 5
[5] = PZD 6
[6] = PZD 7
[7] = PZD 8
[8] = PZD 9
[9] = PZD 10
[10] = PZD 11
[11] = PZD 12
[12] = PZD 13
[13] = PZD 14

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Bit 0 | ON | OFF | - |
| 01 | Bit 1 | ON | OFF | - |
| 02 | Bit 2 | ON | OFF | - |
| 03 | Bit 3 | ON | OFF | - |
| 04 | Bit 4 | ON | OFF | - |
| 05 | Bit 5 | ON | OFF | - |
| 06 | Bit 6 | ON | OFF | - |
| 07 | Bit 7 | ON | OFF | - |
| 08 | Bit 8 | ON | OFF | - |
| 09 | Bit 9 | ON | OFF | - |
| 10 | Bit 10 | ON | OFF | - |
| 11 | Bit 11 | ON | OFF | - |
| 12 | Bit 12 | ON | OFF | - |
| 13 | Bit 13 | ON | OFF | - |
| 14 | Bit 14 | ON | OFF | - |
| 15 | Bit 15 | ON | OFF | - |

## r2054 PROFIBUS status / PB status

CU230P-2_DP

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2410 |
| **Min** | **Max** | **Factory setting** |
| 0 | 4 | - |

**Description:** Status display for the PROFIBUS interface.

**Value:**
0: OFF
1: No connection (search for baud rate)
2: Connection OK (baud rate found)
3: Cyclic connection with master (data exchange)
4: Cyclic data OK

## r2055[0...2] PROFIBUS diagnostics standard / PB diag standard

CU230P-2_DP

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2410 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Diagnostics display for the PROFIBUS interface.

**Index:**
[0] = Master bus address
[1] = Master input total length bytes
[2] = Master output total length bytes

## r2057 PROFIBUS address switch diagnostics / PB addr_sw diag

CU230P-2_DP

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2410 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the setting of the PROFIBUS address switch "DP ADDRESS" on the Control Unit.

**Dependency:** Refer to: p0918

**Notice:** The display is updated after switching on, and not cyclically.

## r2060[0...10] CO: PROFIdrive PZD receive double word / PZD recv DW

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer32 |
| **Can be changed:** - | **Scaling:** 4000H | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2440, 2468 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Connector output to interconnect PZD (setpoints) with double word format received from the fieldbus controller.

**Index:**
[0] = PZD 1 + 2
[1] = PZD 2 + 3
[2] = PZD 3 + 4
[3] = PZD 4 + 5
[4] = PZD 5 + 6
[5] = PZD 6 + 7
[6] = PZD 7 + 8
[7] = PZD 8 + 9
[8] = PZD 9 + 10
[9] = PZD 10 + 11
[10] = PZD 11 + 12

**Dependency:** Refer to: r2050

**Notice:** Where there is a multiple interconnection of a connector output, all the connector inputs must either have Integer or FloatingPoint data types.

A BICO interconnection for a single PZD can only take place either on r2050 or r2060.

## p2061[0...12] CI: PROFIBUS PZD send double word / PZD send DW

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Integer32 |
| **Can be changed:** U, T | **Scaling:** 4000H | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2470 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Selects the PZD (actual values) with double word format to be sent to the fieldbus controller.

**Index:**
[0] = PZD 1 + 2
[1] = PZD 2 + 3
[2] = PZD 3 + 4
[3] = PZD 4 + 5
[4] = PZD 5 + 6
[5] = PZD 6 + 7
[6] = PZD 7 + 8
[7] = PZD 8 + 9
[8] = PZD 9 + 10
[9] = PZD 10 + 11
[10] = PZD 11 + 12
[11] = PZD 12 + 13
[12] = PZD 13 + 14

**Dependency:** Refer to: p2051

**Notice:** A BICO interconnection for a single PZD can only take place either on p2051 or p2061.

The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

## r2063[0...12] PROFIdrive diagnostics PZD send double word / Diag send DW

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2470 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the PZD (actual values) with double word format sent to the fieldbus controller.

**Index:**
[0] = PZD 1 + 2
[1] = PZD 2 + 3
[2] = PZD 3 + 4

[3] = PZD 4 + 5
[4] = PZD 5 + 6
[5] = PZD 6 + 7
[6] = PZD 7 + 8
[7] = PZD 8 + 9
[8] = PZD 9 + 10
[9] = PZD 10 + 11
[10] = PZD 11 + 12
[11] = PZD 12 + 13
[12] = PZD 13 + 14

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Bit 0 | ON | OFF | - |
| 01 | Bit 1 | ON | OFF | - |
| 02 | Bit 2 | ON | OFF | - |
| 03 | Bit 3 | ON | OFF | - |
| 04 | Bit 4 | ON | OFF | - |
| 05 | Bit 5 | ON | OFF | - |
| 06 | Bit 6 | ON | OFF | - |
| 07 | Bit 7 | ON | OFF | - |
| 08 | Bit 8 | ON | OFF | - |
| 09 | Bit 9 | ON | OFF | - |
| 10 | Bit 10 | ON | OFF | - |
| 11 | Bit 11 | ON | OFF | - |
| 12 | Bit 12 | ON | OFF | - |
| 13 | Bit 13 | ON | OFF | - |
| 14 | Bit 14 | ON | OFF | - |
| 15 | Bit 15 | ON | OFF | - |
| 16 | Bit 16 | ON | OFF | - |
| 17 | Bit 17 | ON | OFF | - |
| 18 | Bit 18 | ON | OFF | - |
| 19 | Bit 19 | ON | OFF | - |
| 20 | Bit 20 | ON | OFF | - |
| 21 | Bit 21 | ON | OFF | - |
| 22 | Bit 22 | ON | OFF | - |
| 23 | Bit 23 | ON | OFF | - |
| 24 | Bit 24 | ON | OFF | - |
| 25 | Bit 25 | ON | OFF | - |
| 26 | Bit 26 | ON | OFF | - |
| 27 | Bit 27 | ON | OFF | - |
| 28 | Bit 28 | ON | OFF | - |
| 29 | Bit 29 | ON | OFF | - |
| 30 | Bit 30 | ON | OFF | - |
| 31 | Bit 31 | ON | OFF | - |

**Notice:** A maximum of 4 indices of the "trace" function can be used.

## r2067[0...1] PZD maximum interconnected / PZDmaxIntercon

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display for the maximum interconnected PZD in the receive/send direction
Index 0: receive (r2050, r2060)
Index 1: send (p2051, p2061)

## r2074[0...11] PROFIdrive diagnostics bus address PZD receive / Diag addr recv

CU230P-2_DP

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the PROFIBUS address of the sender from which the process data (PZD) is received.

**Index:**
[0] = PZD 1
[1] = PZD 2
[2] = PZD 3
[3] = PZD 4
[4] = PZD 5
[5] = PZD 6
[6] = PZD 7
[7] = PZD 8
[8] = PZD 9
[9] = PZD 10
[10] = PZD 11
[11] = PZD 12

**Note:** Value range:

0 - 125: Bus address of the sender

65535: Not assigned

## r2075[0...11] PROFIdrive diagnostics telegram offset PZD receive / Diag offs recv

CU230P-2_DP

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2410 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the PZD byte offset in the PROFIdrive receive telegram (controller output).

**Index:**
[0] = PZD 1
[1] = PZD 2
[2] = PZD 3
[3] = PZD 4
[4] = PZD 5
[5] = PZD 6
[6] = PZD 7
[7] = PZD 8
[8] = PZD 9
[9] = PZD 10
[10] = PZD 11
[11] = PZD 12

**Note:** Value range:

0 - 242: Byte offset

65535: Not assigned

## r2076[0...13] PROFIdrive diagnostics telegram offset PZD send / Diag offs send

CU230P-2_DP

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2410 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the PZD byte offset in the PROFIdrive send telegram (controller input).

**Index:**
[0] = PZD 1
[1] = PZD 2
[2] = PZD 3
[3] = PZD 4

[4] = PZD 5
[5] = PZD 6
[6] = PZD 7
[7] = PZD 8
[8] = PZD 9
[9] = PZD 10
[10] = PZD 11
[11] = PZD 12
[12] = PZD 13
[13] = PZD 14

**Note:** Value range:

0 - 242: Byte offset

65535: Not assigned

## r2077[0...15] PROFIBUS diagnostics peer-to-peer data transfer addresses / PB diag peer addr

CU230P-2_DP

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned8 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the addresses of the slaves (peers) where peer-to-peer data transfer has been configured via PROFIBUS.

## p2079 PROFIdrive PZD telegram selection extended / PZD telegr ext

CU230P-2_DP
CU230P-2_PN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 1 | 999 | 1 |

**Description:** Sets the send and receive telegram.

Contrary to p0922, a telegram can be selected using p2079 and subsequently expanded.

**Value:**
1: Standard telegram 1, PZD-2/2
20: Standard telegram 20, PZD-2/6
350: SIEMENS telegram 350, PZD-4/4
352: SIEMENS telegram 352, PZD-6/6
353: SIEMENS telegram 353, PZD-2/2, PKW-4/4
354: SIEMENS telegram 354, PZD-6/6, PKW-4/4
999: Free telegram configuration with BICO

**Dependency:** Refer to: p0922

**Note:** For p0922 < 999 the following applies:

p2079 has the same value and is inhibited. All of the interconnections and extensions contained in the telegram are inhibited.

For p0922 = 999 the following applies:

p2079 can be freely set. If p2079 is also set to 999, then all of the interconnections can be set.

For p0922 = 999 and p2079 < 999 the following applies:

The interconnections contained in the telegram are inhibited. However, the telegram can be extended.

## p2080[0...15] BI: Binector-connector converter status word 1 / Bin/con ZSW1

CU230P-2_BT
CU230P-2_CAN
CU230P-2_HVAC

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2472 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Selects bits to be sent to the PROFIdrive controller.

The individual bits are combined to form status word 1.

**Index:**
[0] = Bit 0
[1] = Bit 1
[2] = Bit 2

[3] = Bit 3
[4] = Bit 4
[5] = Bit 5
[6] = Bit 6
[7] = Bit 7
[8] = Bit 8
[9] = Bit 9
[10] = Bit 10
[11] = Bit 11
[12] = Bit 12
[13] = Bit 13
[14] = Bit 14
[15] = Bit 15

**Dependency:** Refer to: p2088, r2089

**Notice:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

## p2080[0...15] BI: Binector-connector converter status word 1 / Bin/con ZSW1

| | | | |
|---|---|---|---|
| CU230P-2_DP | **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| CU230P-2_PN | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 2472 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | [0] 899.0<br>[1] 899.1<br>[2] 899.2<br>[3] 2139.3<br>[4] 899.4<br>[5] 899.5<br>[6] 899.6<br>[7] 2139.7<br>[8] 2197.7<br>[9] 899.9<br>[10] 2199.1<br>[11] 1407.7<br>[12] 0<br>[13] 2135.14<br>[14] 2197.3<br>[15] 2135.15 |

**Description:** Selects bits to be sent to the PROFIdrive controller.

The individual bits are combined to form status word 1.

**Index:**
[0] = Bit 0
[1] = Bit 1
[2] = Bit 2
[3] = Bit 3
[4] = Bit 4
[5] = Bit 5
[6] = Bit 6
[7] = Bit 7
[8] = Bit 8
[9] = Bit 9
[10] = Bit 10
[11] = Bit 11
[12] = Bit 12
[13] = Bit 13
[14] = Bit 14
[15] = Bit 15

**Dependency:** Refer to: p2088, r2089

**Notice:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

## p2081[0...15] BI: Binector-connector converter status word 2 / Bin/con ZSW2

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2472 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Selects bits to be sent to the PROFIdrive controller.
The individual bits are combined to form status word 2.

**Index:**
[0] = Bit 0
[1] = Bit 1
[2] = Bit 2
[3] = Bit 3
[4] = Bit 4
[5] = Bit 5
[6] = Bit 6
[7] = Bit 7
[8] = Bit 8
[9] = Bit 9
[10] = Bit 10
[11] = Bit 11
[12] = Bit 12
[13] = Bit 13
[14] = Bit 14
[15] = Bit 15

**Dependency:** Refer to: p2088, r2089

**Notice:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

## p2082[0...15] BI: Binector-connector converter status word 3 / Bin/con ZSW3

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2472 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Selects bits to be sent to the PROFIdrive controller.
The individual bits are combined to form free status word 3.

**Index:**
[0] = Bit 0
[1] = Bit 1
[2] = Bit 2
[3] = Bit 3
[4] = Bit 4
[5] = Bit 5
[6] = Bit 6
[7] = Bit 7
[8] = Bit 8
[9] = Bit 9
[10] = Bit 10
[11] = Bit 11
[12] = Bit 12
[13] = Bit 13
[14] = Bit 14
[15] = Bit 15

**Dependency:** Refer to: p2088, r2089

**Notice:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

## p2083[0...15] BI: Binector-connector converter status word 4 / Bin/con ZSW4

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2472 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Selects bits to be sent to the PROFIdrive controller.
The individual bits are combined to form free status word 4.

**Index:**
[0] = Bit 0
[1] = Bit 1
[2] = Bit 2
[3] = Bit 3
[4] = Bit 4
[5] = Bit 5
[6] = Bit 6
[7] = Bit 7
[8] = Bit 8
[9] = Bit 9
[10] = Bit 10
[11] = Bit 11
[12] = Bit 12
[13] = Bit 13
[14] = Bit 14
[15] = Bit 15

**Dependency:** Refer to: p2088, r2089

## p2084[0...15] BI: Binector-connector converter status word 5 / Bin/con ZSW5

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2472 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Selects bits to be sent to the PROFIdrive controller.
The individual bits are combined to form free status word 5.

**Index:**
[0] = Bit 0
[1] = Bit 1
[2] = Bit 2
[3] = Bit 3
[4] = Bit 4
[5] = Bit 5
[6] = Bit 6
[7] = Bit 7
[8] = Bit 8
[9] = Bit 9
[10] = Bit 10
[11] = Bit 11
[12] = Bit 12
[13] = Bit 13
[14] = Bit 14
[15] = Bit 15

**Dependency:** Refer to: p2088, r2089

## p2088[0...4] Invert binector-connector converter status word / Bin/con ZSW inv

| CU230P-2_BT<br>CU230P-2_CAN<br>CU230P-2_HVAC | | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 2472 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | 0000 0000 0000 0000 bin |

**Description:** Setting to invert the individual binector inputs of the binector connector converter.

**Index:**
[0] = Status word 1
[1] = Status word 2
[2] = Free status word 3
[3] = Free status word 4
[4] = Free status word 5

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Bit 0 | Inverted | Not inverted | - |
| 01 | Bit 1 | Inverted | Not inverted | - |
| 02 | Bit 2 | Inverted | Not inverted | - |
| 03 | Bit 3 | Inverted | Not inverted | - |
| 04 | Bit 4 | Inverted | Not inverted | - |
| 05 | Bit 5 | Inverted | Not inverted | - |
| 06 | Bit 6 | Inverted | Not inverted | - |
| 07 | Bit 7 | Inverted | Not inverted | - |
| 08 | Bit 8 | Inverted | Not inverted | - |
| 09 | Bit 9 | Inverted | Not inverted | - |
| 10 | Bit 10 | Inverted | Not inverted | - |
| 11 | Bit 11 | Inverted | Not inverted | - |
| 12 | Bit 12 | Inverted | Not inverted | - |
| 13 | Bit 13 | Inverted | Not inverted | - |
| 14 | Bit 14 | Inverted | Not inverted | - |
| 15 | Bit 15 | Inverted | Not inverted | - |

**Dependency:** Refer to: p2080, p2081, p2082, p2083, r2089

## p2088[0...4] Invert binector-connector converter status word / Bin/con ZSW inv

| CU230P-2_DP<br>CU230P-2_PN | | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 2472 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | [0] 1010 1000 0000 0000 bin<br>[1...4] 0000 0000 0000 0000 bin |

**Description:** Setting to invert the individual binector inputs of the binector connector converter.

**Index:**
[0] = Status word 1
[1] = Status word 2
[2] = Free status word 3
[3] = Free status word 4
[4] = Free status word 5

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Bit 0 | Inverted | Not inverted | - |
| 01 | Bit 1 | Inverted | Not inverted | - |
| 02 | Bit 2 | Inverted | Not inverted | - |
| 03 | Bit 3 | Inverted | Not inverted | - |
| 04 | Bit 4 | Inverted | Not inverted | - |
| 05 | Bit 5 | Inverted | Not inverted | - |
| 06 | Bit 6 | Inverted | Not inverted | - |
| 07 | Bit 7 | Inverted | Not inverted | - |
| 08 | Bit 8 | Inverted | Not inverted | - |
| 09 | Bit 9 | Inverted | Not inverted | - |
| 10 | Bit 10 | Inverted | Not inverted | - |
| 11 | Bit 11 | Inverted | Not inverted | - |
| 12 | Bit 12 | Inverted | Not inverted | - |

| | | | | |
|---|---|---|---|---|
| 13 | Bit 13 | Inverted | Not inverted | - |
| 14 | Bit 14 | Inverted | Not inverted | - |
| 15 | Bit 15 | Inverted | Not inverted | - |

**Dependency:** Refer to: p2080, p2081, p2082, p2083, r2089

## r2089[0...4] CO: Send binector-connector converter status word / Bin/con ZSW send

**Access level:** 3 **Calculated:** - **Data type:** Unsigned16
**Can be changed:** - **Scaling:** - **Dyn. index:** -
**Units group:** - **Unit selection:** - **Func. diagram:** 2472

| Min | Max | Factory setting |
|---|---|---|
| - | - | - |

**Description:** Connector output to interconnect the status words to a PZD send word.

**Index:**
[0] = Status word 1
[1] = Status word 2
[2] = Free status word 3
[3] = Free status word 4
[4] = Free status word 5

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Bit 0 | ON | OFF | - |
| 01 | Bit 1 | ON | OFF | - |
| 02 | Bit 2 | ON | OFF | - |
| 03 | Bit 3 | ON | OFF | - |
| 04 | Bit 4 | ON | OFF | - |
| 05 | Bit 5 | ON | OFF | - |
| 06 | Bit 6 | ON | OFF | - |
| 07 | Bit 7 | ON | OFF | - |
| 08 | Bit 8 | ON | OFF | - |
| 09 | Bit 9 | ON | OFF | - |
| 10 | Bit 10 | ON | OFF | - |
| 11 | Bit 11 | ON | OFF | - |
| 12 | Bit 12 | ON | OFF | - |
| 13 | Bit 13 | ON | OFF | - |
| 14 | Bit 14 | ON | OFF | - |
| 15 | Bit 15 | ON | OFF | - |

**Dependency:** Refer to: p2051, p2080, p2081, p2082, p2083

**Note:** r2089 together with p2080 to p2084 forms five binector-connector converters.

## r2090.0...15 BO: PROFIdrive PZD1 receive bit-serial / PZD1 recv bitw

**Access level:** 3 **Calculated:** - **Data type:** Unsigned16
**Can be changed:** - **Scaling:** - **Dyn. index:** -
**Units group:** - **Unit selection:** - **Func. diagram:** 2468, 9204, 9206, 9360

| Min | Max | Factory setting |
|---|---|---|
| - | - | - |

**Description:** Binector output for bit-serial interconnection of PZD1 (normally control word 1) received from the PROFIdrive controller.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Bit 0 | ON | OFF | - |
| 01 | Bit 1 | ON | OFF | - |
| 02 | Bit 2 | ON | OFF | - |
| 03 | Bit 3 | ON | OFF | - |
| 04 | Bit 4 | ON | OFF | - |
| 05 | Bit 5 | ON | OFF | - |
| 06 | Bit 6 | ON | OFF | - |
| 07 | Bit 7 | ON | OFF | - |
| 08 | Bit 8 | ON | OFF | - |
| 09 | Bit 9 | ON | OFF | - |
| 10 | Bit 10 | ON | OFF | - |
| 11 | Bit 11 | ON | OFF | - |
| 12 | Bit 12 | ON | OFF | - |

| | | | | |
|---|---|---|---|---|
| 13 | Bit 13 | ON | OFF | - |
| 14 | Bit 14 | ON | OFF | - |
| 15 | Bit 15 | ON | OFF | - |

## r2091.0...15 BO: PROFIdrive PZD2 receive bit-serial / PZD2 recv bitw

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2468, 9204, 9206 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Binector output for bit-serial interconnection of PZD2 received from the PROFIdrive controller.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Bit 0 | ON | OFF | - |
| 01 | Bit 1 | ON | OFF | - |
| 02 | Bit 2 | ON | OFF | - |
| 03 | Bit 3 | ON | OFF | - |
| 04 | Bit 4 | ON | OFF | - |
| 05 | Bit 5 | ON | OFF | - |
| 06 | Bit 6 | ON | OFF | - |
| 07 | Bit 7 | ON | OFF | - |
| 08 | Bit 8 | ON | OFF | - |
| 09 | Bit 9 | ON | OFF | - |
| 10 | Bit 10 | ON | OFF | - |
| 11 | Bit 11 | ON | OFF | - |
| 12 | Bit 12 | ON | OFF | - |
| 13 | Bit 13 | ON | OFF | - |
| 14 | Bit 14 | ON | OFF | - |
| 15 | Bit 15 | ON | OFF | - |

## r2092.0...15 BO: PROFIdrive PZD3 receive bit-serial / PZD3 recv bitw

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2468, 9204, 9206 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Binector output for bit-serial interconnection of PZD3 received from the PROFIdrive controller.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Bit 0 | ON | OFF | - |
| 01 | Bit 1 | ON | OFF | - |
| 02 | Bit 2 | ON | OFF | - |
| 03 | Bit 3 | ON | OFF | - |
| 04 | Bit 4 | ON | OFF | - |
| 05 | Bit 5 | ON | OFF | - |
| 06 | Bit 6 | ON | OFF | - |
| 07 | Bit 7 | ON | OFF | - |
| 08 | Bit 8 | ON | OFF | - |
| 09 | Bit 9 | ON | OFF | - |
| 10 | Bit 10 | ON | OFF | - |
| 11 | Bit 11 | ON | OFF | - |
| 12 | Bit 12 | ON | OFF | - |
| 13 | Bit 13 | ON | OFF | - |
| 14 | Bit 14 | ON | OFF | - |
| 15 | Bit 15 | ON | OFF | - |

## r2093.0...15 BO: PROFIdrive PZD4 receive bit-serial / PZD4 recv bitw

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2468, 9204, 9206 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Binector output for bit-serial interconnection of PZD4 (normally control word 2) received from the PROFIdrive controller.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Bit 0 | ON | OFF | - |
| 01 | Bit 1 | ON | OFF | - |
| 02 | Bit 2 | ON | OFF | - |
| 03 | Bit 3 | ON | OFF | - |
| 04 | Bit 4 | ON | OFF | - |
| 05 | Bit 5 | ON | OFF | - |
| 06 | Bit 6 | ON | OFF | - |
| 07 | Bit 7 | ON | OFF | - |
| 08 | Bit 8 | ON | OFF | - |
| 09 | Bit 9 | ON | OFF | - |
| 10 | Bit 10 | ON | OFF | - |
| 11 | Bit 11 | ON | OFF | - |
| 12 | Bit 12 | ON | OFF | - |
| 13 | Bit 13 | ON | OFF | - |
| 14 | Bit 14 | ON | OFF | - |
| 15 | Bit 15 | ON | OFF | - |

## r2094.0...15 BO: Connector-binector converter binector output / Con/bin outp

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2468, 9360 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Binector output for bit-serial onward interconnection of a PZD word received from the PROFIdrive controller.
The PZD is selected via p2099[0].

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Bit 0 | ON | OFF | - |
| 01 | Bit 1 | ON | OFF | - |
| 02 | Bit 2 | ON | OFF | - |
| 03 | Bit 3 | ON | OFF | - |
| 04 | Bit 4 | ON | OFF | - |
| 05 | Bit 5 | ON | OFF | - |
| 06 | Bit 6 | ON | OFF | - |
| 07 | Bit 7 | ON | OFF | - |
| 08 | Bit 8 | ON | OFF | - |
| 09 | Bit 9 | ON | OFF | - |
| 10 | Bit 10 | ON | OFF | - |
| 11 | Bit 11 | ON | OFF | - |
| 12 | Bit 12 | ON | OFF | - |
| 13 | Bit 13 | ON | OFF | - |
| 14 | Bit 14 | ON | OFF | - |
| 15 | Bit 15 | ON | OFF | - |

**Dependency:** Refer to: p2099

## r2095.0...15 BO: Connector-binector converter binector output / Con/bin outp

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2468, 9360 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Binector output for bit-serial interconnection of a PZD word received from the PROFIdrive controller.
The PZD is selected via p2099[1].

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Bit 0 | ON | OFF | - |
| 01 | Bit 1 | ON | OFF | - |
| 02 | Bit 2 | ON | OFF | - |
| 03 | Bit 3 | ON | OFF | - |
| 04 | Bit 4 | ON | OFF | - |
| 05 | Bit 5 | ON | OFF | - |
| 06 | Bit 6 | ON | OFF | - |
| 07 | Bit 7 | ON | OFF | - |
| 08 | Bit 8 | ON | OFF | - |
| 09 | Bit 9 | ON | OFF | - |
| 10 | Bit 10 | ON | OFF | - |
| 11 | Bit 11 | ON | OFF | - |
| 12 | Bit 12 | ON | OFF | - |
| 13 | Bit 13 | ON | OFF | - |
| 14 | Bit 14 | ON | OFF | - |
| 15 | Bit 15 | ON | OFF | - |

**Dependency:** Refer to: p2099

## p2098[0...1] Inverter connector-binector converter binector output / Con/bin outp inv

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2468, 9360 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0000 0000 0000 0000 bin |

**Description:** Setting to invert the individual binector outputs of the connector-binector converter.
Using p2098[0], the signals of connector input p2099[0] are influenced.
Using p2098[1], the signals of connector input p2099[1] are influenced.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Bit 0 | Inverted | Not inverted | - |
| 01 | Bit 1 | Inverted | Not inverted | - |
| 02 | Bit 2 | Inverted | Not inverted | - |
| 03 | Bit 3 | Inverted | Not inverted | - |
| 04 | Bit 4 | Inverted | Not inverted | - |
| 05 | Bit 5 | Inverted | Not inverted | - |
| 06 | Bit 6 | Inverted | Not inverted | - |
| 07 | Bit 7 | Inverted | Not inverted | - |
| 08 | Bit 8 | Inverted | Not inverted | - |
| 09 | Bit 9 | Inverted | Not inverted | - |
| 10 | Bit 10 | Inverted | Not inverted | - |
| 11 | Bit 11 | Inverted | Not inverted | - |
| 12 | Bit 12 | Inverted | Not inverted | - |
| 13 | Bit 13 | Inverted | Not inverted | - |
| 14 | Bit 14 | Inverted | Not inverted | - |
| 15 | Bit 15 | Inverted | Not inverted | - |

**Dependency:** Refer to: r2094, r2095, p2099

## p2099[0...1] CI: Connector-binector converter signal source / Con/bin S_src

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Integer16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2468, 9360 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for the connector-binector converter.

A PZD receive word can be selected as signal source. The signals are available to be serially passed-on (interconnection).

**Dependency:** Refer to: r2094, r2095

**Note:** From the signal source set via the connector input, the corresponding lower 16 bits are converted.

p2099[0...1] together with r2094.0...15 and r2095.0...15 forms two connector-binector converters:

Connector input p2099[0] to binector output in r2094.0...15

Connector input p2099[1] to binector output in r2095.0...15

## p2100[0...19] Change fault response fault number / Chng resp F_no

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8050, 8075 |
| **Min** | **Max** | **Factory setting** |
| 0 | 65535 | 0 |

**Description:** Selects the faults for which the fault response should be changed

**Dependency:** The fault is selected and the required response is set under the same index.

Refer to: p2101

**Note:** Re-parameterization is also possible if a fault is present. The change only becomes effective after the fault has been resolved.

## p2101[0...19] Change fault response response / Chng resp resp

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8050, 8075 |
| **Min** | **Max** | **Factory setting** |
| 0 | 6 | 0 |

**Description:** Sets the fault response for the selected fault.

**Value:**
0: NONE
1: OFF1
2: OFF2
3: OFF3
5: STOP2
6: Internal armature short-circuit / DC braking

**Dependency:** The fault is selected and the required response is set under the same index.

Refer to: p2100

**Notice:** For the following cases, it is not possible to re-parameterize the fault response to a fault:

- Fault number does not exist (exception value = 0).
- Message type is not "fault" (F).
- Fault response is not permissible for the set fault number.

**Note:** Re-parameterization is also possible if a fault is present. The change only becomes effective after the fault has been resolved.

The fault response can only be changed for faults with the appropriate identification.

Example:

F12345 and fault response = NONE (OFF1, OFF2)

--> The fault response NONE can be changed to OFF1 or OFF2.

Re value = 1 (OFF1):

Braking along the ramp-function generator down ramp followed by a pulse inhibit.

Re value = 2 (OFF2):
Internal/external pulse inhibit.
Re value = 3 (OFF3):
Braking along the OFF3 down ramp followed by a pulse inhibit.
Re value = 5 (STOP2):
n_set = 0
Re value = 6 (armature short-circuit, internal/DC braking):
This value can only be set for all drive data sets when p1231 = 4.
a) DC braking is not possible for synchronous motors.
b) DC braking is possible for induction motors.

## p2103[0...n] BI: 1. Acknowledge faults / 1. Acknowledge

CU230P-2_BT
CU230P-2_CAN
CU230P-2_HVAC

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2441, 2442, 2443, 2447, 2475, 2546, 9220, 9677, 9678 |
| **Min** | **Max** | **Factory setting** |
| - | - | [0] 722.2<br>[1] 0<br>[2] 0<br>[3] 0 |

**Description:** Sets the first signal source to acknowledge faults.

**Notice:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

**Note:** A fault acknowledgement is triggered with a 0/1 signal.

## p2103[0...n] BI: 1. Acknowledge faults / 1. Acknowledge

CU230P-2_DP
CU230P-2_PN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2441, 2442, 2443, 2447, 2475, 2546, 9220, 9677, 9678 |
| **Min** | **Max** | **Factory setting** |
| - | - | [0] 2090.7<br>[1] 722.2<br>[2] 2090.7<br>[3] 2090.7 |

**Description:** Sets the first signal source to acknowledge faults.

**Notice:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

**Note:** A fault acknowledgement is triggered with a 0/1 signal.

## p2104[0...n] BI: 2. Acknowledge faults / 2. Acknowledge

CU230P-2_BT
CU230P-2_CAN
CU230P-2_HVAC

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2546, 8060 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the second signal source to acknowledge faults.

**Note:** A fault acknowledgement is triggered with a 0/1 signal.

## p2104[0...n] BI: 2. Acknowledge faults / 2. Acknowledge

CU230P-2_DP
CU230P-2_PN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2546, 8060 |
| **Min** | **Max** | **Factory setting** |
| - | - | [0] 722.2<br>[1] 0<br>[2] 0<br>[3] 0 |

**Description:** Sets the second signal source to acknowledge faults.

**Note:** A fault acknowledgement is triggered with a 0/1 signal.

## p2105[0...n] BI: 3. Acknowledge faults / 3. Acknowledge

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2546, 8060 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the third signal source to acknowledge faults.

**Note:** A fault acknowledgement is triggered with a 0/1 signal.

## p2106[0...n] BI: External fault 1 / External fault 1

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2546 |
| **Min** | **Max** | **Factory setting** |
| - | - | 1 |

**Description:** Sets the signal source for external fault 1.

**Note:** An external fault is triggered with a 1/0 signal.

## p2107[0...n] BI: External fault 2 / External fault 2

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2546 |
| **Min** | **Max** | **Factory setting** |
| - | - | 1 |

**Description:** Sets the signal source for external fault 2.

**Note:** An external fault is triggered with a 1/0 signal.

## p2108[0...n] BI: External fault 3 / External fault 3

PM230
PM240
PM250, PM260

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2546 |
| **Min** | **Max** | **Factory setting** |
| - | - | 1 |

**Description:** Sets the signal source for external fault 3.

External fault 3 is initiated by the following AND logic operation:

- BI: p2108 negated
- BI: p3111
- BI: p3112 negated

**Dependency:** Refer to: p3110, p3111, p3112

**Note:** An external fault is triggered with a 1/0 signal.

## p2108[0...n] BI: External fault 3 / External fault 3

PM330

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2546 |
| **Min** | **Max** | **Factory setting** |
| - | - | 4022.1 |

**Description:** Sets the signal source for external fault 3.
External fault 3 is initiated by the following AND logic operation:
- BI: p2108 negated
- BI: p3111
- BI: p3112 negated

**Dependency:** Refer to: p3110, p3111, p3112

**Note:** An external fault is triggered with a 1/0 signal.

## r2109[0...63] Fault time removed in milliseconds / t_flt resolved ms

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8050, 8060 |
| **Min** | **Max** | **Factory setting** |
| - [ms] | - [ms] | - [ms] |

**Description:** Displays the system runtime in milliseconds when the fault was removed.

**Dependency:** Refer to: r0945, r0947, r0948, r0949, r2130, r2133, r2136, p8400

**Notice:** The time comprises r2136 (days) and r2109 (milliseconds).

**Note:** The buffer parameters are cyclically updated in the background (refer to status signal in r2139).
The structure of the fault buffer and the assignment of the indices is shown in r0945.

## r2110[0...63] Alarm number / Alarm number

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8065 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** This parameter is identical to r2122.

## p2111 Alarm counter / Alarm counter

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8050, 8065 |
| **Min** | **Max** | **Factory setting** |
| 0 | 65535 | 0 |

**Description:** Number of alarms that have occurred after the last reset.

**Dependency:** When p2111 is set to 0, the following is initiated:
- all of the alarms of the alarm buffer that have gone [0...7] are transferred into the alarm history [8...63].
- the alarm buffer [0...7] is deleted.

Refer to: r2110, r2122, r2123, r2124, r2125

**Note:** The parameter is reset to 0 at POWER ON.

## p2112[0...n] BI: External alarm 1 / External alarm 1

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2546 |
| **Min** | **Max** | **Factory setting** |
| - | - | 1 |

**Description:** Sets the signal source for external alarm 1.

**Note:** An external alarm is triggered with a 1/0 signal.

## r2114[0...1] System runtime total / Sys runtime tot

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the total system runtime for the drive unit.
The time comprises r2114[0] (milliseconds) and r2114[1] (days).
After r2114[0] has reached a value of 86.400.000 ms (24 hours) this value is reset and r2114[1] is incremented.

**Index:** [0] = Milliseconds
[1] = Days

**Dependency:** Refer to: r0948, r2109, r2123, r2125, r2130, r2136, r2145, r2146

**Note:** When the electronic power supply is switched out, the counter values are saved.
After the drive unit is powered up, the counter continues to run with the last value that was saved.

## p2116[0...n] BI: External alarm 2 / External alarm 2

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2546 |
| **Min** | **Max** | **Factory setting** |
| - | - | 1 |

**Description:** Sets the signal source for external alarm 2.

**Note:** An external alarm is triggered with a 1/0 signal.

## p2117[0...n] BI: External alarm 3 / External alarm 3

PM230
PM240
PM250, PM260

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2546 |
| **Min** | **Max** | **Factory setting** |
| - | - | 1 |

**Description:** Sets the signal source for external alarm 3.

**Note:** An external alarm is triggered with a 1/0 signal.

## p2117[0...n] BI: External alarm 3 / External alarm 3

PM330

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2546 |
| **Min** | **Max** | **Factory setting** |
| - | - | 4022.0 |

**Description:** Sets the signal source for external alarm 3.

**Note:** An external alarm is triggered with a 1/0 signal.

## p2118[0...19] Change message type message number / Chng type msg_no

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8050, 8075 |
| **Min** | **Max** | **Factory setting** |
| 0 | 65535 | 0 |

**Description:** Selects faults or alarms for which the message type should be changed.

**Dependency:** Selects the fault or alarm selection and sets the required type of message realized under the same index.

Refer to: p2119

**Note:** Re-parameterization is also possible if a message is present. The change only becomes effective after the message has gone.

## p2119[0...19] Change message type type / Change type type

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8050, 8075 |
| **Min** | **Max** | **Factory setting** |
| 1 | 3 | 1 |

**Description:** Sets the message type for the selected fault or alarm.

**Value:**
1: Fault (F)
2: Alarm (A)
3: No message (N)

**Dependency:** Selects the fault or alarm selection and sets the required type of message realized under the same index.

Refer to: p2118

**Note:** Re-parameterization is also possible if a message is present. The change only becomes effective after the message has gone.

The message type can only be changed for messages with the appropriate identification (exception, value = 0).

Example:

F12345(A) --> Fault F12345 can be changed to alarm A12345.

In this case, the message number that may be possibly entered in p2100[0...19] and p2126[0...19] is automatically removed.

## r2120 CO: Sum of fault and alarm buffer changes / Sum buffer changed

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8065 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the sum of all of the fault and alarm buffer changes in the drive unit.

**Dependency:** Refer to: r0944, r2121

## r2121 CO: Counter alarm buffer changes / Alrm buff changed

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8065 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** This counter is incremented every time the alarm buffer changes.

**Dependency:** Refer to: r2110, r2122, r2123, r2124, r2125

## r2122[0...63] Alarm code / Alarm code

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8050, 8065 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the number of alarms that have occurred.

**Dependency:** Refer to: r2110, r2123, r2124, r2125, r2134, r2145, r2146, r3121, r3123

**Notice:** The properties of the alarm buffer should be taken from the corresponding product documentation.

**Note:** The buffer parameters are cyclically updated in the background (refer to status signal in r2139).

Alarm buffer structure (general principle):

r2122[0], r2124[0], r2123[0], r2125[0] --> alarm 1 (the oldest)

. . .

r2122[7], r2124[7], r2123[7], r2125[7] --> Alarm 8 (the latest)

When the alarm buffer is full, the alarms that have gone are entered into the alarm history:

r2122[8], r2124[8], r2123[8], r2125[8] --> Alarm 1 (the latest)

. . .

r2122[63], r2124[63], r2123[63], r2125[63] --> alarm 56 (the oldest)

## r2123[0...63] Alarm time received in milliseconds / t_alarm recv ms

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8050, 8065 |
| **Min** | **Max** | **Factory setting** |
| - [ms] | - [ms] | - [ms] |

**Description:** Displays the system runtime in milliseconds when the alarm occurred.

**Dependency:** Refer to: r2110, r2122, r2124, r2125, r2134, r2145, r2146, p8400

**Notice:** The time comprises r2145 (days) and r2123 (milliseconds).

**Note:** The buffer parameters are cyclically updated in the background (refer to status signal in r2139).

The structure of the alarm buffer and the assignment of the indices is shown in r2122.

## r2124[0...63] Alarm value / Alarm value

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8050, 8065 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays additional information about the active alarm (as integer number).

**Dependency:** Refer to: r2110, r2122, r2123, r2125, r2134, r2145, r2146, r3121, r3123

**Note:** The buffer parameters are cyclically updated in the background (refer to status signal in r2139).

The structure of the alarm buffer and the assignment of the indices is shown in r2122.

## r2125[0...63] Alarm time removed in milliseconds / t_alarm res ms

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8050, 8065 |
| **Min** | **Max** | **Factory setting** |
| - [ms] | - [ms] | - [ms] |

**Description:** Displays the system runtime in milliseconds when the alarm was cleared.

**Dependency:** Refer to: r2110, r2122, r2123, r2124, r2134, r2145, r2146, p8400

**Notice:** The time comprises r2146 (days) and r2125 (milliseconds).

**Note:** The buffer parameters are cyclically updated in the background (refer to status signal in r2139).
The structure of the alarm buffer and the assignment of the indices is shown in r2122.

## p2126[0...19] Change acknowledge mode fault number / Chng ackn F_no

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8050, 8075 |
| **Min** | **Max** | **Factory setting** |
| 0 | 65535 | 0 |

**Description:** Selects the faults for which the acknowledge mode is to be changed

**Dependency:** Selects the faults and sets the required acknowledge mode realized under the same index
Refer to: p2127

**Note:** Re-parameterization is also possible if a fault is present. The change only becomes effective after the fault has been resolved.

## p2127[0...19] Change acknowledge mode mode / Chng ackn mode

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8050, 8075 |
| **Min** | **Max** | **Factory setting** |
| 1 | 2 | 1 |

**Description:** Sets the acknowledge mode for selected fault.

**Value:**
1: Acknowledgment only using POWER ON
2: Ack IMMEDIATELY after the fault cause has been removed

**Dependency:** Selects the faults and sets the required acknowledge mode realized under the same index
Refer to: p2126

**Notice:** It is not possible to re-parameterize the acknowledge mode for a fault in the following cases:
- Fault number does not exist (exception value = 0).
- Message type is not "fault" (F).
- Acknowledge mode is not permissible for the set fault number.

**Note:** Re-parameterization is also possible if a fault is present. The change only becomes effective after the fault has been resolved.
The acknowledge mode can only be changed for faults with the appropriate identification.
Example:
F12345 and acknowledge mode = IMMEDIATELY (POWER ON)
--> The acknowledge mode can be changed from IMMEDIATELY to POWER ON.

## p2128[0...15] Faults/alarms trigger selection / F/A trigger sel

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8050, 8070 |
| **Min** | **Max** | **Factory setting** |
| 0 | 65535 | 0 |

**Description:** Sets the faults/alarms for which a trigger signal should be generated in r2129.0...15.

**Dependency:** If the fault/alarm set in p2128[0...15] occurs, then the particular binector output r2129.0...15 is set.
Refer to: r2129

## r2129.0...15 CO/BO: Faults/alarms trigger signal / F/A trigger signal

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8070 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display and BICO output for the trigger signals of the faults/alarms set in p2128[0...15].

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Trigger signal p2128[0] | ON | OFF | - |
| 01 | Trigger signal p2128[1] | ON | OFF | - |
| 02 | Trigger signal p2128[2] | ON | OFF | - |
| 03 | Trigger signal p2128[3] | ON | OFF | - |
| 04 | Trigger signal p2128[4] | ON | OFF | - |
| 05 | Trigger signal p2128[5] | ON | OFF | - |
| 06 | Trigger signal p2128[6] | ON | OFF | - |
| 07 | Trigger signal p2128[7] | ON | OFF | - |
| 08 | Trigger signal p2128[8] | ON | OFF | - |
| 09 | Trigger signal p2128[9] | ON | OFF | - |
| 10 | Trigger signal p2128[10] | ON | OFF | - |
| 11 | Trigger signal p2128[11] | ON | OFF | - |
| 12 | Trigger signal p2128[12] | ON | OFF | - |
| 13 | Trigger signal p2128[13] | ON | OFF | - |
| 14 | Trigger signal p2128[14] | ON | OFF | - |
| 15 | Trigger signal p2128[15] | ON | OFF | - |

**Dependency:** If the fault/alarm set in p2128[0...15] occurs, then the particular binector output r2129.0...15 is set.

Refer to: p2128

**Note:** CO: r2129 = 0 --> None of the selected messages has occurred.

CO: r2129 > 0 --> At least one of the selected messages has occurred.

## r2130[0...63] Fault time received in days / t_fault recv days

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8060 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the system runtime in days when the fault occurred.

**Dependency:** Refer to: r0945, r0947, r0948, r0949, r2109, r2133, r2136, p8401

**Notice:** The time comprises r2130 (days) and r0948 (milliseconds).

The value displayed in p2130 refers to 01.01.1970.

**Note:** The buffer parameters are cyclically updated in the background (refer to status signal in r2139).

## r2131 CO: Actual fault code / Act fault code

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8060 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the code of the oldest active fault.

**Dependency:** Refer to: r3131, r3132

**Note:** 0: No fault present.

## r2132 CO: Actual alarm code / Actual alarm code

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8065 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the code of the last alarm that occurred.

**Note:** 0: No alarm present.

## r2133[0...63] Fault value for float values / Fault val float

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8060 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays additional information about the fault that occurred for float values.

**Dependency:** Refer to: r0945, r0947, r0948, r0949, r2109, r2130, r2136

**Note:** The buffer parameters are cyclically updated in the background (refer to status signal in r2139).

## r2134[0...63] Alarm value for float values / Alarm value float

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8065 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays additional information about the active alarm for float values.

**Dependency:** Refer to: r2110, r2122, r2123, r2124, r2125, r2145, r2146, r3121, r3123

**Note:** The buffer parameters are cyclically updated in the background (refer to status signal in r2139).

## r2135.12...15 CO/BO: Status word faults/alarms 2 / ZSW fault/alarm 2

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2548 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display and BICO output for the second status word of faults and alarms.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 12 | Fault motor overtemperature | Yes | No | 8016 |
| 13 | Fault power unit thermal overload | Yes | No | 8014 |
| 14 | Alarm motor overtemperature | Yes | No | 8016 |
| 15 | Alarm power unit thermal overload | Yes | No | 8014 |

## r2136[0...63] Fault time removed in days / t_flt resolv days

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8060 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the system runtime in days when the fault was removed.

**Dependency:** Refer to: r0945, r0947, r0948, r0949, r2109, r2130, r2133, p8401

**Notice:** The time comprises r2136 (days) and r2109 (milliseconds).

**Note:** The buffer parameters are cyclically updated in the background (refer to status signal in r2139).

## r2138.7...15 CO/BO: Control word faults/alarms / STW fault/alarm

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2546 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display and BICO output for the control word of faults and alarms.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 07 | Acknowledge fault | Yes | No | 8060 |
| 10 | External alarm 1 (A07850) effective | Yes | No | 8065 |
| 11 | External alarm 2 (A07851) effective | Yes | No | 8065 |
| 12 | External alarm 3 (A07852) effective | Yes | No | 8065 |
| 13 | External fault 1 (F07860) effective | Yes | No | 8060 |
| 14 | External fault 2 (F07861) effective | Yes | No | 8060 |
| 15 | External fault 3 (F07862) effective | Yes | No | 8060 |

**Dependency:** Refer to: p2103, p2104, p2105, p2106, p2107, p2108, p2112, p2116, p2117, p3110, p3111, p3112

## r2139.0...15 CO/BO: Status word faults/alarms 1 / ZSW fault/alarm 1

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2548 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display and BICO output for status word 1 of faults and alarms.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Being acknowledged | Yes | No | - |
| 01 | Acknowledgment required | Yes | No | - |
| 03 | Fault present | Yes | No | 8060 |
| 06 | Internal message 1 present | Yes | No | - |
| 07 | Alarm present | Yes | No | 8065 |
| 08 | Internal message 2 present | Yes | No | - |
| 11 | Alarm class bit 0 | High | Low | - |
| 12 | Alarm class bit 1 | High | Low | - |
| 13 | Maintenance required | Yes | No | - |
| 14 | Maintenance urgently required | Yes | No | - |
| 15 | Fault gone/can be acknowledged | Yes | No | - |

**Note:** Re bit 03, 07:

These bits are set if at least one fault/alarm occurs. Data is entered into the fault/alarm buffer with delay. This is the reason that the fault/alarm buffer should only be read if, after "fault present" or "alarm present" has occurred, a change in the buffer was also detected (r0944, r9744, r2121).

Re bit 06, 08:

These status bits are used for internal diagnostic purposes only.

Re bit 11, 12:

These status bits are used for the classification of internal alarm classes and are intended for diagnostic purposes only on certain automation systems with integrated SINAMICS functionality.

## p2140[0...n] Hysteresis speed 2 / n_hysteresis 2

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,5 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 8010 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [rpm] | 300.00 [rpm] | 90.00 [rpm] |

**Description:** Sets the hysteresis speed (bandwidth) for the following signals:

"|n_act| < = speed threshold value 2" (BO: r2197.1)

"|n_act| > speed threshold value 2" (BO: r2197.2)

**Dependency:** Refer to: p2155, r2197

## p2141[0...n] Speed threshold 1 / n_thresh val 1

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,5 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 8010 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [rpm] | 210000.00 [rpm] | 5.00 [rpm] |

**Description:** Sets the speed threshold value for the signal "f or n comparison value reached or exceeded" (BO: r2199.1).

**Dependency:** Refer to: p2142, r2199

## p2142[0...n] Hysteresis speed 1 / n_hysteresis 1

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,5 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 8010 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [rpm] | 300.00 [rpm] | 2.00 [rpm] |

**Description:** Sets the hysteresis speed (bandwidth) for the signal "f or n / v comparison value reached or exceeded" (BO: r2199.1).

**Dependency:** Refer to: p2141, r2199

## p2144[0...n] BI: Motor stall monitoring enable (negated) / Mot stall enab neg

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8012 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for the negated enable (0 = enable) of the motor stall monitoring.

**Dependency:** Refer to: p2163, p2164, p2166, r2197, r2198

**Note:** When interconnecting the enable signal with r2197.7 then the stall signal is suppressed if there is no speed setpoint - actual value deviation.

## r2145[0...63] Alarm time received in days / t_alarm recv days

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8065 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the system runtime in days when the alarm occurred.

**Dependency:** Refer to: r2110, r2122, r2123, r2124, r2125, r2134, r2146, p8401

**Notice:** The time comprises r2145 (days) and r2123 (milliseconds).

**Note:** The buffer parameters are cyclically updated in the background (refer to status signal in r2139).

## r2146[0...63] Alarm time removed in days / t_alarm res days

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8065 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the system runtime in days when the alarm was cleared.

**Dependency:** Refer to: r2110, r2122, r2123, r2124, r2125, r2134, r2145, p8401

**Notice:** The time comprises r2146 (days) and r2125 (milliseconds).

**Note:** The buffer parameters are cyclically updated in the background (refer to status signal in r2139).

## p2148[0...n] BI: RFG active / RFG active

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,5 | **Data type:** U32 / Binary |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8011 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for the signal "ramp-function generator active" for the following signals/messages:

"Speed setpoint - actual value deviation within tolerance t_on" (BO: r2199.4)

"Ramp-up/ramp-down completed" (BO: r2199.5)

**Notice:** The parameter may be protected as a result of p0922 or p2079 and cannot be changed.

**Note:** The binector input is automatically interconnected to r1199.2 as a default setting.

## p2149[0...n] Monitoring configuration / Monit config

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | 0000 1001 bin |

**Description:** Sets the configuration for messages and monitoring functions.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Enable alarm A07903 | Yes | No | 8011 |
| 01 | Load monitoring only in the 1st quadrant | Yes | No | 8013 |
| 03 | n_act > p2155 own hysteresis | Yes | No | 8010 |
| 05 | Stall monitoring for encoderless speed control | Yes | No | - |

**Dependency:** Refer to: r2197

**Note:** Re bit 00:

Alarm A07903 is output when the bit is set with r2197.7 = 0 (n_set <> n_act).

Re bit 01:

When the bit is set, load monitoring is only carried out in the 1st quadrant as a result of the positive characteristic parameters (p2182 ... p2190).

Re bit 03:

When the bit is set, r2197.1 and r2197.2 are determined using separate hysteresis functions.

Re bit 05:

When this bit is set, a change to open-loop speed controlled operation is only possible when the motor is stationary.

## p2150[0...n] Hysteresis speed 3 / n_hysteresis 3

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,5 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 8010, 8011, 8020 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [rpm] | 300.00 [rpm] | 2.00 [rpm] |

**Description:** Sets the hysteresis speed (bandwidth) for the following signals:

"|n_act| < speed threshold value 3" (BO: r2199.0)

"n_set >= 0" (BO: r2198.5)

"n_act >= 0" (BO: r2197.3)

**Dependency:** Refer to: p2161, r2197, r2199

## p2151[0...n] CI: Speed setpoint for messages/signals / n_set for msg

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** T | **Scaling:** p2000 | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8011 |
| **Min** | **Max** | **Factory setting** |
| - | - | 1170[0] |

**Description:** Sets the signal source for the speed setpoint for the following messages:
"Speed setpoint - actual value deviation within tolerance t_off" (BO: r2197.7)
"Ramp-up/ramp-down completed" (BO: r2199.5)
"|n_set| < p2161" (BO: r2198.4)
"n_set > 0" (BO: r2198.5)

**Dependency:** Refer to: r2197, r2198, r2199

## p2153[0...n] Speed actual value filter time constant / n_act_filt T

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8010 |
| **Min** | **Max** | **Factory setting** |
| 0 [ms] | 1000000 [ms] | 0 [ms] |

**Description:** Sets the time constant of the PT1 element to smooth the speed / velocity actual value.
The smoothed actual speed/velocity is compared with the threshold values and is only used for messages and signals.

**Dependency:** Refer to: r2169

## p2155[0...n] Speed threshold 2 / n_thresh val 2

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,5 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 8010 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [rpm] | 210000.00 [rpm] | 900.00 [rpm] |

**Description:** Sets the speed threshold value for the following messages:
"|n_act| < = speed threshold value 2" (BO: r2197.1)
"|n_act| > speed threshold value 2" (BO: r2197.2)

**Dependency:** Refer to: p2140, r2197

## p2156[0...n] On delay comparison value reached / t_on cmpr val rchd

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8010 |
| **Min** | **Max** | **Factory setting** |
| 0.0 [ms] | 10000.0 [ms] | 0.0 [ms] |

**Description:** Sets the switch-in delay time for the signal "comparison value reached" (BO: r2199.1).

**Dependency:** Refer to: p2141, p2142, r2199

## p2161[0...n] Speed threshold 3 / n_thresh val 3

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,5 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 8010, 8011 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [rpm] | 210000.00 [rpm] | 5.00 [rpm] |

**Description:** Sets the speed threshold value for the signal "|n_act| < speed threshold value 3" (BO: r2199.0).

**Dependency:** Refer to: p2150, r2199

## p2162[0...n] Hysteresis speed n_act > n_max / Hyst n_act>n_max

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,5 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 8010 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [rpm] | 60000.00 [rpm] | 0.00 [rpm] |

**Description:** Sets the hysteresis speed (bandwidth) for the signal "n_act > n_max" (BO: r2197.6).

**Dependency:** Refer to: r1084, r1087, r2197

**Notice:** For p0322 = 0, the following applies: p2162 <= 0.1 * p0311

For p0322 > 0, the following applies: p2162 <= 1.02 * p0322 - p1082

If one of the conditions is violated, p2162 is appropriately and automatically reduced when exiting the commissioning mode.

**Note:** For a negative speed limit (r1087) the hysteresis is effective below the limit value and for a positive speed limit (r1084) above the limit value.

If significant overshoot occurs in the maximum speed range (e.g. due to load shedding), you are advised to increase the dynamic response of the speed controller (if possible). If this is insufficient, the hysteresis p2162 can only be increased by more than 10% of the rated speed when the maximum speed (p0322) of the motor is sufficiently greater than the speed limit p1082.

## p2163[0...n] Speed threshold 4 / n_thresh val 4

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,5 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 8011 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [rpm] | 210000.00 [rpm] | 90.00 [rpm] |

**Description:** Sets the speed threshold value for the "speed setpoint - actual value deviation in tolerance t_off" signal/message (BO: r2197.7).

**Dependency:** Refer to: p2164, p2166, r2197

## p2164[0...n] Hysteresis speed 4 / n_hysteresis 4

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,5 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 8011 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [rpm] | 200.00 [rpm] | 2.00 [rpm] |

**Description:** Sets the hysteresis speed (bandwidth) for the "speed setpoint - actual value deviation in tolerance t_off" signal/message (BO: r2197.7).

**Dependency:** Refer to: p2163, p2166, r2197

## p2166[0...n] Off delay n_act = n_set / t_del_off n_i=n_so

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8011 |
| **Min** | **Max** | **Factory setting** |
| 0.0 [ms] | 10000.0 [ms] | 200.0 [ms] |

**Description:** Sets the switch-off delay time for the "speed setpoint - actual value deviation in tolerance t_off" signal/message (BO: r2197.7).

**Dependency:** Refer to: p2163, p2164, r2197

## p2167[0...n] Switch-on delay n_act = n_set / t_on n_act=n_set

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8011 |
| **Min** | **Max** | **Factory setting** |
| 0.0 [ms] | 10000.0 [ms] | 200.0 [ms] |

**Description:** Sets the switch-on delay for the "speed setpoint - actual value deviation in tolerance t_on" signal/message (BO: r2199.4).

## r2169 CO: Actual speed smoothed signals / n_act smth message

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2000 | **Dyn. index:** - |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 8010 |
| **Min** | **Max** | **Factory setting** |
| - [rpm] | - [rpm] | - [rpm] |

**Description:** Display and connector output of the smoothed speed actual value for messages.

**Dependency:** Refer to: p2153

## p2170[0...n] Current threshold value / I_thres

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,5 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** p2002 | **Dyn. index:** DDS, p0180 |
| **Units group:** 6_2 | **Unit selection:** p0505 | **Func. diagram:** 8020 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [Arms] | 10000.00 [Arms] | 0.00 [Arms] |

**Description:** Sets the absolute current threshold for the messages.
"I_act >= I_threshold p2170" (BO: r2197.8)
"I_act < I_threshold p2170" (BO: r2198.8)

**Dependency:** Refer to: p2171

## p2171[0...n] Current threshold value reached delay time / I_thresh rch t_del

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8020 |
| **Min** | **Max** | **Factory setting** |
| 0 [ms] | 10000 [ms] | 10 [ms] |

**Description:** Sets the delay time for the comparison of the current actual value (r0068) with the current threshold value (p2170).

**Dependency:** Refer to: p2170

## p2172[0...n] DC link voltage threshold value / Vdc thresh val

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** p2001 | **Dyn. index:** DDS, p0180 |
| **Units group:** 5_2 | **Unit selection:** p0505 | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 [V] | 2000 [V] | 800 [V] |

**Description:** Sets the DC link voltage threshold value for the following messages:
"Vdc_act <= Vdc_threshold p2172" (BO: r2197.9)
"Vdc_act > Vdc_threshold p2172" (BO: r2197.10)

**Dependency:** Refer to: p2173

## p2173[0...n] DC link voltage comparison delay time / t_del Vdc

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 [ms] | 10000 [ms] | 10 [ms] |

**Description:** Sets the delay time for the comparison of the DC link voltage r0070 with the threshold value p2172.

**Dependency:** Refer to: p2172

## p2175[0...n] Motor blocked speed threshold / Mot lock n_thresh

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,5 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 8012 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [rpm] | 210000.00 [rpm] | 120.00 [rpm] |

**Description:** Sets the speed threshold for the message "Motor blocked" (BO: r2198.6).

**Dependency:** Refer to: p0500, p2177, r2198

**Note:** The following applies for encoderless vector control for induction motors:

At low speeds in open-loop speed controlled operation (see p1755, p1756), a blocked motor cannot be detected.

## p2177[0...n] Motor blocked delay time / Mot lock t_del

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,5 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8012 |
| **Min** | **Max** | **Factory setting** |
| 0.000 [s] | 65.000 [s] | 3.000 [s] |

**Description:** Sets the delay time for the message "Motor blocked" (BO: r2198.6).

**Dependency:** Refer to: p0500, p2175, r2198

**Note:** The following applies for sensorless vector control:

At low speeds a locked motor can only be detected if no change is made to open-loop speed controlled operation. If this is the case, the value in p2177 must be reduced accordingly (p2177 < p1758) before time p2177 has elapsed in order to detect the locked state reliably.

As countermeasure, it is generally also possible to set p1750.6. This is only not permitted if the drive is slowly reversed by the load at the torque limit (speed below p1755 for longer than p1758).

## p2178[0...n] Motor stalled delay time / Mot stall t_del

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8012 |
| **Min** | **Max** | **Factory setting** |
| 0.000 [s] | 10.000 [s] | 0.010 [s] |

**Description:** Sets the delay time for the message "Motor stalled" (BO: r2198.7).

**Dependency:** Refer to: r2198

**Note:** In the open-loop speed controlled operating range (see p1755, p1756), vector control stall monitoring depends on threshold p1745.

At higher speeds, the difference between flux setpoint r0083 and flux actual value r0084 is monitored.

## p2179[0...n] Output load identification current limit / Outp_ld iden I_lim

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,5 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** p2002 | **Dyn. index:** DDS, p0180 |
| **Units group:** 6_2 | **Unit selection:** p0505 | **Func. diagram:** 8020 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [Arms] | 1000.00 [Arms] | 0.00 [Arms] |

**Description:** Sets the current limit for output load identification.
A missing output load is displayed using the "Output load not available" message (r2197.11 = 1).
This message is output with a delay time (p2180).

**Dependency:** Refer to: p2180

**Notice:** For synchronous motors the output current can be almost zero under no load conditions.

**Note:** Missing output load is signaled in the following cases:
- the motor is not connected.
- a phase failure has occurred.

## p2180[0...n] Output load detection delay time / Out_load det t_del

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8020 |
| **Min** | **Max** | **Factory setting** |
| 0 [ms] | 10000 [ms] | 2000 [ms] |

**Description:** Sets the delay time for the message "output load not available" (r2197.11 = 1).

**Dependency:** Refer to: p2179

## p2181[0...n] Load monitoring response / Load monit resp

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8013 |
| **Min** | **Max** | **Factory setting** |
| 0 | 6 | 0 |

**Description:** Sets the response when evaluating the load monitoring.

**Value:**
0: Load monitoring disabled
1: A07920 for torque/speed too low
2: A07921 for torque/speed too high
3: A07922 for torque/speed out of tolerance
4: F07923 for torque/speed too low
5: F07924 for torque/speed too high
6: F07925 for torque/speed out of tolerance

**Dependency:** Refer to: p2182, p2183, p2184, p2185, p2186, p2187, p2188, p2189, p2190, p2192, p2193, r2198, p3230, p3231

**Note:** The response to the faults F07923 ... F07925 can be set.
This parameter setting has no effect on the production of fault F07936.

## p2182[0...n] Load monitoring speed threshold value 1 / n_thresh 1

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 8013 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [rpm] | 210000.00 [rpm] | 150.00 [rpm] |

**Description:** Sets the speed/torque envelope curve for load monitoring.
The envelope curve (upper and lower envelope curve) is defined as follows based on 3 speed thresholds:
p2182 (n_threshold 1) --> p2185 (M_threshold 1, upper), p2186 (M_threshold 1, lower)
p2183 (n_threshold 2) --> p2187 (M_threshold 2, upper), p2188 (M_threshold 2, lower)
p2184 (n_threshold 3) --> p2189 (M_threshold 3, upper), p2190 (M_threshold 3, lower)

**Dependency:** The following applies: p2182 < p2183 < p2184

Refer to: p2183, p2184, p2185, p2186

**Note:** In order that the load monitoring can reliably respond, the speed threshold p2182 should always be set lower than the minimum motor speed to be monitored.

## p2183[0...n] Load monitoring speed threshold value 2 / n_thresh 2

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 8013 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [rpm] | 210000.00 [rpm] | 900.00 [rpm] |

**Description:** Sets the speed/torque envelope curve for load monitoring.

The envelope curve (upper and lower envelope curve) is defined as follows based on 3 speed thresholds:

p2182 (n_threshold 1) --> p2185 (M_threshold 1, upper), p2186 (M_threshold 1, lower)

p2183 (n_threshold 2) --> p2187 (M_threshold 2, upper), p2188 (M_threshold 2, lower)

p2184 (n_threshold 3) --> p2189 (M_threshold 3, upper), p2190 (M_threshold 3, lower)

**Dependency:** The following applies: p2182 < p2183 < p2184

Refer to: p2182, p2184, p2187, p2188

## p2184[0...n] Load monitoring speed threshold value 3 / n_thresh 3

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 8013 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [rpm] | 210000.00 [rpm] | 1500.00 [rpm] |

**Description:** Sets the speed/torque envelope curve for load monitoring.

The envelope curve (upper and lower envelope curve) is defined as follows based on 3 speed thresholds:

p2182 (n_threshold 1) --> p2185 (M_threshold 1, upper), p2186 (M_threshold 1, lower)

p2183 (n_threshold 2) --> p2187 (M_threshold 2, upper), p2188 (M_threshold 2, lower)

p2184 (n_threshold 3) --> p2189 (M_threshold 3, upper), p2190 (M_threshold 3, lower)

**Dependency:** The following applies: p2182 < p2183 < p2184

Refer to: p2182, p2183, p2189, p2190

**Note:** In order that the load monitoring can reliably respond, the speed threshold p2184 should always be set higher than the maximum motor speed to be monitored.

## p2185[0...n] Load monitoring torque threshold 1 upper / M_thresh 1 upper

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** 7_1 | **Unit selection:** p0505 | **Func. diagram:** 8013 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [Nm] | 20000000.00 [Nm] | 10000000.00 [Nm] |

**Description:** Sets the speed/torque envelope curve for load monitoring.

**Dependency:** The following applies: p2185 > p2186

Refer to: p2182, p2186

**Note:** The upper envelope curve is defined by p2185, p2187 and p2189.

## p2186[0...n] Load monitoring torque threshold 1 lower / M_thresh 1 lower

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** 7_1 | **Unit selection:** p0505 | **Func. diagram:** 8013 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [Nm] | 20000000.00 [Nm] | 0.00 [Nm] |

**Description:** Sets the speed/torque envelope curve for load monitoring.

**Dependency:** The following applies: p2186 < p2185
Refer to: p2182, p2185

**Note:** The lower envelope curve is defined by p2186, p2188 and p2190.

## p2187[0...n] Load monitoring torque threshold 2 upper / M_thresh 2 upper

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** 7_1 | **Unit selection:** p0505 | **Func. diagram:** 8013 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [Nm] | 20000000.00 [Nm] | 10000000.00 [Nm] |

**Description:** Sets the speed/torque envelope curve for load monitoring.

**Dependency:** The following applies: p2187 > p2188
Refer to: p2183, p2188

**Note:** The upper envelope curve is defined by p2185, p2187 and p2189.

## p2188[0...n] Load monitoring torque threshold 2 lower / M_thresh 2 lower

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** 7_1 | **Unit selection:** p0505 | **Func. diagram:** 8013 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [Nm] | 20000000.00 [Nm] | 0.00 [Nm] |

**Description:** Sets the speed/torque envelope curve for load monitoring.

**Dependency:** The following applies: p2188 < p2187
Refer to: p2183, p2187

**Note:** The lower envelope curve is defined by p2186, p2188 and p2190.

## p2189[0...n] Load monitoring torque threshold 3 upper / M_thresh 3 upper

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** 7_1 | **Unit selection:** p0505 | **Func. diagram:** 8013 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [Nm] | 20000000.00 [Nm] | 10000000.00 [Nm] |

**Description:** Sets the speed/torque envelope curve for load monitoring.

**Dependency:** The following applies: p2189 > p2190
Refer to: p2184, p2190

**Note:** The upper envelope curve is defined by p2185, p2187 and p2189.

## p2190[0...n] Load monitoring torque threshold 3 lower / M_thresh 3 lower

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** 7_1 | **Unit selection:** p0505 | **Func. diagram:** 8013 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [Nm] | 20000000.00 [Nm] | 0.00 [Nm] |

**Description:** Sets the speed/torque envelope curve for load monitoring.

**Dependency:** The following applies: p2190 < p2189
Refer to: p2184, p2189

**Note:** The lower envelope curve is defined by p2186, p2188 and p2190.

## p2192[0...n] Load monitoring delay time / Load monit t_del

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8013 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [s] | 65.00 [s] | 10.00 [s] |

**Description:** Sets the delay time to evaluate the load monitoring.

## p2193[0...n] Load monitoring configuration / Load monit config

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8013 |
| **Min** | **Max** | **Factory setting** |
| 0 | 3 | 1 |

**Description:** Sets the load monitoring configuration.

**Value:**
0: Monitoring switched out
1: Monitoring torque and load drop
2: Monitoring speed and load drop
3: Monitoring load drop

**Dependency:** Refer to: p2182, p2183, p2184, p2185, p2186, p2187, p2188, p2189, p2190, p2192, r2198, p3230, p3231, p3232

## r2197.0...13 CO/BO: Status word monitoring 1 / ZSW monitor 1

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2534 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display and BICO output for the first status word of the monitoring functions.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | \|n_act\| <= n_min p1080 | Yes | No | 8020 |
| 01 | \|n_act\| <= speed threshold value 2 p2155 | Yes | No | 8010 |
| 02 | \|n_act\| > speed threshold value 2 p2155 | Yes | No | 8010 |
| 03 | n_act >= 0 | Yes | No | 8011 |
| 04 | \|n_act\| >= n_set | Yes | No | 8020 |
| 05 | \|n_act\| <= n_standstill p1226 | Yes | No | 8020 |
| 06 | \|n_act\| > n_max | Yes | No | 8010 |
| 07 | Speed setp - act val deviation in tolerance t_off | Yes | No | 8011 |
| 08 | I_act >= I_threshold value p2170 | Yes | No | 8020 |
| 09 | Vdc_act <= Vdc_threshold value p2172 | Yes | No | 8020 |
| 10 | Vdc_act > Vdc_threshold value p2172 | Yes | No | 8020 |
| 11 | Output load is not present | Yes | No | 8020 |
| 13 | \|n_act\| > n_max (F07901) | Yes | No | - |

**Notice:** Re bit 06:

When the overspeed is reached, this bit is set and F07901 output immediately following this. The bit is canceled again as soon as the next pulse inhibit is present.

**Note:** Re bit 00:

The threshold value is set in p1080 and the hysteresis in p2150.

Re bit 01, 02:

The threshold value is set in p2155 and the hysteresis in p2140.

Re bit 03:

1 signal direction of rotation positive.

0 signal: direction of rotation negative.

The hysteresis is set in p2150.

Re bit 04:
The threshold value is set in r1119 and the hysteresis in p2150.
Re bit 05:
The threshold value is set in p1266 and the delay time in p1228.
Re bit 06:
The hysteresis is set in p2162.
Re bit 07:
The threshold value is set in p2163 and the hysteresis is set in p2164.
Re bit 08:
The threshold value is set in p2170 and the delay time in p2171.
Re bit 09, 10:
The threshold value is set in p2172 and the delay time in p2173.
Re bit 11:
The threshold value is set in p2179 and the delay time in p2180.
Re bit 13:
Only for internal Siemens use.

## r2198.4...12 CO/BO: Status word monitoring 2 / ZSW monitor 2

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2536 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display and BICO output for the second status word of the monitoring functions.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 04 | \|n_set\| < p2161 | Yes | No | 8011 |
| 05 | n_set > 0 | Yes | No | 8011 |
| 06 | Motor blocked | Yes | No | 8012 |
| 07 | Motor stalled | Yes | No | 8012 |
| 08 | \|I_act\| < I_threshold value p2170 | Yes | No | 8020 |
| 11 | Load monitoring signals an alarm | Yes | No | 8013 |
| 12 | Load monitoring signals a fault condition | Yes | No | 8013 |

**Note:** Re bit 12:
This bit is reset after the fault cause disappears, even if the fault itself is still present.

## r2199.0...5 CO/BO: Status word monitoring 3 / ZSW monitor 3

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2537 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display and BICO output for the third status word of the monitoring functions.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | \|n_act\| < speed threshold value 3 | Yes | No | 8010 |
| 01 | f or n comparison value reached or exceeded | Yes | No | 8010 |
| 04 | Speed setp - act val deviation in tolerance t_on | Yes | No | 8011 |
| 05 | Ramp-up/ramp-down completed | Yes | No | 8011 |

**Note:** Re bit 00:
The speed threshold value 3 is set in p2161.
Re bit 01:
The comparison value is set in p2141. We recommend setting the hysteresis (p2142) for canceling the bit to a value lower than that in p2141. Otherwise, the bit is not reset.

**p2200[0...n]** **BI: Technology controller enable / Tec_ctrl enable**

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7958 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source to switch in/switch out the technology controller.
The technology controller is switched in with a 1 signal.

**p2201[0...n]** **CO: Technology controller fixed value 1 / Tec_ctrl fix val1**

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** DDS, p0180 |
| **Units group:** 9_1 | **Unit selection:** p0595 | **Func. diagram:** 7950, 7951 |
| **Min** | **Max** | **Factory setting** |
| -200.00 [%] | 200.00 [%] | 10.00 [%] |

**Description:** Sets the value for fixed value 1 of the technology controller.
**Dependency:** Refer to: p2220, p2221, p2222, p2223, r2224, r2229
**Notice:** A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

**p2202[0...n]** **CO: Technology controller fixed value 2 / Tec_ctr fix val 2**

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** DDS, p0180 |
| **Units group:** 9_1 | **Unit selection:** p0595 | **Func. diagram:** 7950, 7951 |
| **Min** | **Max** | **Factory setting** |
| -200.00 [%] | 200.00 [%] | 20.00 [%] |

**Description:** Sets the value for fixed value 2 of the technology controller.
**Dependency:** Refer to: p2220, p2221, p2222, p2223, r2224, r2229
**Notice:** A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

**p2203[0...n]** **CO: Technology controller fixed value 3 / Tec_ctr fix val 3**

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** DDS, p0180 |
| **Units group:** 9_1 | **Unit selection:** p0595 | **Func. diagram:** 7950, 7951 |
| **Min** | **Max** | **Factory setting** |
| -200.00 [%] | 200.00 [%] | 30.00 [%] |

**Description:** Sets the value for fixed value 3 of the technology controller.
**Dependency:** Refer to: p2220, p2221, p2222, p2223, r2224, r2229
**Notice:** A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

**p2204[0...n]** **CO: Technology controller fixed value 4 / Tec_ctr fix val 4**

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** DDS, p0180 |
| **Units group:** 9_1 | **Unit selection:** p0595 | **Func. diagram:** 7950, 7951 |
| **Min** | **Max** | **Factory setting** |
| -200.00 [%] | 200.00 [%] | 40.00 [%] |

**Description:** Sets the value for fixed value 4 of the technology controller.
**Dependency:** Refer to: p2220, p2221, p2222, p2223, r2224, r2229
**Notice:** A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

## p2205[0...n] CO: Technology controller fixed value 5 / Tec_ctr fix val 5

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** DDS, p0180 |
| **Units group:** 9_1 | **Unit selection:** p0595 | **Func. diagram:** 7950 |
| **Min** | **Max** | **Factory setting** |
| -200.00 [%] | 200.00 [%] | 50.00 [%] |

**Description:** Sets the value for fixed value 5 of the technology controller.
**Dependency:** Refer to: p2220, p2221, p2222, p2223, r2224, r2229
**Notice:** A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

## p2206[0...n] CO: Technology controller fixed value 6 / Tec_ctr fix val 6

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** DDS, p0180 |
| **Units group:** 9_1 | **Unit selection:** p0595 | **Func. diagram:** 7950 |
| **Min** | **Max** | **Factory setting** |
| -200.00 [%] | 200.00 [%] | 60.00 [%] |

**Description:** Sets the value for fixed value 6 of the technology controller.
**Dependency:** Refer to: p2220, p2221, p2222, p2223, r2224, r2229
**Notice:** A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

## p2207[0...n] CO: Technology controller fixed value 7 / Tec_ctr fix val 7

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** DDS, p0180 |
| **Units group:** 9_1 | **Unit selection:** p0595 | **Func. diagram:** 7950 |
| **Min** | **Max** | **Factory setting** |
| -200.00 [%] | 200.00 [%] | 70.00 [%] |

**Description:** Sets the value for fixed value 7 of the technology controller.
**Dependency:** Refer to: p2220, p2221, p2222, p2223, r2224, r2229
**Notice:** A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

## p2208[0...n] CO: Technology controller fixed value 8 / Tec_ctr fix val 8

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** DDS, p0180 |
| **Units group:** 9_1 | **Unit selection:** p0595 | **Func. diagram:** 7950 |
| **Min** | **Max** | **Factory setting** |
| -200.00 [%] | 200.00 [%] | 80.00 [%] |

**Description:** Sets the value for fixed value 8 of the technology controller.
**Dependency:** Refer to: p2220, p2221, p2222, p2223, r2224, r2229
**Notice:** A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

## p2209[0...n] CO: Technology controller fixed value 9 / Tec_ctr fix val 9

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** DDS, p0180 |
| **Units group:** 9_1 | **Unit selection:** p0595 | **Func. diagram:** 7950 |
| **Min** | **Max** | **Factory setting** |
| -200.00 [%] | 200.00 [%] | 90.00 [%] |

**Description:** Sets the value for fixed value 9 of the technology controller.
**Dependency:** Refer to: p2220, p2221, p2222, p2223, r2224, r2229
**Notice:** A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

## p2210[0...n] CO: Technology controller fixed value 10 / Tec_ctr fix val 10

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** DDS, p0180 |
| **Units group:** 9_1 | **Unit selection:** p0595 | **Func. diagram:** 7950 |
| **Min** | **Max** | **Factory setting** |
| -200.00 [%] | 200.00 [%] | 100.00 [%] |

**Description:** Sets the value for fixed value 10 of the technology controller.

**Dependency:** Refer to: p2220, p2221, p2222, p2223, r2224, r2229

**Notice:** A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

## p2211[0...n] CO: Technology controller fixed value 11 / Tec_ctr fix val 11

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** DDS, p0180 |
| **Units group:** 9_1 | **Unit selection:** p0595 | **Func. diagram:** 7950 |
| **Min** | **Max** | **Factory setting** |
| -200.00 [%] | 200.00 [%] | 110.00 [%] |

**Description:** Sets the value for fixed value 11 of the technology controller.

**Dependency:** Refer to: p2220, p2221, p2222, p2223, r2224, r2229

**Notice:** A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

## p2212[0...n] CO: Technology controller fixed value 12 / Tec_ctr fix val 12

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** DDS, p0180 |
| **Units group:** 9_1 | **Unit selection:** p0595 | **Func. diagram:** 7950 |
| **Min** | **Max** | **Factory setting** |
| -200.00 [%] | 200.00 [%] | 120.00 [%] |

**Description:** Sets the value for fixed value 12 of the technology controller.

**Dependency:** Refer to: p2220, p2221, p2222, p2223, r2224, r2229

**Notice:** A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

## p2213[0...n] CO: Technology controller fixed value 13 / Tec_ctr fix val 13

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** DDS, p0180 |
| **Units group:** 9_1 | **Unit selection:** p0595 | **Func. diagram:** 7950 |
| **Min** | **Max** | **Factory setting** |
| -200.00 [%] | 200.00 [%] | 130.00 [%] |

**Description:** Sets the value for fixed value 13 of the technology controller.

**Dependency:** Refer to: p2220, p2221, p2222, p2223, r2224, r2229

**Notice:** A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

## p2214[0...n] CO: Technology controller fixed value 14 / Tec_ctr fix val 14

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** DDS, p0180 |
| **Units group:** 9_1 | **Unit selection:** p0595 | **Func. diagram:** 7950 |
| **Min** | **Max** | **Factory setting** |
| -200.00 [%] | 200.00 [%] | 140.00 [%] |

**Description:** Sets the value for fixed value 14 of the technology controller.

**Dependency:** Refer to: p2220, p2221, p2222, p2223, r2224, r2229

**Notice:** A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

## p2215[0...n] CO: Technology controller fixed value 15 / Tec_ctr fix val 15

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** DDS, p0180 |
| **Units group:** 9_1 | **Unit selection:** p0595 | **Func. diagram:** 7950 |
| **Min** | **Max** | **Factory setting** |
| -200.00 [%] | 200.00 [%] | 150.00 [%] |

**Description:** Sets the value for fixed value 15 of the technology controller.

**Dependency:** Refer to: p2220, p2221, p2222, p2223, r2224, r2229

**Notice:** A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

## p2216[0...n] Technology controller fixed value selection method / Tec_ctr FixVal sel

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7950, 7951 |
| **Min** | **Max** | **Factory setting** |
| 1 | 2 | 1 |

**Description:** Sets the method to select the fixed setpoints.

**Value:**
1: Direct selection
2: Binary selection

## p2220[0...n] BI: Technology controller fixed value selection bit 0 / Tec_ctrl sel bit 0

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7950, 7951 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source to select a fixed value of the technology controller.

**Dependency:** Refer to: p2221, p2222, p2223

## p2221[0...n] BI: Technology controller fixed value selection bit 1 / Tec_ctrl sel bit 1

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7950, 7951 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source to select a fixed value of the technology controller.

**Dependency:** Refer to: p2220, p2222, p2223

## p2222[0...n] BI: Technology controller fixed value selection bit 2 / Tec_ctrl sel bit 2

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7950, 7951 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source to select a fixed value of the technology controller.

**Dependency:** Refer to: p2220, p2221, p2223

## p2223[0...n] BI: Technology controller fixed value selection bit 3 / Tec_ctrl sel bit 3

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7950, 7951 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source to select a fixed value of the technology controller.

**Dependency:** Refer to: p2220, p2221, p2222

## r2224 CO: Technology controller fixed value effective / Tec_ctr FixVal eff

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** 9_1 | **Unit selection:** p0595 | **Func. diagram:** 7950, 7951 |
| **Min** | **Max** | **Factory setting** |
| - [%] | - [%] | - [%] |

**Description:** Display and connector output for the selected and active fixed value of the technology controller.

**Dependency:** Refer to: r2229

## r2225.0 CO/BO: Technology controller fixed value selection status word / Tec_ctr FixVal ZSW

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display and BICO output for the status word of the fixed value selection of the technology controller.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Technology controller fixed value selected | Yes | No | 7950, 7951 |

## r2229 Technology controller number actual / Tec_ctrl No. act

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7950 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the number of the selected fixed setpoint of the technology controller.

**Dependency:** Refer to: r2224

## p2230[0...n] Technology controller motorized potentiometer configuration / Tec_ctr mop config

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7954 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0000 0100 bin |

**Description:** Sets the configuration for the motorized potentiometer of the technology controller.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Data save active | Yes | No | - |
| 02 | Initial rounding-off active | Yes | No | - |
| 03 | Non-volatile data save active for p2230.0 = 1 | Yes | No | - |
| 04 | Ramp-function generator always active | Yes | No | - |

**Dependency:** Refer to: r2231, p2240

**Notice:** For p0014 = 1, the following applies:

After the value has been modified, no further parameter modifications can be made and the status is shown in r3996. Modifications can be made again when r3996 = 0.

**Note:** Re bit 00:

0: The setpoint for the motorized potentiometer is not saved and after ON is entered using p2240.

1: The setpoint for the motorized potentiometer is saved and after ON is entered using r2231. In order to save in a non-volatile fashion, bit 03 should be set to 1.

Re bit 02:

0: Without initial rounding-off

1: With initial rounding-off.

The selected ramp-up/down time is correspondingly exceeded. The initial rounding-off is a sensitive way of specifying small changes (progressive reaction when keys are pressed). The jerk for initial rounding is independent of the ramp-up time and only depends on the selected maximum value (p2237).

It is calculated as follows:

r = 0.0001 x max(p2237, |p2238| ) [%] / 0.13^2 [s^2]

The jerk is effective until the maximum acceleration is reached (a_max = p2237 [%] / p2247 [s] or a_max = p2238 [%] / p2248 [s]), after which the drive continues to run linearly with constant acceleration.

The higher the maximum acceleration (the lower that p2247 is), the longer the ramp-up time increases with respect to the set ramp-up time.

Re bit 03:

0: Non-volatile data save de-activated.

1. The setpoint for the motorized potentiometer is saved in a non-volatile fashion (for p2230.0 = 1).

Re bit 04:

When the bit is set, the ramp-function generator is computed independent of the pulse enable. The actual output value of the motorized potentiometer is always in r2250.

## r2231 Technology controller motorized potentiometer setpoint memory / Tec_ctrl mop mem

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** 9_1 | **Unit selection:** p0595 | **Func. diagram:** 7954 |
| **Min** | **Max** | **Factory setting** |
| - [%] | - [%] | - [%] |

**Description:** Displays the setpoint memory for the motorized potentiometer of the technology controller.

For p2230.0 = 1, the last setpoint that was saved is entered after ON.

**Dependency:** Refer to: p2230

## p2235[0...n] BI: Technology controller motorized potentiometer raise setpoint / Tec_ctrl mop raise

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7954 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source to continually increase the setpoint for the motorized potentiometer of the technology controller.

The setpoint change (CO: r2250) depends on the set ramp-up time (p2247) and the duration of the signal that is present (BI: p2235).

**Dependency:** Refer to: p2236

## p2236[0...n] BI: Technology controller motorized potentiometer lower setpoint / Tec_ctrl mop lower

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7954 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source to continually reduce the setpoint for the motorized potentiometer of the technology controller.
The setpoint change (CO: r2250) depends on the set ramp-down time (p2248) and the duration of the signal that is present (BI: p2236).

**Dependency:** Refer to: p2235

## p2237[0...n] Technology controller motorized potentiometer maximum value / Tec_ctrl mop max

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** 9_1 | **Unit selection:** p0595 | **Func. diagram:** 7954 |
| **Min** | **Max** | **Factory setting** |
| -200.00 [%] | 200.00 [%] | 100.00 [%] |

**Description:** Sets the maximum value for the motorized potentiometer of the technology controller.

**Dependency:** Refer to: p2238

## p2238[0...n] Technology controller motorized potentiometer minimum value / Tec_ctrl mop min

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** 9_1 | **Unit selection:** p0595 | **Func. diagram:** 7954 |
| **Min** | **Max** | **Factory setting** |
| -200.00 [%] | 200.00 [%] | -100.00 [%] |

**Description:** Sets the minimum value for the motorized potentiometer of the technology controller.

**Dependency:** Refer to: p2237

## p2240[0...n] Technology controller motorized potentiometer starting value / Tec_ctrl mop start

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** 9_1 | **Unit selection:** p0595 | **Func. diagram:** 7954 |
| **Min** | **Max** | **Factory setting** |
| -200.00 [%] | 200.00 [%] | 0.00 [%] |

**Description:** Sets the starting value for the motorized potentiometer of the technology controller.
For p2230.0 = 0, this setpoint is entered after ON.

**Dependency:** Refer to: p2230

## r2245 CO: Technology controller mot. potentiometer setpoint before RFG / Tec_ctr mop befRFG

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** 9_1 | **Unit selection:** p0595 | **Func. diagram:** 7954 |
| **Min** | **Max** | **Factory setting** |
| - [%] | - [%] | - [%] |

**Description:** Sets the effective setpoint in front of the internal motorized potentiometer ramp-function generator of the technology controller.

**Dependency:** Refer to: r2250

## p2247[0...n] Technology controller motorized potentiometer ramp-up time / Tec_ctr mop t_r-up

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7954 |
| **Min** | **Max** | **Factory setting** |
| 0.0 [s] | 1000.0 [s] | 10.0 [s] |

**Description:** Sets the ramp-up time for the internal ramp-function generator for the motorized potentiometer of the technology controller.

**Dependency:** Refer to: p2248

**Note:** The time is referred to 100 %.

When the initial rounding-off is activated (p2230.2 = 1) the ramp-up is correspondingly extended.

## p2248[0...n] Technology controller motorized potentiometer ramp-down time / Tec_ctrMop t_rdown

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7954 |
| **Min** | **Max** | **Factory setting** |
| 0.0 [s] | 1000.0 [s] | 10.0 [s] |

**Description:** Sets the ramp-down time for the internal ramp-function generator for the motorized potentiometer of the technology controller.

**Dependency:** Refer to: p2247

**Note:** The time is referred to 100 %.

When the initial rounding-off is activated (p2230.2 = 1) the ramp-down is correspondingly extended.

## r2250 CO: Technology controller motorized potentiometer setpoint after RFG / Tec_ctr mop aftRFG

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** 9_1 | **Unit selection:** p0595 | **Func. diagram:** 7954 |
| **Min** | **Max** | **Factory setting** |
| - [%] | - [%] | - [%] |

**Description:** Displays the effective setpoint after the internal ramp-function generator for the motorized potentiometer of the technology controller.

**Dependency:** Refer to: r2245

## p2251 Technology controller mode / Tec_ctrl mode

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7958 |
| **Min** | **Max** | **Factory setting** |
| 0 | 0 | 0 |

**Description:** Sets the mode for using the technology controller output.

**Value:** 0: Technology controller as main speed setpoint

**Dependency:** p2251 = 0 is only effective if the enable signal of the technology controller is interconnected (p2200 > 0).

## p2253[0...n] CI: Technology controller setpoint 1 / Tec_ctrl setp 1

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7958 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for the setpoint 1 of the technology controller.

**Dependency:** Refer to: p2254, p2255

## p2254[0...n] CI: Technology controller setpoint 2 / Tec_ctrl setp 2

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7958 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for the setpoint 2 of the technology controller.

**Dependency:** Refer to: p2253, p2256

## p2255 Technology controller setpoint 1 scaling / Tec_ctrl set1 scal

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7958 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [%] | 100.00 [%] | 100.00 [%] |

**Description:** Sets the scaling for the setpoint 1 of the technology controller.

**Dependency:** Refer to: p2253

## p2256 Technology controller setpoint 2 scaling / Tec_ctrl set2 scal

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7958 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [%] | 100.00 [%] | 100.00 [%] |

**Description:** Sets the scaling for the setpoint 2 of the technology controller.

**Dependency:** Refer to: p2254

## p2257 Technology controller ramp-up time / Tec_ctrl t_ramp-up

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7958 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [s] | 650.00 [s] | 1.00 [s] |

**Description:** Sets the ramp-up time of the technology controller.

**Dependency:** Refer to: p2258

**Note:** The ramp-up time is referred to 100 %.

## p2258 Technology controller ramp-down time / Tec_ctrl t_ramp-dn

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7958 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [s] | 650.00 [s] | 1.00 [s] |

**Description:** Sets the ramp-down time of the technology controller.

**Dependency:** Refer to: p2257

**Note:** The ramp-down time is referred to 100 %.

## r2260 CO: Technology controller setpoint after ramp-function generator / Tec_ctr set aftRFG

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** 9_1 | **Unit selection:** p0595 | **Func. diagram:** 7958 |
| **Min** | **Max** | **Factory setting** |
| - [%] | - [%] | - [%] |

**Description:** Sets the setpoint after the ramp-function generator of the technology controller.

## p2261 Technology controller setpoint filter time constant / Tec_ctrl set T

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7958 |
| **Min** | **Max** | **Factory setting** |
| 0.000 [s] | 60.000 [s] | 0.000 [s] |

**Description:** Sets the time constant for the setpoint filter (PT1) of the technology controller.

## r2262 CO: Technology controller setpoint after filter / Tec_ctr set aftFlt

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** 9_1 | **Unit selection:** p0595 | **Func. diagram:** 7958 |
| **Min** | **Max** | **Factory setting** |
| - [%] | - [%] | - [%] |

**Description:** Display and connector output for the smoothed setpoint after the setpoint filter (PT1) of the technology controller.

## p2263 Technology controller type / Tec_ctrl type

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7958 |
| **Min** | **Max** | **Factory setting** |
| 0 | 1 | 0 |

**Description:** Sets the type of technology controller.

**Value:**
0: D component in the actual value signal
1: D component in the fault signal

## p2264[0...n] CI: Technology controller actual value / Tec_ctrl act val

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7958 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for the actual value of the technology controller.

## p2265 Technology controller actual value filter time constant / Tec_ctrl act T

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7958 |
| **Min** | **Max** | **Factory setting** |
| 0.000 [s] | 60.000 [s] | 0.000 [s] |

**Description:** Sets the time constant for the actual value filter (PT1) of the technology controller.

## r2266 CO: Technology controller actual value after filter / Tec_ctr act aftFlt

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** 9_1 | **Unit selection:** p0595 | **Func. diagram:** 7958 |
| **Min** | **Max** | **Factory setting** |
| - [%] | - [%] | - [%] |

**Description:** Display and connector output for the smoothed actual value after the filter (PT1) of the technology controller.

## p2267 Technology controller upper limit actual value / Tec_ctrl u_lim act

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** 9_1 | **Unit selection:** p0595 | **Func. diagram:** 7958 |
| **Min** | **Max** | **Factory setting** |
| -200.00 [%] | 200.00 [%] | 100.00 [%] |

**Description:** Sets the upper limit for the actual value signal of the technology controller.

**Dependency:** Refer to: p2264, p2265, p2271

**Notice:** If the actual value exceeds this upper limit, this results in fault F07426.

## p2268 Technology controller lower limit actual value / Tec_ctrl l_lim act

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** 9_1 | **Unit selection:** p0595 | **Func. diagram:** 7958 |
| **Min** | **Max** | **Factory setting** |
| -200.00 [%] | 200.00 [%] | -100.00 [%] |

**Description:** Sets the lower limit for the actual value signal of the technology controller.

**Dependency:** Refer to: p2264, p2265, p2271

**Notice:** If the actual value falls below this lower limit, this results in fault F07426.

## p2269 Technology controller gain actual value / Tech_ctrl gain act

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7958 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [%] | 500.00 [%] | 100.00 [%] |

**Description:** Sets the scaling factor for the actual value of the technology controller.

**Dependency:** Refer to: p2264, p2265, p2267, p2268, p2271

**Note:** For 100%, the actual value is not changed.

## p2270 Technology controller actual value function / Tec_ctr ActVal fct

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7958 |
| **Min** | **Max** | **Factory setting** |
| 0 | 3 | 0 |

**Description:** Setting to use an arithmetic function for the actual value signal of the technology controller.

**Value:**
0: No function
1: Root function (root from x)
2: Square function (x * x)
3: Cube function (x * x * x)

**Dependency:** Refer to: p2264, p2265, p2267, p2268, p2269, p2271

## p2271 Technology controller actual value inversion (sensor type) / Tech_ctrl act inv

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7958 |
| **Min** | **Max** | **Factory setting** |
| 0 | 1 | 0 |

**Description:** Setting to invert the actual value signal of the technology controller.

The inversion depends on the sensor type for the actual value signal.

**Value:**
0: No inversion
1: Inversion actual value signal

**Caution:** If the actual value inversion is incorrectly selected, then the closed-loop control with the technology controller can become unstable and can oscillate!

**Note:** The correct setting can be determined as follows:

- inhibit the technology controller (p2200 = 0).

- increase the motor speed and in so doing, measure the actual value signal of the technology controller.

--> If the actual value increases as the motor speed increases, then p2271 should be set to 0 (no inversion).

--> If the actual value decreases as the motor speed increases, then p2271 should be set to 1 (the actual value signal is inverted).

## r2272 CO: Technology controller actual value scaled / Tech_ctrl act scal

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** 9_1 | **Unit selection:** p0595 | **Func. diagram:** 7958 |
| **Min** | **Max** | **Factory setting** |
| - [%] | - [%] | - [%] |

**Description:** Display and connector output for the scaled actual value signal of the technology controller.

**Dependency:** Refer to: p2264, p2265, r2266, p2267, p2268, p2269, p2270, p2271

## r2273 CO: Technology controller error / Tec_ctrl error

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** 9_1 | **Unit selection:** p0595 | **Func. diagram:** 7958 |
| **Min** | **Max** | **Factory setting** |
| - [%] | - [%] | - [%] |

**Description:** Displays the error (system deviation) between the setpoint and actual value of the technology controller.

**Dependency:** Refer to: p2263

## p2274 Technology controller differentiation time constant / Tec_ctrl D comp T

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7958 |
| **Min** | **Max** | **Factory setting** |
| 0.000 [s] | 60.000 [s] | 0.000 [s] |

**Description:** Sets the time constant for the differentiation (D component) of the technology controller.

**Note:** p2274 = 0: Differentiation is disabled.

## p2280 Technology controller proportional gain / Tec_ctrl Kp

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7958 |
| **Min** | **Max** | **Factory setting** |
| 0.000 | 1000.000 | 1.000 |

**Description:** Sets the proportional gain (P component) of the technology controller.

**Note:** p2280 = 0: The proportional gain is disabled.

## p2285 Technology controller integral time / Tec_ctrl Tn

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7958 |
| **Min** | **Max** | **Factory setting** |
| 0.000 [s] | 10000.000 [s] | 30.000 [s] |

**Description:** Sets the integral time (I component, integrating time constant) of the technology controller.

**Notice:** The following applies for p2251 = 0:

If the output of the technology controller lies within the range of a suppression (skip) bandwidth (p1091 ... p1094, p1101) or below the minimum speed (p1080), the integral component of the controller is held so that the controller temporarily works as a P controller. This is necessary in order to prevent the controller from behaving in an unstable manner, as the ramp-function generator switches to the parameterized up and down ramps (p1120, p1121) at the same time in order to avoid setpoint steps. This state can be exited or avoided by changing the controller setpoint or by using the start speed (= minimum speed).

**Note:** When the controller output reaches the limit, the I component of the controller is held.

p2285 = 0:

The integral time is disabled and the I component of the controller is reset.

## p2286[0...n] BI: Hold technology controller integrator / Tec_ctr integ hold

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7958 |
| **Min** | **Max** | **Factory setting** |
| - | - | 56.13 |

**Description:** Sets the signal source to hold the integrator for the technology controller.

## p2289[0...n] CI: Technology controller pre-control signal / Tec_ctr prectr_sig

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7958 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for the pre-control signal of the technology controller.

## p2291 CO: Technology controller maximum limiting / Tec_ctrl max_lim

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7958 |
| **Min** | **Max** | **Factory setting** |
| -200.00 [%] | 200.00 [%] | 100.00 [%] |

**Description:** Sets the maximum limit of the technology controller.

**Dependency:** Refer to: p2292

**Caution:** The maximum limit must always be greater than the minimum limit (p2291 > p2292).

## p2292 CO: Technology controller minimum limiting / Tec_ctrl min_lim

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7958 |
| **Min** | **Max** | **Factory setting** |
| -200.00 [%] | 200.00 [%] | 0.00 [%] |

**Description:** Sets the minimum limit of the technology controller.

**Dependency:** Refer to: p2291

**Caution:** The maximum limit must always be greater than the minimum limit (p2291 > p2292).

## p2293 Technology controller ramp-up/ramp-down time / Tec_ctr t_RU/RD

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7958 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [s] | 100.00 [s] | 1.00 [s] |

**Description:** Sets the ramping time for the output signal of the technology controller.

**Dependency:** Refer to: p2291, p2292

**Note:** The time refers to the set maximum and minimum limits (p2291, p2292).

## r2294 CO: Technology controller output signal / Tec_ctrl outp_sig

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7958 |
| **Min** | **Max** | **Factory setting** |
| - [%] | - [%] | - [%] |

**Description:** Display and connector output for the output signal of the technology controller.

**Dependency:** Refer to: p2295

## p2295 CO: Technology controller output scaling / Tec_ctrl outp scal

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7958 |
| **Min** | **Max** | **Factory setting** |
| -100.00 [%] | 100.00 [%] | 100.00 [%] |

**Description:** Sets the scaling for the output signal of the technology controller.

## p2296[0...n] CI: Technology controller output scaling / Tec_ctrl outp scal

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7958 |
| **Min** | **Max** | **Factory setting** |
| - | - | 2295[0] |

**Description:** Sets the signal source for the scaling value of the technology controller.

**Dependency:** Refer to: p2295

## p2297[0...n] CI: Technology controller maximum limit signal source / Tec_ctrMaxLimS_src

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7958 |
| **Min** | **Max** | **Factory setting** |
| - | - | 1084[0] |

**Description:** Sets the signal source for the maximum limiting of the technology controller.

**Dependency:** Refer to: p2291

**Note:** In order that the output of the technology controller does not exceed the maximum speed limit, its upper limit p2297 should be connected to the actual maximum speed r1084.

## p2298[0...n] CI: Technology controller minimum limit signal source / Tec_ctrl min_l s_s

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7958 |
| **Min** | **Max** | **Factory setting** |
| - | - | 2292[0] |

**Description:** Sets the signal source for the minimum limiting of the technology controller.

**Dependency:** Refer to: p2292

**Note:** If the technology controller is rotated in a negative direction in mode p2251 = 0, its lower limit p2298 should be connected to the actual minimum speed r1087.

## p2299[0...n] CI: Technology controller limit offset / Tech_ctrl lim offs

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7958 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for the offset of the output limiting of the technology controller.

## p2302 Technology controller output signal starting value / Tec_ctr start val

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7958 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [%] | 200.00 [%] | 0.00 [%] |

**Description:** Sets the start value for the output of the technology controller.

If the drive is switched on and the technology controller is already enabled (see p2200, r0056.3), then its output signal r2294 first goes to the start value p2302, before the controller starts to operate.

**Dependency:** The starting value is only effective in the mode "technology controller as main speed setpoint" (p2251 = 0).

If the technology controller is first enabled when the drive is switched on, a start speed remains ineffective, and the controller output starts with the actual setpoint speed of the ramp-function generator.

**Note:** If the technology controller operates on the speed/setpoint channel (p2251 = 0), then the starting value is interpreted as the starting speed and when operation is enabled, is connected to the output of the technology controller (r2294).

If fault F07426 "technology controller actual value limited" occurs while ramping up to the starting value and if the associated reaction has been set to "NONE" (see p2100, p2101), the starting value is kept as the speed setpoint instead of a switch to closed-loop control operation.

## p2306 Technology controller fault signal inversion / Tec_ctrl fault inv

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7958 |
| **Min** | **Max** | **Factory setting** |
| 0 | 1 | 0 |

**Description:** Setting to invert the fault signal of the technology controller.

The setting depends on the type of control loop.

**Value:**
0: No inversion
1: Inversion

**Caution:** If the actual value inversion is incorrectly selected, then the closed-loop control with the technology controller can become unstable and can oscillate!

**Note:** The correct setting can be determined as follows:

- inhibit the technology controller (p2200 = 0).
- increase the motor speed and in so doing, measure the actual value signal (of the technology controller).
- if the actual value increases with increasing motor speed, then the inversion should be switched out.
- if the actual value decreases with increasing motor speed, then the inversion should be set.

If value = 0:

The drive reduces the output speed when the actual value rises (e.g. for heating fans, intake pump, compressor).

If value = 1:

The drive increases the output speed when the actual value increases (e.g. for cooling fans, discharge pumps).

## r2344 CO: Technology controller last speed setpoint (smoothed) / Tec_ctrl n_setp_sm

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7958 |
| **Min** | **Max** | **Factory setting** |
| - [%] | - [%] | - [%] |

**Description:** Displays the smoothed speed setpoint of the technology controller prior to switching to operation with fault response (see p2345).

**Dependency:** Refer to: p2345

**Note:** Smoothing time = 10 s

## p2345 Technology controller fault response / Tech_ctrl flt resp

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7958 |
| **Min** | **Max** | **Factory setting** |
| 0 | 2 | 0 |

**Description:** Sets the response of the technology controller to the occurrence of fault F07426 (technology controller actual value limited).

The fault response is executed if status bit 8 or 9 in the technology controller status word r2349 is set. If both status bits are zero, a switch back to technology controller operation will follow.

**Value:**
0: Function inhibited
1: On fault: Changeover to r2344 (or p2302)
2: On fault: Changeover to p2215

**Dependency:** The parameterized fault response is only effective if the technology controller mode is set to p2251 = 0 (technology controller as main setpoint).

Refer to: p2267, p2268, r2344

**Notice:** Dependent upon the application, the changing over of the setpoint when fault F07426 occurs can lead to the fault condition disappearing and the re-activation of the technology controller. This can repeat itself and cause limit oscillations. In this case, a different fault response or a different fixed setpoint 15 for the fault response p2345 = 2 should be selected.

**Note:** The parameterized fault response can only be achieved if the default fault response of the technology controller fault F07426 is set to "NONE" (see p2100, p2101). If a fault response other than "NONE" is entered in p2101 for F07426, p2345 must be set to zero.

If the fault occurs during ramping up to the starting setpoint p2302, this starting setpoint is retained as the final value (there is no changeover to the fault response setpoint).

## r2349.0...12 CO/BO: Technology controller status word / Tec_ctrl status

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7958 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the status word of the technology controller.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Technology controller de-activated | Yes | No | - |
| 01 | Technology controller limited | Yes | No | - |
| 02 | Technology controller motorized potentiometer limited max | Yes | No | - |
| 03 | Technology controller motorized potentiometer limited min | Yes | No | - |
| 04 | Technology controller speed setpoint total in setpoint channel | Yes | No | - |
| 05 | Technology controller RFG bypassed in the setpoint channel | Yes | No | - |
| 06 | Technology controller starting value at the current limit | No | Yes | - |
| 08 | Technology controller actual value at the minimum | Yes | No | - |
| 09 | Technology controller actual value at the maximum | Yes | No | - |
| 10 | Technology controller output at the minimum | Yes | No | - |
| 11 | Technology controller output at the maximum | Yes | No | - |
| 12 | Fault response active | Yes | No | - |

## p2370[0...n] Closed-loop cascade control enable / Csc_ctrl enab

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 1 | 0 |

**Description:** Sets the signal source to switch in/switch out the closed-loop cascade control function.

1 signal: The function is switched in.

**Value:**
0: Closed-loop cascade control inhibited
1: Closed-loop cascade control enabled

**Note:** The technology controller must be activated (p2200) and configured (p2251 = 0) in order to use the function.

Negative speed setpoints should be excluded.

## p2371 Closed-loop cascade control configuration / Csc_ctrl config

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 8 | 0 |

**Description:** Parameter for configuring the connection and disconnection of external motors to and from the line voltage.

Connecting external motors to the line voltage enables up to three additional drives to be controlled by the technology controller in addition to the main drive. The complete system, therefore, comprises one closed-loop-controlled main drive and up to three other drives, which can be controlled via contactors or motor starters. The contactors or motor starters are switched by the converter's digital outputs (see also r2379).

Switching-in motor:

If the main drive is operated at maximum speed and the deviation at the technology controller input increases further, the control will in addition connect external motors M1 through M3 to the line voltage. At the same time, the main drive is ramped down to the closed-loop cascade control switch-in/switch-out speed (p2378) via the down ramp, so that the total output power can be kept as constant as possible. During this time the technology controller is switched off.

Switching-off the motor:

If the main drive is operated at minimum speed and the deviation at the technology controller input decreases further, the control will disconnect external motors M1 through M3 from the line voltage. At the same time, the main drive is ramped up to the closed-loop cascade control switch-in/switch-out speed (p2378) via the up ramp, so that the total output power can be kept as constant as possible.

**Value:**
0: Closed-loop cascade control inhibited
1: M1 = 1X
2: M1 = 1X, M2 = 1X
3: M1 = 1X, M2 = 2X
4: M1 = 1X, M2 = 1X, M3 = 1X
5: M1 = 1X, M2 = 1X, M3 = 2X
6: M1 = 1X, M2 = 2X, M3 = 2X
7: M1 = 1X, M2 = 1X, M3 = 3X
8: M1 = 1X, M2 = 2X, M3 = 3X

**Dependency:** Refer to: p2372

**Note:** Selecting 2X means that a motor is switched in with twice the power (as opposed to 1X, which equates to the motor power at the converter).

## p2372 Closed-loop cascade control mode motor selection / Csc_ctrl mode

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 3 | 0 |

**Description:** Parameter for selecting the control mode for switching-in and switching-out external motors.

Selection 2 and 3 support selection options for automatically interchanging the motors, which are connected to the line supply.

**Value:**
0: Fixed sequence
1: Closed-loop cascade control after absolute operating hours
2: Automatic replacement after continuous operating hours
3: Automatic replacement after absolute operating hours

**Note:** Re p2372 = 0:

Motor selection for switching-in/switching-out follows a fixed sequence and is dependent on the closed-loop cascade control configuration (p2371).

Re p2372 = 1:

Motor selection for switching-in/switching-out is derived from the operating hours counter p2380. When switching-in, the motor with the least operating hours is connected. When switching-out, the motor with the most operating hours is disconnected.

Re p2372 = 2:

Motor selection for switching-in/switching-out is derived from the operating hours counter p2380. When switching-in, the motor with the least operating hours is connected. When switching-out, the motor with the most operating hours is disconnected.

In addition, those motors which have been in operation continuously for longer than the time set in p2381 are interchanged automatically.

If p2371 = 4 (selection of three identical motors), the switch is only performed between two motors, if the required input power of one single external motor is sufficient for the actual operating point.

Re p2372 = 3:

Motor selection for switching-in/switching-out is derived from the operating hours counter p2380. When switching-in, the motor with the least operating hours is connected. When switching-out, the motor with the most operating hours is disconnected.

In addition, those motors which have been in operation for a total time longer than that set in p2382 are interchanged automatically.

Re p2372 = 2, 3:

This automatic interchange (autochange) is only possible if the designated motor is not in operation. If all motors are in operation, the interchange will not be possible and alarm A07427 appears.

Autochange mode is only possible if p2371 = 2, 4 (motors of the same size).

## p2373 Closed-loop cascade control switch-in threshold / Csc_ctrl sw-in thr

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** 9_1 | **Unit selection:** p0595 | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.0 [%] | 200.0 [%] | 20.0 [%] |

**Description:** Threshold value for the delayed switching-in or non-delayed switching-out of external motors connected to the line. Motor switching-in is activated if the maximum speed is reached and the wait time in p2374 has expired.

**Dependency:** Refer to: p2374

## p2374 Closed-loop cascade control switch-in delay / Csc_ctrl t_in_del

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 [s] | 650 [s] | 30 [s] |

**Description:** Additional delay time for connecting external motors to the line voltage after the system deviation of the technology controller has exceeded the threshold value p2373 and the motor has reached the maximum speed.

**Dependency:** Refer to: p2373

**Note:** If the deviation at the technology controller input exceeds the overcontrol threshold p2376, the delay time is bypassed.

## p2375 Closed-loop cascade control switch-out delay / Csc_ctrl t_out_del

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 [s] | 650 [s] | 30 [s] |

**Description:** Additional delay time for the disconnection of external motors from the line after the system deviation of the technology controller has exceeded the threshold p2373 and the motor has reached the minimum speed p1080.

**Dependency:** Refer to: p2373, p2376

**Note:** If the deviation at the technology controller input exceeds the overcontrol threshold -p2376, the delay time is bypassed.

## p2376 Closed-loop cascade control overcontrol threshold / Csc_ctr ovctr_thr

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** 9_1 | **Unit selection:** p0595 | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.0 [%] | 200.0 [%] | 25.0 [%] |

**Description:** Threshold value for instantaneous switching-in or switching-out external motors.

**Note:** If the maximum speed is reached and the deviation at the technology controller input exceeds the overcontrol threshold p2376 at the same time, the delay time p2374 is bypassed and the motor is immediately switched-in (connected).

If the minimum speed is reached and the deviation at the technology controller input exceeds the overcontrol threshold -p2376 at the same time, the delay time p2375 is bypassed and the motor is immediately switched-out (disconnected).

## p2377 Closed-loop cascade control interlocking time / Csc_ctrl t_interl

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 [s] | 650 [s] | 0 [s] |

**Description:** Interlocking time during which, following the connection or disconnection of an external motor, no further motors are connected or disconnected using the closed-loop cascade control. This avoids duplicate switching operations.

## p2378 Closed-loop cascade control switch-in/switch-out speed / Csc_ctrl n_in/out

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.0 [%] | 100.0 [%] | 50.0 [%] |

**Description:** Sets the speed for the main drive, which is approached directly after an external motor has been connected or disconnected.

The parameter value refers to the maximum speed (p1082).

## r2379.0...7 CO/BO: Closed-loop cascade control status word / Csc_ctrl ZSW

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the status word of the closed-loop cascade control

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Start external motor 1 | Yes | No | - |
| 01 | Start external motor 2 | Yes | No | - |
| 02 | Start external motor 3 | Yes | No | - |
| 03 | Switching-in mot | Yes | No | - |
| 04 | Switch-in/switch-out active | Yes | No | - |
| 05 | All motors active | Yes | No | - |
| 06 | Automatic replacement not possible | Yes | No | - |
| 07 | Alarm active | Yes | No | - |

## p2380[0...2] Closed-loop cascade control operating hours / Csc_ctrl op_hrs

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.0 [h] | 340.28235E36 [h] | 0.0 [h] |

**Description:** Displays the operating hours for the external motors.

The display can only be reset to zero.

**Index:**
[0] = Motor 1
[1] = Motor 2
[2] = Motor 3

## p2381 Closed-loop cascade control max time for continuous operation / Csc_ctrl t_max

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.1 [h] | 100000.0 [h] | 24.0 [h] |

**Description:** Time limit for the continuous operation of external motors.

Continuous operation is measured starting from when a motor is connected to the line voltage. It ends when a motor is disconnected from the line.

## p2382 Closed-loop cascade control operating time limit / Csc_ctrl t_max op

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.1 [h] | 100000.0 [h] | 24.0 [h] |

**Description:** Limit for the total operating time of external motors.

The total operating time of an external motor increases every time it is switched in.

## p2383 Closed-loop cascade control switch-out sequence / Csc_ctr sw-out seq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 1 | 0 |

**Description:** Selection of the response used to stop the motors when the OFF command is sent.

Re p2383 = 1:

OFF1 disconnects the external motors from the line in the order 3 - 2 - 1. The time set in p2387 is applied as a delay time between the disconnection of each motor. The main motor is only switched off if all the external motors have already been switched off.

In the case of OFF2 and OFF3, the external motors and the main motor are switched off immediately with the OFF command (same behavior as with p2383 = 0).

**Value:**
0: Normal stop
1: Sequential stop

**Caution:** If p2383 = 1 and the OFF1 command is pending, the main motor will not be stopped until all external motors have been disconnected and time p2387 has elapsed. The disconnection of the external motors can also serve as a means to re-accelerate the main motor.

## p2384 Closed-loop cascade control motor switch-on delay / Csc_ctr t_del_on

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.000 [s] | 999.000 [s] | 0.000 [s] |

**Description:** Delay time once the switch-in conditions have been met until the external motor is switched on.

The activation of the corresponding status bit (r2379) for controlling the contactors or the motor starter is delayed by this time, while the main motor speed already decreases down to the switch-in speed (p2378).

## p2385 Closed-loop cascade control holding time switch-in speed / Csc_ctr t_hld n_in

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.000 [s] | 999.000 [s] | 0.000 [s] |

**Description:** Time during which the switch-in speed (see p2378) of the main motor is maintained after an external motor has been switched-in and the main motor has been decelerated to the switch-in speed.

## p2386 Closed-loop cascade control motor switch-of delay / Csc_ctrl t_del_off

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.000 [s] | 999.000 [s] | 0.000 [s] |

**Description:** Delay time once the switch-out conditions have been met until the external motor is switched off.

The resetting of the corresponding status bit (r2379) for controlling the contactors or the motor starter is delayed by this time, while the main motor ramps up to the switch-out speed (p2378).

## p2387 Closed-loop cascade control holding time switch-out speed / CscCtr t_hld n_out

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.000 [s] | 999.000 [s] | 0.000 [s] |

**Description:** Time during which the switch-out speed (see p2378) of the main motor is maintained after an external motor has been switched-out and the main motor has been accelerated to the switch-out speed.

## p2390[0...n] Energy-saving mode start speed / En_sav n_start

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,5 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** p2000 | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.000 [rpm] | 21000.000 [rpm] | 0.000 [rpm] |

**Description:** Sets the start speed for the energy-saving mode function.

The total speed of this activation threshold is the sum of the minimum speed p1080 and p2390.

If the speed setpoint undershoots this start speed, the delay time in p2391 is started. If the restart threshold is no longer reached before the delay time expires, the energy-saving mode boost speed p2395 is impressed for the time period p2394 and then the motor is brought to a standstill via the down ramp of the setpoint channel. The drive is powered down (energy-saving mode active). The drive is automatically powered up again as soon as the speed setpoint exceeds the restart threshold.

**Note:** The energy-saving mode start speed is set to 4 % of the nominal speed when commissioning is completed.

## p2391[0...n] Energy-saving mode delay time / En_sav t_delay

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 [s] | 3599 [s] | 120 [s] |

**Description:** Sets the delay time for the energy-saving mode function.

To ensure that the drive can be shut down (pulse inhibit), a restart condition must not occur during this time.

**Dependency:** Refer to: p2390, p2392, p2393

## p2392 Energy-saving mode restart value with technology controller / En_savRest tec_ctr

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,5 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** 9_1 | **Unit selection:** p0595 | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.000 [%] | 200.000 [%] | 0.000 [%] |

**Description:** Sets the motor restart time for the energy-saving mode function.

If the energy-saving mode function is active, the technology controller continues to operate and supplies a speed setpoint to the setpoint channel. Since the drive is de-activated, there is no system deviation at the input of the technology controller. As soon as this exceeds the restart value p2392, the drive is automatically powered up and the speed is controlled to 1.05 * (p1080 + p2390) via the up ramp of the setpoint channel.

**Note:** The restart value is set to 5 % when commissioning is completed.

## p2393[0...n] Energy-saving mode restart speed relative without tec_ctrl / En_savResNoTec_ctr

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,5 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.000 [rpm] | 21000.000 [rpm] | 0.000 [rpm] |

**Description:** Sets the start speed to restart the motor for the energy-saving mode function.

When the energy-saving mode is active, a speed setpoint is still supplied to the setpoint channel. If the setpoint increases again and in so doing exceeds the restart speed, the drive is automatically powered up and the speed setpoint is controlled to p1080 + p2390 + p2393 via the up ramp of the setpoint channel.

The restart speed is the sum of the minimum speed p1080, the energy-saving mode start speed p2390 and the relative restart speed p2393.

**Dependency:** Refer to: p1080

**Note:** The parameter is set to 6 % of the nominal speed when commissioning is exited.

## p2394[0...n] Energy-saving mode boost time period / En_sav t_boost

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 [s] | 3599 [s] | 0 [s] |

**Description:** Sets the boost time period for the energy-saving mode function.

Before the drive is finally powered down (energy-saving mode), the setpoint speed is changed to the boost speed p2395 for the time set in p2394. Depending on the application, this allows the energy-saving mode intervals to be extended (in time).

**Caution:** The controller is not operational while the boost speed is being impressed. As a result, for example, for pump applications, it must be ensured that the tank does not overflow as a result of the additional boost. For compressors, it must be ensured that the boost speed does not result in an overpressure condition.

**Note:** If a boost speed is not approached, then the boost time period is set to 0 s.

## p2395[0...n] Energy-saving mode boost speed / En_sav n_boost

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** p2000 | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.000 [rpm] | 21000.000 [rpm] | 0.000 [rpm] |

**Description:** Sets the boost speed for the energy-saving mode function.

The motor is accelerated to the energy-saving mode boost speed p2395 for the energy-saving mode boost time period p2394 before it is brought to a standstill via the down ramp of the setpoint channel (p1121) and subsequently powered down (pulse inhibit).

**Dependency:** Refer to: p2394

**Caution:** The controller is not operational while the boost speed is being impressed. As a result, for example, for pump applications, it must be ensured that the tank does not overflow as a result of the additional boost. For compressors, it must be ensured that the boost speed does not result in an overpressure condition.

## p2396[0...n] Energy-saving mode max shutdown time / En_sav t_off max

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 [s] | 863999 [s] | 0 [s] |

**Description:** Sets the maximum shutdown time for the energy-saving mode function.

If the drive is in the energy-saving mode (pulse inhibit) then it is powered up again at the latest after the maximum power-down time has expired. If the restart conditions are fulfilled earlier, then the drive is correspondingly powered up earlier.

**Danger:** The drive automatically powers itself up at the latest after the maximum power-down time has expired.

**Caution:** Once the maximum shutdown time has expired, the drive switches itself on automatically and accelerates to the start speed. The technology controller only becomes effective again when this speed is reached (for p2398 = 1).

Depending on the application, e.g. for pumps, it should be ensured that as a result of cyclic starts the tank does not overflow or for compressors, an overpressure condition does not occur.

**Note:** Automatic restart once the maximum OFF time has elapsed is de-activated by setting p2396 = 0 s.

## r2397[0...1] CO: Energy-saving mode output speed actual / En_sav n_outp act

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** p2000 | **Dyn. index:** - |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - [rpm] | - [rpm] | - [rpm] |

**Description:** Displays the actual output speed for the energy-saving mode function.

**Note:** Zero is displayed if the boost or starting speed is not active.

## p2398 Energy-saving mode / En_save mode

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 1 | 0 |

**Description:** Sets the operating mode for the energy-saving mode function.

**Value:**
0: Energy-saving mode inhibited
1: Energy-saving mode activated

**Dependency:** Refer to: p2200, p2251

**Caution:** When this function is active, the motor can start again automatically.

**Note:** When the energy-saving mode function (p2398 = 1) is activated, its behavior is defined as to whether the technology controller is additionally switched in (closed-loop) or switched out (open-loop).

The technology controller is enabled via binector input p2200 and its mode is set in p2251.

p2200 = 0, p2251 = 0:

Energy-saving mode operates without technology controller (open-loop)

p2200 = 1, p2251 = 0:

Energy-saving mode operates with technology controller (closed-loop)

## r2399.0...8 CO/BO: Energy-saving mode status would / En_save ZSW

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the status word for the energy-saving mode function.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Energy-saving mode enabled (p2398 <> 0) | Yes | No | - |
| 01 | Energy-saving mode active | Yes | No | - |
| 02 | Energy-saving mode delay time active | Yes | No | - |
| 03 | Energy-saving mode boost active | Yes | No | - |
| 04 | Energy-saving mode motor switched off | Yes | No | - |
| 05 | Energy-saving mode switched off cyclic restart active | Yes | No | - |
| 06 | Energy-saving mode motor restarts | Yes | No | - |
| 07 | Energy-saving mode supplies total setpoint for ramp-fct. gen. | Yes | No | - |
| 08 | Energy-saving mode bypasses ramp-fct. gen. in setpoint channel | Yes | No | - |

**Dependency:** Refer to: p2398

## p2900[0...n] CO: Fixed value 1 [%] / Fixed value 1 [%]

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 1021 |
| **Min** | **Max** | **Factory setting** |
| -10000.00 [%] | 10000.00 [%] | 0.00 [%] |

**Description:** Setting and connector output for a fixed percentage value.

**Dependency:** Refer to: p2901, r2902, p2930

**Notice:** A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

**Note:** The value can be used to interconnect a scaling function (e.g. scaling of the main setpoint)

## p2901[0...n] CO: Fixed value 2 [%] / Fixed value 2 [%]

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 1021 |
| **Min** | **Max** | **Factory setting** |
| -10000.00 [%] | 10000.00 [%] | 0.00 [%] |

**Description:** Setting and connector output for a fixed percentage value.

**Dependency:** Refer to: p2900, p2930

**Notice:** A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

**Note:** The value can be used to interconnect a scaling function (e.g. scaling of the supplementary setpoint)

| r2902[0...14] | **CO: Fixed values [%] / Fixed values [%]** | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| | **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 1021 |
| | **Min** | **Max** | **Factory setting** |
| | - [%] | - [%] | - [%] |

**Description:** Display and connector output for frequently used percentage values.

**Index:**
[0] = Fixed value +0 %
[1] = Fixed value +5 %
[2] = Fixed value +10 %
[3] = Fixed value +20 %
[4] = Fixed value +50 %
[5] = Fixed value +100 %
[6] = Fixed value +150 %
[7] = Fixed value +200 %
[8] = Fixed value -5 %
[9] = Fixed value -10 %
[10] = Fixed value -20 %
[11] = Fixed value -50 %
[12] = Fixed value -100 %
[13] = Fixed value -150 %
[14] = Fixed value -200 %

**Dependency:** Refer to: p2900, p2901, p2930

**Note:** The signal sources can, for example, be used to interconnect scalings.

| p2930[0...n] | **CO: Fixed value M [Nm] / Fixed value M [Nm]** | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| | **Can be changed:** U, T | **Scaling:** p2003 | **Dyn. index:** DDS, p0180 |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 1021 |
| | **Min** | **Max** | **Factory setting** |
| | -100000.00 [Nm] | 100000.00 [Nm] | 0.00 [Nm] |

**Description:** Setting and connector output for a fixed torque value.

**Dependency:** Refer to: p2900, p2901, r2902

**Notice:** A BICO interconnection to a parameter that belongs to a drive data set always acts on the effective data set.

**Note:** The value can, for example, be used to interconnect a supplementary torque.

| r2969[0...6] | **Direct axis flux model display / Mot Psid trace** | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| | **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | - | - | - |

**Description:** Display of the direct axis flux model of the closed-loop controlled reluctance motor for diagnostic purposes:

Display of the entered direct axis current id:
idx0: current in Arms
Display of the saturation curves of the direct axis flux psid(id, iq):
idx1: flux in Vsrms with respect to the direct axis current for iq = 0
idx2: flux in Vsrms with respect to the direct axis current for iq = 0.5 * p2950
idx3: flux in Vsrms with respect to the direct axis current for iq = p2950
Displays the relative error of the current inversion(id(psid, iq) - id) / p2950:
idx4: error with respect to direct axis current for iq = 0
idx5: error with respect to direct axis current for iq = 0.5 * p2950
idx6: error with respect to direct axis current for iq = p2950

**Index:**
[0] = d-current
[1] = d-flux iq0
[2] = d-flux iq1
[3] = d-flux iq2
[4] = d-current error iq0
[5] = d-current error iq1
[6] = d-current error q2

**Note:** The display is only generated when the pulses are inhibited.

## p3110 External fault 3 power-up delay / Ext fault 3 t_on

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2546 |
| **Min** | **Max** | **Factory setting** |
| 0 [ms] | 1000 [ms] | 0 [ms] |

**Description:** Sets the delay time for external fault 3.

**Dependency:** Refer to: p2108, p3111, p3112

## p3111[0...n] BI: External fault 3 enable / Ext fault 3 enab

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | 1 |

**Description:** Sets the signal source for the enable signal of external fault 3.
External fault 3 is initiated by the following AND logic operation:
- BI: p2108 negated
- BI: p3111
- BI: p3112 negated

**Dependency:** Refer to: p2108, p3110, p3112

## p3112[0...n] BI: External fault 3 enable negated / Ext flt 3 enab neg

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for the negated enable signal of external fault 3.
External fault 3 is initiated by the following AND logic operation:
- BI: p2108 negated
- BI: p3111
- BI: p3112 negated

**Dependency:** Refer to: p2108, p3110, p3111

## r3113.0...15 CO/BO: NAMUR message bit bar / NAMUR bit bar

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display and BICO output for the status of the NAMUR message bit bar.
The faults and alarms are assigned to the appropriate signaling/message classes and influence a specific message bit.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Fault converter information electronics/software error | Yes | No | - |
| 01 | Network fault | Yes | No | - |
| 02 | DC link overvoltage | Yes | No | - |
| 03 | Fault drive converter power electronics | Yes | No | - |
| 04 | Drive converter overtemperature | Yes | No | - |
| 05 | Ground fault | Yes | No | - |
| 06 | Motor overload | Yes | No | - |
| 07 | Bus error | Yes | No | - |
| 08 | External safety-relevant shutdown | Yes | No | - |
| 10 | Error communication internal | Yes | No | - |
| 11 | Fault infeed | Yes | No | - |
| 15 | Other faults | Yes | No | - |

**Note:**

Re bit 00:

Hardware or software malfunction was identified. Carry out a POWER ON of the component involved. If it occurs again, contact the hotline.

Re bit 01:

A line supply fault has occurred (phase failure, voltage level, ...). Check the line supply / fuses. Check the supply voltage. Check the wiring.

Re bit 02:

The DC link voltage has assumed an inadmissibly high value. Check the dimensioning of the system (line supply, reactor, voltages). Check the infeed settings.

Re bit 03:

An inadmissible operating state of the power electronics was identified (overcurrent, overtemperature, IGBT failure, ...). Check that the permissible load cycles are maintained. Check the ambient temperatures (fan).

Re bit 04:

The temperature in the component has exceeded the highest permissible limit. Check the ambient temperature / control cabinet cooling.

Re bit 05:

A ground fault / inter-phase short-circuit was detected in the power cables or in the motor windings. Check the power cable (connection). Check the motor.

Re bit 06:

The motor was operated outside the permissible limits (temperature, current, torque, ...). Check the load cycles and limits that have been set. Check the ambient temperature / motor cooling.

Re bit 07:

The communication to the higher-level control system (internal coupling, PROFIBUS, PROFINET, ...) is faulted or interrupted. Check the state of the higher-level control system. Check the communication connection/wiring. Check the bus configuration / clock cycles.

Re bit 08:

A safety operation monitoring function (Safety) has detected an error.

Re bit 09:

When evaluating the encoder signals (track signals, zero marks, absolute values, ...) an illegal signal state was detected. Check the encoder / state of the encoder signals. Observe the maximum frequencies.

Re bit 10:

The internal communication between the SINAMICS components is faulted or interrupted. Check the DRIVE-CLiQ wiring. Ensure an EMC-compliant design. Observe the maximum permissible quantity structure / clock cycles.

Re bit 11:

The infeed is faulted or has failed. Check the infeed and the surroundings (line supply, filter, reactors, fuses, ...). Check the closed-loop infeed control.

Re bit 15:

Group fault. Determine the precise cause of the fault using the commissioning tool.

## p3117 Change safety message type / Ch. SI mess type

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 1 | 0 |

**Description:** Sets the re-parameterization of all safety messages for faults and alarms.

The relevant message type during changeover is selected by the firmware.

0: Safety messages are not re-parameterized

1: Safety messages are re-parameterized

**Note:** A change only becomes effective after a POWER ON.

## r3120[0...63] Component fault / Comp fault

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8060 |
| **Min** | **Max** | **Factory setting** |
| 0 | 3 | - |

**Description:** Displays the component of the fault which has occurred.

**Value:**
0: No assignment
1: Control Unit
2: Power Module
3: Motor

**Dependency:** Refer to: r0945, r0947, r0948, r0949, r2109, r2130, r2133, r2136, r3122

**Note:** The buffer parameters are cyclically updated in the background (refer to status signal in r2139).

The structure of the fault buffer and the assignment of the indices is shown in r0945.

## r3121[0...63] Component alarm / Comp alarm

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8065 |
| **Min** | **Max** | **Factory setting** |
| 0 | 3 | - |

**Description:** Displays the component of the alarm which has occurred.

**Value:**
0: No assignment
1: Control Unit
2: Power Module
3: Motor

**Dependency:** Refer to: r2110, r2122, r2123, r2124, r2125, r2134, r2145, r2146, r3123

**Note:** The buffer parameters are cyclically updated in the background (refer to status signal in r2139).

The structure of the alarm buffer and the assignment of the indices is shown in r2122.

## r3122[0...63] Diagnostic attribute fault / Diag_attr fault

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8060 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the diagnostic attribute of the fault which has occurred.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Hardware replacement recommended | Yes | No | - |
| 15 | Message has gone | Yes | No | - |
| 16 | PROFIdrive fault class bit 0 | High | Low | - |
| 17 | PROFIdrive fault class bit 1 | High | Low | - |

| | | | | |
|---|---|---|---|---|
| 18 | PROFIdrive fault class bit 2 | High | Low | - |
| 19 | PROFIdrive fault class bit 3 | High | Low | - |
| 20 | PROFIdrive fault class bit 4 | High | Low | - |

**Dependency:** Refer to: r0945, r0947, r0948, r0949, r2109, r2130, r2133, r2136, r3120

**Note:** The buffer parameters are cyclically updated in the background (refer to status signal in r2139).

The structure of the fault buffer and the assignment of the indices is shown in r0945.

Re bits 20 ... 16:

Bits 20, 19, 18, 17, 16 = 0, 0, 0, 0, 0 --> PROFIdrive message class 0: not assigned

Bits 20, 19, 18, 17, 16 = 0, 0, 0, 0, 1 --> PROFIdrive message class 1: hardware fault/software error

Bits 20, 19, 18, 17, 16 = 0, 0, 0, 1, 0 --> PROFIdrive message class 2: line fault

Bits 20, 19, 18, 17, 16 = 0, 0, 0, 1, 1 --> PROFIdrive message class 3: supply voltage fault

Bits 20, 19, 18, 17, 16 = 0, 0, 1, 0, 0 --> PROFIdrive message class 4: DC link fault

Bits 20, 19, 18, 17, 16 = 0, 0, 1, 0, 1 --> PROFIdrive message class 5: power electronics faulted

Bits 20, 19, 18, 17, 16 = 0, 0, 1, 1, 0 --> PROFIdrive message class 6: overtemperature electronic components

Bits 20, 19, 18, 17, 16 = 0, 0, 1, 1, 1 --> PROFIdrive message class 7: ground fault/phase fault detected

Bits 20, 19, 18, 17, 16 = 0, 1, 0, 0, 0 --> PROFIdrive message class 8: motor overload

Bits 20, 19, 18, 17, 16 = 0, 1, 0, 0, 1 --> PROFIdrive message class 9: communication error to the higher-level control

Bits 20, 19, 18, 17, 16 = 0, 1, 0, 1, 0 --> PROFIdrive message class 10: safe monitoring channel has identified an error

Bits 20, 19, 18, 17, 16 = 0, 1, 0, 1, 1 --> PROFIdrive message class 11: incorrect position actual value/speed actual value or not available

Bits 20, 19, 18, 17, 16 = 0, 1, 1, 0, 0 --> PROFIdrive message class 12: internal (DRIVE-CLiQ) communication error

Bits 20, 19, 18, 17, 16 = 0, 1, 1, 0, 1 --> PROFIdrive message class 13: infeed unit faulted

Bits 20, 19, 18, 17, 16 = 0, 1, 1, 1, 0 --> PROFIdrive message class 14: braking controller/Braking Module faulted

Bits 20, 19, 18, 17, 16 = 0, 1, 1, 1, 1 --> PROFIdrive message class 15: line filter faulted

Bits 20, 19, 18, 17, 16 = 1, 0, 0, 0, 0 --> PROFIdrive message class 16: external measured value/signal state outside the permissible range

Bits 20, 19, 18, 17, 16 = 1, 0, 0, 0, 1 --> PROFIdrive message class 17: application/technology function faulted

Bits 20, 19, 18, 17, 16 = 1, 0, 0, 1, 0 --> PROFIdrive message class 18: error in the parameterization/configuration/commissioning sequence

Bits 20, 19, 18, 17, 16 = 1, 0, 0, 1, 1 --> PROFIdrive message class 19: general drive fault

## r3123[0...63] Diagnostic attribute alarm / Diag_attr alarm

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8065 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the diagnostic attribute of the alarm which has occurred.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Hardware replacement recommended | Yes | No | - |
| 11 | Alarm class bit 0 | High | Low | - |
| 12 | Alarm class bit 1 | High | Low | - |
| 13 | Maintenance required | Yes | No | - |
| 14 | Maintenance urgently required | Yes | No | - |
| 15 | Message has gone | Yes | No | - |
| 16 | PROFIdrive fault class bit 0 | High | Low | - |
| 17 | PROFIdrive fault class bit 1 | High | Low | - |
| 18 | PROFIdrive fault class bit 2 | High | Low | - |
| 19 | PROFIdrive fault class bit 3 | High | Low | - |
| 20 | PROFIdrive fault class bit 4 | High | Low | - |

**Dependency:** Refer to: r2110, r2122, r2123, r2124, r2125, r2134, r2145, r2146, r3121

**Note:** The buffer parameters are cyclically updated in the background (refer to status signal in r2139).

The structure of the alarm buffer and the assignment of the indices is shown in r2122.

Re bit 12, 11:

These status bits are used for the classification of internal alarm classes and are intended for diagnostic purposes only on certain automation systems with integrated SINAMICS functionality.

Re bits 20 ... 16:
Bits 20, 19, 18, 17, 16 = 0, 0, 0, 0, 0 --> PROFIdrive message class 0: not assigned
Bits 20, 19, 18, 17, 16 = 0, 0, 0, 0, 1 --> PROFIdrive message class 1: hardware fault/software error
Bits 20, 19, 18, 17, 16 = 0, 0, 0, 1, 0 --> PROFIdrive message class 2: line fault
Bits 20, 19, 18, 17, 16 = 0, 0, 0, 1, 1 --> PROFIdrive message class 3: supply voltage fault
Bits 20, 19, 18, 17, 16 = 0, 0, 1, 0, 0 --> PROFIdrive message class 4: DC link fault
Bits 20, 19, 18, 17, 16 = 0, 0, 1, 0, 1 --> PROFIdrive message class 5: power electronics faulted
Bits 20, 19, 18, 17, 16 = 0, 0, 1, 1, 0 --> PROFIdrive message class 6: overtemperature electronic components
Bits 20, 19, 18, 17, 16 = 0, 0, 1, 1, 1 --> PROFIdrive message class 7: ground fault/phase fault detected
Bits 20, 19, 18, 17, 16 = 0, 1, 0, 0, 0 --> PROFIdrive message class 8: motor overload
Bits 20, 19, 18, 17, 16 = 0, 1, 0, 0, 1 --> PROFIdrive message class 9: communication error to the higher-level control
Bits 20, 19, 18, 17, 16 = 0, 1, 0, 1, 0 --> PROFIdrive message class 10: safe monitoring channel has identified an error
Bits 20, 19, 18, 17, 16 = 0, 1, 0, 1, 1 --> PROFIdrive message class 11: incorrect position actual value/speed actual value or not available
Bits 20, 19, 18, 17, 16 = 0, 1, 1, 0, 0 --> PROFIdrive message class 12: internal (DRIVE-CLiQ) communication error
Bits 20, 19, 18, 17, 16 = 0, 1, 1, 0, 1 --> PROFIdrive message class 13: infeed unit faulted
Bits 20, 19, 18, 17, 16 = 0, 1, 1, 1, 0 --> PROFIdrive message class 14: braking controller/Braking Module faulted
Bits 20, 19, 18, 17, 16 = 0, 1, 1, 1, 1 --> PROFIdrive message class 15: line filter faulted
Bits 20, 19, 18, 17, 16 = 1, 0, 0, 0, 0 --> PROFIdrive message class 16: external measured value/signal state outside the permissible range
Bits 20, 19, 18, 17, 16 = 1, 0, 0, 0, 1 --> PROFIdrive message class 17: application/technology function faulted
Bits 20, 19, 18, 17, 16 = 1, 0, 0, 1, 0 --> PROFIdrive message class 18: error in the parameterization/configuration/commissioning sequence
Bits 20, 19, 18, 17, 16 = 1, 0, 0, 1, 1 --> PROFIdrive message class 19: general drive fault

## r3131 CO: Actual fault value / Act fault val

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8060 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the fault value of the oldest active fault.

**Dependency:** Refer to: r2131, r3132

## r3132 CO: Actual component number / Comp_no act

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8060 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the component number of the oldest fault that is still active.

**Dependency:** Refer to: r2131, r3131

## p3230[0...n] CI: Load monitoring speed actual value / Load monit n_act

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** T | **Scaling:** p2000 | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8012, 8013 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for the speed actual value of the load monitoring.

**Dependency:** Refer to: r2169, p2181, p2192, p2193, p3231

**Note:** The parameter is only effective for p2193 = 2.

## p3231[0...n] Load monitoring speed deviation / Load monit n_dev

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** 3_1 | **Unit selection:** p0505 | **Func. diagram:** 8013 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [rpm] | 210000.00 [rpm] | 150.00 [rpm] |

**Description:** Sets the permissible speed deviation during load monitoring (for p2193 = 2).

**Dependency:** Refer to: r2169, p2181, p2193, p3230

## p3232[0...n] BI: Load monitoring failure detection / Load_moni fail_det

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8013 |
| **Min** | **Max** | **Factory setting** |
| - | - | 1 |

**Description:** Sets the signal source for detecting a failure.

**Dependency:** Refer to: p2192, p2193

**Note:** Monitoring is triggered with a 0 signal, as soon as the time in p2192 has expired.

## p3233[0...n] Torque actual value filter time constant / M_act_filt T

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8013 |
| **Min** | **Max** | **Factory setting** |
| 0 [ms] | 1000000 [ms] | 100 [ms] |

**Description:** Sets the time constant for the PT1 element to smooth the torque actual value.

The smoothed torque actual value is compared with the threshold values and is only used for messages and signals.

## p3235 Phase failure signal motor monitoring time / Ph_fail t_monit

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 [ms] | 2000 [ms] | 320 [ms] |

**Description:** Sets the monitoring time for phase failure detection of the motor.

**Notice:** After the value has been modified, no further parameter modifications can be made and the status is shown in r3996. Modifications can be made again when r3996 = 0.

**Note:** For p3235 = 0 the function is deactivated.

The monitoring is automatically de-activated during the flying restart operation for a motor that is still rotating.

3-phase phase failures cannot be detected and are indicated by other messages (e.g. F07902).

## p3320[0...n] Fluid flow machine power point 1 / Fluid_mach P1

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.00 | 100.00 | 25.00 |

**Description:** For the energy-saving display of a fluid-flow machine, a typical flow characteristic P = f(n) with 5 points along the characteristic is required.

This parameter specifies the power (P) of point 1 as a [%].

The characteristic comprises the following value pairs:

Power (P) / speed (n)

p3320 / p3321 --> point 1 (P1 / n1)

p3322 / p3323 --> point 2 (P2 / n2)

p3324 / p3325 --> point 3 (P3 / n3)

p3326 / p3327 --> point 4 (P4 / n4)

p3328 / p3329 --> point 5 (P5 / n5)

**Dependency:** Refer to: r0041, p3321, p3322, p3323, p3324, p3325, p3326, p3327, p3328, p3329

**Note:** The reference value for power and speed is the rated power/rated speed.

The energy saved is displayed in r0041.

## p3321[0...n] Fluid flow machine speed point 1 / Fluid_mach n1

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.00 | 100.00 | 0.00 |

**Description:** For the energy-saving display of a fluid-flow machine, a typical flow characteristic P = f(n) with 5 points along the characteristic is required.

This parameter specifies the speed (n) of point 1 as a [%].

The characteristic comprises the following value pairs:

Power (P) / speed (n)

p3320 / p3321 --> point 1 (P1 / n1)

p3322 / p3323 --> point 2 (P2 / n2)

p3324 / p3325 --> point 3 (P3 / n3)

p3326 / p3327 --> point 4 (P4 / n4)

p3328 / p3329 --> point 5 (P5 / n5)

**Dependency:** Refer to: r0041, p3320, p3322, p3323, p3324, p3325, p3326, p3327, p3328, p3329

**Note:** The reference value for power and speed is the rated power/rated speed.

The energy saved is displayed in r0041.

## p3322[0...n] Fluid flow machine power point 2 / Fluid_mach P2

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.00 | 100.00 | 50.00 |

**Description:** For the energy-saving display of a fluid-flow machine, a typical flow characteristic P = f(n) with 5 points along the characteristic is required.

This parameter specifies the power (P) of point 2 as a [%].

**Dependency:** Refer to: r0041, p3320, p3321, p3323, p3324, p3325, p3326, p3327, p3328, p3329

**Note:** The reference value for power and speed is the rated power/rated speed.

The energy saved is displayed in r0041.

## p3323[0...n] Fluid flow machine speed point 2 / Fluid_mach n2

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.00 | 100.00 | 25.00 |

**Description:** For the energy-saving display of a fluid-flow machine, a typical flow characteristic P = f(n) with 5 points along the characteristic is required.

This parameter specifies the speed (n) of point 2 as a [%].

**Dependency:** Refer to: r0041, p3320, p3321, p3322, p3324, p3325, p3326, p3327, p3328, p3329

**Note:** The reference value for power and speed is the rated power/rated speed.
The energy saved is displayed in r0041.

## p3324[0...n] Fluid flow machine power point 3 / Fluid_mach P3

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.00 | 100.00 | 77.00 |

**Description:** For the energy-saving display of a fluid-flow machine, a typical flow characteristic P = f(n) with 5 points along the characteristic is required.
This parameter specifies the power (P) of point 3 as a [%].

**Dependency:** Refer to: r0041, p3320, p3321, p3322, p3323, p3325, p3326, p3327, p3328, p3329

**Note:** The reference value for power and speed is the rated power/rated speed.
The energy saved is displayed in r0041.

## p3325[0...n] Fluid flow machine speed point 3 / Fluid_mach n3

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.00 | 100.00 | 50.00 |

**Description:** For the energy-saving display of a fluid-flow machine, a typical flow characteristic P = f(n) with 5 points along the characteristic is required.
This parameter specifies the speed (n) of point 3 as a [%].

**Dependency:** Refer to: r0041, p3320, p3321, p3322, p3323, p3324, p3326, p3327, p3328, p3329

**Note:** The reference value for power and speed is the rated power/rated speed.
The energy saved is displayed in r0041.

## p3326[0...n] Fluid flow machine power point 4 / Fluid_mach P4

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.00 | 100.00 | 92.00 |

**Description:** For the energy-saving display of a fluid-flow machine, a typical flow characteristic P = f(n) with 5 points along the characteristic is required.
This parameter specifies the power (P) of point 4 as a [%].

**Dependency:** Refer to: r0041, p3320, p3321, p3322, p3323, p3324, p3325, p3327, p3328, p3329

**Note:** The reference value for power and speed is the rated power/rated speed.
The energy saved is displayed in r0041.

## p3327[0...n] Fluid flow machine speed point 4 / Fluid_mach n4

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.00 | 100.00 | 75.00 |

**Description:** For the energy-saving display of a fluid-flow machine, a typical flow characteristic P = f(n) with 5 points along the characteristic is required.
This parameter specifies the speed (n) of point 4 as a [%].

**Dependency:** Refer to: r0041, p3320, p3321, p3322, p3323, p3324, p3325, p3326, p3328, p3329

**Note:** The reference value for power and speed is the rated power/rated speed.
The energy saved is displayed in r0041.

## p3328[0...n] Fluid flow machine power point 5 / Fluid_mach P5

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.00 | 100.00 | 100.00 |

**Description:** For the energy-saving display of a fluid-flow machine, a typical flow characteristic P = f(n) with 5 points along the characteristic is required.

This parameter specifies the power (P) of point 5 as a [%].

**Dependency:** Refer to: r0041, p3320, p3321, p3322, p3323, p3324, p3325, p3326, p3327, p3329

**Note:** The reference value for power and speed is the rated power/rated speed.

The energy saved is displayed in r0041.

## p3329[0...n] Fluid flow machine speed point 5 / Fluid_mach n5

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.00 | 100.00 | 100.00 |

**Description:** For the energy-saving display of a fluid-flow machine, a typical flow characteristic P = f(n) with 5 points along the characteristic is required.

This parameter specifies the speed (n) of point 5 as a [%].

**Dependency:** Refer to: r0041, p3320, p3321, p3322, p3323, p3324, p3325, p3326, p3327, p3328

**Note:** The reference value for power and speed is the rated power/rated speed.

The energy saved is displayed in r0041.

## p3330[0...n] BI: 2/3 wire control command 1 / 2/3 wire cmd 1

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2272, 2273 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for command 1 for the two-wire control/three-wire control.

**Dependency:** Refer to: p0015, p3331, p3332, r3333, p3334

**Note:** The mode of operation of this binector input is dependent on the wire control set in p0015.

## p3331[0...n] BI: 2/3 wire control command 2 / 2/3 wire cmd 2

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2272, 2273 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for command 2 for the two-wire control/three-wire control.

**Dependency:** Refer to: p0015, p3330, p3332, r3333, p3334

**Note:** The mode of operation of this binector input is dependent on the wire control set in p0015.

## p3332[0...n] BI: 2/3 wire control command 3 / 2/3 wire cmd 3

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** CDS, p0170 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2273 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for command 3 for the two-wire control/three-wire control.

**Dependency:** Refer to: p0015, p3330, p3331, r3333, p3334

**Note:** The mode of operation of this binector input is dependent on the wire control set in p0015.

## r3333.0...3 CO/BO: 2/3 wire control control word / 2/3 wire STW

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2272, 2273 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the control word for the two wire control/three wire control.
The control signals are dependent on the wire control set in p0015 and the signal states at the digital inputs.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | ON | Yes | No | - |
| 01 | Reversing | Yes | No | - |
| 02 | ON inverted | Yes | No | - |
| 03 | Reversing inverted | Yes | No | - |

**Dependency:** Refer to: p0015, p3330, p3331, p3332, p3334

## p3334 2/3 wire control selection / 2/3 wire select

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2272, 2273 |
| **Min** | **Max** | **Factory setting** |
| 0 | 4 | 0 |

**Description:** Sets the two wire control/three wire control.

**Value:**
0: No wire control
1: Two wire control clockwise/counterclockwise 1
2: Two wire control clockwise/counterclockwise 2
3: Three wire control enable clockwise/counterclockwise
4: Three wire control enable ON/reversing

**Dependency:** Refer to: p0015, p3330, p3331, p3332, r3333

**Note:** This value depends on the wire control set in p0015.

## p3855[0...n] DC quantity controller configuration / DC_ctrl config

PM230
PM240

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,5 | **Data type:** Unsigned32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6797 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0111 bin |

**Description:** Configuration of the DC quantity controller in the overmodulation range.
No DC quantity control for power units that can also be connected through 1 phase to the line supply (r0204.15 = 1).

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | DC quantity controller on | Yes | No | - |
| 01 | Bandwidth increased | Yes | No | - |
| 02 | 7. Harmonics reduced | Yes | No | - |
| 03 | Filter active | Yes | No | - |

**Dependency:** The modulator mode p1802 must enable operation in the overmodulation range. In addition, the overmodulation limit p1803 must be greater than 103 %.

Set the modulator mode p1802 = 10, if the DC quantity control is deactivated and overmodulation is to be prevented.

**Notice:** Motor identification must be carried out before activating the DC quantity control in the overmodulation range.

## p3856[0...n] Compound braking current / Compound I_brake

PM240

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.00 [%] | 250.00 [%] | 0.00 [%] |

**Description:** Compound braking current is used to define the amount of DC current that is produced on stopping the motor during U/f operation to further increase the DC brake function.

Compound braking is a superimposition of the DC brake function with regenerative braking (net braking along the ramp) after OFF1 or OFF3. This permits braking with controlled motor frequency and minimum power input into the motor.

Effective braking without using additional hardware components is obtained by optimizing the ramp down time and compound braking.

**Dependency:** The compound braking current is only activated if the DC link voltage exceeds the threshold value in r1282.

Compound braking does not operate in the following cases:

- DC braking activated (p1230, r1239).
- motor is still not magnetized (e.g. for flying restart).
- vector control parameterized (p1300 >= 20).
- synchronous motor used (p0300 = 2xx).

**Notice:** Generally, increasing the braking current improves the braking effect when stopping the motor. However, if the value is set too high, then the drive can be tripped (shut down) as a result of overcurrent or ground fault.

Recommendation: p3856 < 100 % x (r0209 - r0331) / p0305 / 2

Compound braking generates a current in the motor with a ripple manifesting the rotational frequency. The higher the braking current is set, the higher the resulting ripple, especially when the Vdc_max control is simultaneously active (refer to p1280).

**Note:** The parameter value is entered relative to the rated motor current (p0305).

Compound braking is deactivated with p3856 = 0%.

## p3857[0...n] DC quantity controller P gain / DC_ctrl Kp

PM230
PM240

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,4 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6797 |
| **Min** | **Max** | **Factory setting** |
| 0.000 | 100000.000 | 0.000 |

**Description:** Sets the proportional gain of the DC quantity controller for the overmodulation range.

## p3858[0...n] DC quantity controller integral time / DC_ctrl Tn

PM230
PM240

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1,3,4 | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6797 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [ms] | 1000.00 [ms] | 2.00 [ms] |

**Description:** Sets the integral time for the DC quantity controller.

## r3859.1 CO/BO: DC quantity control status word / DC_ctrl ZSW

PM230

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6797 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display and connector output for the status word of the DC quantity control.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 01 | DC quantity control active in the overmodulation range | Yes | No | - |

**Dependency:** Refer to: p3856

## r3859.0...1 CO/BO: Compound braking/DC quantity control status word / Comp-br/DC_ctr ZSW

PM240

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 6797 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display and connector output for the status word of the compound braking and DC quantity control.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Compound braking active | Yes | No | - |
| 01 | DC quantity control active in the overmodulation range | Yes | No | - |

**Dependency:** Refer to: p3856

## p3880 BI: ESM activation signal source / ESM act s s

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7033 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source to activate the essential service mode (ESM) via digital input.

Using this function, when required the motor can be operated for as long as possible (e.g. to extract smoke).

BI: p3880 = 1 signal:

The essential service mode is activated.

BI: p3880 = 0 signal:

The essential service mode is deactivated.

**Dependency:** Refer to: p3881, p3882, p3883, p3884, r3887, p3888, r3889

**Warning:** When activating the essential service mode (BI: p3880 = 1 signal), the motor immediately runs according to the selected setpoint source. When the essential service mode is activated, the motor cannot be stopped using the OFF commands.

**Note:** ESM: Essential Service Mode

Permissible signal sources:

- BO: r0722.x (high active)
- BO: r0723.x (low active), x = 0 ... 5, 11, 12

## p3881 ESM setpoint source / ESM setp_src

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7033 |
| **Min** | **Max** | **Factory setting** |
| 0 | 7 | 0 |

**Description:** Sets the setpoint source for essential service mode (ESM).

**Value:**
0: Last known setpoint (r1078 smoothed)
1: Fixed speed setpoint 15 (p1015)
2: Control Unit analog input 0 (AI 0, r0755[0])
3: Fieldbus
4: Techn controller
6: Enable the response OFF1
7: Enable the response OFF2

**Warning:**
Re p3881 = 4:
If the technology controller is used as setpoint source, then this must first be configured. p2251 must be set to 0.

**Note:**
ESM: Essential Service Mode
When the essential service mode is activated, the effective speed setpoint is displayed in r1114.
Re p3881 = 0:
The last known setpoint value is only transmitted safely if it was present consistently for at least 30 s prior to activating the essential service mode. If this condition is not met, fixed speed setpoint 15 (p1015) is used.
Re p3881 = 6:
n_act = 0: pulse cancellation and switching-on inhibited.
n_active > 0: braking along the ramp-function generator down ramp (p1121), pulse cancellation and switching-on inhibited.
Re p3881 = 7:
n_act = 0: pulse cancellation and switching-on inhibited.
n_act > 0: immediate pulse cancellation and switching-on inhibited.

## p3882 ESM setpoint source alternative / ESM setp_src alt

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7033 |
| **Min** | **Max** | **Factory setting** |
| 0 | 2 | 0 |

**Description:**
Sets the alternative setpoint source for essential service mode (ESM).
This setpoint is used when the setpoint source set in p3881 is lost.

**Value:**
0: Last known setpoint (r1078 smoothed)
1: Fixed speed setpoint 15 (p1015)
2: Maximum speed (p1082)

**Dependency:**
Refer to: p3881

**Note:**
ESM: Essential Service Mode
The alternative setpoint source is only active for p3881 = 2, 3, 4.

## p3883 BI: ESM direction of rotation signal source / ESM rot dir s s

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7033 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:**
Sets the signal source for the direction of rotation during essential service mode (ESM).
p3883 = 1 signal:
Direction of rotation of the setpoint, parameterized for essential service mode, is reversed.
p3883 = 0 signal:
Direction of rotation of the setpoint parameterized for essential service mode is kept.

**Warning:**
The direction reversal is not taken into account if p3881 = 4 is set (technology controller) and the technology controller is also active as the setpoint source.

**Note:**
ESM: Essential Service Mode

## p3884 CI: ESM setpoint technology controller / ESM setp tech_ctrl

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7033 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for the setpoint for p3881 = 4 (technology controller) in the essential service mode (ESM).

**Dependency:** Refer to: p3881

**Note:** ESM: Essential Service Mode

Re p3884 = 0:

The technology controller uses the setpoint from p2253.

## r3887[0...1] ESM number of activations/faults / ESM act/fault qty

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7033 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the number of activations and faults that have occurred for the essential service mode (ESM).

**Index:** [0] = Activation of the essential service mode
[1] = Faults during the essential service mode

**Dependency:** Refer to: p3888

**Note:** ESM: Essential Service Mode

## p3888 ESM reset number of activations/faults / ESM act/F qty r

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Unsigned8 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7033 |
| **Min** | **Max** | **Factory setting** |
| 0 | 1 | 0 |

**Description:** Setting to reset the number of activations and faults that have occurred for the essential service mode (ESM).

1: counter reset active (r3887[0, 1])

0: inactive

**Dependency:** Refer to: r3887

**Note:** ESM: Essential Service Mode

The parameter is automatically reset to zero after the counter has been reset.

## r3889.0...10 CO/BO: ESM status word / ESM ZSW

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7033 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display and BICO output for the status word of the essential service mode (ESM).

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Essential service mode (ESM) activated | Yes | No | - |
| 01 | Direction of rotation inverted | Yes | No | - |
| 02 | Setpoint signal lost | Yes | No | - |
| 03 | Technology controller actual value (p2264) lost | Yes | No | - |
| 04 | Bypass active | Yes | No | - |
| 05 | Setpoint technology controller parameterized (p3884) | Yes | No | - |

| | | | | |
|---|---|---|---|---|
| 06 | Technology controller during essential service mode active | Yes | No | - |
| 09 | Response OFF1/OFF2 activated | Yes | No | - |
| 10 | Automatic restart interrupted (F07320) | Yes | No | - |

**Note:** ESM: Essential Service Mode

## p3900 Completion of quick commissioning / Compl quick_comm

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** C(1) | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 3 | 0 |

**Description:** Exits quick commissioning (p0010 = 1) with automatic calculation of all parameters of all existing drive data sets that depend on the entries made during quick commissioning.

p3900 = 1 initially includes a parameter reset (factory setting, the same as p0970 = 1) for all parameters of the drive object; however, without overwriting the entries made during the quick commissioning.

The interconnections of PROFIBUS PZD telegram selection (p0922) and the interconnections via p15 and p1500 are re-established and all of the dependent motor, open-loop and control-loop control parameters are calculated (corresponding to p0340 = 1).

p3900 = 2 includes the restoration of the interconnections of PROFIBUS PZD telegram selection (p0922) and the interconnections via p15 and p1500 and the calculations corresponding to p0340 = 1.

p3900 = 3 only includes the calculations associated with the motor, open-loop and closed-loop control parameters corresponding to p0340 = 1.

**Value:**
0: No quick parameterization
1: Quick parameterization after parameter reset
2: Quick parameterization (only) for BICO and motor parameters
3: Quick parameterization for motor parameters (only)

**Notice:** After the value has been modified, no further parameter modifications can be made and the status is shown in r3996. Modifications can be made again when r3996 = 0.

**Note:** When the calculations have been completed, p3900 and p0010 are automatically reset to a value of zero.

When calculating motor, open-loop and closed-loop control parameters (such as for p0340 = 1) parameters associated with a selected Siemens catalog motor are not overwritten.

If a catalog motor has not been selected (p0300), then the following parameters are reset with p3900 > 0 in order to restore the situation that applied when commissioning the drive for the first time:

induction motor: p0320, p0352, p0362 ... p0369, p0604, p0605, p0626 ... p0628

synchronous motor: p0326, p0327, p0352, p0604, p0605

## r3925[0...n] Identification final display / Ident final_disp

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1 | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the commissioning steps that have been carried out.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Motor/control parameters calculated (p0340 = 1, p3900 > 0) | Yes | No | - |
| 02 | Motor data identification carried out at standstill (p1910 = 1) | Yes | No | - |
| 03 | Rotating measurement carried out (p1960 = 1, 2) | Yes | No | - |
| 08 | Motor identification data have been automatically backed up | Yes | No | - |
| 15 | Motor equivalent circuit diagram parameters changed | Yes | No | - |

**Note:** The individual bits are only set if the appropriate action has been initiated and successfully completed.

When motor rating plate parameters are changed, the final display is reset.

## r3926[0...n] Voltage generation alternating base voltage amplitude / U_gen altern base

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** MDS |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - [V] | - [V] | - [V] |

**Description:** Displays the base voltage for the alternating voltage in the context of motor data identification.

0:

No alternating voltages. The function is de-activated.

<0:

Automatic determination of the base voltage and wobbulation / self-setting based on the converter and the connected motor.

Otherwise:

Base voltage for alternating current generation in volts (wobbulation active).

## r3927[0...n] Motor data identification control word / MotID STW

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1 | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Successfully completed component of the last motor data identification carried out.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Stator inductance estimate no measurement | Yes | No | - |
| 02 | Rotor time constant estimate no measurement | Yes | No | - |
| 03 | Leakage inductance estimate no measurement | Yes | No | - |
| 05 | Determine Tr and Lsig evaluation in the time range | Yes | No | - |
| 06 | Activate vibration damping | Yes | No | - |
| 07 | De-activate vibration detection | Yes | No | - |
| 11 | De-activate pulse measurement Lq Ld | Yes | No | - |
| 12 | De-activate rotor resistance Rr measurement | Yes | No | - |
| 14 | De-activate valve interlocking time measurement | Yes | No | - |
| 15 | Determine only stator resistance, valve voltage fault, dead time | Yes | No | - |
| 16 | Short motor identification (lower quality) | Yes | No | - |
| 17 | Measurement without control parameter calculation | Yes | No | - |
| 18 | After motID direct transition into operation | Yes | No | - |
| 19 | After MotID automatically save results | Yes | No | - |
| 20 | Estimate cable resistance | Yes | No | - |
| 21 | Calibrating the output voltage measurement | Yes | No | - |

**Dependency:** Refer to: r3925

**Note:** The parameter is a copy of p1909.

## r3928[0...n] Rotating measurement configuration / Rot meas config

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** p0340 = 1 | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** DDS, p0180 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Successfully completed component of the last rotating measurement carried out.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 01 | Saturation characteristic identification | Yes | No | - |
| 02 | Moment of inertia identification | Yes | No | - |
| 03 | Re-calculates the speed controller parameters | Yes | No | - |
| 04 | Speed controller optimization (vibration test) | Yes | No | - |
| 05 | q leakage inductance ident. (for current controller adaptation) | Yes | No | - |
| 11 | Do not change the controller parameters during the measurement | Yes | No | - |
| 12 | Measurement shortened | Yes | No | - |
| 13 | After measurement direct transition into operation | Yes | No | - |

**Dependency:** Refer to: r3925

**Note:** The parameter is a copy of p1959.

## r3929[0...n] Motor data identification modulated voltage generation / MotID U_gen mod

**Access level:** 4 | **Calculated:** p0340 = 1 | **Data type:** Unsigned32

**Can be changed:** - | **Scaling:** - | **Dyn. index:** DDS, p0180

**Units group:** - | **Unit selection:** - | **Func. diagram:** -

| Min | Max | Factory setting |
|---|---|---|
| - | - | - |

**Description:** Configuration of voltage generation for the various MotID sections in the case of the most recent successful MotID.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Wobble U_generate to determine dead-time correction | Yes | No | - |
| 01 | Wobble U_generate to determine stator resistance | Yes | No | - |
| 02 | Wobble U_generation to determine rotor time constant | Yes | No | - |
| 03 | Wobble U_generation to determine leakage inductance | Yes | No | - |
| 04 | Wobble U_generation to determine dynamic leakage inductance | Yes | No | - |
| 05 | Wobble U_generation to determine magnetizing inductance | Yes | No | - |
| 08 | Alternating U_generate to determine dead-time correction | Yes | No | - |
| 09 | Alternating U_generate to determine stator resistance | Yes | No | - |
| 10 | Alternating U_generate to determine rotor time constant | Yes | No | - |
| 11 | Alternating U_generate to determine leakage inductance | Yes | No | - |
| 12 | Alternating U_generate to determine dyn. leakage inductance | Yes | No | - |
| 13 | Alternating U_generate to determine magnetizing inductance | Yes | No | - |

## r3930[0...4] Power unit EEPROM characteristics / PU characteristics

**Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16

**Can be changed:** - | **Scaling:** - | **Dyn. index:** -

**Units group:** - | **Unit selection:** - | **Func. diagram:** -

| Min | Max | Factory setting |
|---|---|---|
| - | - | - |

**Description:** Displays the characteristics (A5E number and versions) of the power unit.

[0]: A5E number xxxx (A5Exxxxyyyy)

[1]: A5E number yyyy (A5Exxxxyyyy)

[2]: File version (logistic)

[3]: File version (fixed data)
[4]: File version (calib data)

## p3950 Service parameter / Serv par

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** C, U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** For service personnel only.

## r3974 Drive unit status word / Drv_unit ZSW

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the status word for the drive unit.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Software reset active | Yes | No | - |
| 01 | Writing of parameters disabled as parameter save in progress | Yes | No | - |
| 02 | Writing of parameters disabled as macro is running | Yes | No | - |

## r3978 BICO CounterDevice / BICO CounterDevice

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the counter reading for modified BICO interconnections on this device.
The counter is incremented by one for each modified BICO interconnection.

## p3981 Faults acknowledge drive object / Faults ackn DO

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned8 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 8060 |
| **Min** | **Max** | **Factory setting** |
| 0 | 1 | 0 |

**Description:** Setting to acknowledge all active faults of a drive object.

**Notice:** Safety messages cannot be acknowledged using this parameter.

**Note:** Parameter should be set from 0 to 1 to acknowledge.
After acknowledgement, the parameter is automatically reset to 0.

## p3985 Master control mode selection / PcCtrl mode select

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 1 | 0 |

**Description:** Sets the mode to change over the master control / LOCAL mode.

**Value:**
0: Change master control for STW1.0 = 0
1: Change master control in operation

**Danger:** When changing the master control in operation, the drive can manifest undesirable behavior - e.g. it can accelerate up to another setpoint.

## r3986 Parameter count / Parameter No.

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the number of parameters for this drive unit.

The number comprises the device-specific and the drive-specific parameters.

**Dependency:** Refer to: r0980, r0981, r0989

## r3988[0...1] Boot state / Boot_state

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 800 | - |

**Description:** Index 0:

Displays the boot state.

Index 1:

Displays the partial boot state

**Value:**

0: Not active
1: Fatal fault
10: Fault
20: Reset all parameters
30: Drive object modified
40: Download using commissioning software
50: Parameter download using commissioning software
90: Reset Control Unit
100: Start initialization
101: Only for internal Siemens use
110: Instantiate Control Unit basis
111: Only for internal Siemens use
112: Only for internal Siemens use
113: Only for internal Siemens use
114: Only for internal Siemens use
115: Parameter download using commissioning software
117: Only for internal Siemens use
150: Wait until Power Module is determined
160: Evaluate Power Module
170: Instantiate Control Unit reset
180: Only for internal Siemens use
200: First commissioning
210: Create drive packages
250: Wait for fault acknowledge
325: Wait for input of drive type
350: Determine drive type
360: Only for internal Siemens use
370: Wait until p0010 is set to 0
380: Only for internal Siemens use
550: Call conversion functions for parameter
625: Wait for non-cyclic start
650: Start cyclic operation
660: Evaluate drive commissioning status
670: Only for internal Siemens use
680: Only for internal Siemens use
690: Wait for non-cyclic start
700: Save parameters

725: Wait for cyclic
740: Check the ability to operate
745: Start cyclic calculations
750: Interrupt enable
800: Initialization finished

**Index:** [0] = System
[1] = Partial boot

## r3996[0...1] Parameter write inhibit status / Par_write inhib st

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned8 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays whether writing to parameters is inhibited.

r3996[0] = 0:

Parameter write not inhibited.

0 < r3996[0] < 100:

Parameter write inhibited. The value shows how the calculations are progressing.

**Index:** [0] = Progress calculations
[1] = Cause

**Note:** Re index 1:

Only for internal Siemens troubleshooting.

## r4022.0...3 CO/BO: PM330 digital inputs status / PM330 DI status

PM330

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the status of the digital inputs of the PM330 power unit.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | DI 0 (X9.3, external alarm) | High | Low | - |
| 01 | DI 1 (X9.4, external fault) | High | Low | - |
| 02 | DI 2 (X9.5, Emergency Off category 0) | High | Low | - |
| 03 | DI 3 (X9.6, Emergency Off category 1) | High | Low | - |

**Dependency:** Refer to: r4023

**Note:** DI: Digital Input

## r4023.0...3 CO/BO: PM330 digital inputs status inverted / PM330 DI stat inv

PM330

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the inverted status of the digital inputs of Power Module 330 (PM330).

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | DI 0 (X9.3, external alarm) | High | Low | - |
| 01 | DI 1 (X9.4, external fault) | High | Low | - |
| 02 | DI 2 (X9.5, Emergency Off category 0) | High | Low | - |
| 03 | DI 3 (X9.6, Emergency Off category 1) | High | Low | - |

**Dependency:** Refer to: r4022

**Note:** DI: Digital Input

## r4047 PM330 digital outputs status / PM330 DO status

PM330

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the status of the digital outputs of Power Module 330 (PM330).

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | DO 0 (X9.8: enable signal UDC link charged) | High | Low | - |
| 01 | DO 1 (X9.11/X9.12: main contactor control) | High | Low | - |

**Note:** DO: Digital Output

## p4095 PM330 digital inputs simulation mode / PM330 DI sim_mode

PM330

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | 0000 bin |

**Description:** Sets the simulation mode for digital inputs of the PM330 power unit.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | DI 0 (X9.3, external alarm) | Simulation | Terminal eval | - |
| 01 | DI 1 (X9.4, external fault) | Simulation | Terminal eval | - |
| 02 | DI 2 (X9.5, Emergency Off category 0) | Simulation | Terminal eval | - |
| 03 | DI 3 (X9.6, Emergency Off category 1) | Simulation | Terminal eval | - |

**Dependency:** The setpoint for the input signals is specified using p4096.

Refer to: p4096

**Note:** This parameter is not saved when data is backed-up (p0971, p0977).

DI: Digital Input

## p4096 PM330 digital inputs simulation mode setpoint / PM330 DI sim setp

PM330

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | 0000 bin |

**Description:** Sets the setpoint for the input signals in the digital input simulation mode of the PM330 power unit.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | DI 0 (X9.3, external alarm) | High | Low | - |
| 01 | DI 1 (X9.4, external fault) | High | Low | - |
| 02 | DI 2 (X9.5, Emergency Off category 0) | High | Low | - |
| 03 | DI 3 (X9.6, Emergency Off category 1) | High | Low | - |

**Dependency:** The simulation of a digital input is selected using p4095.

Refer to: p4095

**Note:** This parameter is not saved when data is backed-up (p0971, p0977).

DI: Digital Input

## r5600 Pe energy saving mode ID / Pe mode ID

| | | | |
|---|---|---|---|
| CU230P-2_PN | **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| | **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | 0 | 255 | - |

**Description:** Displays the PROFIenergy mode ID of the effective energy saving mode.

**Value:**
0: POWER OFF
2: Energy-saving mode 2
255: Ready

**Note:** Pe: PROFIenergy profiles

## p5602[0...1] Pe energy-saving mode pause time minimal / Pe mod t_pause min

| | | | |
|---|---|---|---|
| CU230P-2_PN | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 2381 |
| | **Min** | **Max** | **Factory setting** |
| | 300000 [ms] | 4294967295 [ms] | [0] 300000 [ms]<br>[1] 480000 [ms] |

**Description:** Sets the minimum possible pause time for the energy-saving mode.

The value is the sum of the following times:

- Energy-saving mode transition time
- Operating state transition time regular
- Energy-saving mode, dwell time minimal

**Index:**
[0] = Reserved
[1] = Mode 2

**Note:** It is not permissible that the value is less than the sum of the "energy-saving mode transition time" and the "operating state transition time" (system properties).

Pe: PROFIenergy profiles

## p5606[0...1] Pe energy-saving mode dwell time maximum / Pe t_dwell max

| | | | |
|---|---|---|---|
| CU230P-2_PN | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | 0 [ms] | 4294967295 [ms] | 4294967295 [ms] |

**Description:** Sets the maximum dwell time for the energy-saving mode.

**Index:**
[0] = Reserved
[1] = Mode 2

**Note:** Pe: PROFIenergy profiles

## p5611 Pe energy-saving properties general / Pe properties gen

| | | | |
|---|---|---|---|
| CU230P-2_PN | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | - | - | 0000 bin |

**Description:** Sets the general properties for energy-saving.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Inhibit PROFIenergy control commands | Yes | No | - |
| 01 | Drive initiates OFF1 when transitioning to energy-saving mode | Yes | No | - |
| 02 | Trans into energy-saving mode from PROFIdrive state S4 poss | Yes | No | - |

**Note:** Pe: PROFIenergy profiles
PROFIdrive state S4: operation

## p5612[0...1] Pe energy-saving properties mode-dependent / Pe properties mod

CU230P-2_PN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | [0] 0110 bin<br>[1] 0000 bin |

**Description:** Sets the mode-dependent properties for energy-saving.

**Index:** [0] = Reserved
[1] = Mode 2

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Reserved | Yes | No | - |

**Note:** Pe: PROFIenergy profiles

## r5613.0...1 CO/BO: Pe energy-saving active/inactive / Pe save act/inact

CU230P-2_PN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned8 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display and binector output for the state display PROFIenergy energy saving active or inactive.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Pe active | Yes | No | - |
| 01 | Pe inactive | Yes | No | - |

**Note:** Bit 0 and bit 1 are inverse of one another.
Pe: PROFIenergy profiles

## p5614 BI: Pe set switch-on inhibit signal source / Pe sw on_inh s_src

CU230P-2_PN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source to set in the PROFIdrive state S1 "switching-on inhibit".

**Dependency:** Refer to: r5613

**Note:** Pe: PROFIenergy profiles

## r7758[0...19] KHP Control Unit serial number / KHP CU ser_no

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned8 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the actual serial number of the Control Unit.
The individual characters of the serial number are displayed in the ASCII code in the indices.
For the commissioning software, the ASCII characters are displayed uncoded.

**Dependency:** Refer to: p7765, p7766, p7767, p7768

**Notice:** An ASCII table (excerpt) can be found, for example, in the appendix to the List Manual.

**Note:** KHP: Know-How Protection

## p7759[0...19] KHP Control Unit reference serial number / KHP CU ref ser_no

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned8 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Sets the reference serial number for the Control Unit.

Using this parameter, if a Control Unit and/or a memory card is replaced at the end customer, the OEM can again adapt the project to the modified hardware.

**Dependency:** Refer to: p7765, p7766, p7767, p7768

**Note:** KHP: Know-How Protection

- The OEM may only change this parameter for the use case "Sending encrypted SINAMICS data".

- SINAMICS only evaluates this parameter when powering up from the encrypted "Load into file system..." output or when powering up from the encrypted PS files. The evaluation is only made when know-how protection and memory card copy protection have been activated.

## r7760 Write protection/know-how protection status / Wr_prot/KHP stat

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the status for the write protection and know-how protection.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Write protection active | Yes | No | - |
| 01 | Know-how protection active | Yes | No | - |
| 02 | Know-how protection temporarily withdrawn | Yes | No | - |
| 03 | Know-how protection cannot be deactivated | Yes | No | - |
| 04 | Extended copy protection is active | Yes | No | - |
| 05 | Basic copy protection is active | Yes | No | - |
| 06 | Trace and measuring functions for diagnostic purposes active | Yes | No | - |

**Dependency:** Refer to: p7761, p7765, p7766, p7767, p7768

**Note:** KHP: Know-How Protection

Re bit 00:

Write protection can be activated/deactivated via p7761 on the Control Unit.

Re bit 01:

The know-how protection can be activated by entering a password (p7766 ... p7768).

Re bit 02:

If it has already been activated, know-how protection can be temporarily deactivated by entering the valid password in p7766. In this case, bit 1 = 0 and bit 2 = 1 offset.

Re bit 03:

Know-how protection cannot be deactivated, as p7766 is not entered in the OEM exception list (only the factory setting is possible). This bit is only set if know-how protection is active (bit 1 = 1) and p7766 has not been entered in the OEM exception list.

Re bit 04:

When know-how protection has been activated, the contents of the memory card (parameter and DCC data) can be additionally protected against being used with other memory cards/Control Units. This bit is only set if know-how protection is active and p7765 bit 00 is set.

Re bit 05:

When know-how protection has been activated, the contents of the memory card (parameter and DCC data) can be additionally protected against being used with other memory cards. This bit is only set if know-how protection is active and in p7765 bit 01 is set and not bit 00.

Re bit 06:

When know-how protection is activated, the drive data can be traced using the device trace function. This bit is only set if know-how protection is active and in p7765.2 is set.

## p7761 Write protection / Write protection

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 1 | 0 |

**Description:** Setting for activating/de-activating the write protection for adjustable parameters.

**Value:**
0: Deactivate write protection
1: Activate write protection

**Dependency:** Refer to: r7760

**Note:** Parameters with the "WRITE_NO_LOCK" attributes are excluded from the write protection.

A product-specific list of these parameters is also available in the corresponding List Manual.

## p7762 Write protection multi-master fieldbus system access behavior / Fieldbus acc_behav

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 1 | 0 |

**Description:** Sets the behavior for write protection when accessing via multi-master fieldbus systems (e.g. CAN, BACnet).

**Value:**
0: Write access independent of p7761
1: Write access dependent on p7761

**Dependency:** Refer to: r7760, p7761

## p7763 KHP OEM exception list number of indices for p7764 / KHP OEM qty p7764

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 1 | 500 | 1 |

**Description:** Sets the number of parameters for the OEM exception list (p7764[0...n]).

p7764[0...n], with n = p7763 - 1

**Dependency:** Refer to: p7764

**Note:** KHP: Know-How Protection

Even if know-how protection is set, parameters in this list can be read and written to.

## p7764[0...n] KHP OEM exception list / KHP OEM excep list

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** p7763 |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 65535 | [0] 7766<br>[1...499] 0 |

**Description:** OEM exception list (p7764[0...n] for setting parameters that should be excluded from know-how protection.

p7764[0...n], with n = p7763 - 1

**Dependency:** The number of indices depends on p7763.

Refer to: p7763

**Note:** KHP: Know-How Protection

Even if know-how protection is set, parameters in this list can be read and written to.

## p7765 KHP configuration / KHP config

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | 0000 bin |

**Description:** Configuration settings for know-how protection.

Re bit 00, 01:

When KHP is activated, this means that the OEM can define whether the parameters and DCC data encrypted on the memory card should be protected before using on other memory cards/Control Units.

Re bit 02:

This means that the OEM can define whether it is possible or not to trace the drive data using the device trace function although KHP is activated.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Extended copy protection - linked to the memory card and CU | Yes | No | - |
| 01 | Basic copy protection - linked to the memory card | Yes | No | - |
| 02 | Permit trace and measuring functions for diagnostic purposes | Yes | No | - |

**Dependency:** Refer to: p7766, p7767, p7768

**Note:** KHP: Know-How Protection

For copy protection, the serial numbers of the memory card and/or Control Unit are checked.

The memory card copy protection and preventing data to be traced are only effective when the know-how protection has been activated.

Re bit 00, 01:

If both bits are inadvertently set to 1 (e.g. at the BOP), then the setting of bit 0 applies.

There is no copy protection if both bits are set to 0.

## p7766[0...29] KHP password input / KHP passw input

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Sets the password for know-how protection.

Example of a password:

123aBc = 49 50 51 97 66 99 dec (ASCII characters)

[0] = character 1 (e.g. 49 dec)

[1] = character 2 (e.g. 50 dec)

...

[5] = character 6 (e.g. 99 dec)

[29] = 0 dec (completes the entry)

**Dependency:** Refer to: p7767, p7768

**Notice:** An ASCII table (excerpt) can be found, for example, in the appendix to the List Manual.

When using the STARTER commissioning software, the password should be entered using the associated dialogs.

The following rules apply when entering the password:

- Password entry must start with p7766[0].
- No gaps are permissible in the password.
- Entering a password is completed when writing to p7766[29] (p7766[29] = 0 for passwords less than 30 characters).

**Note:** KHP: Know-How Protection
When reading, p7766[0...29] = 42 dec (ASCII character = "*") is displayed.
Parameters with the "KHP_WRITE_NO_LOCK" attribute are not involved in the know-how protection.
Parameters with the "KHP_ACTIVE_READ" attribute can be read even when know-how protection is activated.
A product-specific list of these parameters is also available in the corresponding List Manual.

## p7767[0...29] KHP password new / KHP passw new

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Sets the new password for know-how protection.
**Dependency:** Refer to: p7766, p7768
**Note:** KHP: Know-How Protection
When reading, p7767[0...29] = 42 dec (ASCII character = "*") is displayed.

## p7768[0...29] KHP password confirmation / KHP passw confirm

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Confirms the new password for know-how protection.
**Dependency:** Refer to: p7766, p7767
**Note:** KHP: Know-How Protection
When reading, p7768[0...29] = 42 dec (ASCII character = "*") is displayed.

## p7769[0...20] KHP memory card reference serial number / KHP mem ref ser_no

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned8 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Sets the reference serial number for the memory card.
Using this parameter, if a Control Unit and/or a memory card is replaced at the end customer, the OEM can again adapt the project to the modified hardware.
**Dependency:** Refer to: p7765, p7766, p7767, p7768
**Note:** KHP: Know-How Protection
- The OEM may only change this parameter for the use case "Sending encrypted SINAMICS data".
- SINAMICS only evaluates this parameter when powering up from the encrypted "Load into file system..." output or when powering up from the encrypted PS files. The evaluation is only made when know-how protection and memory card copy protection have been activated.

## p7775 NVRAM data backup/import/delete / NVRAM backup

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** C, U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 17 | 0 |

**Description:** Setting to backup/import/delete NVRAM data.
NVRAM data are non-volatile data in the device (e.g. fault buffer).

For NVRAM data actions, the following data are excluded:

- Crash diagnostics
- CU operating hours counter
- CU temperature
- Safety logbook

**Value:**
0: Inactive
1: NVRAM data backup to memory card
2: Import NVRAM data from the memory card
3: Delete NVRAM data in the device
10: Error when clearing
11: Error when backing up, memory card not available
12: Error when backing up, insufficient memory space
13: Error when backing up
14: Error when importing, memory card not available
15: Error when importing, checksum error
16: Error when importing, no NVRAM data available
17: Error when importing

**Notice:** Re value = 2, 3:

These actions are only possible when pulses are inhibited.

**Note:** After the action has been successfully completed, the parameter is automatically set to zero.

The actions importing and deleting NVRAM data immediately initiate a warm restart.

If the procedure was not successfully completed, then an appropriate fault value is displayed (p7775 >= 10).

## r7841[0...15] Power Module serial number / PM serial no.

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Unsigned8 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the actual serial number of the Power Module.

The individual characters of the serial number are displayed in the ASCII code in the indices.

**Notice:** An ASCII table (excerpt) can be found, for example, in the appendix to the List Manual.

## r7843[0...20] Memory card serial number / Mem_card ser.no

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** Unsigned8 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the actual serial number of the memory card.

The individual characters of the serial number are displayed in the ASCII code in the indices.

**Notice:** An ASCII table (excerpt) can be found, for example, in the appendix to the List Manual.

**Note:** Example: displaying the serial number for a memory card:

r7843[0] = 49 dec --> ASCII characters = "1" --> serial number, character 1

r7843[1] = 49 dec --> ASCII characters = "1" --> serial number, character 2

r7843[2] = 49 dec --> ASCII characters = "1" --> serial number, character 3

r7843[3] = 57 dec --> ASCII characters = "9" --> serial number, character 4

r7843[4] = 50 dec --> ASCII characters = "2" --> serial number, character 5

r7843[5] = 51 dec --> ASCII characters = "3" --> serial number, character 6

r7843[6] = 69 dec --> ASCII characters = "E" --> serial number, character 7

r7843[7] = 0 dec --> ASCII characters = " " --> serial number, character 8

...

r7843[19] = 0 dec --> ASCII characters = " " --> serial number, character 20

r7843[20] = 0 dec

Serial number = 111923E

## r7901[0...81] Sampling times / t_sample

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - [µs] | - [µs] | - [µs] |

**Description:** Displays the sampling times currently present on the drive unit.

r7901[0...63]: sampling times of hardware time slices.

r7901[64...82]: sampling times of software time slices.

r7901[x] = 0 means that in the associated time slice, no methods have been registered.

**Note:** The basis for the software time slices is T_NRK = p7901[13].

## r7903 Hardware sampling times still assignable / HW t_samp free

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the number of hardware sampling times that can still be assigned.

These free sampling times can be used by OA applications such as DCC or FBLOCKS.

**Note:** OA: Open Architecture

## p8400[0...2] RTC time / RTC time

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 59 | 0 |

**Description:** Sets and displays the time on the real-time clock in hours, minutes, and seconds.

The time is stored in the internal clock block in the drive and continues to run even if the supply voltage for the Control Unit is interrupted (for approx. 5 days).

**Index:**
[0] = Hour (0 ... 23)
[1] = Minute (0 ... 59)
[2] = Second (0 ... 59)

**Note:** The time from p8400 and p8401 is used to display the fault and alarm times.

The parameter is not reset when the factory setting is restored (p0010 = 30, p0970).

The time is entered and displayed in 24-hour format.

RTC: Real-time clock

## p8401[0...2] RTC date / RTC date

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 9999 | [0] 1<br>[1] 1<br>[2] 1970 |

**Description:** Sets and displays the date on the real-time clock in year, month, and day.

The date is stored in the internal clock block in the drive and continues to run even if the supply voltage for the Control Unit is interrupted (for approx. 5 days).

**Recommend.:** When the date is set as an index, the day should always be written last because, if a date is invalid, the day is always corrected to the last valid day in that particular month of the year.

**Index:** [0] = Day (1 ... 31)
[1] = Month (1 ... 12)
[2] = Year (YYYY)

**Note:** The time from p8400 and p8401 is used to display the fault and alarm times.

The parameter is not reset when the factory setting is restored (p0010 = 30, p0970).

RTC: Real-time clock

## r8404 RTC weekday / RTC weekday

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 1 | 7 | - |

**Description:** Displays the weekday on the real-time clock.

**Value:**
1: Monday
2: Tuesday
3: Wednesday
4: Thursday
5: Friday
6: Saturday
7: Sunday

**Note:** RTC: Real-time clock

## p8405 Activate/de-activate RTC alarm A01098 / RTC A01098 act

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 1 | 1 |

**Description:** Sets whether the real-time clock outputs an alarm if the time is not synchronized (e.g. if the power supply was switched off for an extended period).

**Value:**
0: Alarm A01098 de-activated
1: Alarm A01098 activated

**Note:** RTC: Real-time clock

## p8409 RTC DTC activation / RTC DTC act

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 1 | 1 |

**Description:** Sets the activation/de-activation of the parameters for timers DTC1, DTC2, DTC3.

For p8409 = 0, the following applies:

DTC1 parameters p8410, p8411, p8412 are inactive and can be set. Binector output r8413.0 = 0.

DTC2 parameters p8420, p8421, p8422 are inactive and can be set. Binector output r8423.0 = 0.

DTC3 parameters p8430, p8431, p8432 are inactive and can be set. Binector output r8433.0 = 0.

For p8409 = 1, the following applies:

DTC1 parameters p8410, p8411, p8412 are active and cannot be set. Binector outputs r8413 are active.

DTC2 parameters p8420, p8421, p8422 are active and cannot be set. Binector outputs r8423 are active.

DTC3 parameters p8430, p8431, p8432 are active and cannot be set. Binector outputs r8433 are active.

**Value:**
0: DTC inactive and can be set
1: DTC active and cannot be set

**Dependency:** Refer to: p8410, p8411, p8412, r8413, p8420, p8421, p8422, r8423, p8430, p8431, p8432, r8433

**Note:** DTC: Digital Time Clock (timer)

RTC: Real-time clock

## p8410[0...6] RTC DTC1 weekday of activation / RTC DTC1 day act

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 1 | 0 |

**Description:** Sets the weekday on which timer 1 is activated (DTC1).

The switch-on/off time is set in p8411/p8412 and the result displayed via binector output r8413.

**Value:**
0: Weekday de-activated
1: Weekday activated

**Index:**
[0] = Monday
[1] = Tuesday
[2] = Wednesday
[3] = Thursday
[4] = Friday
[5] = Saturday
[6] = Sunday

**Dependency:** Refer to: p8409, p8411, p8412, r8413

**Notice:** This parameter can only be changed when p8409 = 0.

**Note:** DTC: Digital Time Clock (timer)

RTC: Real-time clock

## p8411[0...1] RTC DTC1 switch-on time / RTC DTC1 t_ON

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 59 | 0 |

**Description:** Setting of the switch-on time in hours and minutes for time switch 1 (DTC1).

BO: r8413 = 1 signal:

The condition for the set weekday (p8410) and switch-on time has been fulfilled.

**Index:**
[0] = Hour (0 ... 23)
[1] = Minute (0 ... 59)

**Dependency:** Refer to: p8409, p8410, r8413

**Notice:** This parameter can only be changed when p8409 = 0.

**Note:** DTC: Digital Time Clock (timer)

RTC: Real-time clock

## p8412[0...1] RTC DTC1 off time / RTC DTC1 t_OFF

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 59 | 0 |

**Description:** Sets the switch-off time in hours and minutes for time switch 1 (DTC1).

BO: r8413 = 0 signal:

The condition for the set weekday (p8410) and switch-off time has been fulfilled.

**Index:**
[0] = Hour (0 ... 23)
[1] = Minute (0 ... 59)

**Dependency:** Refer to: p8409, p8410, r8413

**Notice:** This parameter can only be changed when p8409 = 0.

**Note:** DTC: Digital Time Clock (timer)

RTC: Real-time clock

## r8413.0...1 BO: RTC DTC1 output / RTC DTC1 output

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display and binector output for the output of time switch 1 (DTC1).

Where a weekday is de-activated, the following applies (p8410):

- The binector output for this timer is inactive (r8413.0 = 0).

Where a weekday is activated, the following applies (p8410):

- The ON/OFF time setting (p8411, p8412) for this timer has an instant effect on the binector output (r8413).

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Timer on | Yes | No | - |
| 01 | Timer ON negated | No | Yes | - |

**Dependency:** Refer to: p8409, p8410, p8411, p8412

**Notice:** This parameter can only be changed when p8409 = 0.

**Note:** DTC: Digital Time Clock (timer)

RTC: Real-time clock

## p8420[0...6] RTC DTC2 weekday of activation / RTC DTC2 day act

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 1 | 0 |

**Description:** Sets the weekday on which timer 2 is activated (DTC2).

The switch-on/off time is set in p8421/p8422 and the result displayed via binector output r8423.

**Value:**
0: Weekday de-activated
1: Weekday activated

**Index:**
[0] = Monday
[1] = Tuesday
[2] = Wednesday
[3] = Thursday
[4] = Friday
[5] = Saturday
[6] = Sunday

**Dependency:** Refer to: p8409, p8421, p8422, r8423

**Notice:** This parameter can only be changed when p8409 = 0.

**Note:** DTC: Digital Time Clock (timer)

RTC: Real-time clock

## p8421[0...1] RTC DTC2 switch-on time / RTC DTC2 t_ON

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 59 | 0 |

**Description:** Sets the switch on time in hours and minutes for time switch 2 (DTC2).

BO: r8423 = 1 signal:

The condition for the set weekday (p8420) and switch-on time has been fulfilled.

**Index:**
[0] = Hour (0 ... 23)
[1] = Minute (0 ... 59)

**Dependency:** Refer to: p8409, p8420, r8423

**Notice:** This parameter can only be changed when p8409 = 0.

**Note:** DTC: Digital Time Clock (timer)
RTC: Real-time clock

## p8422[0...1] RTC DTC2 off time / RTC DTC2 t_OFF

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 59 | 0 |

**Description:** Sets the switch off time in hours and minutes for time switch 2 (DTC2).
BO: r8423 = 0 signal:
The condition for the set weekday (p8420) and switch-off time has been fulfilled.

**Index:** [0] = Hour (0 ... 23)
[1] = Minute (0 ... 59)

**Dependency:** Refer to: p8409, p8420, r8423

**Notice:** This parameter can only be changed when p8409 = 0.

**Note:** DTC: Digital Time Clock (timer)
RTC: Real-time clock

## r8423.0...1 BO: RTC DTC2 output / RTC DTC2 output

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display and binector output for the output of timer 2 (DTC2).
Where a weekday is de-activated, the following applies (p8420):
- The binector output for this timer is inactive (r8423.0 = 0).
Where a weekday is activated, the following applies (p8420):
- The ON/OFF time setting (p8421, p8422) for this timer has an instant effect on the binector output (r8423).

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Timer on | Yes | No | - |
| 01 | Timer ON negated | No | Yes | - |

**Dependency:** Refer to: p8409, p8420, p8421, p8422

**Notice:** This parameter can only be changed when p8409 = 0.

**Note:** DTC: Digital Time Clock (timer)
RTC: Real-time clock

## p8430[0...6] RTC DTC3 weekday of activation / RTC DTC3 day act

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 1 | 0 |

**Description:** Sets the weekday on which timer 3 is activated (DTC3).
The switch-on/off time is set in p8431/p8432 and the result displayed via binector output r8433.

**Value:**
0: Weekday de-activated
1: Weekday activated

**Index:** [0] = Monday
[1] = Tuesday
[2] = Wednesday
[3] = Thursday
[4] = Friday
[5] = Saturday
[6] = Sunday

**Dependency:** Refer to: p8409, p8431, p8432, r8433

**Notice:** This parameter can only be changed when p8409 = 0.

**Note:** DTC: Digital Time Clock (timer)
RTC: Real-time clock

## p8431[0...1] RTC DTC3 switch-on time / RTC DTC3 t_ON

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 59 | 0 |

**Description:** Sets the switch on time in hours and minutes for timer 3 (DTC3).
BO: r8433 = 1 signal:
The condition for the set weekday (p8430) and switch-on time has been fulfilled.

**Index:** [0] = Hour (0 ... 23)
[1] = Minute (0 ... 59)

**Dependency:** Refer to: p8409, p8430, r8433

**Notice:** This parameter can only be changed when p8409 = 0.

**Note:** DTC: Digital Time Clock (timer)
RTC: Real-time clock

## p8432[0...1] RTC DTC3 off time / RTC DTC3 t_OFF

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 59 | 0 |

**Description:** Sets the switch off time in hours and minutes for timer 3 (DTC3).
BO: r8433 = 0 signal:
The condition for the set weekday (p8430) and switch-off time has been fulfilled.

**Index:** [0] = Hour (0 ... 23)
[1] = Minute (0 ... 59)

**Dependency:** Refer to: p8409, p8430, r8433

**Notice:** This parameter can only be changed when p8409 = 0.

**Note:** DTC: Digital Time Clock (timer)
RTC: Real-time clock

## r8433.0...1 BO: RTC DTC3 output / RTC DTC3 output

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display and binector output for the output of timer 3 (DTC3).
Where a weekday is de-activated, the following applies (p8430):
- The binector output for this timer is inactive (r8433.0 = 0).
Where a weekday is activated, the following applies (p8430):
- The ON/OFF time setting (p8431, p8432) for this timer has an instant effect on the binector output (r8433).

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Timer on | Yes | No | - |
| 01 | Timer ON negated | No | Yes | - |

**Dependency:** Refer to: p8409, p8430, p8431, p8432

**Notice:** This parameter can only be changed when p8409 = 0.

**Note:** DTC: Digital Time Clock (timer)
RTC: Real-time clock

## r8570[0...39] Macro drive object / Macro DO

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the macro file saved in the appropriate directory on the memory card/device memory.

**Dependency:** Refer to: p0015

**Note:** For a value = 9999999, the following applies: The read operation is still running.

## r8571[0...39] Macro Binector Input (BI) / Macro BI

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the ACX file saved in the appropriate directory in the non-volatile memory.

**Note:** For a value = 9999999, the following applies: The read operation is still running.

## r8572[0...39] Macro Connector Inputs (CI) for speed setpoints / Macro CI n_set

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the ACX file saved in the appropriate directory in the non-volatile memory.

**Dependency:** Refer to: p1000

**Note:** For a value = 9999999, the following applies: The read operation is still running.

## r8573[0...39] Macro Connector Inputs (CI) for torque setpoints / Macro CI M_set

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the ACX file saved in the appropriate directory in the non-volatile memory.

**Note:** For a value = 9999999, the following applies: The read operation is still running.

## r8585 Macro execution actual / Macro executed

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the macro currently being executed on the drive object.

**Dependency:** Refer to: p0015, p1000, r8570, r8571, r8572, r8573

## r8600 CAN device type / Device type

| | | | |
|---|---|---|---|
| CU230P-2_CAN | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| | **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | - | - | - |

**Description:** Displays all of the devices connected to the CAN bus after run-up.
r8600
= 00000000 hex: No drive recognized.
= 02010192 hex: 1 Vector drive

**Note:** Corresponds to the CANopen object 1000 hex.
For each detected drive, the device type is displayed in object 67FF hex.

## r8601 CAN error register / Error register

| | | | |
|---|---|---|---|
| CU230P-2_CAN | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned8 |
| | **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | - | - | - |

**Description:** Displays the error register for CANopen.
Bit 0: Generic error.
0 signal: No error present.
1 signal: Generic error present.
Bit 1 ... 3: Not supported (always a 0 signal).
Bit 4: Communications error.
0 signal: There is no message in the range 8700 ... 8799.
1 signal: There is at least one message (fault or alarm) in the range 8700 ... 8799.
Bit 5 ... 6: Not supported (always a 0 signal).
Bit 7:; Fault outside the range 8700 ... 8799.
0 signal: There is no fault outside the range 8700 ... 8799.
1 signal: There is at least one fault outside the range 8700 ... 8799.

**Note:** Corresponds to the CANopen object 1001 hex.

## p8602 CAN SYNC object / SYNC object

| | | | |
|---|---|---|---|
| CU230P-2_CAN | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | 0000 hex | FFFF FFFF hex | 0080 hex |

**Description:** Sets the SYNC object parameter for the following CANopen objects:
- 1005 hex: COB-ID

**Note:** SINAMICS operates as SYNC load.
COB-ID: CAN object identification

## p8603 CAN COB-ID Emergency Message / COB-ID EMCY Msg

| | | | |
|---|---|---|---|
| CU230P-2_CAN | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | 0000 hex | FFFF FFFF hex | 0000 hex |

**Description:** Sets the COB-ID for the emergency message (error telegram).

It corresponds to the CANopen objects:

- 1014 hex: COB-ID

**Note:** If, when downloading, the pre-set value 0 is downloaded, then the CANopen pre-set value 80 hex + Node-ID is automatically set.

Online, the value 0 is rejected as, according to the CANopen Standard, COB-ID 0 is not permitted here.

The changeover of the node ID using the hardware switch at the Control Unit or per software has no effect on the COB-ID EMCY. The saved value remains effective.

## p8604[0...1] CAN life guarding / Life guarding

CU230P-2_CAN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 65535 | 0 |

**Description:** Sets the life guarding parameter for the following CANopen objects:

- 100C hex: Guard Time
- 100D hex: Life Time Factor

The life time is derived by multiplying guard time by the life time factor.

**Index:** [0] = Time interval [ms] for the life time
[1] = Factor for the lifetime

**Dependency:** Refer to: p8606

**Note:** For p8604[0] = 0 and/or p8604[1] = 0, the life guarding event service (monitoring the node guarding, fault F08700 with fault value = 2) is deactivated.

The node guarding protocol is active without the life guarding event service, if the heartbeat protocol is deactivated (p8606 = 0).

## p8606 CAN Producer Heartbeat Time / Prod Heartb Time

CU230P-2_CAN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 [ms] | 65535 [ms] | 0 [ms] |

**Description:** Sets the time [ms] to cyclically send heartbeat telegrams.

The smallest cycle is 100 ms.

For p8606 = 0, heartbeat telegrams are not sent.

**Dependency:** Refer to: p8604

**Note:** Corresponds to the CANopen object 1017 hex.

Activating the heartbeat protocol automatically deactivates the node guarding.

## r8607[0...3] CAN Identity Object / Identity object

CU230P-2_CAN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** General device information display.

**Index:** [0] = Vendor ID
[1] = Product code
[2] = Revision number
[3] = Serial number

**Note:** Corresponds to the CANopen object 1018 hex.

Re index 3:

The SINAMICS serial number comprises 60 bits.

Of these bits, the following are displayed in this index:

Bits 0 ... 19: Consecutive number

Bits 20 ... 23: Production ID
- 0 hex: Development
- 1 hex: P1 unique number
- 2 hex: P2 unique number
- 3 hex: WA unique number
- 9 hex: Pattern
- F hex: All others

Bits 24 ... 27: Month of manufacture (0 means January, B means December)

Bits 28 ... 31: Year of manufacture (0 means 2002)

## p8608[0...1] CAN Clear Bus Off Error / Clear bus off err

CU230P-2_CAN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 1 | 0 |

**Description:** As a result of a Bus Off error, the CAN controller is set into the initialization state.

Index 0:

The CAN controller is manually started after resolving the cause of the error with p8608[0] = 1.

Index 1:

The automatic CAN bus start function is activated using p8608[1] = 1.

At 2 second intervals, the CAN controller is automatically restarted until the cause of the error has been resolved and a CAN connection has been established.

**Value:**
0: Inactive
1: Start CAN controller

**Index:**
[0] = Manual controller start function
[1] = Activating the automatic controller start function

**Note:** Re index 0:

This parameter is automatically reset to 0 after start.

## p8609[0...1] CAN Error Behavior / Error behavior

CU230P-2_CAN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 2 | 1 |

**Description:** Sets the behavior of the CAN node referred to the communications error or equipment fault.

**Value:**
0: Pre-operational
1: No change
2: Stopped

**Index:**
[0] = Behavior for communication errors
[1] = Behavior for device faults

**Note:** Corresponds to the CANopen object 1029 hex.

## r8610[0...1] CAN First Server SDO / First server SDO

CU230P-2_CAN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the identifier (client/server and server/client) of the SDO channel.

**Index:**
[0] = COB-ID from the client to the server
[1] = COB-ID from the server to the client

**Note:** Corresponds to the CANopen object 1200 hex.

SDO: Service Data Object

## p8611[0...82] CAN Pre-defined Error Field / Pre_def err field

CU230P-2_CAN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0000 hex | FFFF 1000 hex | 0000 hex |

**Description:** Displays the Pre-defined Error Field of the CAN node.

It includes the number of all errors that have occurred, the number of errors that have occurred for each drive and the errors according to their history.

The first 16 bits represent the CANopen error code and the second 16 bits the SINAMICS error code.

Index 1 has the same structure - however, the drive object ID is in the second 16 bits instead of the SINAMICS error code.

CANopen error code:

0000 hex: No error present.

8110 hex: Alarm A08751 present.

8120 hex: Alarm A08752 present.

8130 hex: Alarm A08700(F) with alarm value = 2 present.

1000 hex: Generic error 1 present (there is at least one fault outside the range 8700 ... 8799)

1001 hex: Generic error 2 present (there is at least one alarm in the range 8700 ... 8799 with the exception of A08751, A08752, A08700)

All drive objects are acknowledged by writing the value 0 to index 0. As soon as a fault has been acknowledged or an alarm cleared, then it is also cleared from the fault list.

**Index:**
[0] = Number of all faults in the drive unit
[1] = Most recent drive number / fault number
[2] = Number of faults drive 1
[3] = Fault 1/ drive 1
[4] = Fault 2/ drive 1
[5] = Fault 3/ drive 1
[6] = Fault 4/ drive 1
[7] = Fault 5/ drive 1
[8] = Fault 6/ drive 1

**Note:** Corresponds to the CANopen object 1003 hex.

## p8620 CAN Node-ID / Node ID

CU230P-2_CAN

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Unsigned8 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 1 | 127 | 126 |

**Description:** Display or setting of the CANopen Node ID.

The Node ID can be set as follows:

1) Using the address switch on the Control Unit.

--> p8620 can then only be read and displays the selected Node ID.

--> A change only becomes effective after a POWER ON.

--> CANopen Node ID and PROFIBUS address are identical.

2) Using p8620

--> Only if address 0 is set using the address switch.

--> the Node ID is set as standard to 126.

--> A change only becomes effective after save and POWER ON.

**Dependency:** Refer to: r8621

**Notice:** For p0014 = 1, the following applies:

After the value has been modified, no further parameter modifications can be made and the status is shown in r3996. Modifications can be made again when r3996 = 0.

For p0014 = 0, the following applies:

Before a changed setting becomes permanently effective, a non-volatile RAM to ROM data save is required. To do this, set p0971 = 1 or p0014 = 1.

**Note:** Every node ID change only becomes effective after a POWER ON.

The active node ID is displayed in r8621.

The parameter is not influenced by setting the factory setting.

It is only possible to independently set CANopen node ID and the PROFIBUS address using p0918 and p8620 (prerequisite: the address 0 is set for the address switch).

## r8621 CAN Node-ID active / Node ID active

CU230P-2_CAN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned8 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the active CANopen Node ID.

**Dependency:** Refer to: p8620

## p8622 CAN bit rate / Bit rate

CU230P-2_CAN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 7 | 6 |

**Description:** Setting the bit rate for the CAN bus.

The appropriate bit timings are selected that are defined in p8623 in the associated sub-index.

Example:

Bit rate = 20 kbit/s --> p8622 = 6 --> associated bit timing is in p8623[6].

**Value:**
0: 1 Mbit/s
1: 800 kbit/s
2: 500 kbit/s
3: 250 kbit/s
4: 125 kbit/s
5: 50 kbit/s
6: 20 kbit/s
7: 10 kbit/s

**Dependency:** Refer to: p8623

**Notice:** For p0014 = 1, the following applies:

After the value has been modified, no further parameter modifications can be made and the status is shown in r3996. Modifications can be made again when r3996 = 0.

For p0014 = 0, the following applies:

Before a changed setting becomes permanently effective, a non-volatile RAM to ROM data save is required. To do this, set p0971 = 1 or p0014 = 1.

**Note:** The parameter is not influenced by setting the factory setting.

## p8623[0...7] CAN Bit Timing selection / Bit timing select

| | | | |
|---|---|---|---|
| CU230P-2_CAN | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | 0000 hex | 000F 7FFF hex | [0] 1405 hex<br>[1] 1605 hex<br>[2] 1C05 hex<br>[3] 1C0B hex<br>[4] 1C17 hex<br>[5] 1C3B hex<br>[6] 0002 1C15 hex<br>[7] 0004 1C2B hex |

**Description:** Sets the bit timing for the C_CAN controller to the associated and selected bit rate (p8622).

Bits are distributed to the following parameters of the C_CAN controller in p8623[0...7]:

Bit 0 ... 5: BRP (Baud Rate Prescaler)

Bit 6 ... 7: SJW (Synchronization Jump Width)

Bit 8 ... 11: TSEG1 (Time Segment 1, before the sampling point)

Bit 12 ... 14: TSEG2 (Time Segment 2, after the sampling point)

Bit 15: Reserved

Bit 16 ... 19: BRPE (Baud Rate Prescaler Extension)

Bit 20 ... 31: Reserved

Example:

Bit rate = 20 kbit/s --> p8622 = 6 --> associated bit timing is in p8623[6] --> 0001 2FB6

**Recommend.:** Use the factory setting when setting the bit timing.

**Index:**
[0] = 1 Mbit/s
[1] = 800 kbit/s
[2] = 500 kbit/s
[3] = 250 kbit/s
[4] = 125 kbit/s
[5] = 50 kbit/s
[6] = 20 kbit/s
[7] = 10 kbit/s

**Dependency:** Refer to: p8622

**Note:** The parameter is not influenced by setting the factory setting.

## p8630[0...2] CAN virtual objects / Virtual objects

| | | | |
|---|---|---|---|
| CU230P-2_CAN | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | 0 | 65535 | 0 |

**Description:** Activating access to parameters via manufacturer-specific CANopen objects and setting for the subindex area (index 1) and the parameter area (index 2) when using virtual objects.

This means that it is possible to access all SINAMICS parameters via CAN.

Index 0:

0: Not possible to access virtual CANopen objects

1: Possible to access virtual CANopen objects

Index 1 (sub-index area):

0: 0 ... 255

1: 256 ... 511

2: 512 ... 767

3: 768 ... 1023

Index 2 (parameter area):
0: 1 ... 9999
1: 10000 ... 19999
2: 20000 ... 29999
3: 30000 ... 39999

**Index:** [0] = Drive object number
[1] = Sub-index range
[2] = Parameter range

## p8641 CAN Abort Connection Option Code / Abort con opt code

| CU230P-2_CAN | | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | 0 | 3 | 3 |

**Description:** Sets the drive behavior if a CAN communication error occurs.

**Value:**
0: No response
1: OFF1
2: OFF2
3: OFF3

## r8680[0...36] CAN Diagnosis Hardware / Diagnostics HW

| CU230P-2_CAN | | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| | **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | - | - | - |

**Description:** Displays the register of the CAN controller C_CAN:
Register, Message Interface Register and Message Handler Register - referred to the CAN protocol.

**Index:**
[0] = Control register
[1] = Status register
[2] = Error counter
[3] = Bit timing register
[4] = Interrupt register
[5] = Test register
[6] = Baud rate prescaler extension register
[7] = Interface 1 command request register
[8] = Interface 1 command mask register

**Note:** A description of the individual registers of the C_CAN controller can be taken from "C_CAN User's Manual".

## p8684 CAN NMT state after booting / NMT state aft boot

| CU230P-2_CAN | | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | 4 | 127 | 127 |

**Description:** Sets the CANopen NMT state that is effective after booting.

**Value:**
4: Stopped
5: Operational
127: Pre-operational

**Dependency:** Refer to: p8685

**Note:** Booting in the NMT state pre-operational corresponds to the CANopen standard

## p8685 CAN NMT states / NMT states

CU230P-2_CAN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 129 | 127 |

**Description:** Sets and displays the CANopen NMT state.

**Value:**
0: Initialization
4: Stopped
5: Operational
127: Pre-operational
128: Reset node
129: Reset Communication

**Note:** The value 0 (initialization) is only displayed and cannot be set.

## p8699 CAN: RPDO monitoring time / RPDO t_monit

CU230P-2_CAN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 [ms] | 65535000 [ms] | 0 [ms] |

**Description:** Sets the monitoring time for the process data received via the CAN bus.

A value that is not a multiple integer of the CANopen sampling time is rounded-off.

If no process data is received within this time, then fault F08702 is output.

**Note:** Value = 0: Monitoring is de-activated.

p2048: CANopen sampling time

## p8700[0...1] CAN Receive PDO 1 / Receive PDO 1

CU230P-2_CAN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** C(3), T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9204, 9206 |
| **Min** | **Max** | **Factory setting** |
| 0000 hex | 8000 06DF hex | [0] 8000 06DF hex<br>[1] 00FE hex |

**Description:** Sets the communication parameters for CANopen Receive Process Data Object 1 (RPDO 1).

**Index:**
[0] = PDO COB-ID
[1] = PDO transmission type

**Dependency:** A valid COB-ID can only be set for the available (existing) channel.

**Note:** Corresponds to the CANopen object 1400 hex.

Transmission types 0, 1, FE and FF can be set.

PDO: Process Data Object

## p8701[0...1] CAN Receive PDO 2 / Receive PDO 2

CU230P-2_CAN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** C(3), T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9204, 9206 |
| **Min** | **Max** | **Factory setting** |
| 0000 hex | 8000 06DF hex | [0] 8000 06DF hex<br>[1] 00FE hex |

**Description:** Sets the communication parameters for CANopen Receive Process Data Object 2 (RPDO 2).

**Index:**
[0] = PDO COB-ID
[1] = PDO transmission type

**Dependency:** A valid COB-ID can only be set for the available (existing) channel.

| | |
|---|---|
| **Note:** | Corresponds to the CANopen object 1401 hex.<br>Transmission types 0, 1, FE and FF can be set.<br>PDO: Process Data Object |

## p8702[0...1] CAN Receive PDO 3 / Receive PDO 3

| CU230P-2_CAN | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
|---|---|---|---|
| | **Can be changed:** C(3), T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 9204, 9206 |
| | **Min** | **Max** | **Factory setting** |
| | 0000 hex | 8000 06DF hex | [0] 8000 06DF hex<br>[1] 00FE hex |

| | |
|---|---|
| **Description:** | Sets the communication parameters for CANopen Receive Process Data Object 3 (RPDO 3). |
| **Index:** | [0] = PDO COB-ID<br>[1] = PDO transmission type |
| **Dependency:** | A valid COB-ID can only be set for the available (existing) channel. |
| **Note:** | Corresponds to the CANopen object 1402 hex.<br>Transmission types 0, 1, FE and FF can be set.<br>PDO: Process Data Object |

## p8703[0...1] CAN Receive PDO 4 / Receive PDO 4

| CU230P-2_CAN | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
|---|---|---|---|
| | **Can be changed:** C(3), T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 9204, 9206 |
| | **Min** | **Max** | **Factory setting** |
| | 0000 hex | 8000 06DF hex | [0] 8000 06DF hex<br>[1] 00FE hex |

| | |
|---|---|
| **Description:** | Sets the communication parameters for CANopen Receive Process Data Object 4 (RPDO 4). |
| **Index:** | [0] = PDO COB-ID<br>[1] = PDO transmission type |
| **Dependency:** | A valid COB-ID can only be set for the available (existing) channel. |
| **Note:** | Corresponds to the CANopen object 1403 hex.<br>Transmission types 0, 1, FE and FF can be set.<br>PDO: Process Data Object |

## p8704[0...1] CAN Receive PDO 5 / Receive PDO 5

| CU230P-2_CAN | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
|---|---|---|---|
| | **Can be changed:** C(3), T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 9204 |
| | **Min** | **Max** | **Factory setting** |
| | 0000 hex | 8000 06DF hex | [0] 8000 06DF hex<br>[1] 00FE hex |

| | |
|---|---|
| **Description:** | Sets the communication parameters for CANopen Receive Process Data Object 5 (RPDO 5). |
| **Index:** | [0] = PDO COB-ID<br>[1] = PDO transmission type |
| **Dependency:** | A valid COB-ID can only be set for the available (existing) channel. |
| **Note:** | Corresponds to the CANopen object 1404 hex.<br>Transmission types 0, 1, FE and FF can be set.<br>PDO: Process Data Object |

## p8705[0...1] CAN Receive PDO 6 / Receive PDO 6

CU230P-2_CAN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** C(3), T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9204 |
| **Min** | **Max** | **Factory setting** |
| 0000 hex | 8000 06DF hex | [0] 8000 06DF hex<br>[1] 00FE hex |

**Description:** Sets the communication parameters for CANopen Receive Process Data Object 6 (RPDO 6).

**Index:** [0] = PDO COB-ID
[1] = PDO transmission type

**Dependency:** A valid COB-ID can only be set for the available (existing) channel.

**Note:** Corresponds to the CANopen object 1405 hex.

Transmission types 0, 1, FE and FF can be set.

PDO: Process Data Object

## p8706[0...1] CAN Receive PDO 7 / Receive PDO 7

CU230P-2_CAN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** C(3), T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9204 |
| **Min** | **Max** | **Factory setting** |
| 0000 hex | 8000 06DF hex | [0] 8000 06DF hex<br>[1] 00FE hex |

**Description:** Sets the communication parameters for CANopen Receive Process Data Object 7 (RPDO 7).

**Index:** [0] = PDO COB-ID
[1] = PDO transmission type

**Dependency:** A valid COB-ID can only be set for the available (existing) channel.

**Note:** Corresponds to the CANopen object 1406 hex.

Transmission types 0, 1, FE and FF can be set.

PDO: Process Data Object

## p8707[0...1] CAN Receive PDO 8 / Receive PDO 8

CU230P-2_CAN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** C(3), T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9204 |
| **Min** | **Max** | **Factory setting** |
| 0000 hex | 8000 06DF hex | [0] 8000 06DF hex<br>[1] 00FE hex |

**Description:** Sets the communication parameters for CANopen Receive Process Data Object 8 (RPDO 8).

**Index:** [0] = PDO COB-ID
[1] = PDO transmission type

**Dependency:** A valid COB-ID can only be set for the available (existing) channel.

**Note:** Corresponds to the CANopen object 1407 hex.

Transmission types 0, 1, FE and FF can be set.

PDO: Process Data Object

## p8710[0...3] CAN Receive Mapping for RPDO 1 / Mapping RPDO 1

CU230P-2_CAN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** C(3), T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9204, 9206 |
| **Min** | **Max** | **Factory setting** |
| 0000 hex | FFFF FFFF hex | 0000 hex |

**Description:** Sets the mapping parameters for CANopen Receive Process Data Object 1 (RPDO 1).

**Index:** [0] = Mapped object 1
[1] = Mapped object 2
[2] = Mapped object 3
[3] = Mapped object 4

**Note:** Corresponds to the CANopen object 1600 hex.
Dummy mapping not supported.
The parameter can only be written online when the associated COB ID in p870x is set as invalid.

## p8711[0...3] CAN Receive Mapping for RPDO 2 / Mapping RPDO 2

| | | | |
|---|---|---|---|
| CU230P-2_CAN | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| | **Can be changed:** C(3), T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 9204, 9206 |
| | **Min** | **Max** | **Factory setting** |
| | 0000 hex | FFFF FFFF hex | 0000 hex |

**Description:** Sets the mapping parameters for CANopen Receive Process Data Object 2 (RPDO 2).

**Index:** [0] = Mapped object 1
[1] = Mapped object 2
[2] = Mapped object 3
[3] = Mapped object 4

**Note:** Corresponds to the CANopen object 1601 hex.
Dummy mapping not supported.
The parameter can only be written online when the associated COB ID in p870x is set as invalid.

## p8712[0...3] CAN Receive Mapping for RPDO 3 / Mapping RPDO 3

| | | | |
|---|---|---|---|
| CU230P-2_CAN | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| | **Can be changed:** C(3), T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 9204, 9206 |
| | **Min** | **Max** | **Factory setting** |
| | 0000 hex | FFFF FFFF hex | 0000 hex |

**Description:** Sets the mapping parameters for CANopen Receive Process Data Object 3 (RPDO 3).

**Index:** [0] = Mapped object 1
[1] = Mapped object 2
[2] = Mapped object 3
[3] = Mapped object 4

**Note:** Corresponds to the CANopen object 1602 hex.
Dummy mapping not supported.
The parameter can only be written online when the associated COB ID in p870x is set as invalid.

## p8713[0...3] CAN Receive Mapping for RPDO 4 / Mapping RPDO 4

| | | | |
|---|---|---|---|
| CU230P-2_CAN | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| | **Can be changed:** C(3), T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 9204, 9206 |
| | **Min** | **Max** | **Factory setting** |
| | 0000 hex | FFFF FFFF hex | 0000 hex |

**Description:** Sets the mapping parameters for CANopen Receive Process Data Object 4 (RPDO 4).

**Index:** [0] = Mapped object 1
[1] = Mapped object 2
[2] = Mapped object 3
[3] = Mapped object 4

**Note:** Corresponds to the CANopen object 1603 hex.
Dummy mapping not supported.
The parameter can only be written online when the associated COB ID in p870x is set as invalid.

## p8714[0...3] CAN Receive Mapping for RPDO 5 / Mapping RPDO 5

CU230P-2_CAN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** C(3), T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9204 |
| **Min** | **Max** | **Factory setting** |
| 0000 hex | FFFF FFFF hex | 0000 hex |

**Description:** Sets the mapping parameters for CANopen Receive Process Data Object 5 (RPDO 5).

**Index:**
[0] = Mapped object 1
[1] = Mapped object 2
[2] = Mapped object 3
[3] = Mapped object 4

**Note:** Corresponds to the CANopen object 1604 hex.

Dummy mapping not supported.

The parameter can only be written online when the associated COB ID in p870x is set as invalid.

## p8715[0...3] CAN Receive Mapping for RPDO 6 / Mapping RPDO 6

CU230P-2_CAN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** C(3), T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9204 |
| **Min** | **Max** | **Factory setting** |
| 0000 hex | FFFF FFFF hex | 0000 hex |

**Description:** Sets the mapping parameters for CANopen Receive Process Data Object 6 (RPDO 6).

**Index:**
[0] = Mapped object 1
[1] = Mapped object 2
[2] = Mapped object 3
[3] = Mapped object 4

**Note:** Corresponds to the CANopen object 1605 hex.

Dummy mapping not supported.

The parameter can only be written online when the associated COB ID in p870x is set as invalid.

## p8716[0...3] CAN Receive Mapping for RPDO 7 / Mapping RPDO 7

CU230P-2_CAN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** C(3), T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9204 |
| **Min** | **Max** | **Factory setting** |
| 0000 hex | FFFF FFFF hex | 0000 hex |

**Description:** Sets the mapping parameters for CANopen Receive Process Data Object 7 (RPDO 7).

**Index:**
[0] = Mapped object 1
[1] = Mapped object 2
[2] = Mapped object 3
[3] = Mapped object 4

**Note:** Corresponds to the CANopen object 1606 hex.

Dummy mapping not supported.

The parameter can only be written online when the associated COB ID in p870x is set as invalid.

## p8717[0...3] CAN Receive Mapping for RPDO 8 / Mapping RPDO 8

CU230P-2_CAN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** C(3), T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9204 |
| **Min** | **Max** | **Factory setting** |
| 0000 hex | FFFF FFFF hex | 0000 hex |

**Description:** Sets the mapping parameters for CANopen Receive Process Data Object 8 (RPDO 8).

**Index:** [0] = Mapped object 1
[1] = Mapped object 2
[2] = Mapped object 3
[3] = Mapped object 4

**Note:** Corresponds to the CANopen object 1607 hex.

Dummy mapping not supported.

The parameter can only be written online when the associated COB ID in p870x is set as invalid.

## p8720[0...4] CAN Transmit PDO 1 / Transmit PDO 1

CU230P-2_CAN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** C(3), T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9208, 9210 |
| **Min** | **Max** | **Factory setting** |
| 0000 hex | C000 06DF hex | [0] C000 06DF hex<br>[1] 00FE hex<br>[2] 0000 hex<br>[3] 0000 hex<br>[4] 0000 hex |

**Description:** Sets the communication parameters for CANopen Transmit Process Data Object 1 (TPDO 1).

**Index:** [0] = PDO COB-ID
[1] = PDO transmission type
[2] = Inhibit time (in 100 µs)
[3] = Reserved
[4] = Event timer (in ms)

**Dependency:** A valid COB-ID can only be set for the available (existing) channel.

**Notice:** For inhibit time and event timer, the following apply:

A value that is not a multiple integer of the CANopen sampling time is rounded-off.

**Note:** Corresponds to the CANopen object 1800 hex.

Transmission types 0, 1 ... F0, FE and FF can be set.

p2048: CANopen sampling time

PDO: Process Data Object

## p8721[0...4] CAN Transmit PDO 2 / Transmit PDO 2

CU230P-2_CAN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** C(3), T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9208, 9210 |
| **Min** | **Max** | **Factory setting** |
| 0000 hex | C000 06DF hex | [0] C000 06DF hex<br>[1] 00FE hex<br>[2] 0000 hex<br>[3] 0000 hex<br>[4] 0000 hex |

**Description:** Sets the communication parameters for CANopen Transmit Process Data Object 2 (TPDO 2).

**Index:** [0] = PDO COB-ID
[1] = PDO transmission type
[2] = Inhibit time (in 100 µs)
[3] = Reserved
[4] = Event timer (in ms)

**Dependency:** A valid COB-ID can only be set for the available (existing) channel.

**Notice:** For inhibit time and event timer, the following apply:

A value that is not a multiple integer of the CANopen sampling time is rounded-off.

**Note:** Corresponds to the CANopen object 1801 hex.

Transmission types 0, 1 ... F0, FE and FF can be set.

p2048: CANopen sampling time

PDO: Process Data Object

## p8722[0...4] CAN Transmit PDO 3 / Transmit PDO 3

CU230P-2_CAN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** C(3), T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9208, 9210 |
| **Min** | **Max** | **Factory setting** |
| 0000 hex | C000 06DF hex | [0] C000 06DF hex<br>[1] 00FE hex<br>[2] 0000 hex<br>[3] 0000 hex<br>[4] 0000 hex |

**Description:** Sets the communication parameters for CANopen Transmit Process Data Object 3 (TPDO 3).

**Index:**
[0] = PDO COB-ID
[1] = PDO transmission type
[2] = Inhibit time (in 100 µs)
[3] = Reserved
[4] = Event timer (in ms)

**Dependency:** A valid COB-ID can only be set for the available (existing) channel.

**Notice:** For inhibit time and event timer, the following apply:

A value that is not a multiple integer of the CANopen sampling time is rounded-off.

**Note:** Corresponds to the CANopen object 1802 hex.

Transmission types 0, 1 ... F0, FE and FF can be set.

p2048: CANopen sampling time

PDO: Process Data Object

## p8723[0...4] CAN Transmit PDO 4 / Transmit PDO 4

CU230P-2_CAN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** C(3), T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9208, 9210 |
| **Min** | **Max** | **Factory setting** |
| 0000 hex | C000 06DF hex | [0] C000 06DF hex<br>[1] 00FE hex<br>[2] 0000 hex<br>[3] 0000 hex<br>[4] 0000 hex |

**Description:** Sets the communication parameters for CANopen Transmit Process Data Object 4 (TPDO 4).

**Index:**
[0] = PDO COB-ID
[1] = PDO transmission type
[2] = Inhibit time (in 100 µs)
[3] = Reserved
[4] = Event timer (in ms)

**Dependency:** A valid COB-ID can only be set for the available (existing) channel.

**Notice:** For inhibit time and event timer, the following apply:

A value that is not a multiple integer of the CANopen sampling time is rounded-off.

**Note:** Corresponds to the CANopen object 1803 hex.

Transmission types 0, 1 ... F0, FE and FF can be set.

p2048: CANopen sampling time

PDO: Process Data Object

## p8724[0...4] CAN Transmit PDO 5 / Transmit PDO 5

| | | | |
|---|---|---|---|
| CU230P-2_CAN | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| | **Can be changed:** C(3), T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 9208 |
| | **Min** | **Max** | **Factory setting** |
| | 0000 hex | C000 06DF hex | [0] C000 06DF hex<br>[1] 00FE hex<br>[2] 0000 hex<br>[3] 0000 hex<br>[4] 0000 hex |

**Description:** Sets the communication parameters for CANopen Transmit Process Data Object 5 (TPDO 5).

**Index:**
[0] = PDO COB-ID
[1] = PDO transmission type
[2] = Inhibit time (in 100 µs)
[3] = Reserved
[4] = Event timer (in ms)

**Dependency:** A valid COB-ID can only be set for the available (existing) channel.

**Notice:** For inhibit time and event timer, the following apply:
A value that is not a multiple integer of the CANopen sampling time is rounded-off.

**Note:** Corresponds to the CANopen object 1804 hex.
Transmission types 0, 1 ... F0, FE and FF can be set.
p2048: CANopen sampling time
PDO: Process Data Object

## p8725[0...4] CAN Transmit PDO 6 / Transmit PDO 6

| | | | |
|---|---|---|---|
| CU230P-2_CAN | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| | **Can be changed:** C(3), T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 9208 |
| | **Min** | **Max** | **Factory setting** |
| | 0000 hex | C000 06DF hex | [0] C000 06DF hex<br>[1] 00FE hex<br>[2] 0000 hex<br>[3] 0000 hex<br>[4] 0000 hex |

**Description:** Sets the communication parameters for CANopen Transmit Process Data Object 6 (TPDO 6).

**Index:**
[0] = PDO COB-ID
[1] = PDO transmission type
[2] = Inhibit time (in 100 µs)
[3] = Reserved
[4] = Event timer (in ms)

**Dependency:** A valid COB-ID can only be set for the available (existing) channel.

**Notice:** For inhibit time and event timer, the following apply:
A value that is not a multiple integer of the CANopen sampling time is rounded-off.

**Note:** Corresponds to the CANopen object 1805 hex.
Transmission types 0, 1 ... F0, FE and FF can be set.
p2048: CANopen sampling time
PDO: Process Data Object

## p8726[0...4] CAN Transmit PDO 7 / Transmit PDO 7

CU230P-2_CAN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** C(3), T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9208 |
| **Min** | **Max** | **Factory setting** |
| 0000 hex | C000 06DF hex | [0] C000 06DF hex<br>[1] 00FE hex<br>[2] 0000 hex<br>[3] 0000 hex<br>[4] 0000 hex |

**Description:** Sets the communication parameters for CANopen Transmit Process Data Object 7 (TPDO 7).

**Index:**
[0] = PDO COB-ID
[1] = PDO transmission type
[2] = Inhibit time (in 100 µs)
[3] = Reserved
[4] = Event timer (in ms)

**Dependency:** A valid COB-ID can only be set for the available (existing) channel.

**Notice:** For inhibit time and event timer, the following apply:
A value that is not a multiple integer of the CANopen sampling time is rounded-off.

**Note:** Corresponds to the CANopen object 1806 hex.
Transmission types 0, 1 ... F0, FE and FF can be set.
p2048: CANopen sampling time
PDO: Process Data Object

## p8727[0...4] CAN Transmit PDO 8 / Transmit PDO 8

CU230P-2_CAN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** C(3), T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9208 |
| **Min** | **Max** | **Factory setting** |
| 0000 hex | C000 06DF hex | [0] C000 06DF hex<br>[1] 00FE hex<br>[2] 0000 hex<br>[3] 0000 hex<br>[4] 0000 hex |

**Description:** Sets the communication parameters for CANopen Transmit Process Data Object 8 (TPDO 8).

**Index:**
[0] = PDO COB-ID
[1] = PDO transmission type
[2] = Inhibit time (in 100 µs)
[3] = Reserved
[4] = Event timer (in ms)

**Dependency:** A valid COB-ID can only be set for the available (existing) channel.

**Notice:** For inhibit time and event timer, the following apply:
A value that is not a multiple integer of the CANopen sampling time is rounded-off.

**Note:** Corresponds to the CANopen object 1807 hex.
Transmission types 0, 1 ... F0, FE and FF can be set.
p2048: CANopen sampling time
PDO: Process Data Object

## p8730[0...3] CAN Transmit Mapping for TPDO 1 / Mapping TPDO 1

| | | | |
|---|---|---|---|
| CU230P-2_CAN | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| | **Can be changed:** C(3), T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 9208, 9210 |
| | **Min** | **Max** | **Factory setting** |
| | 0000 hex | FFFF FFFF hex | 0000 hex |

**Description:** Sets the mapping parameters for CANopen Transmit Process Data Object 1 (TPDO 1).

**Index:**
[0] = Mapped object 1
[1] = Mapped object 2
[2] = Mapped object 3
[3] = Mapped object 4

**Note:** Corresponds to the CANopen object 1A00 hex.

The parameter can only be written online when the associated COB ID in p872x is set as invalid.

## p8731[0...3] CAN Transmit Mapping for TPDO 2 / Mapping TPDO 2

| | | | |
|---|---|---|---|
| CU230P-2_CAN | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| | **Can be changed:** C(3), T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 9208, 9210 |
| | **Min** | **Max** | **Factory setting** |
| | 0000 hex | FFFF FFFF hex | 0000 hex |

**Description:** Sets the mapping parameters for CANopen Transmit Process Data Object 2 (TPDO 2).

**Index:**
[0] = Mapped object 1
[1] = Mapped object 2
[2] = Mapped object 3
[3] = Mapped object 4

**Note:** Corresponds to the CANopen object 1A01 hex.

The parameter can only be written online when the associated COB ID in p872x is set as invalid.

## p8732[0...3] CAN Transmit Mapping for TPDO 3 / Mapping TPDO 3

| | | | |
|---|---|---|---|
| CU230P-2_CAN | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| | **Can be changed:** C(3), T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 9208, 9210 |
| | **Min** | **Max** | **Factory setting** |
| | 0000 hex | FFFF FFFF hex | 0000 hex |

**Description:** Sets the mapping parameters for CANopen Transmit Process Data Object 3 (TPDO 3).

**Index:**
[0] = Mapped object 1
[1] = Mapped object 2
[2] = Mapped object 3
[3] = Mapped object 4

**Note:** Corresponds to the CANopen object 1A02 hex.

The parameter can only be written online when the associated COB ID in p872x is set as invalid.

## p8733[0...3] CAN Transmit Mapping for TPDO 4 / Mapping TPDO 4

| | | | |
|---|---|---|---|
| CU230P-2_CAN | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| | **Can be changed:** C(3), T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 9208, 9210 |
| | **Min** | **Max** | **Factory setting** |
| | 0000 hex | FFFF FFFF hex | 0000 hex |

**Description:** Sets the mapping parameters for CANopen Transmit Process Data Object 4 (TPDO 4).

**Index:**
[0] = Mapped object 1
[1] = Mapped object 2
[2] = Mapped object 3
[3] = Mapped object 4

**Note:** Corresponds to the CANopen object 1A03 hex.
The parameter can only be written online when the associated COB ID in p872x is set as invalid.

## p8734[0...3] CAN Transmit Mapping for TPDO 5 / Mapping TPDO 5

CU230P-2_CAN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** C(3), T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9208 |
| **Min** | **Max** | **Factory setting** |
| 0000 hex | FFFF FFFF hex | 0000 hex |

**Description:** Sets the mapping parameters for CANopen Transmit Process Data Object 5 (TPDO 5).

**Index:**
[0] = Mapped object 1
[1] = Mapped object 2
[2] = Mapped object 3
[3] = Mapped object 4

**Note:** Corresponds to the CANopen object 1A04 hex.
The parameter can only be written online when the associated COB ID in p872x is set as invalid.

## p8735[0...3] CAN Transmit Mapping for TPDO 6 / Mapping TPDO 6

CU230P-2_CAN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** C(3), T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9208 |
| **Min** | **Max** | **Factory setting** |
| 0000 hex | FFFF FFFF hex | 0000 hex |

**Description:** Sets the mapping parameters for CANopen Transmit Process Data Object 6 (TPDO 6).

**Index:**
[0] = Mapped object 1
[1] = Mapped object 2
[2] = Mapped object 3
[3] = Mapped object 4

**Note:** Corresponds to the CANopen object 1A05 hex.
The parameter can only be written online when the associated COB ID in p872x is set as invalid.

## p8736[0...3] CAN Transmit Mapping for TPDO 7 / Mapping TPDO 7

CU230P-2_CAN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** C(3), T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9208 |
| **Min** | **Max** | **Factory setting** |
| 0000 hex | FFFF FFFF hex | 0000 hex |

**Description:** Sets the mapping parameters for CANopen Transmit Process Data Object 7 (TPDO 7).

**Index:**
[0] = Mapped object 1
[1] = Mapped object 2
[2] = Mapped object 3
[3] = Mapped object 4

**Note:** Corresponds to the CANopen object 1A06 hex.
The parameter can only be written online when the associated COB ID in p872x is set as invalid.

## p8737[0...3] CAN Transmit Mapping for TPDO 8 / Mapping TPDO 8

CU230P-2_CAN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** C(3), T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9208 |
| **Min** | **Max** | **Factory setting** |
| 0000 hex | FFFF FFFF hex | 0000 hex |

**Description:** Sets the mapping parameters for CANopen Transmit Process Data Object 8 (TPDO 8).

**Index:** [0] = Mapped object 1
[1] = Mapped object 2
[2] = Mapped object 3
[3] = Mapped object 4

**Note:** Corresponds to the CANopen object 1A07 hex.

The parameter can only be written online when the associated COB ID in p872x is set as invalid.

## p8744 CAN PDO mapping configuration / PDO Mapping config

| | | | |
|---|---|---|---|
| CU230P-2_CAN | **Access level:** 2 | **Calculated:** - | **Data type:** Integer16 |
| | **Can be changed:** C, T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 9204, 9206, 9208, 9210 |
| | **Min** | **Max** | **Factory setting** |
| | 1 | 2 | 2 |

**Description:** Selector switch for the PDO mapping.

**Value:**
1: Predefined Connection Set
2: Free PDO Mapping

## r8745[0...15] CO: CAN free PZD receive objects 16 bit / Free PZD recv 16

| | | | |
|---|---|---|---|
| CU230P-2_CAN | **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| | **Can be changed:** - | **Scaling:** 4000H | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | - | - | - |

**Description:** Access to free PZD receive objects 16 bit using the SDO transfer.

An index can only be used, if the corresponding object has not been mapped in a PDO.

**Index:** [0] = PZD object 0
[1] = PZD object 1
[2] = PZD object 2
[3] = PZD object 3
[4] = PZD object 4
[5] = PZD object 5
[6] = PZD object 6
[7] = PZD object 7
[8] = PZD object 8
[9] = PZD object 9
[10] = PZD object 10
[11] = PZD object 11
[12] = PZD object 12
[13] = PZD object 13
[14] = PZD object 14
[15] = PZD object 15

**Note:** Index 0 corresponds to the CANopen object 5800 hex

Index 1 corresponds to the CANopen object 5801 hex

Index 2 corresponds to the CANopen object 5802 hex

Index 3 corresponds to the CANopen object 5803 hex

Index 4 corresponds to the CANopen object 5804 hex

Index 5 corresponds to the CANopen object 5805 hex

Index 6 corresponds to the CANopen object 5806 hex

Index 7 corresponds to the CANopen object 5807 hex

Index 8 corresponds to the CANopen object 5808 hex

Index 9 corresponds to the CANopen object 5809 hex

Index 10 corresponds to the CANopen object 580A hex

Index 11 corresponds to the CANopen object 580B hex

Index 12 corresponds to the CANopen object 580C hex

Index 13 corresponds to the CANopen object 580D hex

Index 14 corresponds to the CANopen object 580E hex

Index 15 corresponds to the CANopen object 580F hex

## p8746[0...15] CI: CAN free PZD send objects 16 bit / Free PZD send 16

| CU230P-2_CAN | | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Integer16 |
| | **Can be changed:** U, T | **Scaling:** 4000H | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | - | - | 0 |

**Description:** Sets the signal source for free PZD send objects 16 bit for SDO transfer.

An index can only be used, if the corresponding object has not been mapped in a PDO.

**Index:**
[0] = PZD object 0
[1] = PZD object 1
[2] = PZD object 2
[3] = PZD object 3
[4] = PZD object 4
[5] = PZD object 5
[6] = PZD object 6
[7] = PZD object 7
[8] = PZD object 8
[9] = PZD object 9
[10] = PZD object 10
[11] = PZD object 11
[12] = PZD object 12
[13] = PZD object 13
[14] = PZD object 14
[15] = PZD object 15

**Note:** Index 0 corresponds to the CANopen object 5810 hex

Index 1 corresponds to the CANopen object 5811 hex

Index 2 corresponds to the CANopen object 5812 hex

Index 3 corresponds to the CANopen object 5813 hex

Index 4 corresponds to the CANopen object 5814 hex

Index 5 corresponds to the CANopen object 5815 hex

Index 6 corresponds to the CANopen object 5816 hex

Index 7 corresponds to the CANopen object 5817 hex

Index 8 corresponds to the CANopen object 5818 hex

Index 9 corresponds to the CANopen object 5819 hex

Index 10 corresponds to the CANopen object 581A hex

Index 11 corresponds to the CANopen object 581B hex

Index 12 corresponds to the CANopen object 581C hex

Index 13 corresponds to the CANopen object 581D hex

Index 14 corresponds to the CANopen object 581E hex

Index 15 corresponds to the CANopen object 581F hex

## r8747[0...7] CO: CAN free PZD receive objects 32 bit / Free PZD recv 32

| CU230P-2_CAN | | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** Integer32 |
| | **Can be changed:** - | **Scaling:** 4000H | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | - | - | - |

**Description:** Access to free PZD receive objects 32 bit using the SDO transfer.

An index can only be used, if the corresponding object has not been mapped in a PDO.

**Index:**
[0] = PZD object 0
[1] = PZD object 1
[2] = PZD object 2
[3] = PZD object 3
[4] = PZD object 4
[5] = PZD object 5
[6] = PZD object 6
[7] = PZD object 7

**Note:** Index 0 corresponds to the CANopen object 5820 hex
Index 1 corresponds to the CANopen object 5821 hex
Index 2 corresponds to the CANopen object 5822 hex
Index 3 corresponds to the CANopen object 5823 hex
Index 4 corresponds to the CANopen object 5824 hex
Index 5 corresponds to the CANopen object 5825 hex
Index 6 corresponds to the CANopen object 5826 hex
Index 7 corresponds to the CANopen object 5827 hex

## p8748[0...7] CI: CAN free PZD send objects 32 bit / Free PZD send 32

CU230P-2_CAN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Integer32 |
| **Can be changed:** U, T | **Scaling:** 4000H | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for free PZD send objects 32 bit for SDO transfer.
An index can only be used, if the corresponding object has not been mapped in a PDO.

**Index:** [0] = PZD object 0
[1] = PZD object 1
[2] = PZD object 2
[3] = PZD object 3
[4] = PZD object 4
[5] = PZD object 5
[6] = PZD object 6
[7] = PZD object 7

**Note:** Index 0 corresponds to the CANopen object 5830 hex
Index 1 corresponds to the CANopen object 5831 hex
Index 2 corresponds to the CANopen object 5832 hex
Index 3 corresponds to the CANopen object 5833 hex
Index 4 corresponds to the CANopen object 5834 hex
Index 5 corresponds to the CANopen object 5835 hex
Index 6 corresponds to the CANopen object 5836 hex
Index 7 corresponds to the CANopen object 5837 hex

## r8750[0...15] CAN mapped 16-bit receive objects / RPDO 16 mapped

CU230P-2_CAN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the mapped 16-bit receive CANopen objects in the process data buffer.
Example:
If, e.g. the control word is mapped in an RPDO, then r8750 indicates the position of the control word in the process data buffer.

**Index:** [0] = PZD 1
[1] = PZD 2
[2] = PZD 3
[3] = PZD 4
[4] = PZD 5
[5] = PZD 6
[6] = PZD 7
[7] = PZD 8
[8] = PZD 9
[9] = PZD 10
[10] = PZD 11
[11] = PZD 12
[12...15] = Reserved

## r8751[0...15] CAN mapped 16-bit transmit objects / TPDO 16 mapped

| CU230P-2_CAN | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
|---|---|---|---|
| | **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | - | - | - |

**Description:** Displays mapped 16-bit transmit CANopen objects in the process data buffer.

**Index:**
[0] = PZD 1
[1] = PZD 2
[2] = PZD 3
[3] = PZD 4
[4] = PZD 5
[5] = PZD 6
[6] = PZD 7
[7] = PZD 8
[8] = PZD 9
[9] = PZD 10
[10] = PZD 11
[11] = PZD 12
[12...15] = Reserved

**Dependency:** Refer to: r8750

## r8760[0...14] CAN mapped 32-bit receive objects / RPDO 32 mapped

| CU230P-2_CAN | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
|---|---|---|---|
| | **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | - | - | - |

**Description:** Displays the mapped 32-bit receive CANopen objects in the process data buffer.

**Index:**
[0] = PZD 1 + 2
[1] = PZD 2 + 3
[2] = PZD 3 + 4
[3] = PZD 4 + 5
[4] = PZD 5 + 6
[5] = PZD 6 + 7
[6] = PZD 7 + 8
[7] = PZD 8 + 9
[8] = PZD 9 + 10
[9] = PZD 10 + 11
[10] = PZD 11 + 12
[11...14] = Reserved

## r8761[0...14] CAN mapped 32-bit transmit objects / TPDO 32 mapped

| CU230P-2_CAN | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
|---|---|---|---|
| | **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | - | - | - |

**Description:** Displays mapped 32-bit transmit CANopen objects in the process data buffer.

**Index:**
[0] = PZD 1 + 2
[1] = PZD 2 + 3
[2] = PZD 3 + 4
[3] = PZD 4 + 5
[4] = PZD 5 + 6
[5] = PZD 6 + 7
[6] = PZD 7 + 8
[7] = PZD 8 + 9
[8] = PZD 9 + 10

[9] = PZD 10 + 11
[10] = PZD 11 + 12
[11...14] = Reserved

## r8762 CO: CAN operating mode display / Op mode display

CU230P-2_CAN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the currently effective CANopen operating mode.

To send the CANopen object 0x6061 mapped in a TPDO, this parameter can be correspondingly interconnected in the PZD interface.

## r8784 CO: CAN status word / Status word

CU230P-2_CAN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9226 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display and connector output for the CANopen status word

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Rdy for switch on | Yes | No | - |
| 01 | Ready | Yes | No | - |
| 02 | Operation enabled | Yes | No | - |
| 03 | Fault present | Yes | No | - |
| 04 | No coasting active | Yes | No | - |
| 05 | No Quick Stop active | Yes | No | - |
| 06 | Switching on inhibited active | Yes | No | - |
| 07 | Alarm present | Yes | No | - |
| 08 | Can be freely interconnected (BI: p8785) | Yes | No | - |
| 09 | Control request | Yes | No | - |
| 10 | Target reached | Yes | No | - |
| 11 | Torque limit reached | Yes | No | - |
| 12 | Velocity equal to zero | Yes | No | - |
| 14 | Can be freely interconnected (BI: p8786) | Yes | No | - |
| 15 | Can be freely interconnected (BI: p8787) | Yes | No | - |

**Note:** Corresponds to CANopen object 6041 hex.

Re bit 10:

When the ramp-function generator is activated, the interconnection from CI: p2151 = r1119 can be changed, so that to evaluate bit 10, the setpoint can be retrieved (taken) from in front of the ramp-function generator.

Re bit 10, 12:

When braking, the two bits must indicate the same state. This is the reason that the following parameters must be set the same:

p2161 (speed threshold value 3, for r2199.0) = p2163 (speed threshold value 4, for r2197.7)

p2150 (hysteresis speed 3, for r2199.0) = p2164 (hysteresis speed 4, for r2197.7)

## p8785 BI: CAN status word bit 8 / Status word bit 8

CU230P-2_CAN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9226 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for bit 8 of the CANopen status word.

**Dependency:** Refer to: r8784

## p8786 BI: CAN status word bit 14 / Status word bit 14

CU230P-2_CAN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9226 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for bit 14 of the CANopen status word.

**Dependency:** Refer to: r8784

## p8787 BI: CAN status word bit 15 / Status word bit 15

CU230P-2_CAN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 9226 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for bit 15 of the CANopen status word.

**Dependency:** Refer to: r8784

## p8790 CAN control word - auto interconnection / STW interc auto

CU230P-2_CAN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** C(3), T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 1 | 0 |

**Description:** Sets the automatic BICO interconnection of the CANopen control word.

**Value:**
0: No interconn
1: Interconnection

**Dependency:** Refer to: r2050, r2090, r2091, r2092, r2093, r8750, r8795

**Note:** The following BICO interconnections are automatically established if the CANopen control word is mapped at one of the locations x = 0 ... 3 in the receive process data buffer.

BI: p0840.0 = r209x.0

BI: p0844.0 = r209x.1

BI: p0848.0 = r209x.2

BI: p0852.0 = r209x.3

BI: p2103.0 = r209x.7

The write access is rejected if a CANopen control word is not mapped at one of these locations.

This also causes the project download of the commissioning software to be canceled.

## p8791 CAN stop option code / Stop opt_code

CU230P-2_CAN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** C(3), T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| -1 | 3 | -1 |

**Description:** Setting for the CANopen control word bit 8 "Stop" (CANopen STW.8).

**Value:**
-1: No interconn
1: Interconnection CANopen STW.8 with p1142
3: Interconnection CANopen STW.8 with p1140

**Dependency:** Refer to: r2050, r8750, r8795

**Note:** Corresponds to CANopen object 605D hex.

The BICO interconnection is established, if the CANopen control word is mapped at one of the locations x = 0 ... 3 in the receive process data buffer.

## r8792[0] CO: CAN velocity mode I16 setpoint / Vel mod I16 set

CU230P-2_CAN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** - | **Scaling:** 4000H | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display and connector output to interconnect standardized I16 setpoint CANopen objects of the velocity mode for SDO transfer.

An index can only be used, if the corresponding object has not been mapped in a PDO.

**Index:** [0] = VL Target Velocity

**Note:** Re index 0:

Corresponds to the CANopen object 6042 hex.

The displayed parameter value is scaled via the reference speed p2000:

4000 hex corresponds to p2000

## r8795.0...15 CO/BO: CAN control word / Control word

CU230P-2_CAN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Access to the CANopen control word using SDO transfer.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | ON/OFF1 | Yes | No | - |
| 01 | Do not activate coast down | Yes | No | - |
| 02 | Do not activate a Quick Stop | Yes | No | - |
| 03 | Operation enable | Yes | No | - |
| 04 | Ramp-function generator enable | Yes | No | - |
| 05 | Continue ramp-function generator | Yes | No (freeze) | - |
| 06 | Speed setpoint enable | Yes | No | - |
| 07 | Acknowledge fault | Yes | No | - |
| 08 | Stop | Yes | No | - |
| 11 | Freely interconn | Yes | No | - |
| 12 | Freely interconn | Yes | No | - |
| 13 | Freely interconn | Yes | No | - |
| 14 | Freely interconn | Yes | No | - |
| 15 | Freely interconn | Yes | No | - |

**Dependency:** Refer to: p8790

**Note:** Corresponds to the CANopen object 6040 hex.

## r8796[0] CO: CAN profile velocity mode I32 setpoints / Pr vel mo I32 set

CU230P-2_CAN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer32 |
| **Can be changed:** - | **Scaling:** 4000H | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display and connector output to interconnect standardized I32 setpoint CANopen objects of the profile velocity mode for SDO transfer.

An index can only be used, if the corresponding object has not been mapped in a PDO.

**Index:** [0] = Target velocity

**Note:** Re index 0:

Corresponds to the CANopen object 60FF hex.

The displayed parameter value is scaled via the reference speed p2000:

4000 0000 hex corresponds to p2000

## r8797[0] CO: CAN profile torque mode I16 setpoints / Pr Tq mod I16 set

| CU230P-2_CAN | **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
|---|---|---|---|
| | **Can be changed:** - | **Scaling:** 4000H | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | - | - | - |

**Description:** Display and connector output to interconnect standardized I16 setpoint CANopen objects of the profile torque mode for SDO transfer.

An index can only be used, if the corresponding object has not been mapped in a PDO.

**Index:** [0] = Target torque

**Note:** Re index 0:

Corresponds to the CANopen object 6071 hex.

The displayed parameter value is scaled via the reference torque p2003:

4000 hex corresponds to p2003

## p8798[0...1] CAN speed conversion factor / n_conv_factor

| CU230P-2_CAN | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
|---|---|---|---|
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | 1 | 4294967295 | 1 |

**Description:** The factor converts the required velocity units into the internal velocity units (U/s).

With the factory setting, for CANopen, the velocity units are increments/second.

The parameter corresponds to the CANopen object 6094 hex.

The internal velocity is calculated as follows:

n_set_internal = object 6094.1 / object 6094.2 * 1/(p0408 * 2^p0418) * n_set_bus

**Index:** [0] = Counter
[1] = Denominator

## p8805 Identification and maintenance 4 configuration / I&M 4 config

| CU230P-2_PN | **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
|---|---|---|---|
| | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | 0 | 1 | 0 |

**Description:** Sets the configuration for the content of identification and maintenance 4 (I&M 4, p8809).

**Value:**
0: Standard value for I&M 4 (p8809)
1: User value for I&M 4 (p8809)

**Dependency:** For p8805 = 0, if the user writes at least one value in p8809[0...53], then p8805 is automatically set to = 1.

When p8805 is reset = 0, then the content of the factory setting is set in p8809.

**Note:** Re p8805 = 0:

PROFINET I&M 4 (p8809) contains the information for the SI change tracking.

Re p8805 = 1:

PROFINET I&M 4 (p8809) contains the values written by the user.

## p8806[0...53] Identification and Maintenance 1 / I&M 1

| CU230P-2_PN | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned8 |
|---|---|---|---|
| | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | - | - | |

**Description:** Parameters for the PROFINET data set "Identification and Maintenance 1" (I&M 1).

This information is known as "System identifier" and "Location identifier".

**Dependency:** Refer to: p8807, p8808

**Notice:** Only characters belonging to the standard ASCII character set may be used (32 dec to 126 dec).

**Note:** An ASCII table (excerpt) can be found, for example, in the appendix to the List Manual.
Re p8806[0...31]:
System identifier.
Re p8806[32...53]:
Location identifier.

## p8807[0...15] Identification and Maintenance 2 / I&M 2

| CU230P-2_PN | | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned8 |
| | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | - | - | |

**Description:** Parameters for the PROFINET data set "Identification and Maintenance 2" (I&M 2).
This information is known as "Installation date".

**Dependency:** Refer to: p8806, p8808

**Note:** An ASCII table (excerpt) can be found, for example, in the appendix to the List Manual.
Re p8807[0...15]:
Dates of installation or first commissioning of the (ASCII) device with the following format options.
YYYY-MM-DD
or
YYYY-MM-DD hh:mm
- YYYY: year
- MM: month 01 ... 12
- DD: day 01 ... 31
- hh: hours 00 ... 23
- mm: minutes 00 ... 59

Separators must be placed between the individual data, i.e. a hyphen '-', space ' ' and colon ':'.

## p8808[0...53] Identification and Maintenance 3 / I&M 3

| CU230P-2_PN | | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned8 |
| | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | - | - | |

**Description:** Parameters for the PROFINET data set "Identification and Maintenance 3" (I&M 3).
This information is known as "Supplementary information".

**Dependency:** Refer to: p8806, p8807

**Notice:** Only characters belonging to the standard ASCII character set may be used (32 dec to 126 dec).

**Note:** An ASCII table (excerpt) can be found, for example, in the appendix to the List Manual.
Re p8808[0...53]:
Any supplementary information and comments (ASCII).

## p8809[0...53] Identification and Maintenance 4 / I&M 4

| CU230P-2_PN | | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned8 |
| | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | 0000 bin | 1111 1111 bin | 0000 bin |

**Description:** Parameters for the PROFINET data set "Identification and Maintenance 4" (I&M 4).
This information is known as "Signature".

**Dependency:** This parameter is preassigned as standard (see note).

After writing information to p8809, p8805 is automatically set to = 1.

Refer to: p8805

**Note:** For p8805 = 0 (factory setting) the following applies:

Parameter p8809 contains the information described below.

Re p8809[0...3]:

Contains the value from r9781[0] "SI change tracking checksum functional".

Re p8809[4...7]:

Contains the value from r9782[0] "SI change tracking time stamp checksum functional".

Re p8809[8...53]:

Reserved.

## r8854 PROFINET state / PN state

CU230P-2_PN

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 255 | - |

**Description:** State display for PROFINET.

**Value:**
0: No initialization
1: Fatal fault
2: Initialization
3: Send configuration
4: Receive configuration
5: Non-cyclic communication
6: Cyclic communications but no setpoints (stop/no clock cycle)
255: Cyclic communication

## r8858[0...39] PROFINET read diagnostics channel / PN diag_chan read

CU230P-2_PN

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the PROFINET diagnostics data.

**Note:** Only for internal Siemens diagnostics.

## r8859[0...7] PROFINET identification data / PN ident data

CU230P-2_PN

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the PROFINET identification data

**Index:**
[0] = Version interface structure
[1] = Version interface driver
[2] = Company (Siemens = 42)
[3] = CB type
[4] = Firmware version
[5] = Firmware date (year)
[6] = Firmware date (day/month)
[7] = Firmware patch/hot fix

**Note:** Example:

r8859[0] = 100 --> version of the interface structure V1.00

r8859[1] = 111 --> version of the interface driver V1.11

r8859[2] = 42 --> SIEMENS

r8859[3] = 0
r8859[4] = 1300 --> first part, firmware version V13.00 (second part, see index 7)
r8859[5] = 2011 --> year 2011
r8859[6] = 2306 --> 23rd June
r8859[7] = 1700 --> second part, firmware version (complete version: V13.00.17.00)

## r8909 PN device ID / PN device ID

| CU230P-2_PN | | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| | **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | - | - | - |

**Description:** Displays the PROFINET Device ID.
Every SINAMICS device type has its own PROFINET Device ID and its own PROFINET GSD.

**Note:** List of the SINAMICS Device IDs:
0501 hex: S120/S150
0504 hex: G130/G150
050A hex: DC MASTER
050C hex: MV
050F hex: G120P
0510 hex: G120C
0511 hex: G120 CU240E-2
0512 hex: G120D
0513 hex: G120 CU250S-2 Vector
0514 hex: G110M

## p8920[0...239] PN Name of Station / PN Name Stat

| CU230P-2_PN | | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned8 |
| | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | - | - | - |

**Description:** Sets the station name for the onboard PROFINET interface on the Control Unit.
The active station name is displayed in r8930.

**Note:** An ASCII table (excerpt) can be found, for example, in the appendix to the List Manual.
The interface configuration (p8920 and following) is activated with p8925.
The parameter is not influenced by setting the factory setting.
PN: PROFINET

## p8921[0...3] PN IP address of station / PN IP of stat

| CU230P-2_PN | | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned8 |
| | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | 0 | 255 | 0 |

**Description:** Sets the IP address for the onboard PROFINET interface on the Control Unit.
The active IP address is displayed in r8931.

**Note:** The interface configuration (p8920 and following) is activated with p8925.
The parameter is not influenced by setting the factory setting.

## p8922[0...3] PN Default Gateway of Station / PN Def Gateway

CU230P-2_PN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned8 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 255 | 0 |

**Description:** Sets the default gateway for the onboard PROFINET interface on the Control Unit.

The active default gateway is displayed in r8932.

**Note:** The interface configuration (p8920 and following) is activated with p8925.

The parameter is not influenced by setting the factory setting.

## p8923[0...3] PN Subnet Mask of Station / PN Subnet Mask

CU230P-2_PN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned8 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 255 | 0 |

**Description:** Sets the subnet mask for the onboard PROFINET interface on the Control Unit.

The active subnet mask is displayed in r8933.

**Note:** The interface configuration (p8920 and following) is activated with p8925.

The parameter is not influenced by setting the factory setting.

## p8924 PN DHCP Mode / PN DHCP Mode

CU230P-2_PN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned8 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 3 | 0 |

**Description:** Sets the DHCP mode for the onboard PROFINET interface on the Control Unit.

The active DHCP mode is displayed in r8934.

**Notice:** When the DHCP mode is active (p8924 > 0), then PROFINET communication via this interface is no longer possible! However, the interface can be used by the STARTER/SCOUT commissioning tool.

**Note:** The interface configuration (p8920 and following) is activated with p8925.

The active DHCP mode is displayed in parameter r8934.

The parameter is not influenced by setting the factory setting.

If value = 0:

DHCP deactivated.

If value = 1:

Reserved.

If value = 2:

DHCP activated. The MAC address of this interface is used for client identification.

If value = 3:

DHCP activated. The station name of this interface is used for client identification.

## p8925 PN interface configuration / PN IF config

CU230P-2_PN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 3 | 0 |

**Description:** Setting to activate the interface configuration for the onboard PROFINET interface on the Control Unit.

p8925 is automatically set to 0 at the end of the operation.

**Value:**
0: No function
1: Reserved
2: Save and activate configuration
3: Delete configuration

**Notice:** When the DHCP mode is active (p8924 > 0), then PROFINET communication via this interface is no longer possible! However, the interface can be used by the STARTER/SCOUT commissioning tool.

**Note:** Re p8925 = 2:

The interface configuration (p8920 and following) is saved and activated after the next POWER ON.

Re p8925 = 3:

The factory setting of the interface configuration is loaded after the next POWER ON.

## r8930[0...239] PN Name of Station active / PN Name Stat act

CU230P-2_PN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned8 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the active station name for the onboard PROFINET interface on the Control Unit.

## r8931[0...3] PN IP Address of Station active / PN IP of Stat act

CU230P-2_PN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned8 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 255 | - |

**Description:** Displays the active IP address for the onboard PROFINET interface on the Control Unit.

## r8932[0...3] PN Default Gateway of Station active / PN Def Gateway act

CU230P-2_PN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned8 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 255 | - |

**Description:** Displays the active default gateway for the onboard PROFINET interface on the Control Unit.

## r8933[0...3] PN Subnet Mask of Station active / PN Subnet Mask act

CU230P-2_PN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned8 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 255 | - |

**Description:** Displays the active subnet mask for the onboard PROFINET interface on the Control Unit.

## r8934 PN DHCP Mode active / PN DHCP Mode act

CU230P-2_PN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned8 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 255 | - |

**Description:** Displays the active DHCP mode for the onboard PROFINET interface on the Control Unit.

**Notice:** When the DHCP mode is active (parameter value greater than 0), PROFINET communication via this interface is no longer possible! However, the interface can be used for commissioning tool such as STARTER or SCOUT.

**Note:** If value = 0:
DHCP deactivated.
If value = 2:
DHCP activated. The MAC address of this interface is used for client identification.
If value = 3:
DHCP activated. The station name of this interface is used for client identification.

## r8935[0...5] PN MAC Address of Station / PN MAC of Station

CU230P-2_PN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned8 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0000 hex | 00FF hex | - |

**Description:** Displays the MAC address for the onboard PROFINET interface on the Control Unit.

## r8939 PN DAP ID / PN DAP ID

CU230P-2_PN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the PROFINET Device Access Point ID (DAP ID) for the onboard PROFINET interface.
The combination of device ID (r8909) and DAP ID uniquely identifies a PROFINET access point.

**Note:** List of the SINAMICS DAP IDs:
20007 hex: CBE20 V4.5
20008 hex: CBE20 V4.6
20107 hex: CU310-2 PN V4.5
20108 hex: CU310-2 PN V4.6
20307 hex: CU320-2 PN V4.5
20308 hex: CU320-2 PN V4.6
20407 hex: CU230P-2 PN /CU240x-2 PN V4.5
20408 hex: CU230P-2 PN /CU240x-2 PN /CU250S-2 PN /G110M PN V4.6
20507 hex: CU250D-2 PN V4.5
20508 hex: CU250D-2 PN V4.6

## p8980 Ethernet/IPprofile / Eth/IP profile

CU230P-2_PN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 1 | 0 |

**Description:** Sets the profile for Ethernet/IP.

**Value:**
0: SINAMICS
1: ODVA AC/DC

**Note:** Changes only become effective after POWER ON.
The parameter is not influenced by setting the factory setting.
ODVA: Open DeviceNet Vendor Association

## p8981 Ethernet/IP ODVA STOP mode / Eth/IP ODVA STOP

| | | | |
|---|---|---|---|
| CU230P-2_PN | **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | 0 | 1 | 0 |

**Description:** Sets the STOP mode for the Ethernet/IP ODVA profile (p8980 = 1).

**Value:**
0: OFF1
1: OFF2

**Dependency:** Refer to: p8980

**Note:** Changes only become effective after POWER ON.

The parameter is not influenced by setting the factory setting.

## p8982 Ethernet/IP ODVA speed scaling / Eth/IP ODVA n scal

| | | | |
|---|---|---|---|
| CU230P-2_PN | **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | 123 | 133 | 128 |

**Description:** Sets the scaling for the speed for Ethernet/IP ODVA profile (p8980 = 1).

**Value:**
123: 32
124: 16
125: 8
126: 4
127: 2
128: 1
129: 0.5
130: 0.25
131: 0.125
132: 0.0625
133: 0.03125

**Dependency:** Refer to: p8980

**Note:** Changes only become effective after POWER ON.

The parameter is not influenced by setting the factory setting.

## p8983 Ethernet/IP ODVA torque scaling / Eth/IP ODVA M scal

| | | | |
|---|---|---|---|
| CU230P-2_PN | **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | 123 | 133 | 128 |

**Description:** Sets the scaling for the torque for Ethernet/IP ODVA profile (p8980 = 1).

**Value:**
123: 32
124: 16
125: 8
126: 4
127: 2
128: 1
129: 0.5
130: 0.25
131: 0.125
132: 0.0625
133: 0.03125

**Dependency:** Refer to: p8980

**Note:** Changes only become effective after POWER ON.

The parameter is not influenced by setting the factory setting.

| p8991 | USB memory access / USB mem acc | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | 1 | 2 | 1 |

**Description:** Selects the storage medium for access via the USB mass storage.

**Value:**
1: Memory card
2: Flash r/w internal

**Note:** A change only becomes effective after a POWER ON.

The parameter is not influenced by setting the factory setting.

| p8999 | USB functionality / USB Fct | | |
|---|---|---|---|
| | **Access level:** 4 | **Calculated:** - | **Data type:** Integer16 |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | 1 | 3 | 3 |

**Description:** Setting the USB functionality.

**Value:**
1: USS commissioning via the virtual COM port
2: Only memory access
3: USB commissioning and memory access

**Note:** COMM: Commissioning.

A change only becomes effective after a POWER ON.

The parameter is not influenced by setting the factory setting.

| p9400 | Safely remove memory card / Mem_card rem | | |
|---|---|---|---|
| | **Access level:** 2 | **Calculated:** - | **Data type:** Integer16 |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| | **Min** | **Max** | **Factory setting** |
| | 0 | 100 | 0 |

**Description:** Setting and display when memory card is "removed safely".

Procedure:

Setting p9400 = 2 results in a value of 3

--> The memory card can be removed safely. After removal the value sets itself to 0 automatically.

Setting p9400 = 2 results in a value of 100

--> The memory card cannot be removed safely. Removal may destroy the file system on the memory card. It may be necessary to set p9400 = 2 again.

**Value:**
0: No memory card inserted
1: Memory card inserted
2: Request "safe removal" of the memory card
3: "Safe removal" possible
100: "Safe removal" not possible due to access

**Dependency:** Refer to: r9401

**Notice:** Removing the memory card without a request (p9400 = 2) and confirmation (p9400 = 3) may destroy the file system on the memory card. The memory card will then no longer work properly and must be replaced.

**Note:** The status when the memory card is being "removed safely" is shown in r9401.

Re value = 0, 1, 3, 100:

These values can only be displayed, not set.

## r9401 Safely remove memory card status / Mem_card rem stat

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the status of the memory card.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Memory card inserted | Yes | No | - |
| 01 | Memory card activated | Yes | No | - |
| 02 | SIEMENS memory card | Yes | No | - |
| 03 | Memory card as USB data storage medium from the PC used | Yes | No | - |

**Dependency:** Refer to: p9400

**Note:** Re bit 01, 00:

Bit 1/0 = 0/0: No memory card inserted (corresponds to p9400 = 0).

Bit 1/0 = 0/1: "Safe removal" possible (corresponds to p9400 = 3).

Bit 1/0 = 1/0: Status not possible.

Bit 1/0 = 1/1: Memory card inserted (corresponds to p9400 = 1, 2, 100).

Re bit 02, 00:

Bit 2/0 = 0/0: No memory card inserted.

Bit 2/0 = 0/1: Memory card inserted, but not a SIEMENS memory card.

Bit 2/0 = 1/0: Status not possible.

Bit 2/0 = 1/1: SIEMENS memory card inserted.

## r9406[0...19] PS file parameter number parameter not transferred / PS par_no n transf

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the parameters that were not able to be transferred when reading the parameter back-up files (PS files) from the non-volatile memory (e.g. memory card).

r9406[0] = 0

--> All of the parameter values were able to be transferred error-free.

r9406[0...x] > 0

--> indicates the parameter number in the following cases:

- parameter, whose value was not able to be completely accepted.

- indexed parameter, where at least 1 index was not able to be accepted. The first index that is not transferred is displayed in r9407.

**Dependency:** Refer to: r9407, r9408

**Note:** All indices from r9406 to r9408 designate the same parameter.

r9406[x] parameter number, parameter not accepted

r9407[x] parameter index, parameter not accepted

r9408[x] fault code, parameter not accepted

## r9407[0...19] PS file parameter index parameter not transferred / PS parameter index

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the first index of the parameters that could not be transferred when the parameter backup files (PS files) were read from the non-volatile memory (e.g. memory card).

If, from an indexed parameter, at least one index was not able to be transferred, then the parameter number is displayed in r9406[n] and the first index that was not transferred is displayed in r9407[n].

r9406[0] = 0

--> All of the parameter values were able to be transferred error-free.

r9406[n] > 0

--> Displays r9407[n] the first index of the parameter number r9406[n] that was not transferred.

**Dependency:** Refer to: r9406, r9408

**Note:** All indices from r9406 to r9408 designate the same parameter.

r9406[x] parameter number, parameter not accepted

r9407[x] parameter index, parameter not accepted

r9408[x] fault code, parameter not accepted

## r9408[0...19] PS file fault code parameter not transferred / PS fault code

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Only for internal Siemens service purposes.

**Dependency:** Refer to: r9406, r9407

**Note:** All indices from r9406 to r9408 designate the same parameter.

r9406[x] parameter number, parameter not accepted

r9407[x] parameter index, parameter not accepted

r9408[x] fault code, parameter not accepted

## r9409 Number of parameters to be saved / Qty par to save

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the number of modified parameters and those that have still not be saved for this drive object.

**Dependency:** Refer to: p0971

**Notice:** Inherent to the system, the list of the parameters to be backed up is empty after the following actions:

- Download
- Warm restart
- Factory setting

In these cases, a new parameter backup must be initiated, which is then the starting point for the list of modified parameters.

**Note:** The modified parameters that still need to be saved are internally listed in r9410 ... r9419.

## r9451[0...29] Units changeover adapted parameters / Unit_chngov par

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the parameters whose parameter would have to be changed during a units changeover.

## r9463 Actual macro / Actual macro

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 999999 | - |

**Description:** Displays the set valid macro.

**Note:** A value of 0 is displayed if a parameter set by a macro is changed.

## p9484 BICO interconnections search signal source / BICO S_src srch

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 4294967295 | 0 |

**Description:** Sets the signal source (BO/CO parameter, BICO coded) to search in the signal sinks.

The signal source to be searched for is set in p9484 (BICO-coded) and the search result is specified using the number (r9485) and the first index (r9486).

**Dependency:** Refer to: r9485, r9486

## r9485 BICO interconnections signal source search count / BICO S_src srchQty

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the number of BICO interconnections to the signal sink being searched for.

**Dependency:** Refer to: p9484, r9486

**Note:** The signal source to be searched is set in p9484 (BICO-coded).

The search result is contained in r9482 and r9483 and is specified by the count (r9485) and the first index (r9486).

## r9486 BICO interconnections signal source search first index / BICO S_src srchIdx

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the first index of the signal source being searched for.

The signal source to be searched for is set in p9484 (BICO-coded) and the search result is specified using the number (r9485) and the first index (r9486).

**Dependency:** Refer to: p9484, r9485

**Note:** The signal source to be searched is set in p9484 (BICO-coded).

The search result is contained in r9482 and r9483 and is specified by the count (r9485) and the first index (r9486).

## r9925[0...99] Firmware file incorrect / FW file incorr

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned8 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the directory and name of the file whose status as shipped from the factory was identified as impermissible.

**Dependency:** Refer to: r9926

**Note:** The directory and name of the file is displayed in the ASCII code.

## r9926 Firmware check status / FW check status

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned8 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the status when the firmware is checked when the system is booted.

0: Firmware not yet checked.

1: Check running.

2: Check successfully completed.

3: Check indicates an error.

**Dependency:** Refer to: r9925

## p9930[0...8] System logbook activation / SYSLOG activation

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Unsigned8 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 255 | 0 |

**Description:** Only for service purposes.

**Index:**
[0] = System logbook stage (0: Not active)
[1] = COM2/COM1 (0: COM2, 1: COM1)
[2] = Activate file write (0: Not active)
[3] = Display time stamp (0: Not displayed)
[4...7] = Reserved
[8] = System logbook file size (stages, each 10 kB)

**Notice:** Before powering down the Control Unit, ensure that the system logbook is switched out (p9930[0] = 0).

If writing to the file is activated (p9930[2] = 1), writing to the file must be de-activated again before switching off the Control Unit (p9930[2] = 0) in order to ensure that the system logbook has been completely written to the file.

## p9931[0...179] System logbook module selection / SYSLOG mod select.

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0000 hex | FFFF FFFF hex | 0000 hex |

**Description:** Only for service purposes.

## p9932 Save system logbook EEPROM / SYSLOG EEPROM save

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Unsigned8 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 255 | 0 |

**Description:** Only for service purposes.

## r9935.0 BO: POWER ON delay signal / POWER ON t_delay

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Unsigned8 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display and binector output for a delay after POWER ON.

After power-on, binector output r9935.0 is set with the start of the first sampling time and is again reset after approx. 100 ms.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | POWER ON delay signal | High | Low | - |

## r9975[0...7] System utilization measured / Sys util meas

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - [%] | - [%] | - [%] |

**Description:** Displays the measured system utilization.

The higher the value displayed, the higher the system utilization.

**Index:**
[0] = Computing time utilization (min)
[1] = Computing time utilization (averaged)
[2] = Computing time utilization (max)
[3] = Largest total utilization (min)
[4] = Largest total utilization (averaged)
[5] = Largest total utilization (max)
[6] = Reserved
[7] = Reserved

**Note:** Re index 3 ... 5:

The total utilizations are determined using all sampling times used. The largest total utilizations are mapped here. The sampling time with the largest total utilization is displayed in r9979.

Total utilization:

Computing time load of sampling time involved including load from higher-priority sampling times (interrupts).

## r9999[0...99] Software error internal supplementary diagnostics / SW_err int diag

| | | |
|---|---|---|
| **Access level:** 4 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Diagnostics parameter to display additional information for internal software errors.

**Note:** Only for internal Siemens troubleshooting.

## p11000 BI: Free tec_ctrl 0 enable / Ftec0 enab

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source to switch in/switch out the free technology controller 0.

1 signal: The technology controller is switched in.

0 signal: The technology controller is switched out.

## p11026 Free tec_ctrl 0 unit selection / Ftec0 unit sel

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** C(5) | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 1 | 46 | 1 |

**Description:** Sets the unit for the parameters of the free technology controller 0.

**Value:**

1: %
2: 1 referred no dimensions
3: bar
4: °C
5: Pa
6: ltr/s
7: m³/s
8: ltr/min
9: m³/min
10: ltr/h
11: m³/h
12: kg/s
13: kg/min
14: kg/h
15: t/min
16: t/h
17: N
18: kN
19: Nm
20: psi
21: °F
22: gallon/s
23: inch³/s
24: gallon/min
25: inch³/min
26: gallon/h
27: inch³/h
28: lb/s
29: lb/min
30: lb/h
31: lbf
32: lbf ft
33: K
34: rpm
35: parts/min
36: m/s
37: ft³/s
38: ft³/min
39: BTU/min
40: BTU/h
41: mbar
42: inch wg
43: ft wg
44: m wg
45: % r.h.
46: g/kg

**Dependency:** Only units of parameters with unit group 9_2 can be changed over using this parameter.

Refer to: p11027

## p11027 Free tec_ctrl 0 unit reference quantity / Ftec0 unit ref

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0.01 | 340.28235E36 | 1.00 |

**Description:** Sets the reference quantity for the unit of the parameters of the free technology controller 0.

When changing over using changeover parameter p11026 to absolute units, all of the parameters involved refer to the reference quantity.

**Dependency:** Refer to: p11026

## p11028 Free tec_ctrl 0 sampling time / Ftec0 t_samp

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| 0 | 4 | 2 |

**Description:** Sets the sampling time for the free technology controller 0.

**Value:**
0: Reserved
1: 128 ms
2: 256 ms
3: 512 ms
4: 1024 ms

## r11049.0...11 CO/BO: Free tec_ctrl 0 status word / Ftec0 stat_word

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the status word of the free technology controller 0.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Deactivated | Yes | No | - |
| 01 | Limited | Yes | No | - |
| 08 | Actual value at the minimum | Yes | No | - |
| 09 | Actual value at the maximum | Yes | No | - |
| 10 | Output at the minimum | Yes | No | - |
| 11 | Output at the maximum | Yes | No | - |

## p11053 CI: Free tec_ctrl 0 setpoint signal source / Ftec0 setp s_s

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for the setpoint of the free technology controller 0.

## p11057 Free tec_ctrl 0 setpoint ramp-up time / Ftec0 setp t_r-up

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [s] | 650.00 [s] | 1.00 [s] |

**Description:** Sets the ramp-up time for the free technology controller 0.

**Dependency:** Refer to: p11058

**Note:** The ramp-up time is referred to 100 %.

## p11058 Free tec_ctrl 0 setpoint ramp-down time / Ftec0 setp t_r-dn

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [s] | 650.00 [s] | 1.00 [s] |

**Description:** Sets the ramp-down time for the free technology controller 0.

**Dependency:** Refer to: p11057

**Note:** The ramp-down time is referred to 100 %.

## r11060 CO: Free tec_ctrl 0 setpoint after ramp-function generator / Ftec0 setp aft RFG

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** 9_2 | **Unit selection:** p11026 | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| - [%] | - [%] | - [%] |

**Description:** Display and connector output for the setpoint after the ramp-function generator of the free technology controller 0.

## p11064 CI: Free tec_ctrl 0 actual value signal source / Ftec0 act v s_s

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for the actual value of the free technology controller 0.

## p11065 Free tec_ctrl 0 actual value smoothing time constant / Ftec0 act v T

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [s] | 60.00 [s] | 0.00 [s] |

**Description:** Sets the smoothing time constant (PT1) for the actual value of the free technology controller 0.

## p11067 Free tec_ctrl 0 actual value upper limit / Ftec0 act v up lim

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** 9_2 | **Unit selection:** p11026 | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| -200.00 [%] | 200.00 [%] | 100.00 [%] |

**Description:** Sets the upper limit for the actual value signal of the free technology controller 0.

**Dependency:** Refer to: p11064

## p11068 Free tec_ctrl 0 actual value lower limit / Ftec0 act v lo lim

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** 9_2 | **Unit selection:** p11026 | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| -200.00 [%] | 200.00 [%] | -100.00 [%] |

**Description:** Sets the lower limit for the actual value signal of the free technology controller 0.

**Dependency:** Refer to: p11064

## p11071 Free tec_ctrl 0 actual value inversion / Ftec0 act v inv

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| 0 | 1 | 0 |

**Description:** Sets the inversion of the actual value signal of the free technology controller 0.

**Value:**
0: No inversion
1: Inversion

## r11072 CO: Free tec_ctrl 0 actual value after limiter / Ftec0 act v af lim

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** 9_2 | **Unit selection:** p11026 | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| - [%] | - [%] | - [%] |

**Description:** Display and connector output for the actual value after the limiter of the free technology controller 0.

## r11073 CO: Free tec_ctrl 0 system deviation / Ftec0 sys dev

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** 9_2 | **Unit selection:** p11026 | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| - [%] | - [%] | - [%] |

**Description:** Display and connector output for the system deviation of the free technology controller 0.

## p11074 Free tec_ctrl 0 differentiation time constant / Ftec0 D comp T

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| 0.000 [s] | 60.000 [s] | 0.000 [s] |

**Description:** Sets the time constant for the differentiation (D component) of the free technology controller 0.

**Note:** Value = 0: Differentiation is de-activated.

## p11080 Free tec_ctrl 0 proportional gain / Ftec0 Kp

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| 0.000 | 1000.000 | 1.000 |

**Description:** Sets the proportional gain (P component) of the free technology controller 0.

**Note:** Value = 0: The proportional gain is de-activated.

## p11085 Free tec_ctrl 0 integral time / Ftec0 Tn

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| 0.000 [s] | 10000.000 [s] | 30.000 [s] |

**Description:** Sets the integral time (I component, integrating time constant) of the free technology controller 0.

**Note:** Value = 0: The integral time is disabled.

If the parameter is set to zero during operation, the I component retains its most recent value.

## p11091 CO: Free tec_ctrl 0 limit maximum / Ftec0 lim max

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| -200.00 [%] | 200.00 [%] | 100.00 [%] |

**Description:** Sets the maximum limit of the free technology controller 0.

**Dependency:** Refer to: p11092

**Note:** The maximum limit must always be greater than the minimum limit (p11091 > p11092).

## p11092 CO: Free tec_ctrl 0 limit minimum / Ftec0 lim min

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| -200.00 [%] | 200.00 [%] | 0.00 [%] |

**Description:** Sets the minimum limit of the free technology controller 0.

**Dependency:** Refer to: p11091

**Note:** The maximum limit must always be greater than the minimum limit (p11091 > p11092).

## p11093 Free tec_ctrl 0 limit ramp-up/ramp-down time / Ftec0 lim r-u/r-dn

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [s] | 100.00 [s] | 1.00 [s] |

**Description:** Sets the ramp-up and ramp-down time for the maximum and minimum limit (p11091, p11092) of the free technology controller 0.

**Dependency:** Refer to: p11091, p11092

**Note:** The ramp-up/ramp-down times are referred to 100%.

## r11094 CO: Free tec_ctrl 0 output signal / Ftec0 out_sig

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| - [%] | - [%] | - [%] |

**Description:** Display and connector output for the output signal of the free technology controller 0.

## p11097 CI: Free tec_ctrl 0 limit maximum signal source / Ftec0 lim max s_s

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| - | - | 11091[0] |

**Description:** Sets the signal source for the maximum limit of the free technology controller 0.

**Dependency:** Refer to: p11091

## p11098 CI: Free tec_ctrl 0 limit minimum signal source / Ftec0 lim min s_s

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| - | - | 11092[0] |

**Description:** Sets the signal source for the minimum limit of the free technology controller 0.

**Dependency:** Refer to: p11092

## p11099 CI: Free tec_ctrl 0 limit offset signal source / Ftec0 lim offs

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for the limit offset of the free technology controller 0.

## p11100 BI: Free tec_ctrl 1 enable / Ftec1 enab

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source to switch in/switch out the free technology controller 1.
1 signal: The technology controller is switched in.
0 signal: The technology controller is switched out.

## p11126 Free tec_ctrl 1 unit selection / Ftec1 unit sel

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** C(5) | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| 1 | 46 | 1 |

**Description:** Sets the unit for the parameters of the free technology controller 1.

**Value:**
1: %
2: 1 referred no dimensions
3: bar
4: °C
5: Pa
6: ltr/s
7: m³/s
8: ltr/min
9: m³/min
10: ltr/h
11: m³/h

12: kg/s
13: kg/min
14: kg/h
15: t/min
16: t/h
17: N
18: kN
19: Nm
20: psi
21: °F
22: gallon/s
23: inch³/s
24: gallon/min
25: inch³/min
26: gallon/h
27: inch³/h
28: lb/s
29: lb/min
30: lb/h
31: lbf
32: lbf ft
33: K
34: rpm
35: parts/min
36: m/s
37: ft³/s
38: ft³/min
39: BTU/min
40: BTU/h
41: mbar
42: inch wg
43: ft wg
44: m wg
45: % r.h.
46: g/kg

**Dependency:** Only units of parameters with unit group 9_3 can be changed over using this parameter.

Refer to: p11127

## p11127 Free tec_ctrl 1 unit reference quantity / Ftec1 unit ref

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| 0.01 | 340.28235E36 | 1.00 |

**Description:** Sets the reference quantity for the unit of the parameters of the free technology controller 1.

When changing over using changeover parameter p11126 to absolute units, all of the parameters involved refer to the reference quantity.

**Dependency:** Refer to: p11126

## p11128 Free tec_ctrl 1 sampling time / Ftec1 t_samp

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| 0 | 4 | 2 |

**Description:** Sets the sampling time for the free technology controller 1.

**Value:**
0: Reserved
1: 128 ms
2: 256 ms
3: 512 ms
4: 1024 ms

## r11149.0...11 CO/BO: Free tec_ctrl 1 status word / Ftec1 stat_word

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the status word of the free technology controller 1.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Deactivated | Yes | No | - |
| 01 | Limited | Yes | No | - |
| 08 | Actual value at the minimum | Yes | No | - |
| 09 | Actual value at the maximum | Yes | No | - |
| 10 | Output at the minimum | Yes | No | - |
| 11 | Output at the maximum | Yes | No | - |

## p11153 CI: Free tec_ctrl 1 setpoint signal source / Ftec1 setp s_s

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for the setpoint of the free technology controller 1.

## p11157 Free tec_ctrl 1 setpoint ramp-up time / Ftec1 setp t_r-up

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [s] | 650.00 [s] | 1.00 [s] |

**Description:** Sets the ramp-up time for the free technology controller 1.

**Dependency:** Refer to: p11158

**Note:** The ramp-up time is referred to 100 %.

## p11158 Free tec_ctrl 1 setpoint ramp-down time / Ftec1 setp t_r-dn

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [s] | 650.00 [s] | 1.00 [s] |

**Description:** Sets the ramp-down time of the free technology controller 1.

**Dependency:** Refer to: p11157

**Note:** The ramp-down time is referred to 100 %.

## r11160 CO: Free tec_ctrl 1 setpoint after ramp-function generator / Ftec1 setp aft RFG

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** 9_3 | **Unit selection:** p11126 | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| - [%] | - [%] | - [%] |

**Description:** Display and connector output for the setpoint after the ramp-function generator of the free technology controller 1.

## p11164 CI: Free tec_ctrl 1 actual value signal source / Ftec1 act v s_s

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for the actual value of the free technology controller 1.

## p11165 Free tec_ctrl 1 actual value smoothing time constant / Ftec1 act v T

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [s] | 60.00 [s] | 0.00 [s] |

**Description:** Sets the smoothing time constant (PT1) for the actual value of the free technology controller 1.

## p11167 Free tec_ctrl 1 actual value upper limit / Ftec1 act v up lim

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** 9_3 | **Unit selection:** p11126 | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| -200.00 [%] | 200.00 [%] | 100.00 [%] |

**Description:** Sets the upper limit for the actual value signal of the free technology controller 1.
**Dependency:** Refer to: p11164

## p11168 Free tec_ctrl 1 actual value lower limit / Ftec1 act v lo lim

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** 9_3 | **Unit selection:** p11126 | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| -200.00 [%] | 200.00 [%] | -100.00 [%] |

**Description:** Sets the lower limit for the actual value signal of the free technology controller 1.
**Dependency:** Refer to: p11164

## p11171 Free tec_ctrl 1 actual value inversion / Ftec1 act v inv

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| 0 | 1 | 0 |

**Description:** Sets the inversion of the actual value signal of the free technology controller 1.
**Value:**
0: No inversion
1: Inversion

## r11172 CO: Free tec_ctrl 1 actual value after limiter / Ftec1 act v af lim

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** 9_3 | **Unit selection:** p11126 | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| - [%] | - [%] | - [%] |

**Description:** Display and connector output for the actual value after the limiter of the free technology controller 1.

## r11173 CO: Free tec_ctrl 1 system deviation / Ftec1 sys dev

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** 9_3 | **Unit selection:** p11126 | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| - [%] | - [%] | - [%] |

**Description:** Display and connector output for the system deviation of the free technology controller 1.

## p11174 Free tec_ctrl 1 differentiation time constant / Ftec1 D comp T

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| 0.000 [s] | 60.000 [s] | 0.000 [s] |

**Description:** Sets the time constant for the differentiation (D component) of the free technology controller 1.

**Note:** Value = 0: Differentiation is de-activated.

## p11180 Free tec_ctrl 1 proportional gain / Ftec1 Kp

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| 0.000 | 1000.000 | 1.000 |

**Description:** Sets the proportional gain (P component) of the free technology controller 1.

**Note:** Value = 0: The proportional gain is de-activated.

## p11185 Free tec_ctrl 1 integral time / Ftec1 Tn

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| 0.000 [s] | 10000.000 [s] | 30.000 [s] |

**Description:** Sets the integral time (I component, integrating time constant) of the free technology controller 1.

**Note:** Value = 0: The integral time is disabled.
If the parameter is set to zero during operation, the I component retains its most recent value.

## p11191 CO: Free tec_ctrl 1 limit maximum / Ftec1 lim max

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| -200.00 [%] | 200.00 [%] | 100.00 [%] |

**Description:** Sets the maximum limit of the free technology controller 1.

**Dependency:** Refer to: p11192

**Note:** The maximum limit must always be greater than the minimum limit (p11191 > p11192).

## p11192 CO: Free tec_ctrl 1 limit minimum / Ftec1 lim min

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| -200.00 [%] | 200.00 [%] | 0.00 [%] |

**Description:** Sets the minimum limit of the free technology controller 1.

**Dependency:** Refer to: p11191

**Note:** The maximum limit must always be greater than the minimum limit (p11191 > p11192).

## p11193 Free tec_ctrl 1 limit ramp-up/ramp-down time / Ftec1 lim r-u/r-dn

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [s] | 100.00 [s] | 1.00 [s] |

**Description:** Sets the ramp-up and ramp-down time for the maximum and minimum limit (p11191, p11192) of the free technology controller 1.

**Dependency:** Refer to: p11191, p11192

**Note:** The ramp-up/ramp-down times are referred to 100%.

## r11194 CO: Free tec_ctrl 1 output signal / Ftec1 out_sig

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| - [%] | - [%] | - [%] |

**Description:** Display and connector output for the output signal of the free technology controller 1.

## p11197 CI: Free tec_ctrl 1 limit maximum signal source / Ftec1 lim max s_s

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| - | - | 11191[0] |

**Description:** Sets the signal source for the maximum limit of the free technology controller 1.

**Dependency:** Refer to: p11191

## p11198 CI: Free tec_ctrl 1 limit minimum signal source / Ftec1 lim min s_s

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| - | - | 11192[0] |

**Description:** Sets the signal source for the minimum limit of the free technology controller 1.

**Dependency:** Refer to: p11192

| | | | |
|---|---|---|---|
| **p11199** | **CI: Free tec_ctrl 1 limit offset signal source / Ftec1 lim offs** | | |
| | **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| | **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | 0 |
| **Description:** | Sets the signal source for the limit offset of the free technology controller 1. | | |

| | | | |
|---|---|---|---|
| **p11200** | **BI: Free tec_ctrl 2 enable / Ftec2 enab** | | |
| | **Access level:** 2 | **Calculated:** - | **Data type:** U32 / Binary |
| | **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | 0 |
| **Description:** | Sets the signal source to switch in/switch out the free technology controller 2.<br>1 signal: The technology controller is switched in.<br>0 signal: The technology controller is switched out. | | |

| | | | |
|---|---|---|---|
| **p11226** | **Free tec_ctrl 2 unit selection / Ftec2 unit sel** | | |
| | **Access level:** 1 | **Calculated:** - | **Data type:** Integer16 |
| | **Can be changed:** C(5) | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| | **Min** | **Max** | **Factory setting** |
| | 1 | 46 | 1 |
| **Description:** | Sets the unit for the parameters of the free technology controller 2. | | |

**Value:**

1: %
2: 1 referred no dimensions
3: bar
4: °C
5: Pa
6: ltr/s
7: m³/s
8: ltr/min
9: m³/min
10: ltr/h
11: m³/h
12: kg/s
13: kg/min
14: kg/h
15: t/min
16: t/h
17: N
18: kN
19: Nm
20: psi
21: °F
22: gallon/s
23: inch³/s
24: gallon/min
25: inch³/min
26: gallon/h
27: inch³/h
28: lb/s
29: lb/min
30: lb/h
31: lbf
32: lbf ft
33: K

34: rpm
35: parts/min
36: m/s
37: ft³/s
38: ft³/min
39: BTU/min
40: BTU/h
41: mbar
42: inch wg
43: ft wg
44: m wg
45: % r.h.
46: g/kg

**Dependency:** Only units of parameters with unit group 9_4 can be changed over using this parameter.

Refer to: p11227

## p11227 Free tec_ctrl 2 unit reference quantity / Ftec2 unit ref

| | | |
|---|---|---|
| **Access level:** 1 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| 0.01 | 340.28235E36 | 1.00 |

**Description:** Sets the reference quantity for the unit of the parameters of the free technology controller 2.

When changing over using changeover parameter p11226 to absolute units, all of the parameters involved refer to the reference quantity.

**Dependency:** Refer to: p11226

## p11228 Free tec_ctrl 2 sampling time / Ftec2 t_samp

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| 0 | 4 | 2 |

**Description:** Sets the sampling time for the free technology controller 2.

**Value:**
0: Reserved
1: 128 ms
2: 256 ms
3: 512 ms
4: 1024 ms

## r11249.0...11 CO/BO: Free tec_ctrl 2 status word / Ftec2 stat_word

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays the status word of the free technology controller 2.

**Bit field:**

| Bit | Signal name | 1 signal | 0 signal | FP |
|---|---|---|---|---|
| 00 | Deactivated | Yes | No | - |
| 01 | Limited | Yes | No | - |
| 08 | Actual value at the minimum | Yes | No | - |
| 09 | Actual value at the maximum | Yes | No | - |
| 10 | Output at the minimum | Yes | No | - |
| 11 | Output at the maximum | Yes | No | - |

## p11253 CI: Free tec_ctrl 2 setpoint signal source / Ftec2 setp s_src

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for the setpoint of the free technology controller 2.

## p11257 Free tec_ctrl 2 setpoint ramp-up time / Ftec2 setp t_r-up

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [s] | 650.00 [s] | 1.00 [s] |

**Description:** Sets the ramp-up time for the free technology controller 2.
**Dependency:** Refer to: p11258
**Note:** The ramp-up time is referred to 100 %.

## p11258 Free tec_ctrl 2 setpoint ramp-down time / Ftec2 setp t_r-dn

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [s] | 650.00 [s] | 1.00 [s] |

**Description:** Sets the ramp-down time of the free technology controller 2.
**Dependency:** Refer to: p11257
**Note:** The ramp-down time is referred to 100 %.

## r11260 CO: Free tec_ctrl 2 setpoint after ramp-function generator / Ftec2 setp aft RFG

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** 9_4 | **Unit selection:** p11226 | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| - [%] | - [%] | - [%] |

**Description:** Display and connector output for the setpoint after the ramp-function generator of the free technology controller 2.

## p11264 CI: Free tec_ctrl 2 actual value signal source / Ftec2 act v s_s

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for the actual value of the free technology controller 2.

## p11265 Free tec_ctrl 2 actual value smoothing time constant / Ftec2 act v T

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [s] | 60.00 [s] | 0.00 [s] |

**Description:** Sets the smoothing time constant (PT1) for the actual value of the free technology controller 2.

## p11267 Free tec_ctrl 2 actual value upper limit / Ftec2 act v up lim

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** 9_4 | **Unit selection:** p11226 | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| -200.00 [%] | 200.00 [%] | 100.00 [%] |

**Description:** Sets the upper limit for the actual value signal of the free technology controller 2.

**Dependency:** Refer to: p11264

## p11268 Free tec_ctrl 2 actual value lower limit / Ftec2 act v lo lim

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** 9_4 | **Unit selection:** p11226 | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| -200.00 [%] | 200.00 [%] | -100.00 [%] |

**Description:** Sets the lower limit for the actual value signal of the free technology controller 2.

**Dependency:** Refer to: p11264

## p11271 Free tec_ctrl 2 actual value inversion / Ftec2 act v inv

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| 0 | 1 | 0 |

**Description:** Sets the inversion of the actual value signal of the free technology controller 2.

**Value:**
0: No inversion
1: Inversion

## r11272 CO: Free tec_ctrl 2 actual value after limiter / Ftec2 act v af lim

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** 9_4 | **Unit selection:** p11226 | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| - [%] | - [%] | - [%] |

**Description:** Display and connector output for the actual value after the limiter of the free technology controller 2.

## r11273 CO: Free tec_ctrl 2 system deviation / Ftec2 sys dev

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** 9_4 | **Unit selection:** p11226 | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| - [%] | - [%] | - [%] |

**Description:** Display and connector output for the system deviation of the free technology controller 2.

## p11274 Free tec_ctrl 2 differentiation time constant / Ftec2 D comp T

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| 0.000 [s] | 60.000 [s] | 0.000 [s] |

**Description:** Sets the time constant for the differentiation (D component) of the free technology controller 2.

**Note:** Value = 0: Differentiation is de-activated.

## p11280 Free tec_ctrl 2 proportional gain / Ftec2 Kp

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| 0.000 | 1000.000 | 1.000 |

**Description:** Sets the proportional gain (P component) of the free technology controller 2.

**Note:** Value = 0: The proportional gain is de-activated.

## p11285 Free tec_ctrl 2 integral time / Ftec2 Tn

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| 0.000 [s] | 10000.000 [s] | 30.000 [s] |

**Description:** Sets the integral time (I component, integrating time constant) of the free technology controller 2.

**Note:** Value = 0: The integral time is disabled.
If the parameter is set to zero during operation, the I component retains its most recent value.

## p11291 CO: Free tec_ctrl 2 limit maximum / Ftec2 lim max

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| -200.00 [%] | 200.00 [%] | 100.00 [%] |

**Description:** Sets the maximum limit of the free technology controller 2.

**Dependency:** Refer to: p11292

**Note:** The maximum limit must always be greater than the minimum limit (p11291 > p11292).

## p11292 CO: Free tec_ctrl 2 limit minimum / Ftec2 lim min

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| -200.00 [%] | 200.00 [%] | 0.00 [%] |

**Description:** Sets the minimum limit of the free technology controller 2.

**Dependency:** Refer to: p11291

**Note:** The maximum limit must always be greater than the minimum limit (p11291 > p11292).

## p11293 Free tec_ctrl 2 limit ramp-up/ramp-down time / Ftec2 lim r-u/r-dn

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| 0.00 [s] | 100.00 [s] | 1.00 [s] |

**Description:** Sets the ramp-up and ramp-down time for the maximum and minimum limit (p11291, p11292) of the free technology controller 2.

**Dependency:** Refer to: p11291, p11292

**Note:** The ramp-up/ramp-down times are referred to 100%.

## r11294 CO: Free tec_ctrl 2 output signal / Ftec2 out_sig

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| - [%] | - [%] | - [%] |

**Description:** Display and connector output for the output signal of the free technology controller 2.

## p11297 CI: Free tec_ctrl 2 limit maximum signal source / Ftec2 lim max s_s

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| - | - | 11291[0] |

**Description:** Sets the signal source for the maximum limit of the free technology controller 2.

**Dependency:** Refer to: p11291

## p11298 CI: Free tec_ctrl 2 limit minimum signal source / Ftec2 lim min s_s

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| - | - | 11292[0] |

**Description:** Sets the signal source for the minimum limit of the free technology controller 2.

**Dependency:** Refer to: p11292

## p11299 CI: Free tec_ctrl 2 limit offset signal source / Ftec2 lim offs

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** U, T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7030 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for the limit offset of the free technology controller 2.

## r20001[0...9] Run-time group sampling time / RTG sampling time

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - [ms] | - [ms] | - [ms] |

**Description:** Displays the current sampling time of the run-time group 0 to 9.

**Index:**
[0] = Run-time group 0
[1] = Run-time group 1
[2] = Run-time group 2
[3] = Run-time group 3
[4] = Run-time group 4
[5] = Run-time group 5
[6] = Run-time group 6
[7] = Run-time group 7
[8] = Run-time group 8
[9] = Run-time group 9

## p20030[0...3] BI: AND 0 inputs / AND 0 inputs

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7210 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source of input quantities I0, I1, I2, I3 of instance AND 0 of the AND function block.

**Index:**
[0] = Input I0
[1] = Input I1
[2] = Input I2
[3] = Input I3

## r20031 BO: AND 0 output Q / AND 0 output Q

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7210 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for binary quantity Q = I0 & I1 & I2 & I3 of instance AND 0 of the AND function block.

## p20032 AND 0 run-time group / AND 0 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7210 |
| **Min** | **Max** | **Factory setting** |
| 1 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which the instance AND 0 of the AND function block is to be called.

**Value:**
1: Run-time group 1
2: Run-time group 2
3: Run-time group 3
4: Run-time group 4
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20033 AND 0 run sequence / AND 0 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7210 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 10 |

**Description:** Setting parameter for the run sequence of instance AND 0 within the run-time group set in p20032.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20034[0...3] BI: AND 1 inputs / AND 1 inputs

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7210 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source of input quantities I0, I1, I2, I3 of instance AND 1 of the AND function block.

**Index:**
[0] = Input I0
[1] = Input I1

[2] = Input I2
[3] = Input I3

## r20035 BO: AND 1 output Q / AND 1 output Q

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7210 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for binary quantity Q = I0 & I1 & I2 & I3 of instance AND 1 of the AND function block.

## p20036 AND 1 run-time group / AND 1 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7210 |
| **Min** | **Max** | **Factory setting** |
| 1 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which the instance AND 1 of the AND function block is to be called.

**Value:**
1: Run-time group 1
2: Run-time group 2
3: Run-time group 3
4: Run-time group 4
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20037 AND 1 run sequence / AND 1 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7210 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 20 |

**Description:** Setting parameter for the run sequence of instance AND 1 within the run-time group set in p20036.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20038[0...3] BI: AND 2 inputs / AND 2 inputs

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7210 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source of input quantities I0, I1, I2, I3 of instance AND 2 of the AND function block.

**Index:**
[0] = Input I0
[1] = Input I1
[2] = Input I2
[3] = Input I3

## r20039 BO: AND 2 output Q / AND 2 output Q

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7210 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for binary quantity Q = I0 & I1 & I2 & I3 of instance AND 2 of the AND function block.

| p20040 | AND 2 run-time group / AND 2 RTG | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 7210 |
| | **Min** | **Max** | **Factory setting** |
| | 1 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which the instance AND 2 of the AND function block is to be called.

**Value:**
1: Run-time group 1
2: Run-time group 2
3: Run-time group 3
4: Run-time group 4
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

| p20041 | AND 2 run sequence / AND 2 RunSeq | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 2710 |
| | **Min** | **Max** | **Factory setting** |
| | 0 | 32000 | 30 |

**Description:** Setting parameter for the run sequence of instance AND 2 within the run-time group set in p20040.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

| p20042[0...3] | BI: AND 3 inputs / AND 3 inputs | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 7210 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | 0 |

**Description:** Sets the signal source of input quantities I0, I1, I2, I3 of instance AND 3 of the AND function block.

**Index:**
[0] = Input I0
[1] = Input I1
[2] = Input I2
[3] = Input I3

| r20043 | BO: AND 3 output Q / AND 3 output Q | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| | **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 7210 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | - |

**Description:** Display parameter for binary quantity Q = I0 & I1 & I2 & I3 of instance AND 3 of the AND function block.

| p20044 | AND 3 run-time group / AND 3 RTG | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 7210 |
| | **Min** | **Max** | **Factory setting** |
| | 1 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which the instance AND 3 of the AND function block is to be called.

**Value:**
1: Run-time group 1
2: Run-time group 2

3: Run-time group 3
4: Run-time group 4
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20045 AND 3 run sequence / AND 3 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7210 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 40 |

**Description:** Setting parameter for the run sequence of instance AND 3 within the run-time group set in p20044.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20046[0...3] BI: OR 0 inputs / OR 0 inputs

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7212 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source of input quantities I0, I1, I2, I3 of instance OR 0 of the OR function block.

**Index:**
[0] = Input I0
[1] = Input I1
[2] = Input I2
[3] = Input I3

## r20047 BO: OR 0 output Q / OR 0 output Q

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7212 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for binary quantity Q = I0 | I1 | I2 | I3 of instance OR 0 of the OR function block.

## p20048 OR 0 run-time group / OR 0 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7212 |
| **Min** | **Max** | **Factory setting** |
| 1 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which the instance OR 0 of the OR function block is to be called.

**Value:**
1: Run-time group 1
2: Run-time group 2
3: Run-time group 3
4: Run-time group 4
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

| p20049 | OR 0 run sequence / OR 0 RunSeq | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 7212 |
| | **Min** | **Max** | **Factory setting** |
| | 0 | 32000 | 60 |

**Description:** Setting parameter for the run sequence of instance OR 0 within the run-time group set in p20048.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

| p20050[0...3] | BI: OR 1 inputs / OR 1 inputs | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 7212 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | 0 |

**Description:** Sets the signal source of input quantities I0, I1, I2, I3 of instance OR 1 of the OR function block.

**Index:**
[0] = Input I0
[1] = Input I1
[2] = Input I2
[3] = Input I3

| r20051 | BO: OR 1 output Q / OR 1 output Q | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| | **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 7212 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | - |

**Description:** Display parameter for binary quantity Q = I0 | I1 | I2 | I3 of instance OR 1 of the OR function block.

| p20052 | OR 1 run-time group / OR 1 RTG | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 7212 |
| | **Min** | **Max** | **Factory setting** |
| | 1 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which the instance OR 1 of the OR function block is to be called.

**Value:**
1: Run-time group 1
2: Run-time group 2
3: Run-time group 3
4: Run-time group 4
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

| p20053 | OR 1 run sequence / OR 1 RunSeq | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 7212 |
| | **Min** | **Max** | **Factory setting** |
| | 0 | 32000 | 70 |

**Description:** Setting parameter for the run sequence of instance OR 1 within the run-time group set in p20052.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20054[0...3] BI: OR 2 inputs / OR 2 inputs

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7212 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source of input quantities I0, I1, I2, I3 of instance OR 2 of the OR function block.

**Index:**
[0] = Input I0
[1] = Input I1
[2] = Input I2
[3] = Input I3

## r20055 BO: OR 2 output Q / OR 2 output Q

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7212 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for binary quantity Q = I0 | I1 | I2 | I3 of instance OR 2 of the OR function block.

## p20056 OR 2 run-time group / OR 2 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7212 |
| **Min** | **Max** | **Factory setting** |
| 1 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which the instance OR 2 of the OR function block is to be called.

**Value:**
1: Run-time group 1
2: Run-time group 2
3: Run-time group 3
4: Run-time group 4
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20057 OR 2 run sequence / OR 2 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7212 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 80 |

**Description:** Setting parameter for the run sequence of instance OR 2 within the run-time group set in p20056.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20058[0...3] BI: OR 3 inputs / OR 3 inputs

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7212 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source of input quantities I0, I1, I2, I3 of instance OR 3 of the OR function block.

**Index:**
[0] = Input I0
[1] = Input I1

[2] = Input I2
[3] = Input I3

## r20059 BO: OR 3 output Q / OR 3 output Q

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7212 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for binary quantity Q = I0 | I1 | I2 | I3 of instance OR 3 of the OR function block.

## p20060 OR 3 run-time group / OR 3 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7212 |
| **Min** | **Max** | **Factory setting** |
| 1 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which the instance OR 3 of the OR function block is to be called.

**Value:**
1: Run-time group 1
2: Run-time group 2
3: Run-time group 3
4: Run-time group 4
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20061 OR 3 run sequence / OR 3 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7212 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 90 |

**Description:** Setting parameter for the run sequence of instance OR 3 within the run-time group set in p20060.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20062[0...3] BI: XOR 0 inputs / XOR 0 inputs

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7214 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source of input quantities I0, I1, I2, I3 of instance XOR 0 of the XOR function block.

**Index:**
[0] = Input I0
[1] = Input I1
[2] = Input I2
[3] = Input I3

## r20063 BO: XOR 0 output Q / XOR 0 output Q

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7214 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for binary quantity Q of instance XOR 0 of the XOR function block.

## p20064 XOR 0 run-time group / XOR 0 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7214 |
| **Min** | **Max** | **Factory setting** |
| 1 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which the instance XOR 0 of the XOR function block is to be called.

**Value:**
1: Run-time group 1
2: Run-time group 2
3: Run-time group 3
4: Run-time group 4
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20065 XOR 0 run sequence / XOR 0 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7214 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 110 |

**Description:** Setting parameter for the run sequence of instance XOR 0 within the run-time group set in p20064.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20066[0...3] BI: XOR 1 inputs / XOR 1 inputs

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7214 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source of input quantities I0, I1, I2, I3 of instance XOR 1 of the XOR function block.

**Index:**
[0] = Input I0
[1] = Input I1
[2] = Input I2
[3] = Input I3

## r20067 BO: XOR 1 output Q / XOR 1 output Q

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7214 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for binary quantity Q of instance XOR 1 of the XOR function block.

## p20068 XOR 1 run-time group / XOR 1 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7214 |
| **Min** | **Max** | **Factory setting** |
| 1 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which the instance XOR 1 of the XOR function block is to be called.

**Value:**
1: Run-time group 1
2: Run-time group 2

3: Run-time group 3
4: Run-time group 4
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20069 XOR 1 run sequence / XOR 1 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7214 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 120 |

**Description:** Setting parameter for the run sequence of instance XOR 1 within the run-time group set in p20068.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20070[0...3] BI: XOR 2 inputs / XOR 2 inputs

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7214 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source of input quantities I0, I1, I2, I3 of instance XOR 2 of the XOR function block.

**Index:**
[0] = Input I0
[1] = Input I1
[2] = Input I2
[3] = Input I3

## r20071 BO: XOR 2 output Q / XOR 2 output Q

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7214 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for binary quantity Q of instance XOR 2 of the XOR function block.

## p20072 XOR 2 run-time group / XOR 2 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7214 |
| **Min** | **Max** | **Factory setting** |
| 1 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which the instance XOR 2 of the XOR function block is to be called.

**Value:**
1: Run-time group 1
2: Run-time group 2
3: Run-time group 3
4: Run-time group 4
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20073 XOR 2 run sequence / XOR 2 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7214 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 130 |

**Description:** Setting parameter for the run sequence of instance XOR 2 within the run-time group set in p20072.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20074[0...3] BI: XOR 3 inputs / XOR 3 inputs

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7214 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source of input quantities I0, I1, I2, I3 of instance XOR 3 of the XOR function block.

**Index:**
[0] = Input I0
[1] = Input I1
[2] = Input I2
[3] = Input I3

## r20075 BO: XOR 3 output Q / XOR 3 output Q

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7214 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for binary quantity Q of instance XOR 3 of the XOR function block.

## p20076 XOR 3 run-time group / XOR 3 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7214 |
| **Min** | **Max** | **Factory setting** |
| 1 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which the instance XOR 3 of the XOR function block is to be called.

**Value:**
1: Run-time group 1
2: Run-time group 2
3: Run-time group 3
4: Run-time group 4
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20077 XOR 3 run sequence / XOR 3 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7214 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 140 |

**Description:** Setting parameter for the run sequence of instance XOR 3 within the run-time group set in p20076.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

| | | | |
|---|---|---|---|
| **p20078** | **BI: NOT 0 input I / NOT 0 input I** | | |
| | **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 7216 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | 0 |
| **Description:** | Sets the signal source of input quantity I of instance NOT 0 of the inverter. | | |

| | | | |
|---|---|---|---|
| **r20079** | **BO: NOT 0 inverted output / NOT 0 inv output** | | |
| | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| | **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 7216 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | - |
| **Description:** | Display parameter for the inverted output of instance NOT 0 of the inverter. | | |

| | | | |
|---|---|---|---|
| **p20080** | **NOT 0 run-time group / NOT 0 RTG** | | |
| | **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 7216 |
| | **Min** | **Max** | **Factory setting** |
| | 1 | 9999 | 9999 |
| **Description:** | Setting parameter for the run-time group in which the instance NOT 0 of the inverter is to be called. | | |
| **Value:** | 1: Run-time group 1<br>2: Run-time group 2<br>3: Run-time group 3<br>4: Run-time group 4<br>5: Run-time group 5<br>6: Run-time group 6<br>9999: Do not calculate | | |

| | | | |
|---|---|---|---|
| **p20081** | **NOT 0 run sequence / NOT 0 RunSeq** | | |
| | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 7216 |
| | **Min** | **Max** | **Factory setting** |
| | 0 | 32000 | 160 |
| **Description:** | Setting parameter for the run sequence of instance NOT 0 within the run-time group set in p20080. | | |
| **Note:** | The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value. | | |

| | | | |
|---|---|---|---|
| **p20082** | **BI: NOT 1 input I / NOT 1 input I** | | |
| | **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 7216 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | 0 |
| **Description:** | Sets the signal source of input quantity I of instance NOT 1 of the inverter. | | |

## r20083 BO: NOT 1 inverted output / NOT 1 inv output

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7216 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for the inverted output of instance NOT 1 of the inverter.

## p20084 NOT 1 run-time group / NOT 1 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7216 |
| **Min** | **Max** | **Factory setting** |
| 1 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which the instance NOT 1 of the inverter is to be called.

**Value:**
1: Run-time group 1
2: Run-time group 2
3: Run-time group 3
4: Run-time group 4
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20085 NOT 1 run sequence / NOT 1 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7216 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 170 |

**Description:** Setting parameter for the run sequence of instance NOT 1 within the run-time group set in p20084.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20086 BI: NOT 2 input I / NOT 2 input I

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7216 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source of input quantity I of instance NOT 2 of the inverter.

## r20087 BO: NOT 2 inverted output / NOT 2 inv output

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7216 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for the inverted output of instance NOT 2 of the inverter.

## p20088 NOT 2 run-time group / NOT 2 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7216 |
| **Min** | **Max** | **Factory setting** |
| 1 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which the instance NOT 2 of the inverter is to be called.

**Value:**
1: Run-time group 1
2: Run-time group 2
3: Run-time group 3
4: Run-time group 4
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20089 NOT 2 run sequence / NOT 2 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7216 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 180 |

**Description:** Setting parameter for the run sequence of instance NOT 2 within the run-time group set in p20088.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20090 BI: NOT 3 input I / NOT 3 input I

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7216 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source of input quantity I of instance NOT 3 of the inverter.

## r20091 BO: NOT 3 inverted output / NOT 3 inv output

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7216 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for the inverted output of instance NOT 3 of the inverter.

## p20092 NOT 3 run-time group / NOT 3 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7216 |
| **Min** | **Max** | **Factory setting** |
| 1 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which the instance NOT 3 of the inverter is to be called.

**Value:**
1: Run-time group 1
2: Run-time group 2
3: Run-time group 3
4: Run-time group 4
5: Run-time group 5

6: Run-time group 6
9999: Do not calculate

## p20093 NOT 3 run sequence / NOT 3 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7216 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 190 |

**Description:** Setting parameter for the run sequence of instance NOT 3 within the run-time group set in p20092.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20094[0...3] CI: ADD 0 inputs / ADD 0 inputs

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7220 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source of input quantities X0, X1, X2, X3 of instance ADD 0 of the adder.

**Index:**
[0] = Input X0
[1] = Input X1
[2] = Input X2
[3] = Input X3

## r20095 CO: ADD 0 output Y / ADD 0 output Y

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7220 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for the output quantity Y = X0 + X1 + X2 + X3 of instance ADD 0 of the adder.

## p20096 ADD 0 run-time group / ADD 0 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7220 |
| **Min** | **Max** | **Factory setting** |
| 5 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which the instance ADD 0 of the adder is to be called.

**Value:**
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20097 ADD 0 run sequence / ADD 0 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7220 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 210 |

**Description:** Setting parameter for the run sequence of instance ADD 0 within the run-time group set in p20096.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20098[0...3] CI: ADD 1 inputs / ADD 1 inputs

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7220 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source of input quantities X0, X1, X2, X3 of instance ADD 1 of the adder.

**Index:**
[0] = Input X0
[1] = Input X1
[2] = Input X2
[3] = Input X3

## r20099 CO: ADD 1 output Y / ADD 1 output Y

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7220 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for the output quantity Y = X0 + X1 + X2 + X3 of instance ADD 1 of the adder.

## p20100 ADD 1 run-time group / ADD 1 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7220 |
| **Min** | **Max** | **Factory setting** |
| 5 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which the instance ADD 1 of the adder is to be called.

**Value:**
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20101 ADD 1 run sequence / ADD 1 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7220 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 220 |

**Description:** Setting parameter for the run sequence of instance ADD 1 within the run-time group set in p20100.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20102[0...1] CI: SUB 0 inputs / SUB 0 inputs

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7220 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source of minuend X1 and subtrahend X2 of instance SUB 0 of the subtractor.

**Index:**
[0] = Minuend X1
[1] = Subtrahend X2

## r20103 CO: SUB 0 difference Y / SUB 0 difference Y

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7220 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for the difference Y = X1 - X2 of instance SUB 0 of the subtractor.

## p20104 SUB 0 run-time group / SUB 0 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7220 |
| **Min** | **Max** | **Factory setting** |
| 5 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which instance SUB 0 of the subtractor is to be called.

**Value:**
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20105 SUB 0 run sequence / SUB 0 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7220 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 240 |

**Description:** Setting parameter for the run sequence of instance SUB 0 within the run-time group set in p20104.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20106[0...1] CI: SUB 1 inputs / SUB 1 inputs

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7220 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source of minuend X1 and subtrahend X2 of instance SUB 1 of the subtractor.

**Index:**
[0] = Minuend X1
[1] = Subtrahend X2

## r20107 CO: SUB 1 difference Y / SUB 1 difference Y

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7220 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for the difference Y = X1 - X2 of instance SUB 1 of the subtractor.

## p20108 SUB 1 run-time group / SUB 1 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7220 |
| **Min** | **Max** | **Factory setting** |
| 5 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which instance SUB 1 of the subtractor is to be called.

**Value:**
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20109 SUB 1 run sequence / SUB 1 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7220 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 250 |

**Description:** Setting parameter for the run sequence of instance SUB 1 within the run-time group set in p20108.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20110[0...3] CI: MUL 0 inputs / MUL 0 inputs

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7222 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source of the factors X0, X1, X2, X3 of instance MUL 0 of the multiplier.

**Index:**
[0] = Factor X0
[1] = Factor X1
[2] = Factor X2
[3] = Factor X3

## r20111 CO: MUL 0 product Y / MUL 0 product Y

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7222 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for the product Y = X0 * X1 * X2 * X3 of instance MUL 0 of the multiplier.

## p20112 MUL 0 run-time group / MUL 0 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7222 |
| **Min** | **Max** | **Factory setting** |
| 5 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which instance MUL 0 of the multiplier is to be called.

**Value:**
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20113 MUL 0 run sequence / MUL 0 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7222 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 270 |

**Description:** Setting parameter for the run sequence of instance MUL 0 within the run-time group set in p20112.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20114[0...3] CI: MUL 1 inputs / MUL 1 inputs

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7222 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source of the factors X0, X1, X2, X3 of instance MUL 1 of the multiplier.

**Index:**
[0] = Factor X0
[1] = Factor X1
[2] = Factor X2
[3] = Factor X3

## r20115 CO: MUL 1 product Y / MUL 1 product Y

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7222 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for the product Y = X0 * X1 * X2 * X3 of instance MUL 1 of the multiplier.

## p20116 MUL 1 run-time group / MUL 1 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7222 |
| **Min** | **Max** | **Factory setting** |
| 5 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which instance MUL 1 of the multiplier is to be called.

**Value:**
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20117 MUL 1 run sequence / MUL 1 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7222 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 280 |

**Description:** Setting parameter for the run sequence of instance MUL 1 within the run-time group set in p20116.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20118[0...1] CI: DIV 0 inputs / DIV 0 inputs

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7222 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source of dividend X1 and divisor X2 of instance DIV 0 of the divider.

**Index:**
[0] = Dividend X0
[1] = Divisor X1

## r20119[0...2] CO: DIV 0 quotient / DIV 0 quotient

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7222 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for quotients Y = X1/X2, integer number quotients YIN, and division remainder MOD = (Y - YIN) x X2 of instance DIV 0 of the divider.

**Index:**
[0] = Quotient Y
[1] = Integer number quotient YIN
[2] = Div remainder MOD

## r20120 BO: DIV 0 divisor is zero QF / DIV 0 divisor=0 QF

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7222 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for the signal QF that the divisor X2 of instance DIV 0 of the divider is zero.

X2 = 0.0 => QF = 1

## p20121 DIV 0 run-time group / DIV 0 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7222 |
| **Min** | **Max** | **Factory setting** |
| 5 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which instance DIV 0 of the divider is to be called.

**Value:**
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20122 DIV 0 run sequence / DIV 0 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7222 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 300 |

**Description:** Setting parameter for the run sequence of instance DIV 0 within the run-time group set in p20121.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20123[0...1] CI: DIV 1 inputs / DIV 1 inputs

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7222 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source of dividend X1 and divisor X2 of instance DIV 1 of the divider.

**Index:**
[0] = Dividend X0
[1] = Divisor X1

## r20124[0...2] CO: DIV 1 quotient / DIV 1 quotient

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7222 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for quotients Y = X1/X2, integer number quotients YIN, and division remainder MOD = (Y - YIN) x X2 of instance DIV 1 of the divider.

**Index:**
[0] = Quotient Y
[1] = Integer number quotient YIN
[2] = Div remainder MOD

## r20125 BO: DIV 1 divisor is zero QF / DIV 1 divisor=0 QF

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7222 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for the signal QF that the divisor X2 of instance DIV 1 of the divider is zero.
X2 = 0.0 => QF = 1

## p20126 DIV 1 run-time group / DIV 1 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7222 |
| **Min** | **Max** | **Factory setting** |
| 5 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which instance DIV 1 of the divider is to be called.

**Value:**
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20127 DIV 1 run sequence / DIV 1 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7222 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 310 |

**Description:** Setting parameter for the run sequence of instance DIV 1 within the run-time group set in p20126.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20128 CI: AVA 0 input X / AVA 0 input X

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7224 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source of the input quantity X of instance AVA 0 of the absolute value generator with sign evaluation.

## r20129 CO: AVA 0 output Y / AVA 0 output Y

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7224 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for output quantity Y of instance AVA 0 of the absolute value generator with sign evaluation.

## r20130 BO: AVA 0 input negative SN / AVA 0 input neg SN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7224 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for signal SN that the input quantity X of instance AVA 0 of the absolute value generator with sign evaluation is negative.

X < 0.0 => SN = 1

## p20131 AVA 0 run-time group / AVA 0 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7224 |
| **Min** | **Max** | **Factory setting** |
| 5 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which instance AVA 0 of the absolute value generator with sign evaluation is to be called.

**Value:**
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20132 AVA 0 run sequence / AVA 0 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7224 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 340 |

**Description:** Setting parameter for the run sequence of instance AVA 0 within the run-time group set in p20131.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20133 CI: AVA 1 input X / AVA 1 input X

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7224 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source of the input quantity X of instance AVA 1 of the absolute value generator with sign evaluation.

## r20134 CO: AVA 1 output Y / AVA 1 output Y

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7224 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for output quantity Y of instance AVA 1 of the absolute value generator with sign evaluation.

## r20135 BO: AVA 1 input negative SN / AVA 1 input neg SN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7224 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for signal SN that the input quantity X of instance AVA 1 of the absolute value generator with sign evaluation is negative.

X < 0.0 => SN = 1

## p20136 AVA 1 run-time group / AVA 1 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7224 |
| **Min** | **Max** | **Factory setting** |
| 5 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which instance AVA 1 of the absolute value generator with sign evaluation is to be called.

**Value:**
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20137 AVA 1 run sequence / AVA 1 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7224 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 350 |

**Description:** Setting parameter for the run sequence of instance AVA 1 within the run-time group set in p20136.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20138 BI: MFP 0 input pulse I / MFP 0 inp_pulse I

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7230 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for the input pulse I of instance MFP 0 of the pulse generator.

## p20139 MFP 0 pulse duration in ms / MFP 0 pulse_dur ms

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7230 |
| **Min** | **Max** | **Factory setting** |
| 0.00 | 5400000.00 | 0.00 |

**Description:** Setting parameter for pulse duration T in milliseconds of instance MFP 0 of the pulse generator.

## r20140 BO: MFP 0 output Q / MFP 0 output Q

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7230 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for output pulse Q of instance MFP 0 of the pulse generator.

## p20141 MFP 0 run-time group / MFP 0 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7230 |
| **Min** | **Max** | **Factory setting** |
| 5 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which the instance MFP 0 of the pulse generator is to be called.

**Value:**
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20142 MFP 0 run sequence / MFP 0 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7230 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 370 |

**Description:** Setting parameter for the run sequence of instance MFP 0 within the run-time group set in p20141.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20143 BI: MFP 1 input pulse I / MFP 1 inp_pulse I

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7230 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for the input pulse I of instance MFP 1 of the pulse generator.

| | | | |
|---|---|---|---|
| **p20144** | **MFP 1 pulse duration in ms / MFP 1 pulse_dur ms** | | |
| | **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 7230 |
| | **Min** | **Max** | **Factory setting** |
| | 0.00 | 5400000.00 | 0.00 |
| **Description:** | Setting parameter for pulse duration T in milliseconds of instance MFP 1 of the pulse generator. | | |

| | | | |
|---|---|---|---|
| **r20145** | **BO: MFP 1 output Q / MFP 1 output Q** | | |
| | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| | **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 7230 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | - |
| **Description:** | Display parameter for output pulse Q of instance MFP 1 of the pulse generator. | | |

| | | | |
|---|---|---|---|
| **p20146** | **MFP 1 run-time group / MFP 1 RTG** | | |
| | **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 7230 |
| | **Min** | **Max** | **Factory setting** |
| | 5 | 9999 | 9999 |
| **Description:** | Setting parameter for the run-time group in which the instance MFP 1 of the pulse generator is to be called. | | |
| **Value:** | 5: Run-time group 5<br>6: Run-time group 6<br>9999: Do not calculate | | |

| | | | |
|---|---|---|---|
| **p20147** | **MFP 1 run sequence / MFP 1 RunSeq** | | |
| | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 7230 |
| | **Min** | **Max** | **Factory setting** |
| | 0 | 32000 | 380 |
| **Description:** | Setting parameter for the run sequence of instance MFP 1 within the run-time group set in p20146. | | |
| **Note:** | The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value. | | |

| | | | |
|---|---|---|---|
| **p20148** | **BI: PCL 0 input pulse I / PCL 0 inp_pulse I** | | |
| | **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 7230 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | 0 |
| **Description:** | Sets the signal source for the input pulse I of instance PCL 0 of the pulse shortener. | | |

| | | | |
|---|---|---|---|
| **p20149** | **PCL 0 pulse duration in ms / PCL 0 pulse_dur ms** | | |
| | **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 7230 |
| | **Min** | **Max** | **Factory setting** |
| | 0.00 | 5400000.00 | 0.00 |
| **Description:** | Setting parameter for pulse duration T in milliseconds of instance PCL 0 of the pulse shortener. | | |

## r20150 BO: PCL 0 output Q / PCL 0 output Q

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7230 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for output pulse Q of instance PCL 0 of the pulse shortener.

## p20151 PCL 0 run-time group / PCL 0 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7230 |
| **Min** | **Max** | **Factory setting** |
| 5 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which the instance PCL 0 of the pulse shortener is to be called.

**Value:**
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20152 PCL 0 run sequence / PCL 0 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7230 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 400 |

**Description:** Setting parameter for the run sequence of instance PCL 0 within the run-time group set in p20151.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20153 BI: PCL 1 input pulse I / PCL 1 inp_pulse I

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7230 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for the input pulse I of instance PCL 1 of the pulse shortener.

## p20154 PCL 1 pulse duration in ms / PCL 1 pulse_dur ms

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7230 |
| **Min** | **Max** | **Factory setting** |
| 0.00 | 5400000.00 | 0.00 |

**Description:** Setting parameter for pulse duration T in milliseconds of instance PCL 1 of the pulse shortener.

## r20155 BO: PCL 1 output Q / PCL 1 output Q

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7230 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for output pulse Q of instance PCL 1 of the pulse shortener.

## p20156 PCL 1 run-time group / PCL 1 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7230 |
| **Min** | **Max** | **Factory setting** |
| 5 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which the instance PCL 1 of the pulse shortener is to be called.

**Value:**
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20157 PCL 1 run sequence / PCL 1 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7230 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 410 |

**Description:** Setting parameter for the run sequence of instance PCL 1 within the run-time group set in p20156.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20158 BI: PDE 0 input pulse I / PDE 0 inp_pulse I

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7232 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for the input pulse I of instance PDE 0 of the closing delay device.

## p20159 PDE 0 pulse delay time in ms / PDE 0 t_del ms

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7232 |
| **Min** | **Max** | **Factory setting** |
| 0.00 | 5400000.00 | 0.00 |

**Description:** Setting parameter for pulse delay time T in milliseconds of instance PDE 0 of the closing delay device.

## r20160 BO: PDE 0 output Q / PDE 0 output Q

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7232 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for output pulse Q of instance PDE 0 of the closing delay device.

## p20161 PDE 0 run-time group / PDE 0 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7232 |
| **Min** | **Max** | **Factory setting** |
| 5 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which instance PDE 0 of the closing delay device is to be called.

**Value:**
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20162 PDE 0 run sequence / PDE 0 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7232 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 430 |

**Description:** Setting parameter for the run sequence of instance PDE 0 within the run-time group set in p20161.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20163 BI: PDE 1 input pulse I / PDE 1 inp_pulse I

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7232 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for the input pulse I of instance PDE 1 of the closing delay device.

## p20164 PDE 1 pulse delay time in ms / PDE 1 t_del ms

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7232 |
| **Min** | **Max** | **Factory setting** |
| 0.00 | 5400000.00 | 0.00 |

**Description:** Setting parameter for pulse delay time T in milliseconds of instance PDE 1 of the closing delay device.

## r20165 BO: PDE 1 output Q / PDE 1 output Q

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7232 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for output pulse Q of instance PDE 1 of the closing delay device.

## p20166 PDE 1 run-time group / PDE 1 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7232 |
| **Min** | **Max** | **Factory setting** |
| 5 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which instance PDE 1 of the closing delay device is to be called.

**Value:**
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20167 PDE 1 run sequence / PDE 1 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7232 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 440 |

**Description:** Setting parameter for the run sequence of instance PDE 1 within the run-time group set in p20166.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20168 BI: PDF 0 input pulse I / PDF 0 inp_pulse I

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7233 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for the input pulse I of instance PDF 0 of the breaking delay device.

## p20169 PDF 0 pulse extension time in ms / PDF 0 t_ext ms

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7233 |
| **Min** | **Max** | **Factory setting** |
| 0.00 | 5400000.00 | 0.00 |

**Description:** Setting parameter for pulse extension time T in milliseconds of instance PDF 0 of the breaking delay device.

## r20170 BO: PDF 0 output Q / PDF 0 output Q

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7233 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for output pulse Q of instance PDF 0 of the breaking delay device.

## p20171 PDF 0 run-time group / PDF 0 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7233 |
| **Min** | **Max** | **Factory setting** |
| 5 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which the instance PDF 0 of the breaking delay device is to be called.

**Value:**
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20172 PDF 0 run sequence / PDF 0 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7233 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 460 |

**Description:** Setting parameter for the run sequence of instance PDF 0 within the run-time group set in p20171.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20173 BI: PDF 1 input pulse I / PDF 1 inp_pulse I

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7233 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for the input pulse I of instance PDF 1 of the breaking delay device.

## p20174 PDF 1 pulse extension time in ms / PDF 1 t_ext ms

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7233 |
| **Min** | **Max** | **Factory setting** |
| 0.00 | 5400000.00 | 0.00 |

**Description:** Setting parameter for pulse extension time T in milliseconds of instance PDF 1 of the breaking delay device.

## r20175 BO: PDF 1 output Q / PDF 1 output Q

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7233 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for output pulse Q of instance PDF 1 of the breaking delay device.

## p20176 PDF 1 run-time group / PDF 1 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7233 |
| **Min** | **Max** | **Factory setting** |
| 5 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which the instance PDF 1 of the breaking delay device is to be called.

**Value:**
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20177 PDF 1 run sequence / PDF 1 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7233 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 470 |

**Description:** Setting parameter for the run sequence of instance PDF 1 within the run-time group set in p20176.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20178[0...1] BI: PST 0 inputs / PST 0 inputs

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7234 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for input pulse I and the reset input R of instance PST 0 of the pulse extension element.

**Index:**
[0] = Input pulse I
[1] = Reset input R

## p20179 PST 0 pulse duration in ms / PST 0 pulse_dur ms

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7234 |
| **Min** | **Max** | **Factory setting** |
| 0.00 | 5400000.00 | 0.00 |

**Description:** Setting parameter for pulse duration T in milliseconds of instance PST 0 of the pulse extension element.

## r20180 BO: PST 0 output Q / PST 0 output Q

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7234 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for output pulse Q of instance PST 0 of the pulse extension element.

## p20181 PST 0 run-time group / PST 0 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7234 |
| **Min** | **Max** | **Factory setting** |
| 5 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which the instance PST 0 of the pulse extension element is to be called.

**Value:**
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20182 PST 0 run sequence / PST 0 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7234 |
| **Min** | **Max** | **Factory setting** |
| 0 | 7999 | 490 |

**Description:** Setting parameter for the run sequence of instance PST 0 within the run-time group set in p20181.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20183[0...1] BI: PST 1 inputs / PST 1 inputs

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7234 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for input pulse I and the reset input R of instance PST 1 of the pulse extension element.

**Index:**
[0] = Input pulse I
[1] = Reset input R

## p20184 PST 1 pulse duration in ms / PST 1 pulse_dur ms

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7234 |
| **Min** | **Max** | **Factory setting** |
| 0.00 | 5400000.00 | 0.00 |

**Description:** Setting parameter for pulse duration T in milliseconds of instance PST 1 of the pulse extension element.

## r20185 BO: PST 1 output Q / PST 1 output Q

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7234 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for output pulse Q of instance PST 1 of the pulse extension element.

## p20186 PST 1 run-time group / PST 1 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7234 |
| **Min** | **Max** | **Factory setting** |
| 5 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which the instance PST 1 of the pulse extension element is to be called.

**Value:**
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20187 PST 1 run sequence / PST 1 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7234 |
| **Min** | **Max** | **Factory setting** |
| 0 | 7999 | 500 |

**Description:** Setting parameter for the run sequence of instance PST 1 within the run-time group set in p20186.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20188[0...1] BI: RSR 0 inputs / RSR 0 inputs

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7240 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for set input S and reset input R of instance RSR 0 of the RS flipflop.

**Index:**
[0] = Set S
[1] = Reset R

## r20189 BO: RSR 0 output Q / RSR 0 output Q

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7240 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for output Q of instance RSR 0 of the RS flipflop

## r20190 BO: RSR 0 inverted output QN / RSR 0 inv outp QN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7240 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for inverted output QN of instance RSR 0 of the RS flipflop.

## p20191 RSR 0 run-time group / RSR 0 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7240 |
| **Min** | **Max** | **Factory setting** |
| 1 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which instance RSR 0 of the RS flipflop is to be called.

**Value:**
1: Run-time group 1
2: Run-time group 2
3: Run-time group 3
4: Run-time group 4
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20192 RSR 0 run sequence / RSR 0 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7240 |
| **Min** | **Max** | **Factory setting** |
| 0 | 7999 | 520 |

**Description:** Setting parameter for the run sequence of instance RSR 0 within the run-time group set in p20191.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20193[0...1] BI: RSR 1 inputs / RSR 1 inputs

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7240 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for set input S and reset input R of instance RSR 1 of the RS flipflop.

**Index:**
[0] = Set S
[1] = Reset R

## r20194 BO: RSR 1 output Q / RSR 1 output Q

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7240 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for output Q of instance RSR 1 of the RS flipflop

## r20195 BO: RSR 1 inverted output QN / RSR 1 inv outp QN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7240 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for inverted output QN of instance RSR 1 of the RS flipflop.

## p20196 RSR 1 run-time group / RSR 1 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7240 |
| **Min** | **Max** | **Factory setting** |
| 1 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which instance RSR 1 of the RS flipflop is to be called.

**Value:**
1: Run-time group 1
2: Run-time group 2
3: Run-time group 3
4: Run-time group 4
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20197 RSR 1 run sequence / RSR 1 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7240 |
| **Min** | **Max** | **Factory setting** |
| 0 | 7999 | 530 |

**Description:** Setting parameter for the run sequence of instance RSR 1 within the run-time group set in p20196.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20198[0...3] BI: DFR 0 inputs / DFR 0 inputs

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7240 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for trigger input I, D input D, set input S, and reset input R of instance DFR 0 of the D flipflop.

**Index:**
[0] = Trigger input I
[1] = D input D
[2] = Set S
[3] = Reset R

## r20199 BO: DFR 0 output Q / DFR 0 output Q

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7240 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for output Q of instance DFR 0 of the D flipflop.

## r20200 BO: DFR 0 inverted output QN / DFR 0 inv outp QN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7240 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for the inverted output QN of instance DFR 0 of the D flipflop.

## p20201 DFR 0 run-time group / DFR 0 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7240 |
| **Min** | **Max** | **Factory setting** |
| 1 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which instance DFR 0 of the D flipflop is to be called.

**Value:**
1: Run-time group 1
2: Run-time group 2
3: Run-time group 3
4: Run-time group 4
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20202 DFR 0 run sequence / DFR 0 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7240 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 550 |

**Description:** Setting parameter for the run sequence of instance DFR 0 within the run-time group set in p20201.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20203[0...3] BI: DFR 1 inputs / DFR 1 inputs

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7240 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for trigger input I, D input D, set input S, and reset input R of instance DFR 1 of the D flipflop.

**Index:**
[0] = Trigger input I
[1] = D input D
[2] = Set S
[3] = Reset R

## r20204 BO: DFR 1 output Q / DFR 1 output Q

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7240 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for output Q of instance DFR 1 of the D flipflop.

## r20205 BO: DFR 1 inverted output QN / DFR 1 inv outp QN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7240 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for the inverted output QN of instance DFR 1 of the D flipflop.

## p20206 DFR 1 run-time group / DFR 1 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7240 |
| **Min** | **Max** | **Factory setting** |
| 1 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which instance DFR 1 of the D flipflop is to be called.

**Value:**
1: Run-time group 1
2: Run-time group 2
3: Run-time group 3
4: Run-time group 4
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20207 DFR 1 run sequence / DFR 1 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7240 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 560 |

**Description:** Setting parameter for the run-time group of instance DFR 1 within the run-time group set in p20206.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20208[0...1] BI: BSW 0 inputs / BSW 0 inputs

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7250 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source of input quantities I0 and I1 of instance BSW 0 of the binary changeover switch.

**Index:**
[0] = Input I0
[1] = Input I1

## p20209 BI: BSW 0 switch setting I / BSW 0 sw_setting

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7250 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source of the switch setting I of instance BSW 0 of the binary changeover switch.

## r20210 BO: BSW 0 output Q / BSW 0 output Q

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7250 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for output quantity Q of instance BSW 0 of the binary changeover switch.

## p20211 BSW 0 run-time group / BSW 0 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7250 |
| **Min** | **Max** | **Factory setting** |
| 1 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which the instance BSW 0 of the binary changeover switch is to be called.

**Value:**
1: Run-time group 1
2: Run-time group 2
3: Run-time group 3
4: Run-time group 4
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20212 BSW 0 run sequence / BSW 0 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7250 |
| **Min** | **Max** | **Factory setting** |
| 0 | 7999 | 580 |

**Description:** Setting parameter for the run sequence of instance BSW 0 within the run-time group set in p20211.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20213[0...1] BI: BSW 1 inputs / BSW 1 inputs

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7250 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source of input quantities I0 and I1 of instance BSW 1 of the binary changeover switch.

**Index:**
[0] = Input I0
[1] = Input I1

## p20214 BI: BSW 1 switch setting I / BSW 1 sw_setting

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7250 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source of the switch setting I of instance BSW 1 of the binary changeover switch.

## r20215 BO: BSW 1 output Q / BSW 1 output Q

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7250 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for output quantity Q of instance BSW 1 of the binary changeover switch.

## p20216 BSW 1 run-time group / BSW 1 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7250 |
| **Min** | **Max** | **Factory setting** |
| 1 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which the instance BSW 1 of the binary changeover switch is to be called.

**Value:**
1: Run-time group 1
2: Run-time group 2
3: Run-time group 3
4: Run-time group 4
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20217 BSW 1 run sequence / BSW 1 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7250 |
| **Min** | **Max** | **Factory setting** |
| 0 | 7999 | 590 |

**Description:** Setting parameter for the run sequence of instance BSW 1 within the run-time group set in p20216.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20218[0...1] CI: NSW 0 inputs / NSW 0 inputs

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7250 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source of input quantities X0 and X1 of instance NSW 0 of the numeric changeover switch.

**Index:**
[0] = Input X0
[1] = Input X1

## p20219 BI: NSW 0 switch setting I / NSW 0 sw_setting

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7250 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source of the switch setting I of instance NSW 0 of the numeric changeover switch.

## r20220 CO: NSW 0 output Y / NSW 0 output Y

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7250 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for output quantity Y of instance NSW 0 of the numeric changeover switch.

## p20221 NSW 0 run-time group / NSW 0 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7250 |
| **Min** | **Max** | **Factory setting** |
| 5 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which the instance NSW 0 of the numeric changeover switch is to be called.

**Value:**
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20222 NSW 0 run sequence / NSW 0 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7250 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 610 |

**Description:** Setting parameter for the run sequence of instance NSW 0 within the run-time group set in p20221.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

| p20223[0...1] | CI: NSW 1 inputs / NSW 1 inputs | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| | **Can be changed:** T | **Scaling:** PERCENT | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 7250 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | 0 |

**Description:** Sets the signal source of input quantities X0 and X1 of instance NSW 1 of the numeric changeover switch.

**Index:**
[0] = Input X0
[1] = Input X1

| p20224 | BI: NSW 1 switch setting I / NSW 1 sw_setting | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 7250 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | 0 |

**Description:** Sets the signal source of the switch setting I of instance NSW 1 of the numeric changeover switch.

| r20225 | CO: NSW 1 output Y / NSW 1 output Y | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| | **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 7250 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | - |

**Description:** Display parameter for output quantity Y of instance NSW 1 of the numeric changeover switch.

| p20226 | NSW 1 run-time group / NSW 1 RTG | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 7250 |
| | **Min** | **Max** | **Factory setting** |
| | 5 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which the instance NSW 1 of the numeric changeover switch is to be called.

**Value:**
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

| p20227 | NSW 1 run sequence / NSW 1 RunSeq | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 7250 |
| | **Min** | **Max** | **Factory setting** |
| | 0 | 32000 | 620 |

**Description:** Setting parameter for the run sequence of instance NSW 1 within the run-time group set in p20226.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

**p20228** **CI: LIM 0 input X / LIM 0 input X**

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7260 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source of input quantity X of instance LIM 0 of the limiter.

**p20229** **LIM 0 upper limit value LU / LIM 0 upper lim LU**

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7260 |
| **Min** | **Max** | **Factory setting** |
| -340.28235E36 | 340.28235E36 | 0.0000 |

**Description:** Setting parameter for the upper limit value LU of instance LIM 0 of the limiter.

**p20230** **LIM 0 lower limit value LL / LIM 0 lower lim LL**

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7260 |
| **Min** | **Max** | **Factory setting** |
| -340.28235E36 | 340.28235E36 | 0.0000 |

**Description:** Setting parameter for the lower limit value LL of instance LIM 0 of the limiter.

**r20231** **CO: LIM 0 output Y / LIM 0 output Y**

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7260 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for the limited output quantity Y of instance LIM 0 of the limiter.

**r20232** **BO: LIM 0 input quantity at the upper limit QU / LIM 0 QU**

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7260 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter of instance LIM 0 of limiter QU (upper limit reached), i.e. QU = 1 for X >= LU.

**r20233** **BO: LIM 0 input quantity at the lower limit QL / LIM 0 QL**

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7260 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter of instance LIM 0 of limiter QL (lower limit reached), i.e. QL = 1 for X <= LL.

## p20234 LIM 0 run-time group / LIM 0 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7260 |
| **Min** | **Max** | **Factory setting** |
| 5 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which instance LIM 0 of the limiter is to be called.

**Value:**
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20235 LIM 0 run sequence / LIM 0 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7260 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 640 |

**Description:** Setting parameter for the run sequence of instance LIM 0 within the run-time group set in p20234.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20236 CI: LIM 1 input X / LIM 1 input X

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7260 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source of input quantity X of instance LIM 1 of the limiter.

## p20237 LIM 1 upper limit value LU / LIM 1 upper lim LU

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7260 |
| **Min** | **Max** | **Factory setting** |
| -340.28235E36 | 340.28235E36 | 0.0000 |

**Description:** Setting parameter for the upper limit value LU of instance LIM 1 of the limiter.

## p20238 LIM 1 lower limit value LL / LIM 1 lower lim LL

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7260 |
| **Min** | **Max** | **Factory setting** |
| -340.28235E36 | 340.28235E36 | 0.0000 |

**Description:** Setting parameter for the lower limit value LL of instance LIM 1 of the limiter.

## r20239 CO: LIM 1 output Y / LIM 1 output Y

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7260 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for the limited output quantity Y of instance LIM 1 of the limiter.

## r20240 BO: LIM 1 input quantity at the upper limit QU / LIM 1 QU

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7260 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter of instance LIM 1 of limiter QU (upper limit reached), i.e. QU = 1 for X >= LU.

## r20241 BO: LIM 1 input quantity at the lower limit QL / LIM 1 QL

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7260 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter of instance LIM 1 of limiter QL (lower limit reached), i.e. QL = 1 for X <= LL.

## p20242 LIM 1 run-time group / LIM 1 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7260 |
| **Min** | **Max** | **Factory setting** |
| 5 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which instance LIM 1 of the limiter is to be called.

**Value:**
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20243 LIM 1 run sequence / LIM 1 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7260 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 650 |

**Description:** Setting parameter for the run sequence of instance LIM 1 within the run-time group set in p20242.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20244[0...1] CI: PT1 0 inputs / PT1 0 inputs

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7262 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source of input quantity X and of setting value SV of instance PT1 0 of the smoothing element.

**Index:**
[0] = Input X
[1] = Setting value SV

## p20245 BI: PT1 0 accept setting value S / PT1 0 acc set val

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7262 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for the "accept setting value" signal of instant PT1 0 of the smoothing element.

## p20246 PT1 0 smoothing time constant in ms / PT1 0 T_smooth ms

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7262 |
| **Min** | **Max** | **Factory setting** |
| 0.00 | 340.28235E36 | 0.00 |

**Description:** Sets the smoothing time constant T in milliseconds of instance PT1 0 of the smoothing element.

## r20247 CO: PT1 0 output Y / PT1 0 output Y

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7262 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for the smoothed output quantity Y of instance PT1 0 of the smoothing element.

## p20248 PT1 0 run-time group / PT1 0 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7262 |
| **Min** | **Max** | **Factory setting** |
| 5 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which instance PT1 0 of the smoothing element is to be called.

**Value:**
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20249 PT1 0 run sequence / PT1 0 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7262 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 670 |

**Description:** Setting parameter for the run sequence of instance PT1 0 within the run-time group set in p20248.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20250[0...1] CI: PT1 1 inputs / PT1 1 inputs

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7262 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source of input quantity X and of setting value SV of instance PT1 1 of the smoothing element.

**Index:** [0] = Input X
[1] = Setting value SV

## p20251 BI: PT1 1 accept setting value S / PT1 1 acc set val

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7262 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for the "accept setting value" signal of instant PT1 1 of the smoothing element.

## p20252 PT1 1 smoothing time constant in ms / PT1 1 T_smooth ms

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7262 |
| **Min** | **Max** | **Factory setting** |
| 0.00 | 340.28235E36 | 0.00 |

**Description:** Sets the smoothing time constant T in milliseconds of instance PT1 1 of the smoothing element.

## r20253 CO: PT1 1 output Y / PT1 1 output Y

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7262 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for the smoothed output quantity Y of instance PT1 1 of the smoothing element.

## p20254 PT1 1 run-time group / PT1 1 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7262 |
| **Min** | **Max** | **Factory setting** |
| 5 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which instance PT1 1 of the smoothing element is to be called.

**Value:**
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20255 PT1 1 run sequence / PT1 1 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7262 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 680 |

**Description:** Setting parameter for the run sequence of instance PT1 1 within the run-time group set in p20254.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20256[0...1] CI: INT 0 inputs / INT 0 inputs

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7264 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source of input quantity X and of setting value SV of instance INT 0 of the integrator.

**Index:**
[0] = Input X
[1] = Setting value SV

## p20257 INT 0 upper limit value LU / INT 0 upper lim LU

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7264 |
| **Min** | **Max** | **Factory setting** |
| -340.28235E36 | 340.28235E36 | 0.0000 |

**Description:** Sets the upper limit value LU of instance INT 0 of the integrator.

## p20258 INT 0 lower limit value LL / INT 0 lower lim LL

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7264 |
| **Min** | **Max** | **Factory setting** |
| -340.28235E36 | 340.28235E36 | 0.0000 |

**Description:** Sets the lower limit value LL of instance INT 0 of the integrator.

## p20259 INT 0 integrating time constant in ms / INT 0 T_Integr ms

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7264 |
| **Min** | **Max** | **Factory setting** |
| 0.00 | 340.28235E36 | 0.00 |

**Description:** Sets the integrating time constant Ti in milliseconds of instance INT 0 of the integrator.

## p20260 BI: INT 0 accept setting value S / INT 0 acc set val

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7264 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for the "accept setting value" signal of instant INT 0 of the integrator.

## r20261 CO: INT 0 output Y / INT 0 output Y

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7264 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for output quantity Y of instance INT 0 of the integrator.
If LL>= LU, then the output quantity Y = LU.

## r20262 BO: INT 0 integrator at the upper limit QU / INT 0 QU

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7264 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for the signal QU that output quantity Y of instance INT 0 of the integrator has reached the upper limit value LU.

## r20263 BO: INT 0 integrator at the lower limit QL / INT 0 QL

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7264 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for the signal QL that output quantity Y of instance INT 0 of the integrator has reached the lower limit value LL.

## p20264 INT 0 run-time group / INT 0 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7264 |
| **Min** | **Max** | **Factory setting** |
| 5 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which instance INT 0 of the integrator is to be called.

**Value:**
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20265 INT 0 run sequence / INT 0 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7264 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 700 |

**Description:** Setting parameter for the run sequence of instance INT 0 within the run-time group set in p20264.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20266 CI: LVM 0 input X / LVM 0 input X

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7270 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source of input quantity X of instance LVM 0 of the double-sided limiter.

| p20267 | LVM 0 interval average value M / LVM 0 avg value M | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 7270 |
| | **Min** | **Max** | **Factory setting** |
| | -340.28235E36 | 340.28235E36 | 0.0000 |
| **Description:** | Setting parameter for the interval average M of instance LVM 0 of the double-sided limiter. | | |

| p20268 | LVM 0 interval limit L / LVM 0 limit L | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 7270 |
| | **Min** | **Max** | **Factory setting** |
| | -340.28235E36 | 340.28235E36 | 0.0000 |
| **Description:** | Setting parameter for the interval limit L of instance LVM 0 of the double-sided limiter. | | |

| p20269 | LVM 0 hyst HY / LVM 0 hyst HY | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 7270 |
| | **Min** | **Max** | **Factory setting** |
| | -340.28235E36 | 340.28235E36 | 0.0000 |
| **Description:** | Setting parameter for hysteresis HY of instance LVM 0 of the double-sided limiter. | | |

| r20270 | BO: LVM 0 input quantity above interval QU / LVM 0 X above QU | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| | **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 7270 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | - |
| **Description:** | Display parameter of instance LVM 0 of the double-sided limiter that input quantity X was at least once X > M + L and X is >= M + L - HY. | | |

| r20271 | BO: LVM 0 input quantity within interval QM / LVM 0 X within QM | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| | **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 7270 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | - |
| **Description:** | Display parameter of instance LVM 0 of the double-sided limiter that the input quantity X lies within the interval. | | |

| r20272 | BO: LVM 0 input quantity below interval QL / LVM 0 X below QL | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| | **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 7270 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | - |
| **Description:** | Display parameter of instance LVM 0 of the double-sided limiter that input quantity X was at least once X < M - L and X is <= M - L + HY. | | |

## p20273 LVM 0 run-time group / LVM 0 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7270 |
| **Min** | **Max** | **Factory setting** |
| 5 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which instance LVM 0 of the double-sided limiter is to be called.

**Value:**
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20274 LVM 0 run sequence / LVM 0 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7270 |
| **Min** | **Max** | **Factory setting** |
| 0 | 7999 | 720 |

**Description:** Setting parameter for the run sequence of instance LVM 0 within the run-time group set in p20273.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20275 CI: LVM 1 input X / LVM 1 input X

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7270 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source of input quantity X of instance LVM 1 of the double-sided limiter.

## p20276 LVM 1 interval average value M / LVM 1 avg value M

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7270 |
| **Min** | **Max** | **Factory setting** |
| -340.28235E36 | 340.28235E36 | 0.0000 |

**Description:** Setting parameter for the interval average M of instance LVM 1 of the double-sided limiter.

## p20277 LVM 1 interval limit L / LVM 1 limit L

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7270 |
| **Min** | **Max** | **Factory setting** |
| -340.28235E36 | 340.28235E36 | 0.0000 |

**Description:** Setting parameter for the interval limit L of instance LVM 1 of the double-sided limiter.

## p20278 LVM 1 hyst HY / LVM 1 hyst HY

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7270 |
| **Min** | **Max** | **Factory setting** |
| -340.28235E36 | 340.28235E36 | 0.0000 |

**Description:** Setting parameter for hysteresis HY of instance LVM 1 of the double-sided limiter.

## r20279 BO: LVM 1 input quantity above interval QU / LVM 1 X above QU

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7270 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter of instance LVM 1 of the double-sided limiter that input quantity X was at least once X > M + L and X is >= M + L - HY.

## r20280 BO: LVM 1 input quantity within interval QM / LVM 1 X within QM

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7270 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter of instance LVM 1 of the double-sided limiter that the input quantity X lies within the interval.

## r20281 BO: LVM 1 input quantity below interval QL / LVM 1 X below QL

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7270 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter of instance LVM 1 of the double-sided limiter that input quantity X was at least once X < M - L and X is <= M - L + HY.

## p20282 LVM 1 run-time group / LVM 1 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7270 |
| **Min** | **Max** | **Factory setting** |
| 5 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which instance LVM 1 of the double-sided limiter is to be called.

**Value:**
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20283 LVM 1 run sequence / LVM 1 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7270 |
| **Min** | **Max** | **Factory setting** |
| 0 | 7999 | 730 |

**Description:** Setting parameter for the run sequence of instance LVM 1 within the run-time group set in p20282.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20284 CI: DIF 0 input X / DIF 0 input X

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7264 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source of input quantity X of instance DIF 0 of the differentiating element.

## p20285 DIF 0 differentiating time constant in ms / DIF 0 T_diff ms

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7264 |
| **Min** | **Max** | **Factory setting** |
| 0.00 | 340.28235E36 | 0.00 |

**Description:** Sets the differentiating time constant Td in milliseconds of instance DIF 0 of the differentiating element.

## r20286 CO: DIF 0 output Y / DIF 0 output Y

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7264 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for output quantity Y of instance DIF 0 of the differentiating element.

## p20287 DIF 0 run-time group / DIF 0 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7264 |
| **Min** | **Max** | **Factory setting** |
| 5 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which instance DIF 0 of the differentiating element is to be called.

**Value:**
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20288 DIF 0 run sequence / DIF 0 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7264 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 750 |

**Description:** Setting parameter for the run sequence of instance DIF 0 within the run-time group set in p20287.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20300 BI: NOT 4 input I / NOT 4 input I

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7216 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source of input quantity I of instance NOT 4 of the inverter.

## r20301 BO: NOT 4 inverted output / NOT 4 inv output

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7216 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for the inverted output of instance NOT 4 of the inverter.

## p20302 NOT 4 run-time group / NOT 4 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7216 |
| **Min** | **Max** | **Factory setting** |
| 1 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which the instance NOT 4 of the inverter is to be called.

**Value:**
1: Run-time group 1
2: Run-time group 2
3: Run-time group 3
4: Run-time group 4
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20303 NOT 4 run sequence / NOT 4 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7216 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 770 |

**Description:** Setting parameter for the run sequence of instance NOT 4 within the run-time group set in p20302.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20304 BI: NOT 5 input I / NOT 5 input I

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7216 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source of input quantity I of instance NOT 5 of the inverter.

## r20305 BO: NOT 5 inverted output / NOT 5 inv output

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7216 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for the inverted output of instance NOT 5 of the inverter.

## p20306 NOT 5 run-time group / NOT 5 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7216 |
| **Min** | **Max** | **Factory setting** |
| 1 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which the instance NOT 5 of the inverter is to be called.

**Value:**
1: Run-time group 1
2: Run-time group 2
3: Run-time group 3
4: Run-time group 4
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20307 NOT 5 run sequence / NOT 5 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7216 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 780 |

**Description:** Setting parameter for the run sequence of instance NOT 5 within the run-time group set in p20306.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20308[0...3] CI: ADD 2 inputs / ADD 2 inputs

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7220 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source of input quantities X0, X1, X2, X3 of instance ADD 2 of the adder.

**Index:**
[0] = Input X0
[1] = Input X1
[2] = Input X2
[3] = Input X3

## r20309 CO: ADD 2 output Y / ADD 2 output Y

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7220 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for the output quantity Y = X0 + X1 + X2 + X3 of instance ADD 2 of the adder.

## p20310 ADD 2 run-time group / ADD 2 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7220 |
| **Min** | **Max** | **Factory setting** |
| 5 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which the instance ADD 2 of the adder is to be called.

**Value:** 5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20311 ADD 2 run sequence / ADD 2 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7220 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 800 |

**Description:** Setting parameter for the run sequence of instance ADD 2 within the run-time group set in p20310.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20312[0...1] CI: NCM 0 inputs / NCM 0 inputs

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7225 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source of input quantities X0 and X1 of instance NCM 0 of the numeric comparator.

**Index:** [0] = Input X0
[1] = Input X1

## r20313 BO: NCM 0 output QU / NCM 0 output QU

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7225 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for binary quantity QU of instance NCM 0 of the numeric comparator.
QU is only set if X0 > X1.

## r20314 BO: NCM 0 output QE / NCM 0 output QE

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7225 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for binary quantity QE of instance NCM 0 of the numeric comparator.
QE is only set if X0 = X1.

## r20315 BO: NCM 0 output QL / NCM 0 output QL

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7225 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for binary quantity QL of instance NCM 0 of the numeric comparator.
QL is only set if X0 < X1.

## p20316 NCM 0 run-time group / NCM 0 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7225 |
| **Min** | **Max** | **Factory setting** |
| 5 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which the instance NCM 0 of the numeric comparator is to be called.

**Value:**
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20317 NCM 0 run sequence / NCM 0 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7225 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 820 |

**Description:** Setting parameter for the run sequence of instance NCM 0 within the run-time group set in p20316.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20318[0...1] CI: NCM 1 inputs / NCM 1 inputs

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7225 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source of input quantities X0 and X1 of instance NCM 1 of the numeric comparator.

**Index:**
[0] = Input X0
[1] = Input X1

## r20319 BO: NCM 1 output QU / NCM 1 output QU

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7225 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for binary quantity QU of instance NCM 1 of the numeric comparator.
QU is only set if X0 > X1.

## r20320 BO: NCM 1 output QE / NCM 1 output QE

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7225 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for binary quantity QE of instance NCM 1 of the numeric comparator.
QE is only set if X0 = X1.

## r20321 BO: NCM 1 output QL / NCM 1 output QL

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7225 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for binary quantity QL of instance NCM 1 of the numeric comparator.
QL is only set if X0 < X1.

## p20322 NCM 1 run-time group / NCM 1 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7225 |
| **Min** | **Max** | **Factory setting** |
| 5 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which the instance NCM 1 of the numeric comparator is to be called.

**Value:**
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20323 NCM 1 run sequence / NCM 1 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7225 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 830 |

**Description:** Setting parameter for the run sequence of instance NCM 1 within the run-time group set in p20322.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20324[0...1] BI: RSR 2 inputs / RSR 2 inputs

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7240 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for set input S and reset input R of instance RSR 2 of the RS flipflop.

**Index:**
[0] = Set S
[1] = Reset R

## r20325 BO: RSR 2 output Q / RSR 2 output Q

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7240 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for output Q of instance RSR 2 of the RS flipflop

## r20326 BO: RSR 2 inverted output QN / RSR 2 inv outp QN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7240 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for inverted output QN of instance RSR 2 of the RS flipflop.

## p20327 RSR 2 run-time group / RSR 2 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7240 |
| **Min** | **Max** | **Factory setting** |
| 1 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which instance RSR 2 of the RS flipflop is to be called.

**Value:**
1: Run-time group 1
2: Run-time group 2
3: Run-time group 3
4: Run-time group 4
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20328 RSR 2 run sequence / RSR 2 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7240 |
| **Min** | **Max** | **Factory setting** |
| 0 | 7999 | 850 |

**Description:** Setting parameter for the run sequence of instance RSR 2 within the run-time group set in p20327.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20329[0...3] BI: DFR 2 inputs / DFR 2 inputs

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7240 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for trigger input I, D input D, set input S, and reset input R of instance DFR 2 of the D flipflop.

**Index:**
[0] = Trigger input I
[1] = D input D
[2] = Set S
[3] = Reset R

## r20330 BO: DFR 2 output Q / DFR 2 output Q

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7240 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for output Q of instance DFR 2 of the D flipflop.

## r20331 BO: DFR 2 inverted output QN / DFR 2 inv outp QN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7240 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for the inverted output QN of instance DFR 2 of the D flipflop.

## p20332 DFR 2 run-time group / DFR 2 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7240 |
| **Min** | **Max** | **Factory setting** |
| 1 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which instance DFR 2 of the D flipflop is to be called.

**Value:**
1: Run-time group 1
2: Run-time group 2
3: Run-time group 3
4: Run-time group 4
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20333 DFR 2 run sequence / DFR 2 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7240 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 870 |

**Description:** Setting parameter for the run-time group of instance DFR 2 within the run-time group set in p20332.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20334 BI: PDE 2 input pulse I / PDE 2 inp_pulse I

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7232 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for the input pulse I of instance PDE 2 of the closing delay device.

## p20335 PDE 2 pulse delay time in ms / PDE 2 t_del ms

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7232 |
| **Min** | **Max** | **Factory setting** |
| 0.00 | 5400000.00 | 0.00 |

**Description:** Setting parameter for pulse delay time T in milliseconds of instance PDE 2 of the closing delay device.

| r20336 | BO: PDE 2 output Q / PDE 2 output Q | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| | **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 7232 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | - |
| **Description:** | Display parameter for output pulse Q of instance PDE 2 of the closing delay device. | | |

| p20337 | PDE 2 run-time group / PDE 2 RTG | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 7232 |
| | **Min** | **Max** | **Factory setting** |
| | 5 | 9999 | 9999 |
| **Description:** | Setting parameter for the run-time group in which instance PDE 2 of the closing delay device is to be called. | | |
| **Value:** | 5: Run-time group 5<br>6: Run-time group 6<br>9999: Do not calculate | | |

| p20338 | PDE 2 run sequence / PDE 2 RunSeq | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 7232 |
| | **Min** | **Max** | **Factory setting** |
| | 0 | 32000 | 890 |
| **Description:** | Setting parameter for the run sequence of instance PDE 2 within the run-time group set in p20337. | | |
| **Note:** | The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value. | | |

| p20339 | BI: PDE 3 input pulse I / PDE 3 inp_pulse I | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 7232 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | 0 |
| **Description:** | Sets the signal source for the input pulse I of instance PDE 3 of the closing delay device. | | |

| p20340 | PDE 3 pulse delay time in ms / PDE 3 t_del ms | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| | **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 7232 |
| | **Min** | **Max** | **Factory setting** |
| | 0.00 | 5400000.00 | 0.00 |
| **Description:** | Setting parameter for pulse delay time T in milliseconds of instance PDE 3 of the closing delay device. | | |

| r20341 | BO: PDE 3 output Q / PDE 3 output Q | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| | **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 7232 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | - |
| **Description:** | Display parameter for output pulse Q of instance PDE 3 of the closing delay device. | | |

## p20342 PDE 3 run-time group / PDE 3 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7232 |
| **Min** | **Max** | **Factory setting** |
| 5 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which instance PDE 3 of the closing delay device is to be called.

**Value:**
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20343 PDE 3 run sequence / PDE 3 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7232 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 900 |

**Description:** Setting parameter for the run sequence of instance PDE 3 within the run-time group set in p20342.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20344 BI: PDF 2 input pulse I / PDF 2 inp_pulse I

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7233 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for the input pulse I of instance PDF 2 of the breaking delay device.

## p20345 PDF 2 pulse extension time in ms / PDF 2 t_ext ms

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7233 |
| **Min** | **Max** | **Factory setting** |
| 0.00 | 5400000.00 | 0.00 |

**Description:** Setting parameter for pulse extension time T in milliseconds of instance PDF 2 of the breaking delay device.

## r20346 BO: PDF 2 output Q / PDF 2 output Q

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7233 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for output pulse Q of instance PDF 2 of the breaking delay device.

## p20347 PDF 2 run-time group / PDF 2 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7233 |
| **Min** | **Max** | **Factory setting** |
| 5 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which the instance PDF 2 of the breaking delay device is to be called.

**Value:**
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

---

## p20348 PDF 2 run sequence / PDF 2 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7233 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 920 |

**Description:** Setting parameter for the run sequence of instance PDE 2 within the run-time group set in p20347.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

---

## p20349 BI: PDF 3 input pulse I / PDF 3 inp_pulse I

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7233 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for the input pulse I of instance PDF 3 of the breaking delay device.

---

## p20350 PDF 3 pulse extension time in ms / PDF 3 t_ext ms

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7233 |
| **Min** | **Max** | **Factory setting** |
| 0.00 | 5400000.00 | 0.00 |

**Description:** Setting parameter for pulse extension time T in milliseconds of instance PDF 3 of the breaking delay device.

---

## r20351 BO: PDF 3 output Q / PDF 3 output Q

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7233 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for output pulse Q of instance PDF 3 of the breaking delay device.

---

## p20352 PDF 3 run-time group / PDF 3 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7233 |
| **Min** | **Max** | **Factory setting** |
| 5 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which the instance PDF 3 of the breaking delay device is to be called.

**Value:**
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20353 PDF 3 run sequence / PDF 3 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7233 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 930 |

**Description:** Setting parameter for the run sequence of instance PDE 3 within the run-time group set in p20352.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20354 BI: MFP 2 input pulse I / MFP 2 inp_pulse I

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7230 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for the input pulse I of instance MFP 2 of the pulse generator.

## p20355 MFP 2 pulse duration in ms / MFP 2 pulse_dur ms

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7230 |
| **Min** | **Max** | **Factory setting** |
| 0.00 | 5400000.00 | 0.00 |

**Description:** Setting parameter for pulse duration T in milliseconds of instance MFP 2 of the pulse generator.

## r20356 BO: MFP 2 output Q / MFP 2 output Q

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7230 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for output pulse Q of instance MFP 2 of the pulse generator.

## p20357 MFP 2 run-time group / MFP 2 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7230 |
| **Min** | **Max** | **Factory setting** |
| 5 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which the instance MFP 2 of the pulse generator is to be called.

**Value:**
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20358 MFP 2 run sequence / MFP 2 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7230 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 950 |

**Description:** Setting parameter for the run sequence of instance MFP 2 within the run-time group set in p20357.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20359 BI: MFP 3 input pulse I / MFP 3 inp_pulse I

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7230 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for the input pulse I of instance MFP 3 of the pulse generator.

## p20360 MFP 3 pulse duration in ms / MFP 3 pulse_dur ms

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7230 |
| **Min** | **Max** | **Factory setting** |
| 0.00 | 5400000.00 | 0.00 |

**Description:** Setting parameter for pulse duration T in milliseconds of instance MFP 3 of the pulse generator.

## r20361 BO: MFP 3 output Q / MFP 3 output Q

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned32 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7230 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for output pulse Q of instance MFP 3 of the pulse generator.

## p20362 MFP 3 run-time group / MFP 3 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7230 |
| **Min** | **Max** | **Factory setting** |
| 5 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which the instance MFP 3 of the pulse generator is to be called.

**Value:**
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20363 MFP 3 run sequence / MFP 3 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7230 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 960 |

**Description:** Setting parameter for the run sequence of instance MFP 3 within the run-time group set in p20362.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

| p20372 | CI: PLI 0 input X / PLI 0 input X | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| | **Can be changed:** T | **Scaling:** PERCENT | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 7226 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | 0 |

**Description:** Sets the signal source for input X of the polyline (20 breakpoints) of instance PLI 0.

| r20373 | CO: PLI 0 output Y / PLI 0 output Y | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| | **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 7226 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | - |

**Description:** Display parameter for the output quantity Y of the polyline (20 breakpoints) of instance PLI 0

| p20374[0...19] | PLI 0 X-coordinate, A breakpoint / PLI 0 X-coordinate | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| | **Can be changed:** T | **Scaling:** PERCENT | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 7226 |
| | **Min** | **Max** | **Factory setting** |
| | -340.28235E36 | 340.28235E36 | 0.0000 |

**Description:** Sets the x-coordinates for the breakpoints (A0...A19) of the polyline (20 breakpoints) of instance PLI 0.

**Index:**
[0] = Breakpoint 0
[1] = Breakpoint 1
[2] = Breakpoint 2
[3] = Breakpoint 3
[4] = Breakpoint 4
[5] = Breakpoint 5
[6] = Breakpoint 6
[7] = Breakpoint 7
[8] = Breakpoint 8
[9] = Breakpoint 9
[10] = Breakpoint 10
[11] = Breakpoint 11
[12] = Breakpoint 12
[13] = Breakpoint 13
[14] = Breakpoint 14
[15] = Breakpoint 15
[16] = Breakpoint 16
[17] = Breakpoint 17
[18] = Breakpoint 18
[19] = Breakpoint 19

| p20375[0...19] | PLI 0 Y-coordinate, B breakpoint / PLI 0 Y-coordinate | | |
|---|---|---|---|
| | **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| | **Can be changed:** T | **Scaling:** PERCENT | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 7226 |
| | **Min** | **Max** | **Factory setting** |
| | -340.28235E36 | 340.28235E36 | 0.0000 |

**Description:** Sets the y-coordinates for the breakpoints (B0...B19) of the polyline (20 breakpoints) of instance PLI 0.

**Index:**
[0] = Breakpoint 0
[1] = Breakpoint 1
[2] = Breakpoint 2
[3] = Breakpoint 3
[4] = Breakpoint 4

[5] = Breakpoint 5
[6] = Breakpoint 6
[7] = Breakpoint 7
[8] = Breakpoint 8
[9] = Breakpoint 9
[10] = Breakpoint 10
[11] = Breakpoint 11
[12] = Breakpoint 12
[13] = Breakpoint 13
[14] = Breakpoint 14
[15] = Breakpoint 15
[16] = Breakpoint 16
[17] = Breakpoint 17
[18] = Breakpoint 18
[19] = Breakpoint 19

## p20376 PLI 0 run-time group / PLI 0 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7226 |
| **Min** | **Max** | **Factory setting** |
| 5 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which instance PLI 0 of the polyline is to be called

**Value:**
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20377 PLI 0 run sequence / PLI 0 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7226 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 980 |

**Description:** Setting parameter for the run sequence of instance PLI 0 within the run-time group set in p20376.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p20378 CI: PLI 1 input X / PLI 1 input X

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7226 |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for input X of the polyline (20 breakpoints) of instance PLI 1.

## r20379 CO: PLI 1 output Y / PLI 1 output Y

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7226 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Display parameter for the output quantity Y of the polyline (20 breakpoints) of instance PLI 1

## p20380[0...19] PLI 1 X-coordinate, A breakpoint / PLI 1 X-coordinate

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7226 |
| **Min** | **Max** | **Factory setting** |
| -340.28235E36 | 340.28235E36 | 0.0000 |

**Description:** Sets the x-coordinates for the breakpoints (A0...A19) of the polyline (20 breakpoints) of instance PLI 1.

**Index:**
[0] = Breakpoint 0
[1] = Breakpoint 1
[2] = Breakpoint 2
[3] = Breakpoint 3
[4] = Breakpoint 4
[5] = Breakpoint 5
[6] = Breakpoint 6
[7] = Breakpoint 7
[8] = Breakpoint 8
[9] = Breakpoint 9
[10] = Breakpoint 10
[11] = Breakpoint 11
[12] = Breakpoint 12
[13] = Breakpoint 13
[14] = Breakpoint 14
[15] = Breakpoint 15
[16] = Breakpoint 16
[17] = Breakpoint 17
[18] = Breakpoint 18
[19] = Breakpoint 19

## p20381[0...19] PLI 1 Y-coordinate, B breakpoint / PLI 1 Y-coordinate

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7226 |
| **Min** | **Max** | **Factory setting** |
| -340.28235E36 | 340.28235E36 | 0.0000 |

**Description:** Sets the y-coordinates for the breakpoints (B0...B19) of the polyline (20 breakpoints) of instance PLI 1.

**Index:**
[0] = Breakpoint 0
[1] = Breakpoint 1
[2] = Breakpoint 2
[3] = Breakpoint 3
[4] = Breakpoint 4
[5] = Breakpoint 5
[6] = Breakpoint 6
[7] = Breakpoint 7
[8] = Breakpoint 8
[9] = Breakpoint 9
[10] = Breakpoint 10
[11] = Breakpoint 11
[12] = Breakpoint 12
[13] = Breakpoint 13
[14] = Breakpoint 14
[15] = Breakpoint 15
[16] = Breakpoint 16
[17] = Breakpoint 17
[18] = Breakpoint 18
[19] = Breakpoint 19

## p20382 PLI 1 run-time group / PLI 1 RTG

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7226 |
| **Min** | **Max** | **Factory setting** |
| 5 | 9999 | 9999 |

**Description:** Setting parameter for the run-time group in which instance PLI 1 of the polyline is to be called

**Value:**
5: Run-time group 5
6: Run-time group 6
9999: Do not calculate

## p20383 PLI 1 run sequence / PLI 1 RunSeq

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 7226 |
| **Min** | **Max** | **Factory setting** |
| 0 | 32000 | 990 |

**Description:** Setting parameter for the run sequence of instance PLI 1 within the run-time group set in p20382.

**Note:** The function blocks with a lower run sequence value are calculated before function blocks with a higher run sequence value.

## p31020 Multi-zone control interconnection / Zone_ctrl intercon

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 1 | 0 |

**Description:** Setting for interconnecting multi-zone control

**Value:**
0: Removing the multi-zone control interconnection
1: Interconnecting multi-zone control

**Notice:** When multi-zone control is interconnected, outputs r31024 and r31027 are always connected to index 0 of parameters p2253 and p2264. Any changes made to the command data set (CDS) in p2253 and p2264 are ignored.

**Note:** Re p31020 = 0:

The following BICO interconnections are automatically removed:

- p31023[0] = 0
- p31023[2] = 0
- p31026[0] = 0
- p31026[1] = 0
- p2253[0] = 0
- p2264[0] = 0

Re p31020 = 1:

The following BICO interconnections are automatically established:

- p31023[0] = r0755[0]
- p31023[2] = r0755[1]
- p31026[0] = r0755[2]
- p31026[1] = r0755[3]
- p2253[0] = r31024
- p2264[0] = r31027

## p31021 Multi-zone control configuration / Zone_ctrl config

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 2 | 0 |

**Description:** Sets the configuration for multi-zone control.

**Value:**
0: Setpoint 1 / multiple actual values
1: Two zones / highest value setting
2: Two zones / lowest value setting

**Note:** Re p31021 = 0:

The setpoint 1 and the output of the actual value processing are forwarded to the technology controller.

Re p31021 = 1:

The highest value setting ensures that the actual values of the two zones remain below their respective setpoint.

Re p31021 = 2:

The lowest value setting ensures that the actual values of the two zones remain above their respective setpoint.

## p31022 Multi-zone control for actual value processing / Zone_ctrl act proc

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** Integer16 |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| 0 | 11 | 0 |

**Description:** Sets the processing method for the multi-zone control actual value (r31027).

**Value:**
0: Only act 1
1: Only act 2
2: Only act 3
3: Difference (actual value 1, 2)
4: Sum (actual value 1, 2)
5: Sum (actual value 1, 2 and 3)
6: Mean value (actual value 1, 2)
7: Mean value (actual value 1, 2 and 3)
8: Minimum (actual value 1, 2)
9: Minimum (actual value 1, 2 and 3)
10: Maximum (actual value 1, 2)
11: Maximum (actual value 1, 2 and 3)

**Note:** Re p31022 = 0, 1, 2:

Only actual value 1, 2, or 3 is used as r31027.

Re p31022 = 3:

The difference between actual values 1 and 2 is used as r31027.

Re p31022 = 4:

The sum of actual values 1 and 2 is used as r31027.

Re p31022 = 5:

The sum of actual values 1, 2, and 3 is used as r31027.

Re p31022 = 6:

The mean value of actual values 1 and 2 is used as r31027.

Re p31022 = 7:

The mean value of actual values 1, 2 and 3 is used as r31027.

Re p31022 = 8:

The lower value of actual values 1 and 2 is used as r31027.

Re p31022 = 9:

The lowest value of actual values 1, 2, and 3 is used as r31027.

Re p31022 = 10:

The higher value of actual values 1 and 2 is used as r31027.

Re p31022 = 11:
The highest value of actual values 1, 2, and 3 is used as r31027.

## p31023[0...3] CI: Multi-zone control setpoint input / Zone_ctrl setp inp

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for the multi-zone control setpoints.

## r31024 CO: Multi-zone control setpoint output / Zone_ctrl set outp

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - [%] | - [%] | - [%] |

**Description:** Displays the relevant setpoint at the multi-zone control output.

## p31025 BI: Multi-zone control day/night switchover / Zone_ctl day_night

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** U32 / Binary |
| **Can be changed:** T | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for the day/night multi-zone control switchover.

## p31026[0...2] CI: Multi-zone control actual-value input / Zon_ctrl act inp

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** U32 / FloatingPoint32 |
| **Can be changed:** T | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - | - | 0 |

**Description:** Sets the signal source for the multi-zone control actual values.

## r31027 CO: Multi-zone control actual-value output / Zon_ctrl act outp

| | | |
|---|---|---|
| **Access level:** 2 | **Calculated:** - | **Data type:** FloatingPoint32 |
| **Can be changed:** - | **Scaling:** PERCENT | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** - |
| **Min** | **Max** | **Factory setting** |
| - [%] | - [%] | - [%] |

**Description:** Displays the relevant actual value at the multi-zone control output.

## r61000[0...239] PROFINET Name of Station / PN Name of Station

CU230P-2_PN

| | | |
|---|---|---|
| **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned8 |
| **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| **Units group:** - | **Unit selection:** - | **Func. diagram:** 2410 |
| **Min** | **Max** | **Factory setting** |
| - | - | - |

**Description:** Displays PROFINET Name of Station.

**Notice:** An ASCII table (excerpt) can be found, for example, in the appendix to the List Manual.

| | | | |
|---|---|---|---|
| **r61001[0...3]** | **PROFINET IP of Station / PN IP of Station** | | |
| CU230P-2_PN | **Access level:** 3 | **Calculated:** - | **Data type:** Unsigned8 |
| | **Can be changed:** - | **Scaling:** - | **Dyn. index:** - |
| | **Units group:** - | **Unit selection:** - | **Func. diagram:** 2410 |
| | **Min** | **Max** | **Factory setting** |
| | - | - | - |
| **Description:** | Displays PROFINET IP of Station. | | |

## 2.3 Parameters for data sets

### 2.3.1 Command Data Sets (CDS)

Product: SINAMICS G120, Version: 4702900, Language: eng, Type: CDS

| | |
|---|---|
| p0641[0...n] | CI: Current limit variable / Curr lim var |
| p0820[0...n] | BI: Drive Data Set selection DDS bit 0 / DDS select., bit 0 |
| p0821[0...n] | BI: Drive Data Set selection DDS bit 1 / DDS select., bit 1 |
| p0840[0...n] | BI: ON / OFF (OFF1) / ON / OFF (OFF1) |
| p0844[0...n] | BI: No coast-down / coast-down (OFF2) signal source 1 / OFF2 S_src 1 |
| p0845[0...n] | BI: No coast-down / coast-down (OFF2) signal source 2 / OFF2 S_src 2 |
| p0848[0...n] | BI: No Quick Stop / Quick Stop (OFF3) signal source 1 / OFF3 S_src 1 |
| p0849[0...n] | BI: No Quick Stop / Quick Stop (OFF3) signal source 2 / OFF3 S_src 2 |
| p0852[0...n] | BI: Enable operation/inhibit operation / Operation enable |
| p0854[0...n] | BI: Control by PLC/no control by PLC / Master ctrl by PLC |
| p1000[0...n] | Speed setpoint selection / n_set sel |
| p1020[0...n] | BI: Fixed speed setpoint selection Bit 0 / n_set_fixed Bit 0 |
| p1021[0...n] | BI: Fixed speed setpoint selection Bit 1 / n_set_fixed Bit 1 |
| p1022[0...n] | BI: Fixed speed setpoint selection Bit 2 / n_set_fixed Bit 2 |
| p1023[0...n] | BI: Fixed speed setpoint selection Bit 3 / n_set_fixed Bit 3 |
| p1035[0...n] | BI: Motorized potentiometer setpoint raise / Mop raise |
| p1036[0...n] | BI: Motorized potentiometer lower setpoint / Mop lower |
| p1039[0...n] | BI: Motorized potentiometer inversion / MotP inv |
| p1041[0...n] | BI: Motorized potentiometer manual/automatic / Mop manual/auto |
| p1042[0...n] | CI: Motorized potentiometer automatic setpoint / Mop auto setpoint |
| p1043[0...n] | BI: Motorized potentiometer accept setting value / MotP acc set val |
| p1044[0...n] | CI: Motorized potentiometer setting value / Mop set val |
| p1051[0...n] | CI: Speed limit RFG positive direction of rotation / n_limit RFG pos |
| p1052[0...n] | CI: Speed limit RFG negative direction of rotation / n_limit RFG neg |
| p1055[0...n] | BI: Jog bit 0 / Jog bit 0 |
| p1056[0...n] | BI: Jog bit 1 / Jog bit 1 |
| p1070[0...n] | CI: Main setpoint / Main setpoint |
| p1071[0...n] | CI: Main setpoint scaling / Main setp scal |
| p1075[0...n] | CI: Supplementary setpoint / Suppl setp |
| p1076[0...n] | CI: Supplementary setpoint scaling / Suppl setp scal |
| p1085[0...n] | CI: Speed limit in positive direction of rotation / n_limit pos |
| p1088[0...n] | CI: Speed limit in negative direction of rotation / n_limit neg |
| p1098[0...n] | CI: Skip speed scaling / n_skip scal |
| p1106[0...n] | CI: Minimum speed signal source / n_min s_src |
| p1108[0...n] | BI: Total setpoint selection / Total setp sel |
| p1109[0...n] | CI: Total setpoint / Total setp |
| p1110[0...n] | BI: Inhibit negative direction / Inhib neg dir |
| p1111[0...n] | BI: Inhibit positive direction / Inhib pos dir |
| p1113[0...n] | BI: Setpoint inversion / Setp inv |
| p1122[0...n] | BI: Bypass ramp-function generator / Bypass RFG |
| p1138[0...n] | CI: Ramp-function generator ramp-up time scaling / RFG t_RU scal |
| p1139[0...n] | CI: Ramp-function generator ramp-down time scaling / RFG t_RD scal |
| p1140[0...n] | BI: Enable ramp-function generator/inhibit ramp-function generator / RFG enable |
| p1141[0...n] | BI: Continue ramp-function generator/freeze ramp-function generator / Continue RFG |
| p1142[0...n] | BI: Enable setpoint/inhibit setpoint / Setpoint enable |
| p1143[0...n] | BI: Ramp-function generator, accept setting value / RFG accept set v |
| p1144[0...n] | CI: Ramp-function generator setting value / RFG setting value |
| p1201[0...n] | BI: Flying restart enable signal source / Fly_res enab S_src |

| | |
|---|---|
| p1230[0...n] | BI: DC braking activation / DC brake act |
| p2103[0...n] | BI: 1. Acknowledge faults / 1. Acknowledge |
| p2104[0...n] | BI: 2. Acknowledge faults / 2. Acknowledge |
| p2105[0...n] | BI: 3. Acknowledge faults / 3. Acknowledge |
| p2106[0...n] | BI: External fault 1 / External fault 1 |
| p2107[0...n] | BI: External fault 2 / External fault 2 |
| p2108[0...n] | BI: External fault 3 / External fault 3 |
| p2112[0...n] | BI: External alarm 1 / External alarm 1 |
| p2116[0...n] | BI: External alarm 2 / External alarm 2 |
| p2117[0...n] | BI: External alarm 3 / External alarm 3 |
| p2144[0...n] | BI: Motor stall monitoring enable (negated) / Mot stall enab neg |
| p2148[0...n] | BI: RFG active / RFG active |
| p2151[0...n] | CI: Speed setpoint for messages/signals / n_set for msg |
| p2200[0...n] | BI: Technology controller enable / Tec_ctrl enable |
| p2220[0...n] | BI: Technology controller fixed value selection bit 0 / Tec_ctrl sel bit 0 |
| p2221[0...n] | BI: Technology controller fixed value selection bit 1 / Tec_ctrl sel bit 1 |
| p2222[0...n] | BI: Technology controller fixed value selection bit 2 / Tec_ctrl sel bit 2 |
| p2223[0...n] | BI: Technology controller fixed value selection bit 3 / Tec_ctrl sel bit 3 |
| p2235[0...n] | BI: Technology controller motorized potentiometer raise setpoint / Tec_ctrl mop raise |
| p2236[0...n] | BI: Technology controller motorized potentiometer lower setpoint / Tec_ctrl mop lower |
| p2253[0...n] | CI: Technology controller setpoint 1 / Tec_ctrl setp 1 |
| p2254[0...n] | CI: Technology controller setpoint 2 / Tec_ctrl setp 2 |
| p2264[0...n] | CI: Technology controller actual value / Tec_ctrl act val |
| p2286[0...n] | BI: Hold technology controller integrator / Tec_ctr integ hold |
| p2289[0...n] | CI: Technology controller pre-control signal / Tec_ctr prectr_sig |
| p2296[0...n] | CI: Technology controller output scaling / Tec_ctrl outp scal |
| p2297[0...n] | CI: Technology controller maximum limit signal source / Tec_ctrMaxLimS_src |
| p2298[0...n] | CI: Technology controller minimum limit signal source / Tec_ctrl min_l s_s |
| p2299[0...n] | CI: Technology controller limit offset / Tech_ctrl lim offs |
| p3111[0...n] | BI: External fault 3 enable / Ext fault 3 enab |
| p3112[0...n] | BI: External fault 3 enable negated / Ext flt 3 enab neg |
| p3230[0...n] | CI: Load monitoring speed actual value / Load monit n_act |
| p3232[0...n] | BI: Load monitoring failure detection / Load_moni fail_det |
| p3330[0...n] | BI: 2/3 wire control command 1 / 2/3 wire cmd 1 |
| p3331[0...n] | BI: 2/3 wire control command 2 / 2/3 wire cmd 2 |
| p3332[0...n] | BI: 2/3 wire control command 3 / 2/3 wire cmd 3 |

## 2.3.2 Drive data sets (DDS)

Product: SINAMICS G120, Version: 4702900, Language: eng, Type: DDS

| | |
|---|---|
| p0340[0...n] | Automatic calculation motor/control parameters / Calc auto par |
| p0640[0...n] | Current limit / Current limit |
| p0644[0...n] | Current limit excitation induction motor / Imax excitat ASM |
| p1001[0...n] | CO: Fixed speed setpoint 1 / n_set_fixed 1 |
| p1002[0...n] | CO: Fixed speed setpoint 2 / n_set_fixed 2 |
| p1003[0...n] | CO: Fixed speed setpoint 3 / n_set_fixed 3 |
| p1004[0...n] | CO: Fixed speed setpoint 4 / n_set_fixed 4 |
| p1005[0...n] | CO: Fixed speed setpoint 5 / n_set_fixed 5 |
| p1006[0...n] | CO: Fixed speed setpoint 6 / n_set_fixed 6 |
| p1007[0...n] | CO: Fixed speed setpoint 7 / n_set_fixed 7 |
| p1008[0...n] | CO: Fixed speed setpoint 8 / n_set_fixed 8 |
| p1009[0...n] | CO: Fixed speed setpoint 9 / n_set_fixed 9 |
| p1010[0...n] | CO: Fixed speed setpoint 10 / n_set_fixed 10 |
| p1011[0...n] | CO: Fixed speed setpoint 11 / n_set_fixed 11 |

| | |
|---|---|
| p1012[0...n] | CO: Fixed speed setpoint 12 / n_set_fixed 12 |
| p1013[0...n] | CO: Fixed speed setpoint 13 / n_set_fixed 13 |
| p1014[0...n] | CO: Fixed speed setpoint 14 / n_set_fixed 14 |
| p1015[0...n] | CO: Fixed speed setpoint 15 / n_set_fixed 15 |
| p1030[0...n] | Motorized potentiometer configuration / Mop configuration |
| p1037[0...n] | Motorized potentiometer maximum speed / MotP n_max |
| p1038[0...n] | Motorized potentiometer minimum speed / MotP n_min |
| p1040[0...n] | Motorized potentiometer starting value / Mop start value |
| p1047[0...n] | Motorized potentiometer ramp-up time / Mop ramp-up time |
| p1048[0...n] | Motorized potentiometer ramp-down time / Mop ramp-down time |
| p1058[0...n] | Jog 1 speed setpoint / Jog 1 n_set |
| p1059[0...n] | Jog 2 speed setpoint / Jog 2 n_set |
| p1063[0...n] | Speed limit setpoint channel / n_limit setp |
| p1080[0...n] | Minimum speed / n_min |
| p1082[0...n] | Maximum speed / n_max |
| p1083[0...n] | CO: Speed limit in positive direction of rotation / n_limit pos |
| p1086[0...n] | CO: Speed limit in negative direction of rotation / n_limit neg |
| p1091[0...n] | Skip speed 1 / n_skip 1 |
| p1092[0...n] | Skip speed 2 / n_skip 2 |
| p1093[0...n] | Skip speed 3 / n_skip 3 |
| p1094[0...n] | Skip speed 4 / n_skip 4 |
| p1101[0...n] | Skip speed bandwidth / n_skip bandwidth |
| p1120[0...n] | Ramp-function generator ramp-up time / RFG ramp-up time |
| p1121[0...n] | Ramp-function generator ramp-down time / RFG ramp-down time |
| p1123[0...n] | Ramp-function generator minimum ramp-up time / RFG t_RU min |
| p1127[0...n] | Ramp-function generator minimum ramp-down time / RFG t_RD min |
| p1130[0...n] | Ramp-function generator initial rounding-off time / RFG t_start_round |
| p1131[0...n] | Ramp-function generator final rounding-off time / RFG t_end_delay |
| p1134[0...n] | Ramp-function generator rounding-off type / RFG round-off type |
| p1135[0...n] | OFF3 ramp-down time / OFF3 t_RD |
| p1136[0...n] | OFF3 initial rounding-off time / RFGOFF3 t_strt_rnd |
| p1137[0...n] | OFF3 final rounding-off time / RFG OFF3 t_end_del |
| p1145[0...n] | Ramp-function generator tracking intensity. / RFG track intens |
| p1148[0...n] | Ramp-function gen. tolerance for ramp-up and ramp-down active / RFG tol HL/RL act |
| p1200[0...n] | Flying restart operating mode / FlyRest op_mode |
| p1202[0...n] | Flying restart search current / FlyRest I_srch |
| p1203[0...n] | Flying restart search rate factor / FlyRst v_Srch Fact |
| p1226[0...n] | Threshold for zero speed detection / n_standst n_thresh |
| p1240[0...n] | Vdc controller configuration (vector control) / Vdc ctr config vec |
| p1243[0...n] | Vdc_max controller dynamic factor / Vdc_max dyn_factor |
| p1245[0...n] | Vdc_min controller switch-in level (kinetic buffering) / Vdc_min on_level |
| p1247[0...n] | Vdc_min controller dynamic factor (kinetic buffering) / Vdc_min dyn_factor |
| p1249[0...n] | Vdc_max controller speed threshold / Vdc_max n_thresh |
| p1250[0...n] | Vdc controller proportional gain / Vdc_ctrl Kp |
| p1251[0...n] | Vdc controller integral time / Vdc_ctrl Tn |
| p1252[0...n] | Vdc controller rate time / Vdc_ctrl t_rate |
| p1255[0...n] | Vdc_min controller time threshold / Vdc_min t_thresh |
| p1256[0...n] | Vdc_min controller response (kinetic buffering) / Vdc_min response |
| p1257[0...n] | Vdc_min controller speed threshold / Vdc_min n_thresh |
| p1262[0...n] | Bypass dead time / Bypass t_dead |
| p1271[0...n] | Flying restart maximum frequency for the inhibited direction / FlyRes f_max dir |
| p1280[0...n] | Vdc controller configuration (U/f) / Vdc_ctr config U/f |
| p1283[0...n] | Vdc_max controller dynamic factor (U/f) / Vdc_max dyn_factor |
| p1284[0...n] | Vdc_max controller time threshold (U/f) / Vdc_max t_thresh |
| p1285[0...n] | Vdc_min controller switch-in level (kinetic buffering) (U/f) / Vdc_min on_level |

| | |
|---|---|
| p1287[0...n] | Vdc_min controller dynamic factor (kinetic buffering) (U/f) / Vdc_min dyn_factor |
| p1290[0...n] | Vdc controller proportional gain (U/f) / Vdc_ctrl Kp |
| p1291[0...n] | Vdc controller integral time (U/f) / Vdc_ctrl Tn |
| p1292[0...n] | Vdc controller rate time (U/f) / Vdc_ctrl t_rate |
| p1295[0...n] | Vdc_min controller time threshold (U/f) / Vdc_min t_thresh |
| p1296[0...n] | Vdc_min controller response (kinetic buffering) (U/f / Vdc_min response |
| p1297[0...n] | Vdc_min controller speed threshold (U/f) / Vdc_min n_thresh |
| p1300[0...n] | Open-loop/closed-loop control operating mode / Op/cl-lp ctrl_mode |
| p1310[0...n] | Starting current (voltage boost) permanent / I_start (Ua) perm |
| p1311[0...n] | Starting current (voltage boost) when accelerating / I_start accel |
| p1312[0...n] | Starting current (voltage boost) when starting / I_start start |
| p1331[0...n] | Voltage limiting / U_lim |
| p1333[0...n] | U/f control FCC starting frequency / U/f FCC f_start |
| p1334[0...n] | U/f control slip compensation starting frequency / Slip comp start |
| p1335[0...n] | Slip compensation scaling / Slip comp scal |
| p1336[0...n] | Slip compensation limit value / Slip comp lim val |
| p1338[0...n] | U/f mode resonance damping gain / Uf Res_damp gain |
| p1339[0...n] | U/f mode resonance damping filter time constant / Uf Res_damp T |
| p1340[0...n] | I_max frequency controller proportional gain / I_max_ctrl Kp |
| p1341[0...n] | I_max frequency controller integral time / I_max_ctrl Tn |
| p1345[0...n] | I_max voltage controller proportional gain / I_max_U_ctrl Kp |
| p1346[0...n] | I_max voltage controller integral time / I_max_U_ctrl Tn |
| p1349[0...n] | U/f mode resonance damping maximum frequency / Uf res_damp f_max |
| p1400[0...n] | Speed control configuration / n_ctrl config |
| p1401[0...n] | Flux control configuration / Flux ctrl config |
| p1402[0...n] | Closed-loop current control and motor model configuration / I_ctrl config |
| p1416[0...n] | Speed setpoint filter 1 time constant / n_set_filt 1 T |
| p1452[0...n] | Speed controller speed actual value smoothing time (sensorless) / n_C n_act T_s SL |
| p1461[0...n] | Speed controller Kp adaptation speed upper scaling / n_ctr Kp n up scal |
| p1463[0...n] | Speed controller Tn adaptation speed upper scaling / n_ctr Tn n up scal |
| p1464[0...n] | Speed controller adaptation speed lower / n_ctrl n lower |
| p1465[0...n] | Speed controller adaptation speed upper / n_ctrl n upper |
| p1470[0...n] | Speed controller encoderless operation P-gain / n_ctrl SL Kp |
| p1472[0...n] | Speed controller encoderless operation integral time / n_ctrl SL Tn |
| p1496[0...n] | Acceleration pre-control scaling / a_prectrl scal |
| p1517[0...n] | Accelerating torque smoothing time constant / M_accel T_smooth |
| p1520[0...n] | CO: Torque limit upper / M_max upper |
| p1521[0...n] | CO: Torque limit lower / M_max lower |
| p1530[0...n] | Power limit motoring / P_max mot |
| p1531[0...n] | Power limit regenerative / P_max gen |
| p1553[0...n] | Stall limit scaling / Stall limit scal |
| r1566[0...n] | Flux reduction factor torque / Flux red fact torq |
| p1567[0...n] | Magnetization scaling / Mag scale |
| p1570[0...n] | CO: Flux setpoint / Flex setp |
| p1574[0...n] | Voltage reserve dynamic / U_reserve dyn |
| p1578[0...n] | Flux reduction flux decrease smoothing time / Flux red T_red |
| p1579[0...n] | Flux reduction flux build-up smoothing time / Flux red T_incr |
| p1580[0...n] | Efficiency optimization / Efficiency opt. |
| p1581[0...n] | Flux reduction factor / Flux red factor |
| p1582[0...n] | Flux setpoint smoothing time / Flux setp T_smth |
| p1584[0...n] | Field weakening operation flux setpoint smoothing time / Field weak T_smth |
| p1586[0...n] | Field weakening characteristic scaling / Field weak scal |
| p1590[0...n] | Flux controller P gain / Flux controller Kp |
| p1592[0...n] | Flux controller integral time / Flux controller Tn |
| p1596[0...n] | Field weakening controller integral-action time / Field_ctrl Tn |

| | |
|---|---|
| p1601[0...n] | Current injection ramp time / I_inject t_ramp |
| p1610[0...n] | Torque setpoint static (sensorless) / M_set static |
| p1611[0...n] | Additional acceleration torque (sensorless) / M_suppl_accel |
| p1616[0...n] | Current setpoint smoothing time / I_set T_smooth |
| p1654[0...n] | Curr. setpoint torque-gen. smoothing time field weakening range / Isq_s T_smth FW |
| p1703[0...n] | Isq current controller pre-control scaling / Isq_ctr_prectrScal |
| p1715[0...n] | Current controller P gain / I_ctrl Kp |
| p1717[0...n] | Current controller integral-action time / I_ctrl Tn |
| p1720[0...n] | Current controller d axis p gain / Id_ctrl Kp |
| p1722[0...n] | Current controller d axis integral time / I_ctrl d-axis Tn |
| p1730[0...n] | Isd controller integral component shutdown threshold / Isd ctrl Tn shutd |
| p1731[0...n] | Isd controller combination current time component / Isd ctr I_combi T1 |
| p1740[0...n] | Gain resonance damping for encoderless closed-loop control / Gain res_damp |
| p1745[0...n] | Motor model error threshold stall detection / MotMod ThreshStall |
| p1749[0...n] | Motor model increase changeover speed encoderless operation / Incr n_chng no enc |
| p1750[0...n] | Motor model configuration / MotMod config |
| p1755[0...n] | Motor model changeover speed encoderless operation / MotMod n_chgSnsorl |
| p1758[0...n] | Motor model changeover delay time closed/open-loop control / MotMod t cl_op |
| p1759[0...n] | Motor model changeover delay time open/closed-loop control / MotMod t op_cl |
| p1764[0...n] | Motor model without encoder speed adaptation Kp / MotMod woE n_adaKp |
| p1767[0...n] | Motor model without encoder speed adaptation Tn / MotMod woE n_adaTn |
| p1774[0...n] | Motor model offset voltage compensation alpha / MotMod offs comp A |
| p1775[0...n] | Motor model offset voltage compensation beta / MotMod offs comp B |
| p1780[0...n] | Motor model adaptation configuration / MotMod adapt conf |
| p1784[0...n] | Motor model feedback scaling / MotMod fdbk scal |
| p1785[0...n] | Motor model Lh adaptation Kp / MotMod Lh Kp |
| p1786[0...n] | Motor model Lh adaptation integral time / MotMod Lh Tn |
| r1787[0...n] | Motor model Lh adaptation corrective value / MotMod Lh corr |
| p1800[0...n] | Pulse frequency setpoint / Pulse freq setp |
| p1802[0...n] | Modulator mode / Modulator mode |
| p1803[0...n] | Maximum modulation depth / Modulat depth max |
| p1806[0...n] | Filter time constant Vdc correction / T_filt Vdc_corr |
| p1820[0...n] | Reverse the output phase sequence / Outp_ph_seq rev |
| p1959[0...n] | Rotating measurement configuration / Rot meas config |
| p2140[0...n] | Hysteresis speed 2 / n_hysteresis 2 |
| p2141[0...n] | Speed threshold 1 / n_thresh val 1 |
| p2142[0...n] | Hysteresis speed 1 / n_hysteresis 1 |
| p2149[0...n] | Monitoring configuration / Monit config |
| p2150[0...n] | Hysteresis speed 3 / n_hysteresis 3 |
| p2153[0...n] | Speed actual value filter time constant / n_act_filt T |
| p2155[0...n] | Speed threshold 2 / n_thresh val 2 |
| p2156[0...n] | On delay comparison value reached / t_on cmpr val rchd |
| p2161[0...n] | Speed threshold 3 / n_thresh val 3 |
| p2162[0...n] | Hysteresis speed n_act > n_max / Hyst n_act>n_max |
| p2163[0...n] | Speed threshold 4 / n_thresh val 4 |
| p2164[0...n] | Hysteresis speed 4 / n_hysteresis 4 |
| p2166[0...n] | Off delay n_act = n_set / t_del_off n_i=n_so |
| p2167[0...n] | Switch-on delay n_act = n_set / t_on n_act=n_set |
| p2170[0...n] | Current threshold value / I_thres |
| p2171[0...n] | Current threshold value reached delay time / I_thresh rch t_del |
| p2172[0...n] | DC link voltage threshold value / Vdc thresh val |
| p2173[0...n] | DC link voltage comparison delay time / t_del Vdc |
| p2175[0...n] | Motor blocked speed threshold / Mot lock n_thresh |
| p2177[0...n] | Motor blocked delay time / Mot lock t_del |
| p2178[0...n] | Motor stalled delay time / Mot stall t_del |

| | |
|---|---|
| p2179[0...n] | Output load identification current limit / Outp_ld iden I_lim |
| p2180[0...n] | Output load detection delay time / Out_load det t_del |
| p2181[0...n] | Load monitoring response / Load monit resp |
| p2182[0...n] | Load monitoring speed threshold value 1 / n_thresh 1 |
| p2183[0...n] | Load monitoring speed threshold value 2 / n_thresh 2 |
| p2184[0...n] | Load monitoring speed threshold value 3 / n_thresh 3 |
| p2185[0...n] | Load monitoring torque threshold 1 upper / M_thresh 1 upper |
| p2186[0...n] | Load monitoring torque threshold 1 lower / M_thresh 1 lower |
| p2187[0...n] | Load monitoring torque threshold 2 upper / M_thresh 2 upper |
| p2188[0...n] | Load monitoring torque threshold 2 lower / M_thresh 2 lower |
| p2189[0...n] | Load monitoring torque threshold 3 upper / M_thresh 3 upper |
| p2190[0...n] | Load monitoring torque threshold 3 lower / M_thresh 3 lower |
| p2192[0...n] | Load monitoring delay time / Load monit t_del |
| p2193[0...n] | Load monitoring configuration / Load monit config |
| p2201[0...n] | CO: Technology controller fixed value 1 / Tec_ctrl fix val1 |
| p2202[0...n] | CO: Technology controller fixed value 2 / Tec_ctr fix val 2 |
| p2203[0...n] | CO: Technology controller fixed value 3 / Tec_ctr fix val 3 |
| p2204[0...n] | CO: Technology controller fixed value 4 / Tec_ctr fix val 4 |
| p2205[0...n] | CO: Technology controller fixed value 5 / Tec_ctr fix val 5 |
| p2206[0...n] | CO: Technology controller fixed value 6 / Tec_ctr fix val 6 |
| p2207[0...n] | CO: Technology controller fixed value 7 / Tec_ctr fix val 7 |
| p2208[0...n] | CO: Technology controller fixed value 8 / Tec_ctr fix val 8 |
| p2209[0...n] | CO: Technology controller fixed value 9 / Tec_ctr fix val 9 |
| p2210[0...n] | CO: Technology controller fixed value 10 / Tec_ctr fix val 10 |
| p2211[0...n] | CO: Technology controller fixed value 11 / Tec_ctr fix val 11 |
| p2212[0...n] | CO: Technology controller fixed value 12 / Tec_ctr fix val 12 |
| p2213[0...n] | CO: Technology controller fixed value 13 / Tec_ctr fix val 13 |
| p2214[0...n] | CO: Technology controller fixed value 14 / Tec_ctr fix val 14 |
| p2215[0...n] | CO: Technology controller fixed value 15 / Tec_ctr fix val 15 |
| p2216[0...n] | Technology controller fixed value selection method / Tec_ctr FixVal sel |
| p2230[0...n] | Technology controller motorized potentiometer configuration / Tec_ctr mop config |
| p2237[0...n] | Technology controller motorized potentiometer maximum value / Tec_ctrl mop max |
| p2238[0...n] | Technology controller motorized potentiometer minimum value / Tec_ctrl mop min |
| p2240[0...n] | Technology controller motorized potentiometer starting value / Tec_ctrl mop start |
| p2247[0...n] | Technology controller motorized potentiometer ramp-up time / Tec_ctr mop t_r-up |
| p2248[0...n] | Technology controller motorized potentiometer ramp-down time / Tec_ctrMop t_rdown |
| p2370[0...n] | Closed-loop cascade control enable / Csc_ctrl enab |
| p2390[0...n] | Energy-saving mode start speed / En_sav n_start |
| p2391[0...n] | Energy-saving mode delay time / En_sav t_delay |
| p2393[0...n] | Energy-saving mode restart speed relative without tec_ctrl / En_savResNoTec_ctr |
| p2394[0...n] | Energy-saving mode boost time period / En_sav t_boost |
| p2395[0...n] | Energy-saving mode boost speed / En_sav n_boost |
| p2396[0...n] | Energy-saving mode max shutdown time / En_sav t_off max |
| p2900[0...n] | CO: Fixed value 1 [%] / Fixed value 1 [%] |
| p2901[0...n] | CO: Fixed value 2 [%] / Fixed value 2 [%] |
| p2930[0...n] | CO: Fixed value M [Nm] / Fixed value M [Nm] |
| p3231[0...n] | Load monitoring speed deviation / Load monit n_dev |
| p3233[0...n] | Torque actual value filter time constant / M_act_filt T |
| p3320[0...n] | Fluid flow machine power point 1 / Fluid_mach P1 |
| p3321[0...n] | Fluid flow machine speed point 1 / Fluid_mach n1 |
| p3322[0...n] | Fluid flow machine power point 2 / Fluid_mach P2 |
| p3323[0...n] | Fluid flow machine speed point 2 / Fluid_mach n2 |
| p3324[0...n] | Fluid flow machine power point 3 / Fluid_mach P3 |
| p3325[0...n] | Fluid flow machine speed point 3 / Fluid_mach n3 |
| p3326[0...n] | Fluid flow machine power point 4 / Fluid_mach P4 |

| | |
|---|---|
| p3327[0...n] | Fluid flow machine speed point 4 / Fluid_mach n4 |
| p3328[0...n] | Fluid flow machine power point 5 / Fluid_mach P5 |
| p3329[0...n] | Fluid flow machine speed point 5 / Fluid_mach n5 |
| p3855[0...n] | DC quantity controller configuration / DC_ctrl config |
| p3856[0...n] | Compound braking current / Compound I_brake |
| p3857[0...n] | DC quantity controller P gain / DC_ctrl Kp |
| p3858[0...n] | DC quantity controller integral time / DC_ctrl Tn |
| r3925[0...n] | Identification final display / Ident final_disp |
| r3927[0...n] | Motor data identification control word / MotID STW |
| r3928[0...n] | Rotating measurement configuration / Rot meas config |
| r3929[0...n] | Motor data identification modulated voltage generation / MotID U_gen mod |

## 2.3.3 Motor data sets (MDS)

Product: SINAMICS G120, Version: 4702900, Language: eng, Type: MDS

| | |
|---|---|
| p0133[0...n] | Motor configuration / Motor config |
| p0300[0...n] | Motor type selection / Mot type sel |
| p0301[0...n] | Motor code number selection / Mot code No. sel |
| p0304[0...n] | Rated motor voltage / Mot U_rated |
| p0305[0...n] | Rated motor current / Mot I_rated |
| p0306[0...n] | Number of motors connected in parallel / Motor qty |
| p0307[0...n] | Rated motor power / Mot P_rated |
| p0308[0...n] | Rated motor power factor / Mot cos phi rated |
| p0309[0...n] | Rated motor efficiency / Mot eta_rated |
| p0310[0...n] | Rated motor frequency / Mot f_rated |
| p0311[0...n] | Rated motor speed / Mot n_rated |
| r0313[0...n] | Motor pole pair number, actual (or calculated) / Mot PolePairNo act |
| p0314[0...n] | Motor pole pair number / Mot pole pair No. |
| p0316[0...n] | Motor torque constant / Mot kT |
| p0320[0...n] | Motor rated magnetizing current/short-circuit current / Mot I_mag_rated |
| p0322[0...n] | Maximum motor speed / Mot n_max |
| p0323[0...n] | Maximum motor current / Mot I_max |
| p0325[0...n] | Motor pole position identification current 1st phase / Mot PolID I 1st ph |
| p0327[0...n] | Optimum motor load angle / Mot phi_load opt |
| p0328[0...n] | Motor reluctance torque constant / Mot kT_reluctance |
| p0329[0...n] | Motor pole position identification current / Mot PolID current |
| r0330[0...n] | Rated motor slip / Mot slip_rated |
| r0331[0...n] | Actual motor magnetizing current/short-circuit current / Mot I_mag_rtd act |
| r0332[0...n] | Rated motor power factor / Mot cos phi rated |
| r0333[0...n] | Rated motor torque / Mot M_rated |
| p0335[0...n] | Motor cooling type / Mot cool type |
| r0337[0...n] | Rated motor EMF / Mot EMF_rated |
| p0341[0...n] | Motor moment of inertia / Mot M_mom of inert |
| p0342[0...n] | Ratio between the total and motor moment of inertia / Mot MomInert Ratio |
| r0343[0...n] | Rated motor current identified / Mot I_rated ident |
| p0344[0...n] | Motor weight (for the thermal motor model) / Mot weight th mod |
| r0345[0...n] | Nominal motor starting time / Mot t_start_rated |
| p0346[0...n] | Motor excitation build-up time / Mot t_excitation |
| p0347[0...n] | Motor de-excitation time / Mot t_de-excitat |
| p0350[0...n] | Motor stator resistance cold / Mot R_stator cold |
| p0352[0...n] | Cable resistance / R_cable |
| p0354[0...n] | Motor rotor resistance cold / Mot R_r cold |
| p0356[0...n] | Motor stator leakage inductance / Mot L_stator leak. |
| p0357[0...n] | Motor stator inductance d axis / Mot L_stator d |

| | |
|---|---|
| p0358[0...n] | Motor rotor leakage inductance / Mot L_rot leak |
| p0360[0...n] | Motor magnetizing inductance / Mot Lh |
| p0362[0...n] | Motor saturation characteristic flux 1 / Mot saturat.flux 1 |
| p0363[0...n] | Motor saturation characteristic flux 2 / Mot saturat.flux 2 |
| p0364[0...n] | Motor saturation characteristic flux 3 / Mot saturat.flux 3 |
| p0365[0...n] | Motor saturation characteristic flux 4 / Mot saturat.flux 4 |
| p0366[0...n] | Motor saturation characteristic I_mag 1 / Mot sat. I_mag 1 |
| p0367[0...n] | Motor saturation characteristic I_mag 2 / Mot sat. I_mag 2 |
| p0368[0...n] | Motor saturation characteristic I_mag 3 / Mot sat. I_mag 3 |
| p0369[0...n] | Motor saturation characteristic I_mag 4 / Mot sat. I_mag 4 |
| r0370[0...n] | Motor stator resistance cold / Mot R_stator cold |
| r0372[0...n] | Cable resistance / Mot R_cable |
| r0373[0...n] | Motor rated stator resistance / Mot R_stator rated |
| r0374[0...n] | Motor rotor resistance cold / Mot R_r cold |
| r0376[0...n] | Rated motor rotor resistance / Mot rated R_rotor |
| r0377[0...n] | Motor leakage inductance total / Mot L_leak total |
| r0382[0...n] | Motor magnetizing inductance transformed / Mot L_magn transf |
| r0384[0...n] | Motor rotor time constant / damping time constant d axis / Mot T_rotor/T_Dd |
| r0386[0...n] | Motor stator leakage time constant / Mot T_stator leak |
| r0395[0...n] | Actual stator resistance / R_stator act |
| r0396[0...n] | Actual rotor resistance / R_rotor act |
| p0601[0...n] | Motor temperature sensor type / Mot_temp_sens type |
| p0604[0...n] | Mot_temp_mod 2/KTY alarm threshold / Mod 2/KTY A thresh |
| p0605[0...n] | Mot_temp_mod 1/2 threshold / Mod 1/2 threshold |
| p0610[0...n] | Motor overtemperature response / Mot temp response |
| p0611[0...n] | I2t motor model thermal time constant / I2t mot_mod T |
| p0612[0...n] | Mot_temp_mod activation / Mot_temp_mod act |
| p0614[0...n] | Thermal resistance adaptation reduction factor / Therm R_adapt red |
| p0615[0...n] | Mot_temp_mod 1 (I2t) fault threshold / I2t F thresh |
| p0620[0...n] | Thermal adaptation, stator and rotor resistance / Mot therm_adapt R |
| p0621[0...n] | Identification stator resistance after restart / Rst_ident Restart |
| p0622[0...n] | Motor excitation time for Rs_ident after powering up again / t_excit Rs_id |
| p0625[0...n] | Motor ambient temperature during commissioning / Mot T_ambient |
| p0626[0...n] | Motor overtemperature, stator core / Mot T_over core |
| p0627[0...n] | Motor overtemperature, stator winding / Mot T_over stator |
| p0628[0...n] | Motor overtemperature rotor winding / Mot T_over rotor |
| p0629[0...n] | Stator resistance reference / R_stator ref |
| r0630[0...n] | Mot_temp_mod ambient temperature / Mod T_ambient |
| r0631[0...n] | Mot_temp_mod stator iron temperature / Mod T_stator |
| r0632[0...n] | Mot_temp_mod stator winding temperature / Mod T_winding |
| r0633[0...n] | Mot_temp_mod rotor temperature / Mod rotor temp |
| p0650[0...n] | Actual motor operating hours / Mot t_oper act |
| p0651[0...n] | Motor operating hours maintenance interval / Mot t_op maint |
| p0826[0...n] | Motor changeover motor number / Mot_chng mot No. |
| p1231[0...n] | DC braking configuration / DCBRK config |
| p1232[0...n] | DC braking braking current / DCBRK I_brake |
| p1233[0...n] | DC braking time / DCBRK time |
| p1234[0...n] | Speed at the start of DC braking / DCBRK n_start |
| p1710[0...n] | Current controller adaptation d axis starting point KP / Id_adapt pt KP |
| p1711[0...n] | Current controller adaptation d axis starting point KP adapted / Id_adap pt KP adap |
| p1712[0...n] | Current controller adaptation d axis p gain adaptation / Id_ctrl Kp adapt |
| p1909[0...n] | Motor data identification control word / MotID STW |
| p1980[0...n] | PolID technique / PolID technique |
| r3926[0...n] | Voltage generation alternating base voltage amplitude / U_gen altern base |

## 2.3.4 Power unit Data Sets (PDS)

Product: SINAMICS G120, Version: 4702900, Language: eng, Type: PDS

| | |
|---|---|
| p0124[0...n] | CU detection via LED / CU detection LED |
| r0200[0...n] | Power unit code number actual / PU code no. act |
| p0201[0...n] | Power unit code number / PU code no |
| r0203[0...n] | Actual power unit type / PU actual type |
| r0204[0...n] | Power unit hardware properties / PU HW property |

# 2.4 BICO parameters (connectors/binectors)

## 2.4.1 Binector inputs (BI)

Product: SINAMICS G120, Version: 4702900, Language: eng, Type: BI

| | |
|---|---|
| p0730 | BI: CU signal source for terminal DO 0 / CU S_src DO 0 |
| p0731 | BI: CU signal source for terminal DO 1 / CU S_src DO 1 |
| p0732 | BI: CU signal source for terminal DO 2 / CU S_src DO 2 |
| p0782[0...1] | BI: CU analog outputs invert signal source / CU AO inv S_src |
| p0806 | BI: Inhibit master control / PcCtrl inhibit |
| p0810 | BI: Command data set selection CDS bit 0 / CDS select., bit 0 |
| p0811 | BI: Command data set selection CDS bit 1 / CDS select., bit 1 |
| p0820[0...n] | BI: Drive Data Set selection DDS bit 0 / DDS select., bit 0 |
| p0821[0...n] | BI: Drive Data Set selection DDS bit 1 / DDS select., bit 1 |
| p0840[0...n] | BI: ON / OFF (OFF1) / ON / OFF (OFF1) |
| p0844[0...n] | BI: No coast-down / coast-down (OFF2) signal source 1 / OFF2 S_src 1 |
| p0845[0...n] | BI: No coast-down / coast-down (OFF2) signal source 2 / OFF2 S_src 2 |
| p0848[0...n] | BI: No Quick Stop / Quick Stop (OFF3) signal source 1 / OFF3 S_src 1 |
| p0849[0...n] | BI: No Quick Stop / Quick Stop (OFF3) signal source 2 / OFF3 S_src 2 |
| p0852[0...n] | BI: Enable operation/inhibit operation / Operation enable |
| p0854[0...n] | BI: Control by PLC/no control by PLC / Master ctrl by PLC |
| p0860 | BI: Line contactor feedback signal / Line contact feedb |
| p1020[0...n] | BI: Fixed speed setpoint selection Bit 0 / n_set_fixed Bit 0 |
| p1021[0...n] | BI: Fixed speed setpoint selection Bit 1 / n_set_fixed Bit 1 |
| p1022[0...n] | BI: Fixed speed setpoint selection Bit 2 / n_set_fixed Bit 2 |
| p1023[0...n] | BI: Fixed speed setpoint selection Bit 3 / n_set_fixed Bit 3 |
| p1035[0...n] | BI: Motorized potentiometer setpoint raise / Mop raise |
| p1036[0...n] | BI: Motorized potentiometer lower setpoint / Mop lower |
| p1039[0...n] | BI: Motorized potentiometer inversion / MotP inv |
| p1041[0...n] | BI: Motorized potentiometer manual/automatic / Mop manual/auto |
| p1043[0...n] | BI: Motorized potentiometer accept setting value / MotP acc set val |
| p1055[0...n] | BI: Jog bit 0 / Jog bit 0 |
| p1056[0...n] | BI: Jog bit 1 / Jog bit 1 |
| p1108[0...n] | BI: Total setpoint selection / Total setp sel |
| p1110[0...n] | BI: Inhibit negative direction / Inhib neg dir |
| p1111[0...n] | BI: Inhibit positive direction / Inhib pos dir |
| p1113[0...n] | BI: Setpoint inversion / Setp inv |
| p1122[0...n] | BI: Bypass ramp-function generator / Bypass RFG |
| p1140[0...n] | BI: Enable ramp-function generator/inhibit ramp-function generator / RFG enable |
| p1141[0...n] | BI: Continue ramp-function generator/freeze ramp-function generator / Continue RFG |
| p1142[0...n] | BI: Enable setpoint/inhibit setpoint / Setpoint enable |
| p1143[0...n] | BI: Ramp-function generator, accept setting value / RFG accept set v |
| p1201[0...n] | BI: Flying restart enable signal source / Fly_res enab S_src |
| p1230[0...n] | BI: DC braking activation / DC brake act |
| p1266 | BI: Bypass control command / Bypass command |
| p1269[0...1] | BI: Bypass switch feedback signal / Bypass FS |
| p2080[0...15] | BI: Binector-connector converter status word 1 / Bin/con ZSW1 |
| p2081[0...15] | BI: Binector-connector converter status word 2 / Bin/con ZSW2 |
| p2082[0...15] | BI: Binector-connector converter status word 3 / Bin/con ZSW3 |
| p2083[0...15] | BI: Binector-connector converter status word 4 / Bin/con ZSW4 |
| p2084[0...15] | BI: Binector-connector converter status word 5 / Bin/con ZSW5 |
| p2103[0...n] | BI: 1. Acknowledge faults / 1. Acknowledge |
| p2104[0...n] | BI: 2. Acknowledge faults / 2. Acknowledge |

| | |
|---|---|
| p2105[0...n] | BI: 3. Acknowledge faults / 3. Acknowledge |
| p2106[0...n] | BI: External fault 1 / External fault 1 |
| p2107[0...n] | BI: External fault 2 / External fault 2 |
| p2108[0...n] | BI: External fault 3 / External fault 3 |
| p2112[0...n] | BI: External alarm 1 / External alarm 1 |
| p2116[0...n] | BI: External alarm 2 / External alarm 2 |
| p2117[0...n] | BI: External alarm 3 / External alarm 3 |
| p2144[0...n] | BI: Motor stall monitoring enable (negated) / Mot stall enab neg |
| p2148[0...n] | BI: RFG active / RFG active |
| p2200[0...n] | BI: Technology controller enable / Tec_ctrl enable |
| p2220[0...n] | BI: Technology controller fixed value selection bit 0 / Tec_ctrl sel bit 0 |
| p2221[0...n] | BI: Technology controller fixed value selection bit 1 / Tec_ctrl sel bit 1 |
| p2222[0...n] | BI: Technology controller fixed value selection bit 2 / Tec_ctrl sel bit 2 |
| p2223[0...n] | BI: Technology controller fixed value selection bit 3 / Tec_ctrl sel bit 3 |
| p2235[0...n] | BI: Technology controller motorized potentiometer raise setpoint / Tec_ctrl mop raise |
| p2236[0...n] | BI: Technology controller motorized potentiometer lower setpoint / Tec_ctrl mop lower |
| p2286[0...n] | BI: Hold technology controller integrator / Tec_ctr integ hold |
| p3111[0...n] | BI: External fault 3 enable / Ext fault 3 enab |
| p3112[0...n] | BI: External fault 3 enable negated / Ext flt 3 enab neg |
| p3232[0...n] | BI: Load monitoring failure detection / Load_moni fail_det |
| p3330[0...n] | BI: 2/3 wire control command 1 / 2/3 wire cmd 1 |
| p3331[0...n] | BI: 2/3 wire control command 2 / 2/3 wire cmd 2 |
| p3332[0...n] | BI: 2/3 wire control command 3 / 2/3 wire cmd 3 |
| p3880 | BI: ESM activation signal source / ESM act s s |
| p3883 | BI: ESM direction of rotation signal source / ESM rot dir s s |
| p5614 | BI: Pe set switch-on inhibit signal source / Pe sw on_inh s_src |
| p8785 | BI: CAN status word bit 8 / Status word bit 8 |
| p8786 | BI: CAN status word bit 14 / Status word bit 14 |
| p8787 | BI: CAN status word bit 15 / Status word bit 15 |
| p11000 | BI: Free tec_ctrl 0 enable / Ftec0 enab |
| p11100 | BI: Free tec_ctrl 1 enable / Ftec1 enab |
| p11200 | BI: Free tec_ctrl 2 enable / Ftec2 enab |
| p20030[0...3] | BI: AND 0 inputs / AND 0 inputs |
| p20034[0...3] | BI: AND 1 inputs / AND 1 inputs |
| p20038[0...3] | BI: AND 2 inputs / AND 2 inputs |
| p20042[0...3] | BI: AND 3 inputs / AND 3 inputs |
| p20046[0...3] | BI: OR 0 inputs / OR 0 inputs |
| p20050[0...3] | BI: OR 1 inputs / OR 1 inputs |
| p20054[0...3] | BI: OR 2 inputs / OR 2 inputs |
| p20058[0...3] | BI: OR 3 inputs / OR 3 inputs |
| p20062[0...3] | BI: XOR 0 inputs / XOR 0 inputs |
| p20066[0...3] | BI: XOR 1 inputs / XOR 1 inputs |
| p20070[0...3] | BI: XOR 2 inputs / XOR 2 inputs |
| p20074[0...3] | BI: XOR 3 inputs / XOR 3 inputs |
| p20078 | BI: NOT 0 input I / NOT 0 input I |
| p20082 | BI: NOT 1 input I / NOT 1 input I |
| p20086 | BI: NOT 2 input I / NOT 2 input I |
| p20090 | BI: NOT 3 input I / NOT 3 input I |
| p20138 | BI: MFP 0 input pulse I / MFP 0 inp_pulse I |
| p20143 | BI: MFP 1 input pulse I / MFP 1 inp_pulse I |
| p20148 | BI: PCL 0 input pulse I / PCL 0 inp_pulse I |
| p20153 | BI: PCL 1 input pulse I / PCL 1 inp_pulse I |
| p20158 | BI: PDE 0 input pulse I / PDE 0 inp_pulse I |
| p20163 | BI: PDE 1 input pulse I / PDE 1 inp_pulse I |
| p20168 | BI: PDF 0 input pulse I / PDF 0 inp_pulse I |

| | |
|---|---|
| p20173 | BI: PDF 1 input pulse I / PDF 1 inp_pulse I |
| p20178[0...1] | BI: PST 0 inputs / PST 0 inputs |
| p20183[0...1] | BI: PST 1 inputs / PST 1 inputs |
| p20188[0...1] | BI: RSR 0 inputs / RSR 0 inputs |
| p20193[0...1] | BI: RSR 1 inputs / RSR 1 inputs |
| p20198[0...3] | BI: DFR 0 inputs / DFR 0 inputs |
| p20203[0...3] | BI: DFR 1 inputs / DFR 1 inputs |
| p20208[0...1] | BI: BSW 0 inputs / BSW 0 inputs |
| p20209 | BI: BSW 0 switch setting I / BSW 0 sw_setting |
| p20213[0...1] | BI: BSW 1 inputs / BSW 1 inputs |
| p20214 | BI: BSW 1 switch setting I / BSW 1 sw_setting |
| p20219 | BI: NSW 0 switch setting I / NSW 0 sw_setting |
| p20224 | BI: NSW 1 switch setting I / NSW 1 sw_setting |
| p20245 | BI: PT1 0 accept setting value S / PT1 0 acc set val |
| p20251 | BI: PT1 1 accept setting value S / PT1 1 acc set val |
| p20260 | BI: INT 0 accept setting value S / INT 0 acc set val |
| p20300 | BI: NOT 4 input I / NOT 4 input I |
| p20304 | BI: NOT 5 input I / NOT 5 input I |
| p20324[0...1] | BI: RSR 2 inputs / RSR 2 inputs |
| p20329[0...3] | BI: DFR 2 inputs / DFR 2 inputs |
| p20334 | BI: PDE 2 input pulse I / PDE 2 inp_pulse I |
| p20339 | BI: PDE 3 input pulse I / PDE 3 inp_pulse I |
| p20344 | BI: PDF 2 input pulse I / PDF 2 inp_pulse I |
| p20349 | BI: PDF 3 input pulse I / PDF 3 inp_pulse I |
| p20354 | BI: MFP 2 input pulse I / MFP 2 inp_pulse I |
| p20359 | BI: MFP 3 input pulse I / MFP 3 inp_pulse I |
| p31025 | BI: Multi-zone control day/night switchover / Zone_ctl day_night |

## 2.4.2 Connector inputs (CI)

Product: SINAMICS G120, Version: 4702900, Language: eng, Type: CI

| | |
|---|---|
| p0641[0...n] | CI: Current limit variable / Curr lim var |
| p0771[0...1] | CI: CU analog outputs signal source / CU AO S_src |
| p1042[0...n] | CI: Motorized potentiometer automatic setpoint / Mop auto setpoint |
| p1044[0...n] | CI: Motorized potentiometer setting value / Mop set val |
| p1051[0...n] | CI: Speed limit RFG positive direction of rotation / n_limit RFG pos |
| p1052[0...n] | CI: Speed limit RFG negative direction of rotation / n_limit RFG neg |
| p1070[0...n] | CI: Main setpoint / Main setpoint |
| p1071[0...n] | CI: Main setpoint scaling / Main setp scal |
| p1075[0...n] | CI: Supplementary setpoint / Suppl setp |
| p1076[0...n] | CI: Supplementary setpoint scaling / Suppl setp scal |
| p1085[0...n] | CI: Speed limit in positive direction of rotation / n_limit pos |
| p1088[0...n] | CI: Speed limit in negative direction of rotation / n_limit neg |
| p1098[0...n] | CI: Skip speed scaling / n_skip scal |
| p1106[0...n] | CI: Minimum speed signal source / n_min s_src |
| p1109[0...n] | CI: Total setpoint / Total setp |
| p1138[0...n] | CI: Ramp-function generator ramp-up time scaling / RFG t_RU scal |
| p1139[0...n] | CI: Ramp-function generator ramp-down time scaling / RFG t_RD scal |
| p1144[0...n] | CI: Ramp-function generator setting value / RFG setting value |
| p2016[0...3] | CI: Comm IF USS PZD send word / Comm USS send word |
| p2051[0...13] | CI: PROFIdrive PZD send word / PZD send word |
| p2061[0...12] | CI: PROFIBUS PZD send double word / PZD send DW |
| p2099[0...1] | CI: Connector-binector converter signal source / Con/bin S_src |
| p2151[0...n] | CI: Speed setpoint for messages/signals / n_set for msg |

| | |
|---|---|
| p2253[0...n] | CI: Technology controller setpoint 1 / Tec_ctrl setp 1 |
| p2254[0...n] | CI: Technology controller setpoint 2 / Tec_ctrl setp 2 |
| p2264[0...n] | CI: Technology controller actual value / Tec_ctrl act val |
| p2289[0...n] | CI: Technology controller pre-control signal / Tec_ctr prectr_sig |
| p2296[0...n] | CI: Technology controller output scaling / Tec_ctrl outp scal |
| p2297[0...n] | CI: Technology controller maximum limit signal source / Tec_ctrMaxLimS_src |
| p2298[0...n] | CI: Technology controller minimum limit signal source / Tec_ctrl min_l s_s |
| p2299[0...n] | CI: Technology controller limit offset / Tech_ctrl lim offs |
| p3230[0...n] | CI: Load monitoring speed actual value / Load monit n_act |
| p3884 | CI: ESM setpoint technology controller / ESM setp tech_ctrl |
| p8746[0...15] | CI: CAN free PZD send objects 16 bit / Free PZD send 16 |
| p8748[0...7] | CI: CAN free PZD send objects 32 bit / Free PZD send 32 |
| p11053 | CI: Free tec_ctrl 0 setpoint signal source / Ftec0 setp s_s |
| p11064 | CI: Free tec_ctrl 0 actual value signal source / Ftec0 act v s_s |
| p11097 | CI: Free tec_ctrl 0 limit maximum signal source / Ftec0 lim max s_s |
| p11098 | CI: Free tec_ctrl 0 limit minimum signal source / Ftec0 lim min s_s |
| p11099 | CI: Free tec_ctrl 0 limit offset signal source / Ftec0 lim offs |
| p11153 | CI: Free tec_ctrl 1 setpoint signal source / Ftec1 setp s_s |
| p11164 | CI: Free tec_ctrl 1 actual value signal source / Ftec1 act v s_s |
| p11197 | CI: Free tec_ctrl 1 limit maximum signal source / Ftec1 lim max s_s |
| p11198 | CI: Free tec_ctrl 1 limit minimum signal source / Ftec1 lim min s_s |
| p11199 | CI: Free tec_ctrl 1 limit offset signal source / Ftec1 lim offs |
| p11253 | CI: Free tec_ctrl 2 setpoint signal source / Ftec2 setp s_src |
| p11264 | CI: Free tec_ctrl 2 actual value signal source / Ftec2 act v s_s |
| p11297 | CI: Free tec_ctrl 2 limit maximum signal source / Ftec2 lim max s_s |
| p11298 | CI: Free tec_ctrl 2 limit minimum signal source / Ftec2 lim min s_s |
| p11299 | CI: Free tec_ctrl 2 limit offset signal source / Ftec2 lim offs |
| p20094[0...3] | CI: ADD 0 inputs / ADD 0 inputs |
| p20098[0...3] | CI: ADD 1 inputs / ADD 1 inputs |
| p20102[0...1] | CI: SUB 0 inputs / SUB 0 inputs |
| p20106[0...1] | CI: SUB 1 inputs / SUB 1 inputs |
| p20110[0...3] | CI: MUL 0 inputs / MUL 0 inputs |
| p20114[0...3] | CI: MUL 1 inputs / MUL 1 inputs |
| p20118[0...1] | CI: DIV 0 inputs / DIV 0 inputs |
| p20123[0...1] | CI: DIV 1 inputs / DIV 1 inputs |
| p20128 | CI: AVA 0 input X / AVA 0 input X |
| p20133 | CI: AVA 1 input X / AVA 1 input X |
| p20218[0...1] | CI: NSW 0 inputs / NSW 0 inputs |
| p20223[0...1] | CI: NSW 1 inputs / NSW 1 inputs |
| p20228 | CI: LIM 0 input X / LIM 0 input X |
| p20236 | CI: LIM 1 input X / LIM 1 input X |
| p20244[0...1] | CI: PT1 0 inputs / PT1 0 inputs |
| p20250[0...1] | CI: PT1 1 inputs / PT1 1 inputs |
| p20256[0...1] | CI: INT 0 inputs / INT 0 inputs |
| p20266 | CI: LVM 0 input X / LVM 0 input X |
| p20275 | CI: LVM 1 input X / LVM 1 input X |
| p20284 | CI: DIF 0 input X / DIF 0 input X |
| p20308[0...3] | CI: ADD 2 inputs / ADD 2 inputs |
| p20312[0...1] | CI: NCM 0 inputs / NCM 0 inputs |
| p20318[0...1] | CI: NCM 1 inputs / NCM 1 inputs |
| p20372 | CI: PLI 0 input X / PLI 0 input X |
| p20378 | CI: PLI 1 input X / PLI 1 input X |
| p31023[0...3] | CI: Multi-zone control setpoint input / Zone_ctrl setp inp |
| p31026[0...2] | CI: Multi-zone control actual-value input / Zon_ctrl act inp |

### 2.4.3 Binector outputs (BO)

Product: SINAMICS G120, Version: 4702900, Language: eng, Type: BO

| | |
|---|---|
| r0751.0...10 | BO: CU analog inputs status word / CU AI status word |
| r0785.0...1 | BO: CU analog outputs status word / CU AO ZSW |
| r0807.0 | BO: Master control active / PcCtrl active |
| r1025.0 | BO: Fixed speed setpoint status / n_setp_fix status |
| r2043.0...2 | BO: PROFIdrive PZD state / PD PZD state |
| r2090.0...15 | BO: PROFIdrive PZD1 receive bit-serial / PZD1 recv bitw |
| r2091.0...15 | BO: PROFIdrive PZD2 receive bit-serial / PZD2 recv bitw |
| r2092.0...15 | BO: PROFIdrive PZD3 receive bit-serial / PZD3 recv bitw |
| r2093.0...15 | BO: PROFIdrive PZD4 receive bit-serial / PZD4 recv bitw |
| r2094.0...15 | BO: Connector-binector converter binector output / Con/bin outp |
| r2095.0...15 | BO: Connector-binector converter binector output / Con/bin outp |
| r8413.0...1 | BO: RTC DTC1 output / RTC DTC1 output |
| r8423.0...1 | BO: RTC DTC2 output / RTC DTC2 output |
| r8433.0...1 | BO: RTC DTC3 output / RTC DTC3 output |
| r9935.0 | BO: POWER ON delay signal / POWER ON t_delay |
| r20031 | BO: AND 0 output Q / AND 0 output Q |
| r20035 | BO: AND 1 output Q / AND 1 output Q |
| r20039 | BO: AND 2 output Q / AND 2 output Q |
| r20043 | BO: AND 3 output Q / AND 3 output Q |
| r20047 | BO: OR 0 output Q / OR 0 output Q |
| r20051 | BO: OR 1 output Q / OR 1 output Q |
| r20055 | BO: OR 2 output Q / OR 2 output Q |
| r20059 | BO: OR 3 output Q / OR 3 output Q |
| r20063 | BO: XOR 0 output Q / XOR 0 output Q |
| r20067 | BO: XOR 1 output Q / XOR 1 output Q |
| r20071 | BO: XOR 2 output Q / XOR 2 output Q |
| r20075 | BO: XOR 3 output Q / XOR 3 output Q |
| r20079 | BO: NOT 0 inverted output / NOT 0 inv output |
| r20083 | BO: NOT 1 inverted output / NOT 1 inv output |
| r20087 | BO: NOT 2 inverted output / NOT 2 inv output |
| r20091 | BO: NOT 3 inverted output / NOT 3 inv output |
| r20120 | BO: DIV 0 divisor is zero QF / DIV 0 divisor=0 QF |
| r20125 | BO: DIV 1 divisor is zero QF / DIV 1 divisor=0 QF |
| r20130 | BO: AVA 0 input negative SN / AVA 0 input neg SN |
| r20135 | BO: AVA 1 input negative SN / AVA 1 input neg SN |
| r20140 | BO: MFP 0 output Q / MFP 0 output Q |
| r20145 | BO: MFP 1 output Q / MFP 1 output Q |
| r20150 | BO: PCL 0 output Q / PCL 0 output Q |
| r20155 | BO: PCL 1 output Q / PCL 1 output Q |
| r20160 | BO: PDE 0 output Q / PDE 0 output Q |
| r20165 | BO: PDE 1 output Q / PDE 1 output Q |
| r20170 | BO: PDF 0 output Q / PDF 0 output Q |
| r20175 | BO: PDF 1 output Q / PDF 1 output Q |
| r20180 | BO: PST 0 output Q / PST 0 output Q |
| r20185 | BO: PST 1 output Q / PST 1 output Q |
| r20189 | BO: RSR 0 output Q / RSR 0 output Q |
| r20190 | BO: RSR 0 inverted output QN / RSR 0 inv outp QN |
| r20194 | BO: RSR 1 output Q / RSR 1 output Q |
| r20195 | BO: RSR 1 inverted output QN / RSR 1 inv outp QN |
| r20199 | BO: DFR 0 output Q / DFR 0 output Q |
| r20200 | BO: DFR 0 inverted output QN / DFR 0 inv outp QN |
| r20204 | BO: DFR 1 output Q / DFR 1 output Q |
| r20205 | BO: DFR 1 inverted output QN / DFR 1 inv outp QN |

| | |
|---|---|
| r20210 | BO: BSW 0 output Q / BSW 0 output Q |
| r20215 | BO: BSW 1 output Q / BSW 1 output Q |
| r20232 | BO: LIM 0 input quantity at the upper limit QU / LIM 0 QU |
| r20233 | BO: LIM 0 input quantity at the lower limit QL / LIM 0 QL |
| r20240 | BO: LIM 1 input quantity at the upper limit QU / LIM 1 QU |
| r20241 | BO: LIM 1 input quantity at the lower limit QL / LIM 1 QL |
| r20262 | BO: INT 0 integrator at the upper limit QU / INT 0 QU |
| r20263 | BO: INT 0 integrator at the lower limit QL / INT 0 QL |
| r20270 | BO: LVM 0 input quantity above interval QU / LVM 0 X above QU |
| r20271 | BO: LVM 0 input quantity within interval QM / LVM 0 X within QM |
| r20272 | BO: LVM 0 input quantity below interval QL / LVM 0 X below QL |
| r20279 | BO: LVM 1 input quantity above interval QU / LVM 1 X above QU |
| r20280 | BO: LVM 1 input quantity within interval QM / LVM 1 X within QM |
| r20281 | BO: LVM 1 input quantity below interval QL / LVM 1 X below QL |
| r20301 | BO: NOT 4 inverted output / NOT 4 inv output |
| r20305 | BO: NOT 5 inverted output / NOT 5 inv output |
| r20313 | BO: NCM 0 output QU / NCM 0 output QU |
| r20314 | BO: NCM 0 output QE / NCM 0 output QE |
| r20315 | BO: NCM 0 output QL / NCM 0 output QL |
| r20319 | BO: NCM 1 output QU / NCM 1 output QU |
| r20320 | BO: NCM 1 output QE / NCM 1 output QE |
| r20321 | BO: NCM 1 output QL / NCM 1 output QL |
| r20325 | BO: RSR 2 output Q / RSR 2 output Q |
| r20326 | BO: RSR 2 inverted output QN / RSR 2 inv outp QN |
| r20330 | BO: DFR 2 output Q / DFR 2 output Q |
| r20331 | BO: DFR 2 inverted output QN / DFR 2 inv outp QN |
| r20336 | BO: PDE 2 output Q / PDE 2 output Q |
| r20341 | BO: PDE 3 output Q / PDE 3 output Q |
| r20346 | BO: PDF 2 output Q / PDF 2 output Q |
| r20351 | BO: PDF 3 output Q / PDF 3 output Q |
| r20356 | BO: MFP 2 output Q / MFP 2 output Q |
| r20361 | BO: MFP 3 output Q / MFP 3 output Q |

### 2.4.4 Connector outputs (CO)

Product: SINAMICS G120, Version: 4702900, Language: eng, Type: CO

| | |
|---|---|
| r0021 | CO: Actual speed smoothed / n_act smooth |
| r0025 | CO: Output voltage smoothed / U_outp smooth |
| r0026 | CO: DC link voltage smoothed / Vdc smooth |
| r0027 | CO: Absolute actual current smoothed / I_act abs val smth |
| r0032 | CO: Active power actual value smoothed / P_actv_act smth |
| r0034 | CO: Motor utilization thermal / Mot_util therm |
| r0035 | CO: Motor temperature / Mot temp |
| r0036 | CO: Power unit overload I2t / PU overload I2t |
| r0037[0...19] | CO: Power unit temperatures / PU temperatures |
| r0060 | CO: Speed setpoint before the setpoint filter / n_set before filt. |
| r0062 | CO: Speed setpoint after the filter / n_set after filter |
| r0063[0...2] | CO: Speed actual value / n_act |
| r0064 | CO: Speed controller system deviation / n_ctrl system dev |
| r0066 | CO: Output frequency / f_outp |
| r0067 | CO: Output current maximum / I_outp max |
| r0068[0...1] | CO: Absolute current actual value / I_act abs val |
| r0069[0...6] | CO: Phase current actual value / I_phase act value |
| r0070 | CO: Actual DC link voltage / Vdc act val |

| | |
|---|---|
| r0072 | CO: Output voltage / U_output |
| r0074 | CO: Modulat_depth / Modulat_depth |
| r0075 | CO: Current setpoint field-generating / Id_set |
| r0076 | CO: Current actual value field-generating / Id_act |
| r0077 | CO: Current setpoint torque-generating / Iq_set |
| r0078 | CO: Current actual value torque-generating / Iq_act |
| r0079 | CO: Torque setpoint / M_set |
| r0080[0...1] | CO: Torque actual value / M_act |
| r0082[0...2] | CO: Active power actual value / P_act |
| r0083 | CO: Flux setpoint / Flex setp |
| r0084[0...1] | CO: Flux actual value / Flux act val |
| r0087 | CO: Actual power factor / Cos phi act |
| r0289 | CO: Maximum power unit output current / PU I_outp max |
| r0752[0...3] | CO: CU analog inputs input voltage/current actual / CU AI U/I_inp act |
| r0755[0...3] | CO: CU analog inputs actual value in percent / CU AI value in % |
| p0791[0...1] | CO: Fieldbus analog outputs / Fieldbus AO |
| r0944 | CO: Counter for fault buffer changes / Fault buff change |
| p1001[0...n] | CO: Fixed speed setpoint 1 / n_set_fixed 1 |
| p1002[0...n] | CO: Fixed speed setpoint 2 / n_set_fixed 2 |
| p1003[0...n] | CO: Fixed speed setpoint 3 / n_set_fixed 3 |
| p1004[0...n] | CO: Fixed speed setpoint 4 / n_set_fixed 4 |
| p1005[0...n] | CO: Fixed speed setpoint 5 / n_set_fixed 5 |
| p1006[0...n] | CO: Fixed speed setpoint 6 / n_set_fixed 6 |
| p1007[0...n] | CO: Fixed speed setpoint 7 / n_set_fixed 7 |
| p1008[0...n] | CO: Fixed speed setpoint 8 / n_set_fixed 8 |
| p1009[0...n] | CO: Fixed speed setpoint 9 / n_set_fixed 9 |
| p1010[0...n] | CO: Fixed speed setpoint 10 / n_set_fixed 10 |
| p1011[0...n] | CO: Fixed speed setpoint 11 / n_set_fixed 11 |
| p1012[0...n] | CO: Fixed speed setpoint 12 / n_set_fixed 12 |
| p1013[0...n] | CO: Fixed speed setpoint 13 / n_set_fixed 13 |
| p1014[0...n] | CO: Fixed speed setpoint 14 / n_set_fixed 14 |
| p1015[0...n] | CO: Fixed speed setpoint 15 / n_set_fixed 15 |
| r1024 | CO: Fixed speed setpoint effective / n_set_fixed eff |
| r1045 | CO: Mot. potentiometer speed setp. in front of ramp-fct. gen. / Mop n_set bef RFG |
| r1050 | CO: Motor. potentiometer setpoint after the ramp-function generator / Mop setp after RFG |
| r1073 | CO: Main setpoint effective / Main setpoint eff |
| r1077 | CO: Supplementary setpoint effective / Suppl setpoint eff |
| r1078 | CO: Total setpoint effective / Total setpoint eff |
| p1083[0...n] | CO: Speed limit in positive direction of rotation / n_limit pos |
| r1084 | CO: Speed limit positive effective / n_limit pos eff |
| p1086[0...n] | CO: Speed limit in negative direction of rotation / n_limit neg |
| r1087 | CO: Speed limit negative effective / n_limit neg eff |
| r1112 | CO: Speed setpoint after minimum limiting / n_set aft min_lim |
| r1114 | CO: Setpoint after the direction limiting / Setp after limit |
| r1119 | CO: Ramp-function generator setpoint at the input / RFG setp at inp |
| r1149 | CO: Ramp-function generator acceleration / RFG acceleration |
| r1170 | CO: Speed controller setpoint sum / n_ctrl setp sum |
| r1258 | CO: Vdc controller output / Vdc_ctrl output |
| r1298 | CO: Vdc controller output (U/f) / Vdc_ctrl output |
| r1337 | CO: Actual slip compensation / Slip comp act val |
| r1343 | CO: I_max controller frequency output / I_max_ctrl f_outp |
| r1348 | CO: U/f control Eco factor actual value / U/f Eco fac act v |
| r1438 | CO: Speed controller speed setpoint / n_ctrl n_set |
| r1445 | CO: Actual speed smoothed / n_act smooth |
| r1468 | CO: Speed controller P-gain effective / n_ctr Kp eff |

| | |
|---|---|
| r1482 | CO: Speed controller I torque output / n_ctrl I-M_outp |
| r1493 | CO: Moment of inertia total, scaled / M_mom inert tot_sc |
| r1508 | CO: Torque setpoint before supplementary torque / M_set bef. M_suppl |
| r1518[0...1] | CO: Accelerating torque / M_accel |
| p1520[0...n] | CO: Torque limit upper / M_max upper |
| p1521[0...n] | CO: Torque limit lower / M_max lower |
| r1538 | CO: Upper effective torque limit / M_max upper eff |
| r1539 | CO: Lower effective torque limit / M_max lower eff |
| r1548[0...1] | CO: Stall current limit torque-generating maximum / Isq_max stall |
| r1568[0...5] | CO: Open-loop flux control closed-loop controlled reluctance motor / Flux ctrl SRM |
| p1570[0...n] | CO: Flux setpoint / Flex setp |
| r1593[0...1] | CO: Field weakening controller / flux controller output / Field/Fl_ctrl outp |
| r1597 | CO: Field weakening controller output / Field_ctrl outp |
| r1598 | CO: Total flux setpoint / Flux setp total |
| r1732[0...1] | CO: Direct-axis voltage setpoint / Direct U set |
| r1733[0...1] | CO: Quadrature-axis voltage setpoint / Quad U set |
| r1770 | CO: Motor model speed adaptation proportional component / MotMod n_adapt Kp |
| r1771 | CO: Motor model speed adaptation I comp. / MotMod n_adapt Tn |
| r1801[0...1] | CO: Pulse frequency / Pulse frequency |
| r1809 | CO: Modulator mode actual / Modulator mode act |
| r2050[0...11] | CO: PROFIBUS PZD receive word / PZD recv word |
| r2060[0...10] | CO: PROFIdrive PZD receive double word / PZD recv DW |
| r2089[0...4] | CO: Send binector-connector converter status word / Bin/con ZSW send |
| r2120 | CO: Sum of fault and alarm buffer changes / Sum buffer changed |
| r2121 | CO: Counter alarm buffer changes / Alrm buff changed |
| r2131 | CO: Actual fault code / Act fault code |
| r2132 | CO: Actual alarm code / Actual alarm code |
| r2169 | CO: Actual speed smoothed signals / n_act smth message |
| p2201[0...n] | CO: Technology controller fixed value 1 / Tec_ctrl fix val1 |
| p2202[0...n] | CO: Technology controller fixed value 2 / Tec_ctr fix val 2 |
| p2203[0...n] | CO: Technology controller fixed value 3 / Tec_ctr fix val 3 |
| p2204[0...n] | CO: Technology controller fixed value 4 / Tec_ctr fix val 4 |
| p2205[0...n] | CO: Technology controller fixed value 5 / Tec_ctr fix val 5 |
| p2206[0...n] | CO: Technology controller fixed value 6 / Tec_ctr fix val 6 |
| p2207[0...n] | CO: Technology controller fixed value 7 / Tec_ctr fix val 7 |
| p2208[0...n] | CO: Technology controller fixed value 8 / Tec_ctr fix val 8 |
| p2209[0...n] | CO: Technology controller fixed value 9 / Tec_ctr fix val 9 |
| p2210[0...n] | CO: Technology controller fixed value 10 / Tec_ctr fix val 10 |
| p2211[0...n] | CO: Technology controller fixed value 11 / Tec_ctr fix val 11 |
| p2212[0...n] | CO: Technology controller fixed value 12 / Tec_ctr fix val 12 |
| p2213[0...n] | CO: Technology controller fixed value 13 / Tec_ctr fix val 13 |
| p2214[0...n] | CO: Technology controller fixed value 14 / Tec_ctr fix val 14 |
| p2215[0...n] | CO: Technology controller fixed value 15 / Tec_ctr fix val 15 |
| r2224 | CO: Technology controller fixed value effective / Tec_ctr FixVal eff |
| r2245 | CO: Technology controller mot. potentiometer setpoint before RFG / Tec_ctr mop befRFG |
| r2250 | CO: Technology controller motorized potentiometer setpoint after RFG / Tec_ctr mop aftRFG |
| r2260 | CO: Technology controller setpoint after ramp-function generator / Tec_ctr set aftRFG |
| r2262 | CO: Technology controller setpoint after filter / Tec_ctr set aftFlt |
| r2266 | CO: Technology controller actual value after filter / Tec_ctr act aftFlt |
| r2272 | CO: Technology controller actual value scaled / Tech_ctrl act scal |
| r2273 | CO: Technology controller error / Tec_ctrl error |
| p2291 | CO: Technology controller maximum limiting / Tec_ctrl max_lim |
| p2292 | CO: Technology controller minimum limiting / Tec_ctrl min_lim |
| r2294 | CO: Technology controller output signal / Tec_ctrl outp_sig |
| p2295 | CO: Technology controller output scaling / Tec_ctrl outp scal |

| | |
|---|---|
| r2344 | CO: Technology controller last speed setpoint (smoothed) / Tec_ctrl n_setp_sm |
| r2397[0...1] | CO: Energy-saving mode output speed actual / En_sav n_outp act |
| p2900[0...n] | CO: Fixed value 1 [%] / Fixed value 1 [%] |
| p2901[0...n] | CO: Fixed value 2 [%] / Fixed value 2 [%] |
| r2902[0...14] | CO: Fixed values [%] / Fixed values [%] |
| p2930[0...n] | CO: Fixed value M [Nm] / Fixed value M [Nm] |
| r3131 | CO: Actual fault value / Act fault val |
| r3132 | CO: Actual component number / Comp_no act |
| r8745[0...15] | CO: CAN free PZD receive objects 16 bit / Free PZD recv 16 |
| r8747[0...7] | CO: CAN free PZD receive objects 32 bit / Free PZD recv 32 |
| r8762 | CO: CAN operating mode display / Op mode display |
| r8784 | CO: CAN status word / Status word |
| r8792[0] | CO: CAN velocity mode I16 setpoint / Vel mod I16 set |
| r8796[0] | CO: CAN profile velocity mode I32 setpoints / Pr vel mo I32 set |
| r8797[0] | CO: CAN profile torque mode I16 setpoints / Pr Tq mod I16 set |
| r11060 | CO: Free tec_ctrl 0 setpoint after ramp-function generator / Ftec0 setp aft RFG |
| r11072 | CO: Free tec_ctrl 0 actual value after limiter / Ftec0 act v af lim |
| r11073 | CO: Free tec_ctrl 0 system deviation / Ftec0 sys dev |
| p11091 | CO: Free tec_ctrl 0 limit maximum / Ftec0 lim max |
| p11092 | CO: Free tec_ctrl 0 limit minimum / Ftec0 lim min |
| r11094 | CO: Free tec_ctrl 0 output signal / Ftec0 out_sig |
| r11160 | CO: Free tec_ctrl 1 setpoint after ramp-function generator / Ftec1 setp aft RFG |
| r11172 | CO: Free tec_ctrl 1 actual value after limiter / Ftec1 act v af lim |
| r11173 | CO: Free tec_ctrl 1 system deviation / Ftec1 sys dev |
| p11191 | CO: Free tec_ctrl 1 limit maximum / Ftec1 lim max |
| p11192 | CO: Free tec_ctrl 1 limit minimum / Ftec1 lim min |
| r11194 | CO: Free tec_ctrl 1 output signal / Ftec1 out_sig |
| r11260 | CO: Free tec_ctrl 2 setpoint after ramp-function generator / Ftec2 setp aft RFG |
| r11272 | CO: Free tec_ctrl 2 actual value after limiter / Ftec2 act v af lim |
| r11273 | CO: Free tec_ctrl 2 system deviation / Ftec2 sys dev |
| p11291 | CO: Free tec_ctrl 2 limit maximum / Ftec2 lim max |
| p11292 | CO: Free tec_ctrl 2 limit minimum / Ftec2 lim min |
| r11294 | CO: Free tec_ctrl 2 output signal / Ftec2 out_sig |
| r20095 | CO: ADD 0 output Y / ADD 0 output Y |
| r20099 | CO: ADD 1 output Y / ADD 1 output Y |
| r20103 | CO: SUB 0 difference Y / SUB 0 difference Y |
| r20107 | CO: SUB 1 difference Y / SUB 1 difference Y |
| r20111 | CO: MUL 0 product Y / MUL 0 product Y |
| r20115 | CO: MUL 1 product Y / MUL 1 product Y |
| r20119[0...2] | CO: DIV 0 quotient / DIV 0 quotient |
| r20124[0...2] | CO: DIV 1 quotient / DIV 1 quotient |
| r20129 | CO: AVA 0 output Y / AVA 0 output Y |
| r20134 | CO: AVA 1 output Y / AVA 1 output Y |
| r20220 | CO: NSW 0 output Y / NSW 0 output Y |
| r20225 | CO: NSW 1 output Y / NSW 1 output Y |
| r20231 | CO: LIM 0 output Y / LIM 0 output Y |
| r20239 | CO: LIM 1 output Y / LIM 1 output Y |
| r20247 | CO: PT1 0 output Y / PT1 0 output Y |
| r20253 | CO: PT1 1 output Y / PT1 1 output Y |
| r20261 | CO: INT 0 output Y / INT 0 output Y |
| r20286 | CO: DIF 0 output Y / DIF 0 output Y |
| r20309 | CO: ADD 2 output Y / ADD 2 output Y |
| r20373 | CO: PLI 0 output Y / PLI 0 output Y |
| r20379 | CO: PLI 1 output Y / PLI 1 output Y |
| r31024 | CO: Multi-zone control setpoint output / Zone_ctrl set outp |

| | |
|---|---|
| r31027 | CO: Multi-zone control actual-value output / Zon_ctrl act outp |

## 2.4.5 Connector/binector outputs (CO/BO)

Product: SINAMICS G120, Version: 4702900, Language: eng, Type: CO/BO

| | |
|---|---|
| r0046.0...31 | CO/BO: Missing enable sig / Missing enable sig |
| r0050.0...1 | CO/BO: Command Data Set CDS effective / CDS effective |
| r0051.0...1 | CO/BO: Drive Data Set DDS effective / DDS effective |
| r0052.0...15 | CO/BO: Status word 1 / ZSW 1 |
| r0053.0...11 | CO/BO: Status word 2 / ZSW 2 |
| r0054.0...15 | CO/BO: Control word 1 / STW 1 |
| r0055.0...15 | CO/BO: Supplementary control word / Suppl STW |
| r0056.0...15 | CO/BO: Status word, closed-loop control / ZSW cl-loop ctrl |
| r0056.0...13 | CO/BO: Status word, closed-loop control / ZSW cl-loop ctrl |
| r0722.0...12 | CO/BO: CU digital inputs status / CU DI status |
| r0723.0...12 | CO/BO: CU digital inputs status inverted / CU DI status inv |
| r0835.2...8 | CO/BO: Data set changeover status word / DDS_ZSW |
| r0836.0...1 | CO/BO: Command Data Set CDS selected / CDS selected |
| r0837.0...1 | CO/BO: Drive Data Set DDS selected / DDS selected |
| r0863.1 | CO/BO: Drive coupling status word/control word / CoupleZSW/STW |
| r0898.0...10 | CO/BO: Control word sequence control / STW seq_ctrl |
| r0899.0...11 | CO/BO: Status word sequence control / ZSW seq_ctrl |
| r1099.0 | CO/BO: Skip band status word / Skip band ZSW |
| r1198.0...15 | CO/BO: Control word setpoint channel / STW setpoint chan |
| r1199.0...8 | CO/BO: Ramp-function generator status word / RFG ZSW |
| r1204.0...13 | CO/BO: Flying restart U/f control status / FlyRest Uf st |
| r1204.0...15 | CO/BO: Flying restart U/f control status / FlyRest Uf st |
| r1205.0...15 | CO/BO: Flying restart vector control status / FlyRest vector st |
| r1205.0...20 | CO/BO: Flying restart vector control status / FlyRest vector st |
| r1214.0...15 | CO/BO: Automatic restart status / AR status |
| r1239.8...13 | CO/BO: DC braking status word / DCBRK ZSW |
| r1261.0...11 | CO/BO: Bypass control/status word / Bypass STW / ZSW |
| r1407.0...23 | CO/BO: Status word speed controller / ZSW n_ctrl |
| r1408.0...14 | CO/BO: Status word current controller / ZSW I_ctrl |
| r1838.0...15 | CO/BO: Gating unit status word 1 / Gating unit ZSW1 |
| r2129.0...15 | CO/BO: Faults/alarms trigger signal / F/A trigger signal |
| r2135.12...15 | CO/BO: Status word faults/alarms 2 / ZSW fault/alarm 2 |
| r2138.7...15 | CO/BO: Control word faults/alarms / STW fault/alarm |
| r2139.0...15 | CO/BO: Status word faults/alarms 1 / ZSW fault/alarm 1 |
| r2197.0...13 | CO/BO: Status word monitoring 1 / ZSW monitor 1 |
| r2198.4...12 | CO/BO: Status word monitoring 2 / ZSW monitor 2 |
| r2199.0...5 | CO/BO: Status word monitoring 3 / ZSW monitor 3 |
| r2225.0 | CO/BO: Technology controller fixed value selection status word / Tec_ctr FixVal ZSW |
| r2349.0...12 | CO/BO: Technology controller status word / Tec_ctrl status |
| r2379.0...7 | CO/BO: Closed-loop cascade control status word / Csc_ctrl ZSW |
| r2399.0...8 | CO/BO: Energy-saving mode status would / En_save ZSW |
| r3113.0...15 | CO/BO: NAMUR message bit bar / NAMUR bit bar |
| r3333.0...3 | CO/BO: 2/3 wire control control word / 2/3 wire STW |
| r3859.1 | CO/BO: DC quantity control status word / DC_ctrl ZSW |
| r3859.0...1 | CO/BO: Compound braking/DC quantity control status word / Comp-br/DC_ctr ZSW |
| r3889.0...10 | CO/BO: ESM status word / ESM ZSW |
| r4022.0...3 | CO/BO: PM330 digital inputs status / PM330 DI status |
| r4023.0...3 | CO/BO: PM330 digital inputs status inverted / PM330 DI stat inv |
| r5613.0...1 | CO/BO: Pe energy-saving active/inactive / Pe save act/inact |

| | |
|---|---|
| r8795.0...15 | CO/BO: CAN control word / Control word |
| r11049.0...11 | CO/BO: Free tec_ctrl 0 status word / Ftec0 stat_word |
| r11149.0...11 | CO/BO: Free tec_ctrl 1 status word / Ftec1 stat_word |
| r11249.0...11 | CO/BO: Free tec_ctrl 2 status word / Ftec2 stat_word |

# 2.5 Parameters for write protection and know-how protection

## 2.5.1 Parameters with "WRITE_NO_LOCK"

The following list contains the parameters with the "WRITE_NO_LOCK" attribute.

These parameters are not affected by the write protection.

Product: SINAMICS G120, Version: 4702900, Language: eng, Type: WRITE_NO_LOCK

| | |
|---|---|
| p0003 | Access level / Acc_level |
| p0010 | Drive commissioning parameter filter / Drv comm. par_filt |
| p0124[0...n] | CU detection via LED / CU detection LED |
| p0970 | Reset drive parameters / Drive par reset |
| p0971 | Save parameters / Save par |
| p0972 | Drive unit reset / Drv_unit reset |
| p2111 | Alarm counter / Alarm counter |
| p3950 | Service parameter / Serv par |
| p3981 | Faults acknowledge drive object / Faults ackn DO |
| p3985 | Master control mode selection / PcCtrl mode select |
| p7761 | Write protection / Write protection |
| p8805 | Identification and maintenance 4 configuration / I&M 4 config |
| p8806[0...53] | Identification and Maintenance 1 / I&M 1 |
| p8807[0...15] | Identification and Maintenance 2 / I&M 2 |
| p8808[0...53] | Identification and Maintenance 3 / I&M 3 |
| p8809[0...53] | Identification and Maintenance 4 / I&M 4 |
| p9400 | Safely remove memory card / Mem_card rem |
| p9484 | BICO interconnections search signal source / BICO S_src srch |

## 2.5.2 Parameters with "KHP_WRITE_NO_LOCK"

The following list contains the parameters with the "KHP_WRITE_NO_LOCK" attribute.

These parameters are not affected by the know-how protection.

Product: SINAMICS G120, Version: 4702900, Language: eng, Type: KHP_WRITE_NO_LOCK

| | |
|---|---|
| p0003 | Access level / Acc_level |
| p0010 | Drive commissioning parameter filter / Drv comm. par_filt |
| p0124[0...n] | CU detection via LED / CU detection LED |
| p0970 | Reset drive parameters / Drive par reset |
| p0971 | Save parameters / Save par |
| p0972 | Drive unit reset / Drv_unit reset |
| p2040 | Fieldbus interface monitoring time / Fieldbus t_monit |
| p2111 | Alarm counter / Alarm counter |
| p3950 | Service parameter / Serv par |
| p3981 | Faults acknowledge drive object / Faults ackn DO |
| p3985 | Master control mode selection / PcCtrl mode select |
| p7761 | Write protection / Write protection |
| p8805 | Identification and maintenance 4 configuration / I&M 4 config |
| p8806[0...53] | Identification and Maintenance 1 / I&M 1 |
| p8807[0...15] | Identification and Maintenance 2 / I&M 2 |
| p8808[0...53] | Identification and Maintenance 3 / I&M 3 |
| p8809[0...53] | Identification and Maintenance 4 / I&M 4 |
| p8980 | Ethernet/IPprofile / Eth/IP profile |
| p8981 | Ethernet/IP ODVA STOP mode / Eth/IP ODVA STOP |

| | |
|---|---|
| p8982 | Ethernet/IP ODVA speed scaling / Eth/IP ODVA n scal |
| p8983 | Ethernet/IP ODVA torque scaling / Eth/IP ODVA M scal |
| p9400 | Safely remove memory card / Mem_card rem |
| p9484 | BICO interconnections search signal source / BICO S_src srch |

## 2.5.3 Parameters with "KHP_ACTIVE_READ"

The following list contains the parameters with the "KHP_ACTIVE_READ" attribute.

These parameters can also be read with activated know-how protection.

Product: SINAMICS G120, Version: 4702900, Language: eng, Type: KHP_ACTIVE_READ

| | |
|---|---|
| p0015 | Macro drive unit / Macro drv unit |
| p0100 | IEC/NEMA mot stds / IEC/NEMA mot stds |
| p0170 | Number of Command Data Sets (CDS) / CDS count |
| p0180 | Number of Drive Data Sets (DDS) / DDS count |
| p0300[0...n] | Motor type selection / Mot type sel |
| p0304[0...n] | Rated motor voltage / Mot U_rated |
| p0305[0...n] | Rated motor current / Mot I_rated |
| p0505 | Selecting the system of units / Unit sys select |
| p0595 | Technological unit selection / Tech unit select |
| p0730 | BI: CU signal source for terminal DO 0 / CU S_src DO 0 |
| p0731 | BI: CU signal source for terminal DO 1 / CU S_src DO 1 |
| p0732 | BI: CU signal source for terminal DO 2 / CU S_src DO 2 |
| p0806 | BI: Inhibit master control / PcCtrl inhibit |
| p0922 | PROFIdrive PZD telegram selection / PZD telegr_sel |
| p1080[0...n] | Minimum speed / n_min |
| p1082[0...n] | Maximum speed / n_max |
| p1520[0...n] | CO: Torque limit upper / M_max upper |
| p2000 | Reference speed reference frequency / n_ref f_ref |
| p2001 | Reference voltage / Reference voltage |
| p2002 | Reference current / I_ref |
| p2003 | Reference torque / M_ref |
| p2006 | Reference temp / Ref temp |
| p2030 | Field bus int protocol selection / Field bus protocol |
| p2038 | PROFIdrive STW/ZSW interface mode / PD STW/ZSW IF mode |
| p2079 | PROFIdrive PZD telegram selection extended / PZD telegr ext |
| p7763 | KHP OEM exception list number of indices for p7764 / KHP OEM qty p7764 |
| p7764[0...n] | KHP OEM exception list / KHP OEM excep list |
| p11026 | Free tec_ctrl 0 unit selection / Ftec0 unit sel |
| p11126 | Free tec_ctrl 1 unit selection / Ftec1 unit sel |
| p11226 | Free tec_ctrl 2 unit selection / Ftec2 unit sel |

## 2.6 Quick commissioning (p0010 = 1)

The parameters required for the quick commissioning (p0010 = 1) are shown in Table 2-10:

Table 2-10 Quick commissioning (p0010 = 1)

| Par. no. | Name | Access level | | Changeable |
|---|---|---|---|---|
| p0010 | Drive, commissioning parameter filter | 1 | | C(1)T |
| p0015 | Macro drive unit | 1 | | C(1) |
| p0100 | IEC/NEMA motor standard | 1 | | C(1) |
| p0205 | Power unit application | 1 | | C(1,2) |
| p0230 | Drive filter type, motor side | 1 | | C(1,2) |
| p0300 | Motor type selection | 2 | | C(1,3) |
| p0301 | Motor code number selection | 2 | | C(1,3) |
| p0304 | Rated motor voltage | 1 | | C(1,3) |
| p0305 | Rated motor current | 1 | | C(1,3) |
| p0306 | Number of motors connected in parallel | 1 | | C(1,3) |
| p0307 | Rated motor power | 1 | | C(1,3) |
| p0308 | Rated motor power factor | 1 | | C(1,3) |
| p0309 | Rated motor efficiency | 1 | | C(1,3) |
| p0310 | Rated motor frequency | 1 | | C(1,3) |
| p0311 | Rated motor speed | 1 | | C(1,3) |
| p0314 | Motor pole pair number | 4 | | C(1,3) |
| p0316 | Motor torque constant | 3 | | C(1,3)UT |
| p0322 | Maximum motor speed | 1 | | C(1,3) |
| p0323 | Maximum motor current | 1 | | C(1,3) |
| p0335 | Motor cooling type | 2 | | C(1,3)T |
| p0500 | Technology application | 4 | PM230<br>PM330 | C(1,5)T |
| p0500 | Technology application | 2 | PM240<br>PM250<br>PM260, PM330 | C(1,5)T |
| p0640 | Current limit | 2 | | C(1,3)UT |
| p0922 | PROFIdrive telegram selection | 1 | | C(1)T |
| p0970 | Reset drive parameters | 1 | | C(1,30) |
| p1080 | Minimum speed | 1 | | C(1)T |
| p1082 | Maximum speed | 1 | | C(1)T |
| p1120 | Ramp-function generator ramp-up time | 1 | | C(1)UT |
| p1121 | Ramp-function generator ramp-down time | 1 | | C(1)UT |
| p1135 | OFF3 ramp-down time | 2 | | C(1)UT |
| p1300 | Open-loop/closed-loop control operating mode | 2 | | C(1)T |

Table 2-10 Quick commissioning (p0010 = 1), continued

| Par. no. | Name | Access level | | Changeable |
|---|---|---|---|---|
| p1500 | Torque setpoint selection | 2 | | C(1)T |
| p1900 | Motor data identification and rotating measurement | 2 | | C(1)T |
| p3900 | Completion of quick commissioning | 1 | | C(1) |

If p0010 = 1 is selected, p0003 (user access level) can be used to select the parameters that are to be accessed.

At the end of the quick commissioning, set p3900 = 1 to perform the required motor calculations and reset all other parameters (not included in p0010 = 1) to their default settings.

**Note**

This only applies for the quick commissioning.

# Function diagrams 3

## Content

# 3.1 Table of contents

## 3.2 Explanation of the function diagrams

### Function diagrams

## Parameters

| Symbol | Meaning |
|---|---|
| Parameter name [Unit] rxxxx[y..z] | Monitoring parameter with unit [Unit] and index range [y..z] or data set [C/D] |
| Parameter name from ... to [Unit] pxxxx[C/D] (Def) | Setting parameter with min/max value and unit [Unit] data set [C/D] and factory setting (Def) *) |

## Connectors

| Symbol | Meaning |
|---|---|
| Parameter name pxxxx[y..z] (Def) | Connector input CI with index range [y..z] or data set [C/D] and factory setting (Def) *) |
| Parameter name [Unit] rxxxx[y..z] | Connector output CO with unit [Unit] and with index range [y..z] |

## Binectors

| Symbol | Meaning |
|---|---|
| Parameter name pxxxx[y..z] (Def.y) | Binector input BI with with index range [y..z] or data set [C/D] and factory setting.bit number (Def) |
| Parameter name rxxxx | Binector output BO |

## Data sets

| Symbol | Meaning |
|---|---|
| pxxxx[C] | Parameter belongs to the Command Data Set (CDS). |
| pxxxx[D] | Parameter belongs to the Drive Data Set (DDS). |
| pxxxx[E] | Parameter belongs to the Encoder Data Set (EDS). |
| pxxxx[M] | Parameter belongs to the Motor Data Set (MDS). |
| pxxxx[P] | Parameter belongs to the Power unit Data Set (PDS). |

## Connectors/binectors

| Symbol | Meaning |
|---|---|
| Parameter name rxxxx rxxxx | Connector/binector output CO/BO |

## Pre-assigned connectors and binectors

| Symbol | Meaning |
|---|---|
| Parameter name from ... to [Unit] pxxxx[D] (Def) | Setting parameter with min/max value and unit [Unit] data set [D] and factory setting (Def) |

## Information on parameters, binectors, connectors

| Symbol | Meaning |
|---|---|
| Parameter name | Parameter name (up to 18 characters) |
| [Unit] | [dimension unit] |
| rxxxx[y] or rxxxx[y..z] or rxxxx[y].ww or rxxxx.ww | "r" = monitoring parameter. These parameters are read-only<br>"xxxx" stands for the parameter number<br>"[y]" specifies the applicable index, "[y…z]" specifies the index range<br>".ww" specifies the bit number (e.g. 0…15). |
| pxxxx[y] or pxxxx[..z] or pxxxx[y].ww or pxxxx.ww | "p" = setting parameter. These parameters can be changed.<br>"xxxx" stands for the parameter number,<br>"[y]" specifies the applicable index, "[y…z]" specifies the index range ".ww" specifies the bit number (e.g. 0…15). |
| from ... to | Value range. |
| (xxxx[y].ww) | Parameter number (xxxx) with Index number [y] and bit number .ww. |
| (Def) | Factory setting. |
| (Def.w) | Factory setting with bit number as prefix. |
| [aaaa.b] | Diagram references for setting parameters that occur a multiple number of times.<br>[Function diagram number, signal path] |

## Cross references between diagrams

| Symbol | Meaning |
|---|---|
| Signal path | The function diagrams are sub-divided into signal paths 1 … 8 in order to facilitate orientation. |
| Text → [aaaa.b] | Text = Unique signal designation<br>aaaa = Signal to target diagram aaaa<br>b = Signal to signal path b |
| [cccc.d] Text → | Text = Unique signal designation<br>cccc = Signal from source diagram cccc<br>d = Signal from signal path d |

To "function diagram name" [aaaa.b] = binectors.

## Cross references for control bits

| Symbol | Meaning |
|---|---|
| pxxxx [aaaa.b] | pxxxx= Original parameter of signal<br>aaaa = Signal from source diagram aaaa<br>b = Signal from signal path b |

*) For some parameters the value for the factory setting is calculated during commissioning for they are dependent on Power Module and motor (see Section 2.1.1 "Calculated").

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| Explanations on the function diagrams | fp_1020_97_61.vsd | Function diagram | - 1020 - |
| Explanation of the symbols (part 1) | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-1 1020 – Explanation of the symbols (part 1)

Fig. 3-2 1021 – Explanation of the symbols (part 2)

## Pre-assigned connectors and binectors

### Fixed percentage values

Fixed value 1 [%]
-10000.00 ... 10000.00 [%]
p2900 [D] (0.00)

or -10 000.00...10 000.00 [%] p2900[D] (0.00) → Fixed value 1 [%] p2900[D]

-10 000.00...10 000.00 [%] p2901[D] (0.00) → Fixed value 2 [%] p2901[D]

p2902[0...14] (0.00) → Fixed values [%] r2902[0...14]

| | | |
|---|---|---|
| p2902[0] = +0 % | p2902[5] = +100 % | p2902[10] = -20 % |
| p2902[1] = +5 % | p2902[6] = +150 % | p2902[11] = -50 % |
| p2902[2] = +10 % | p2902[7] = +200 % | p2902[12] = -100 % |
| p2902[3] = +20 % | p2902[8] = -5 % | p2902[13] = -150 % |
| p2902[4] = +50 % | p2902[9] = -10 % | p2902[14] = -200 % |

### Fixed speed values

n_set_fixed 1
-210000.000 ... 210000.000 [rpm]
p1001 [D] (0.000)

or -210 000.000...210 000.000 [1/min] p1001[D] (0.000) → n_set_fixed 1 p1001[D]

...

-210 000.000...210 000.000 [1/min] p1015[D] (0.000) → n_set_fixed 15 p1015[D]

### Fixed torque value

Fixed value M [Nm]
-100000.00 ... 100000.00 [Nm]
p2930 [D] (0.00)

or -100 000.00...100 000.00 [Nm] p2930[D] (0.00) → Fixed value M [Nm] p2930[D]

## Symbol for monitoring

Monitoring → Axxxxx or Fxxxxx

**Monitoring**
In the bottom right-hand corner of the diagram.

## Symbols for logic functions

**Logical inversion** (1)

**AND element** (&)
with logical inversion of an input signal

**OR element** (≥1)

**Exclusiv-OR/XOR** (=1; $x_1$, $x_2$, y)
y = 1 when x1 ≠ x2 is.

**Comparator** (=; $x_1$, $x_2$, y)
y = 1 when x1 = x2 is.

**R/S flip-flop** (S Q, R $\overline{Q}$)
S = setting input
R = reset input
Q = non-inverted output
$\overline{Q}$ = inverted output

## Symbols for computational and closed-loop control functions

**Sign reversal** (x, -1, y)
y = -x

**Absolute value generator** (x, y)
y = |x|

**Divider** ($x_1$, $x_2$, ÷, y)
$y = \frac{x_1}{x_2}$

**Multiplier** ($x_1$, $x_2$, ×, y)
$y = x_1 \cdot x_2$

**Comparator greater than 0** (x, >0, y)
y = 1, if the analog signal x > 0, i.e. is positive.

**Differentiator** (x, $\frac{d}{dt}$, y)
$y = \frac{dx}{dt}$

## Symbols for computational and closed-loop control functions

**Threshold value switch 1/0** (S, x, y, 1, 0)
Outputs at y a logical "1" if x < S.

**Threshold value switch 0/1** (S, x, y, 1, 0)
Outputs at y a logical "1" if x > S.

**Threshold value 1/0 with hysteresis** (S, H, x, y, 1, 0)
Outputs a logical "1" at y if x < S.
If x >= S + H then y returns to 0.

**Threshold value 0/1 with hysteresis** (S, H, x, y, 1, 0)
Outputs a logical "1" at y if x > S.
If x <= S - H then y returns to 0.

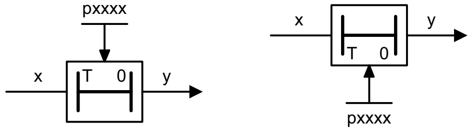
**Limiter** (LU, MLU, x, y, LL, MLL; or)
x is limited to the upper limit LU and the lower limit LL and output at y.
The digital signals MLU and MLL have the value "1", if the upper or lower limit is active.

**Sample & Hold element** (SET, x, S & H, y)
Sample and hold element.
y = x if SET = 1
(not retentively saved at POWER OFF)

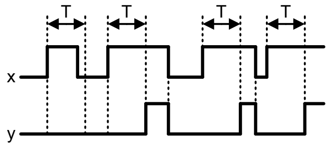
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| Explanations on the function diagrams | fp_1021_97_61.vsd | Function diagram | - 1021 - |
| Explanation of the symbols (part 2) | 07.04.2014 V4.7 | G120 CU230P-2 | |

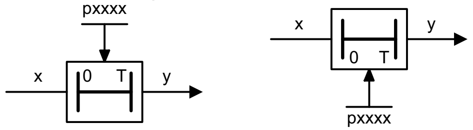
## Switch-on delay



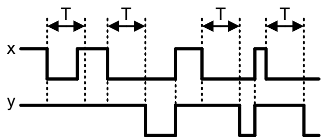

The digital signal x must have the value "1" without any interruption during the time T before output y changes to "1".



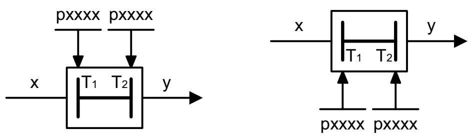

## Switch-off delay



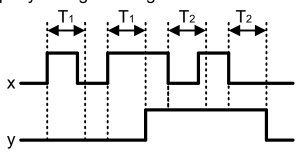

The digital signal x must have the value "0" without interruption during the time T before output y changes to "0".



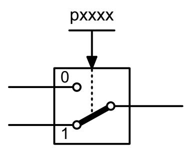

## Delay (switch-on and switch-off)




The digital signal x must have the value "1" without interruption during time T1 or must have the value "0" during time T2 before output y changes its signal state.



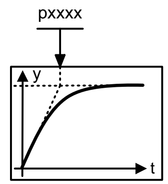

## Switch symbol




### Simple changeover switch

The switch position is shown according to the factory setting (in this case, switch position 1 in the default state on delivery).

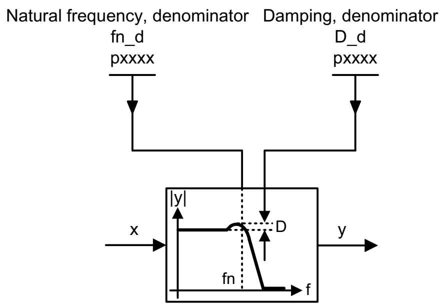
## PT1 element




Delay element, first order.

pxxxx = time constant

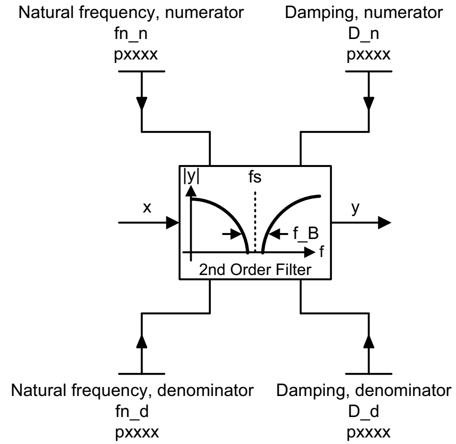
## PT2 low pass




Transfer function

$$H(s) = \frac{1}{\left(\frac{s}{2\,\pi\,fn\_d}\right)^2 + \frac{2 \bullet D\_d}{2\,\pi\,fn\_d} \bullet s + 1}$$

## 2nd-order filter (bandstop/general filter)



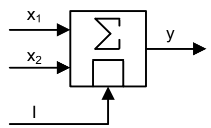

Used as bandstop filter

- center frequency fs: fn_n = fs
  fn_d = fs
- bandwidth f_B: D_n = 0
  $D\_d = \frac{f\_B}{2 \bullet fs}$

Transfer function when used as general filter

$$H(s) = \frac{\left(\frac{s}{2\,\pi\,fn\_n}\right)^2 + \frac{2 \bullet D\_n}{2\,\pi\,fn\_n} \bullet s + 1}{\left(\frac{s}{2\,\pi\,fn\_d}\right)^2 + \frac{2 \bullet D\_d}{2\,\pi\,fn\_d} \bullet s + 1}$$

## Analog adder can be activated




The following applies to I = 1 signal: y = x1 + x2

The following applies to I = 0 signal: y = x1

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Explanations on the function diagrams | | | | | fp_1022_97_61.vsd | Function diagram | - 1022 - |
| Explanation of the symbols (part 3) | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-3 1022 – Explanation of the symbols (part 3)

Fig. 3-4 1030 – Handling BICO technology

## Handling BICO technology

**Binector:** r0723.15 — Binectors are binary signals that can be freely interconnected (BO = Binector Output).
They represent a bit of a "BO:" display parameter (e.g. bit 15 from r0723).

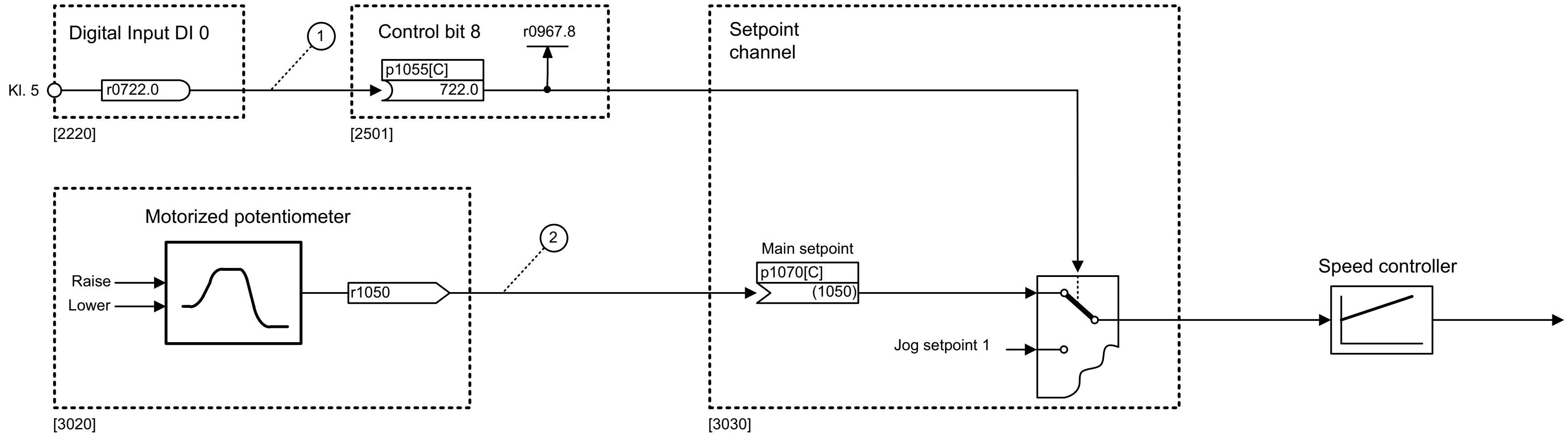
**Connector:** r0723 — Connectors are "analog signals" that can be freely interconnected (e.g. percentage variables, speeds or torques).
Connectors are also "CO:" display parameters (CO = Connector Output).

**Parameterization:**

At the signal destination, the required binector or connector is selected using appropriate parameters:
"BI:" parameter for binectors (BI = Binector Input)
or
"CI:" parameter for connectors (CI = Connector Input)

## Example:

The main setpoint for the speed controller (CI: p1070) should be received from the output of the motorized potentiometer (CO: r1050) and the "jog" command (BI: p1055) from Digital Input DI 0 (BO: r0722.0, Terminal 5 (Kl. 5)) on the CU230.




**Parameterizing steps:**

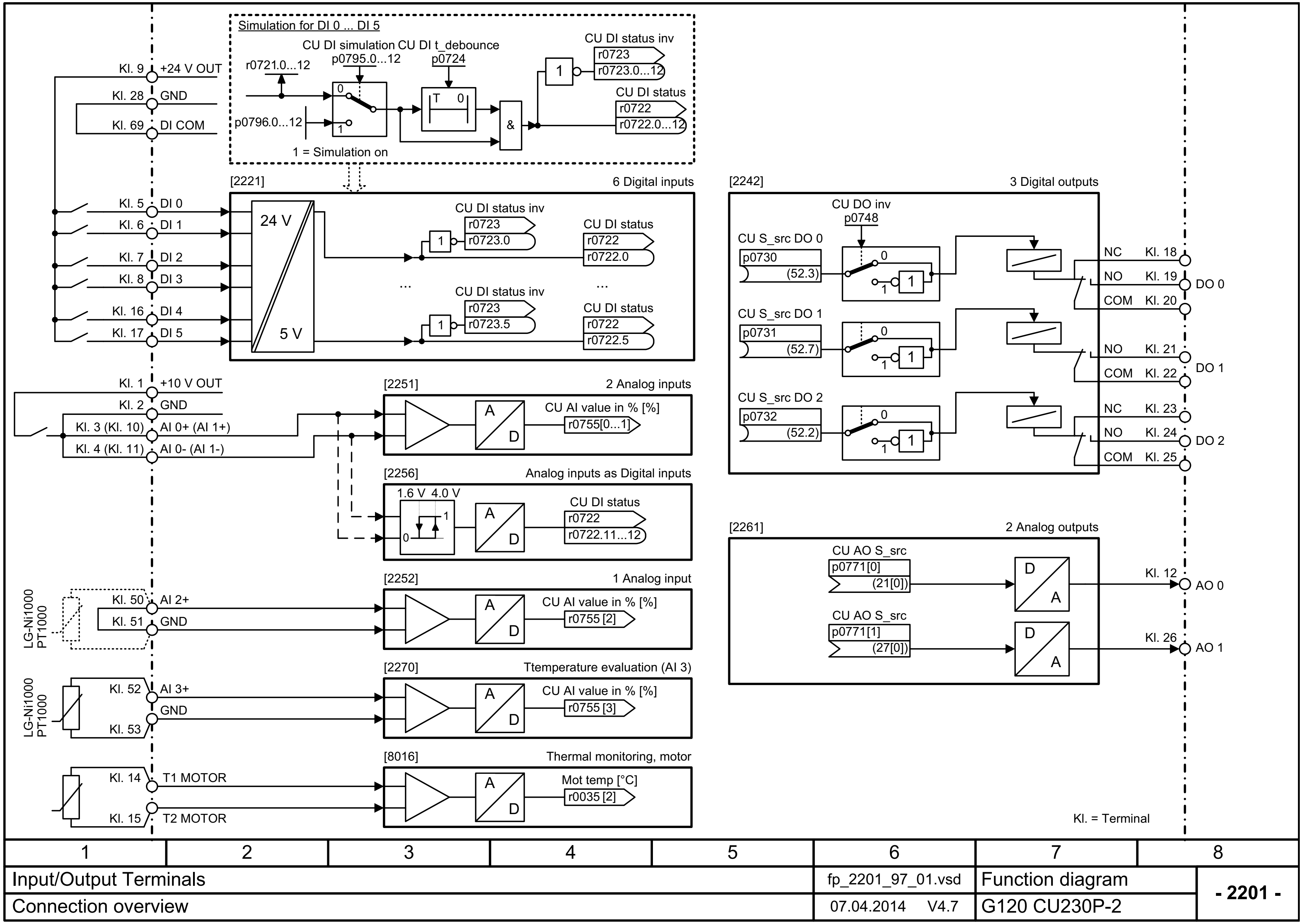
1. p1055[0] = 722.0 — Terminal 5 (Kl. 5) acts as "Jog bit 0".
2. p1070[0] = 1050 — The output of the motorized potentiometer acts as main setpoint for the speed controller.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Explanations on the function diagrams | | | | | fp_1030_97_61.vsd | Function diagram | - 1030 - |
| Handling BICO technology | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

# 3.3 Input/output terminals

## Function diagrams

Fig. 3-5 2201 – Connection overview



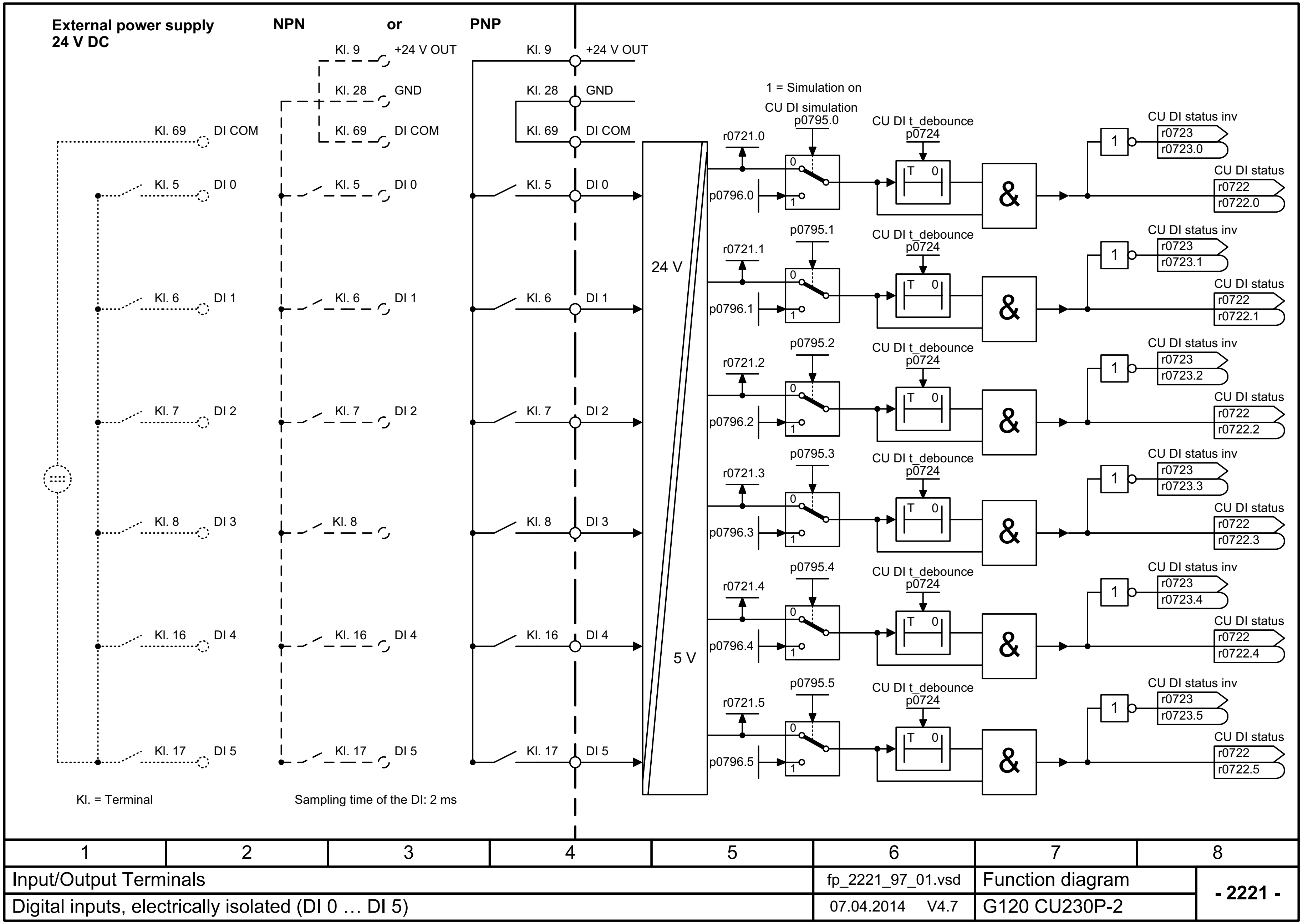
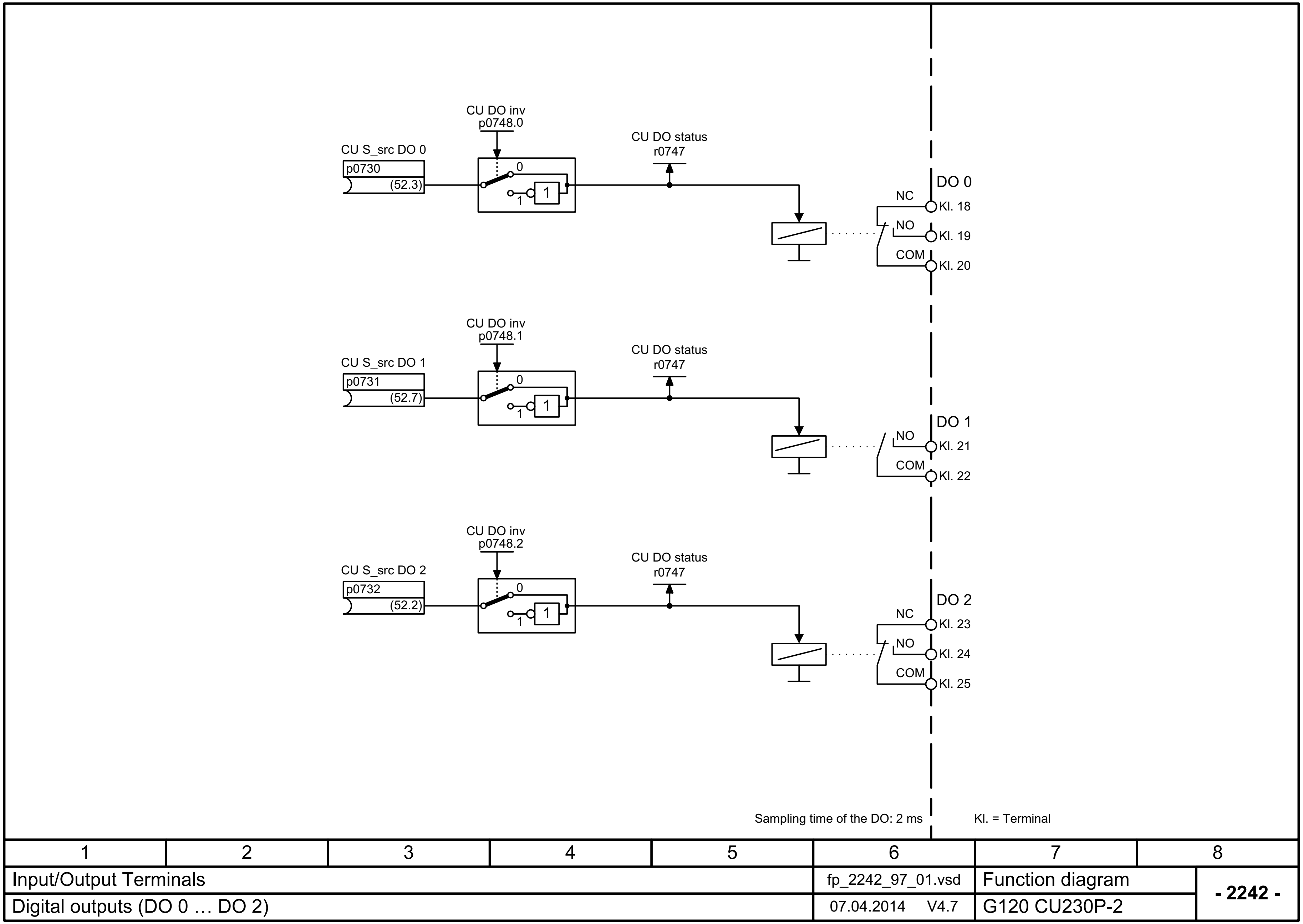
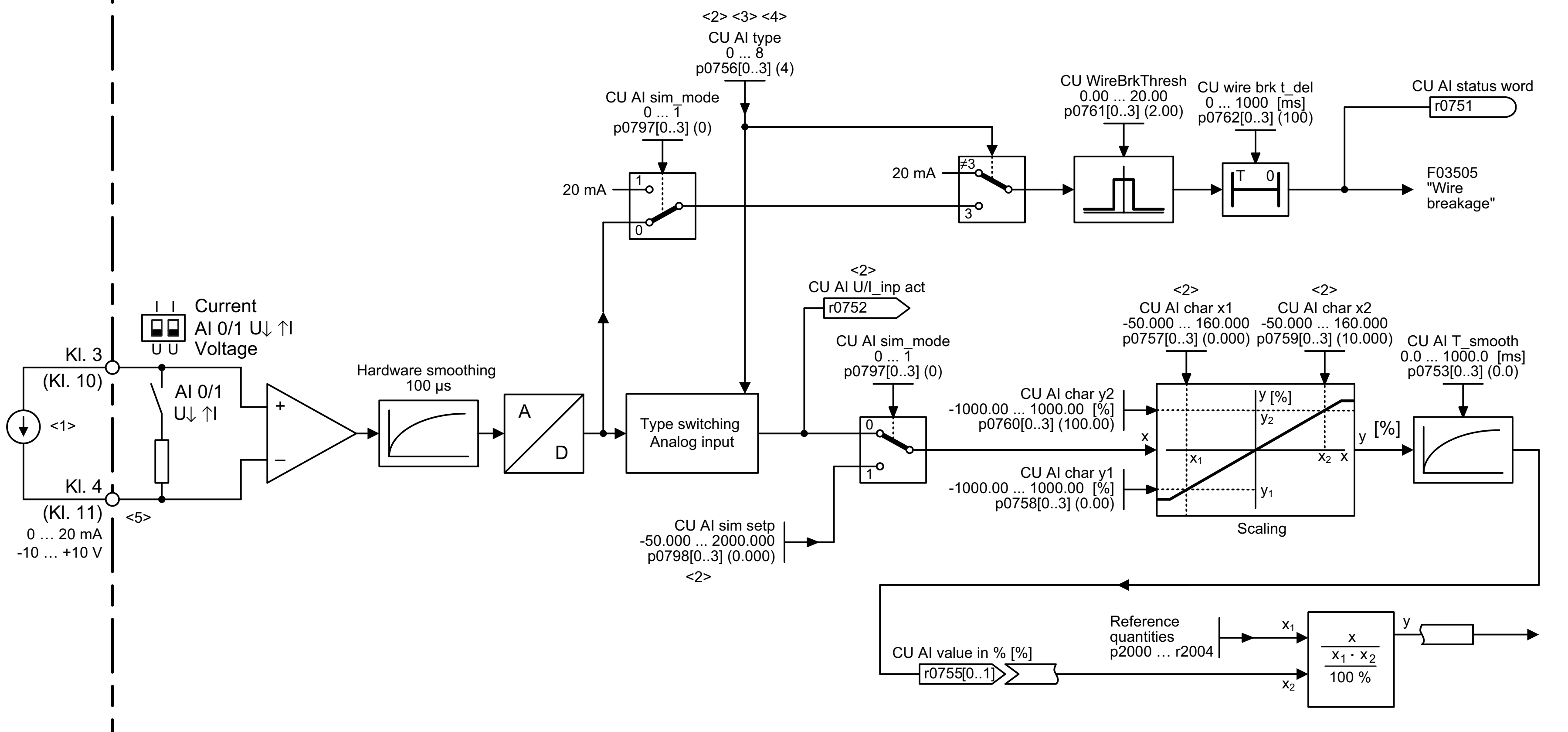



Fig. 3-6 2221 – Digital inputs, electrically isolated (DI 0 … DI 5)

Fig. 3-7 2242 – Digital outputs (DO 0 ... DO 2)






<1> Differential Input!
For an input signal referred to ground, terminal 4 (11) must be connected to reference potential M.
Caution:
The voltage between an input (Kl. 3 (Kl. 10) or Kl. 4 (Kl. 11)) and the ground point must not exceed 35 V.
When the load resistor is switched in (DIP switch in position ↑I), the voltage between the input terminals must not exceed 10 V or the impressed current 80 mA.

<2> For p0756 = 2, 3 the units are mA.
For p0756 = 0, 1, 4 the units are V.

<3> Possible settings p0756[0] and p0756[1]:
= 0: 0 V ... +10 V
= 1: +2 V ... +10 V with monitoring
= 2: 0 mA ... +20 mA
= 3: 4 mA ... +20 mA with monitoring
= 4: -10 V ... +10 V (Default for AI 0 and AI 1)

<4> Wire breakage sensing only activated when p0756 = 1, 3.

<5> Values in brackets --> AI 1

Kl. = Terminal

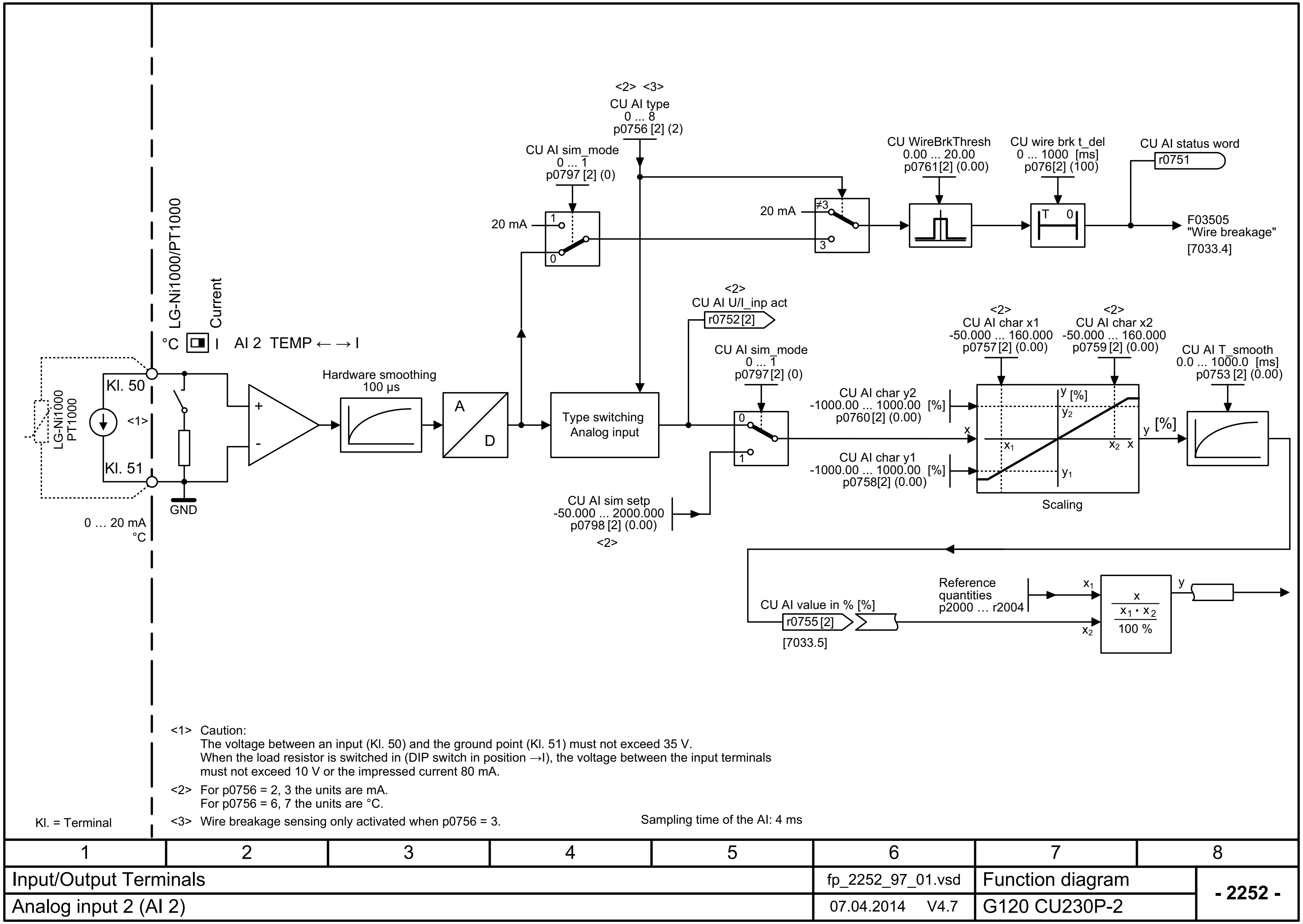
Sampling time of the AI: 4 ms

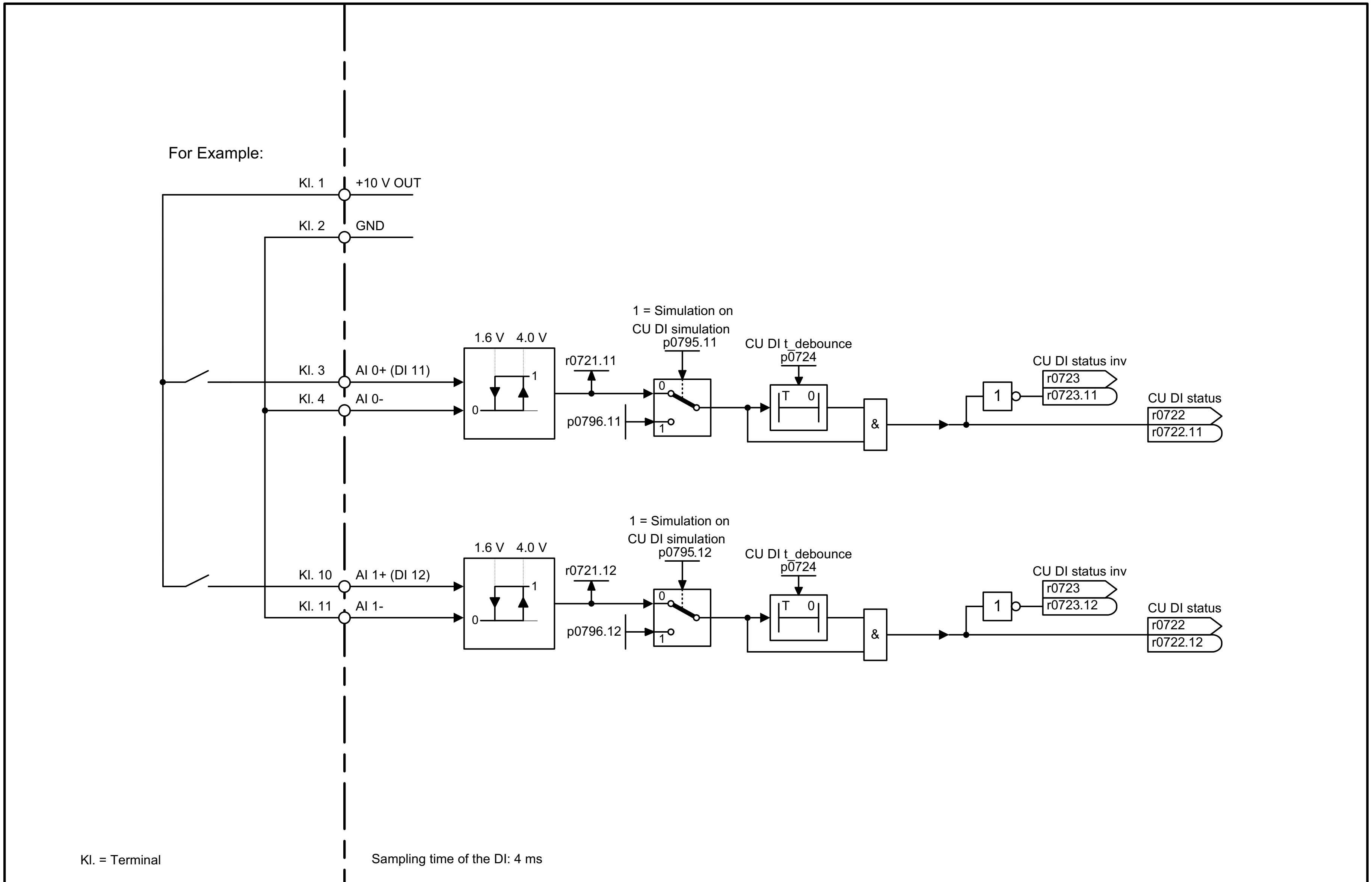
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| Input/Output Terminals | fp_2251_97_52.vsd | Function diagram | - 2251 - |
| Analog inputs 0 ... 1 (AI 0 ... AI 1) | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-8 2251 – Analog inputs 0 ... 1 (AI 0 ... AI 1)

Fig. 3-9 2252 – Analog input 2 (AI 2)



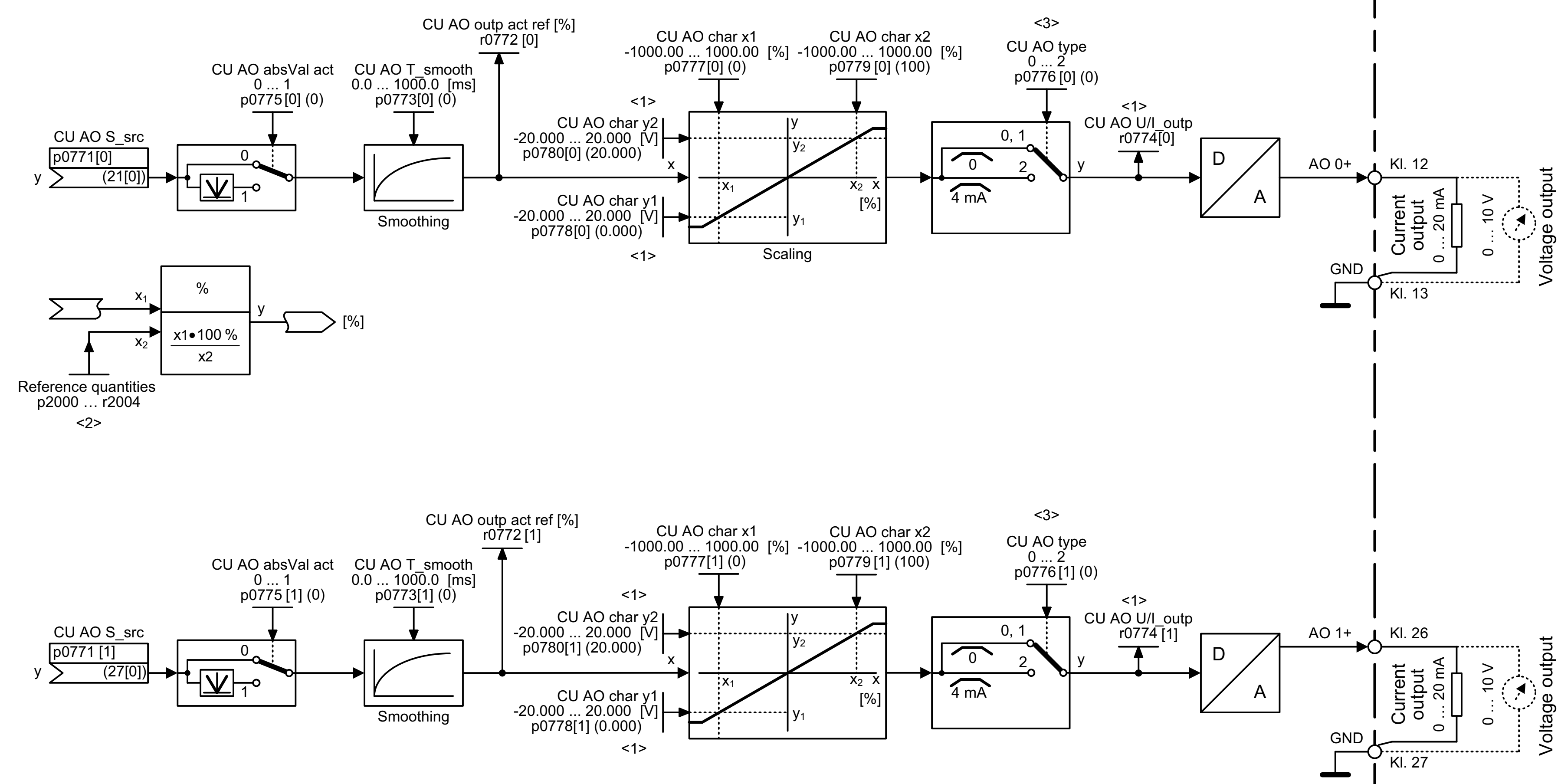



| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| Input/Output Terminals | fp_2256_97_01.vsd | Function diagram | - 2256 - |
| Analog inputs as Digital inputs (DI 11 … DI 12) | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-10 2256 – Analog inputs as digital inputs (DI 11 ... DI 12)

Fig. 3-11 2261 – Analog outputs 0 … 1 (AO 0 … AO 1)




<1> For p0776 = 0, 2 the units are mA.
For p0776 = 1 the units are V.

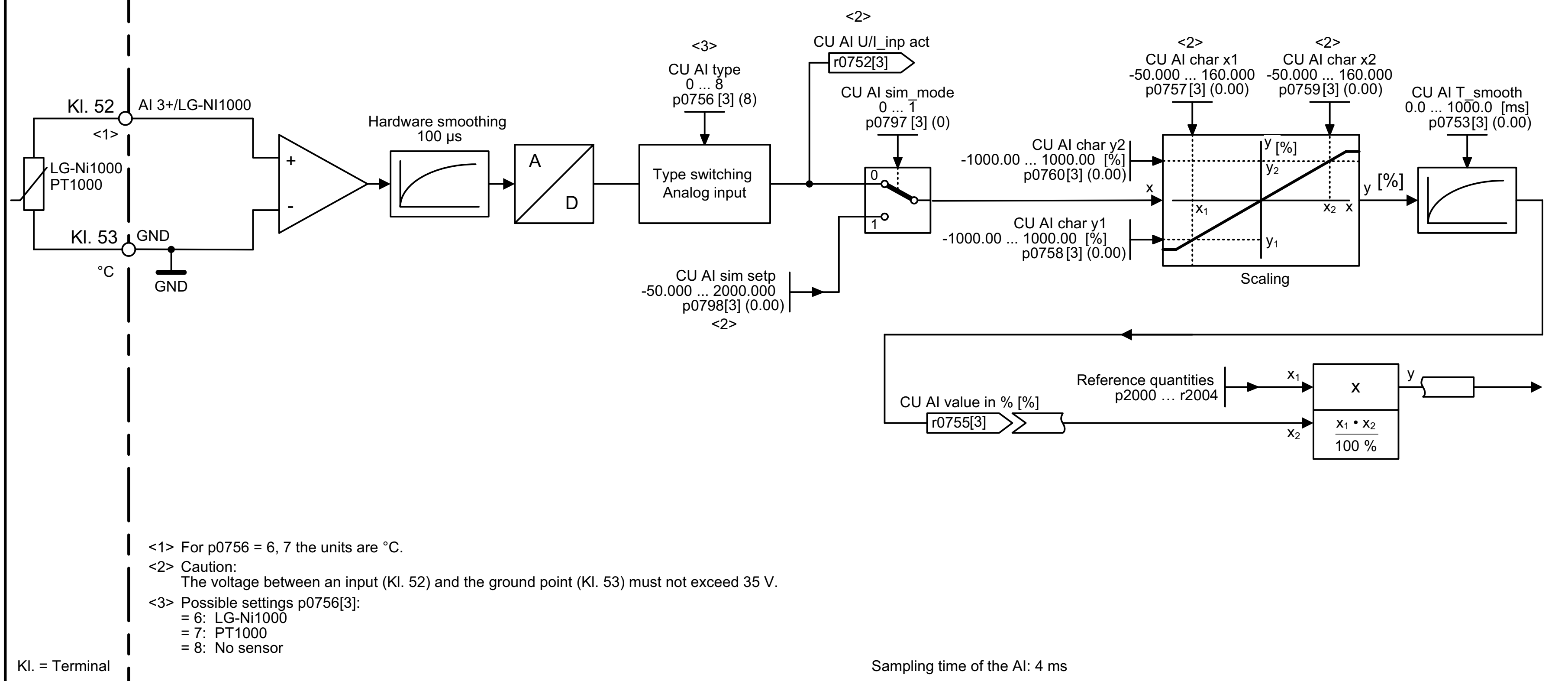
<2> The input signals are referred to the reference quantities p2000 ... r2004 (100 % = p200x).

<3> Possible settings p0776[0] and p0776[1]:
= 0: 0 mA ... +20 mA
= 1: 0 V ... +10 V
= 2: 4 mA ... +20 mA

Sampling time of the AO: 4 ms

Kl. = Terminal

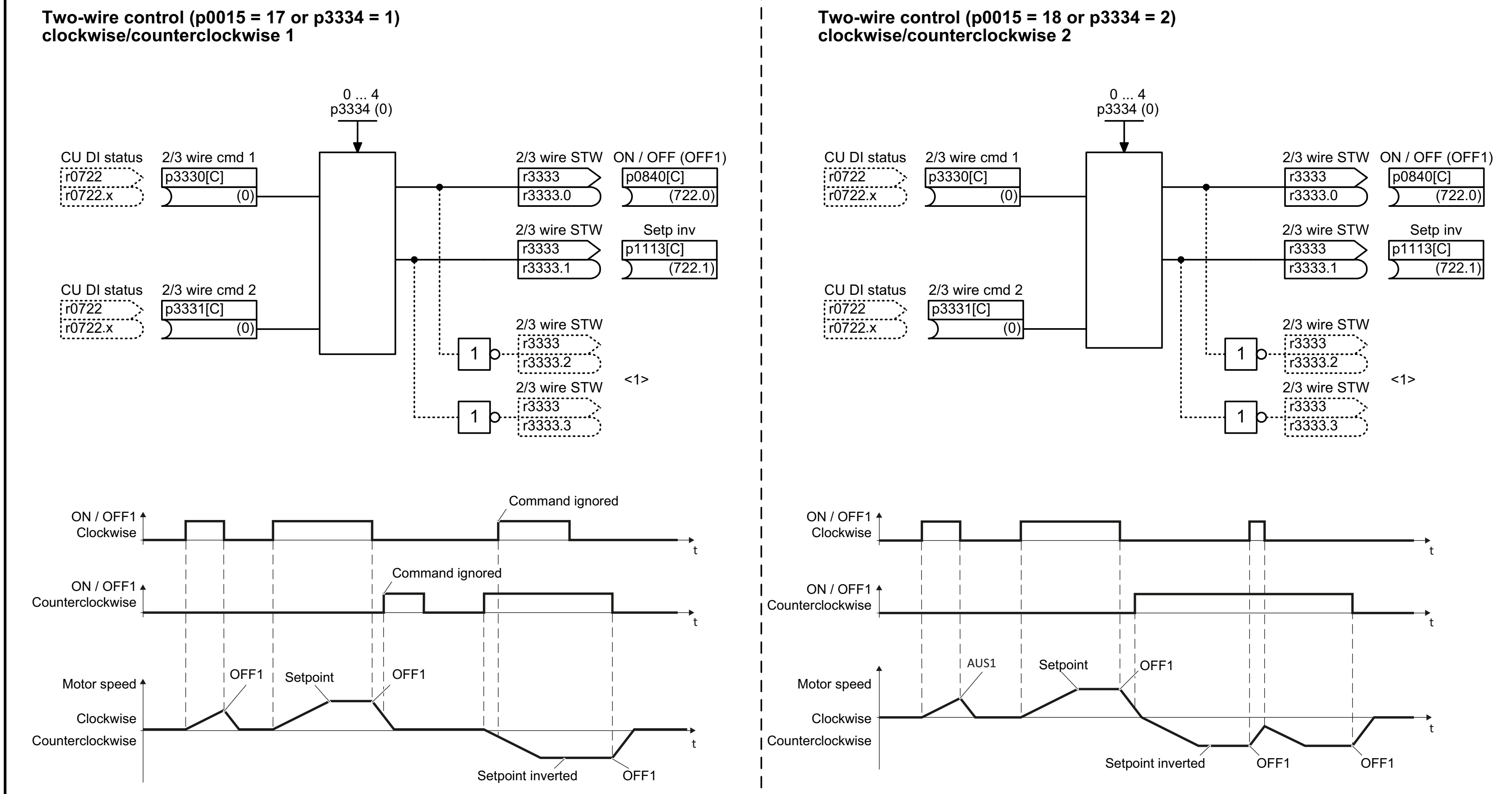
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Input/Output Terminals | | | | | fp_2261_97_01.vsd | Function diagram | - 2261 - |
| Analog outputs 0 … 1 (AO 0 … AO 1) | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |




| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Input/Output Terminals | | | | | fp_2270_97_01.vsd | Function diagram | - 2270 - |
| Temperature evaluation LG-Ni1000/PT1000 (AI 3) | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-12 2270 – Temperature evaluation LG-Ni1000/PT1000 (AI 3)

Fig. 3-13 2272 – Two-wire control

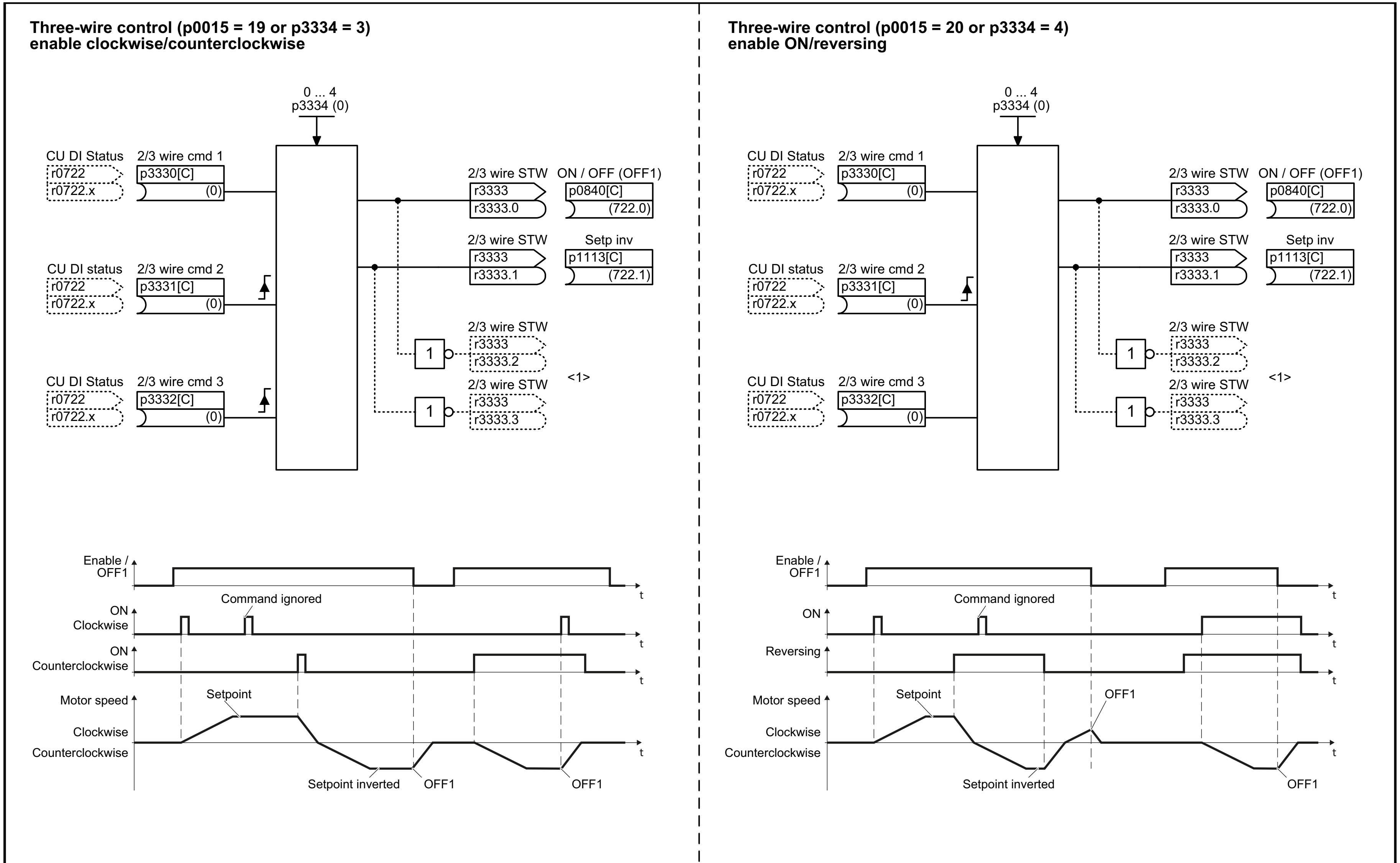



<1> Ongoing interconnection is either possible from r3333.0/r3333.1 or from the inverted signals r3333.2/r3333.3.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| Input/Output Terminals | fp_2272_97_62.vsd | Function diagram | - 2272 - |
| Two-wire control | 07.04.2014 V4.7 | G120 CU230P-2 | |

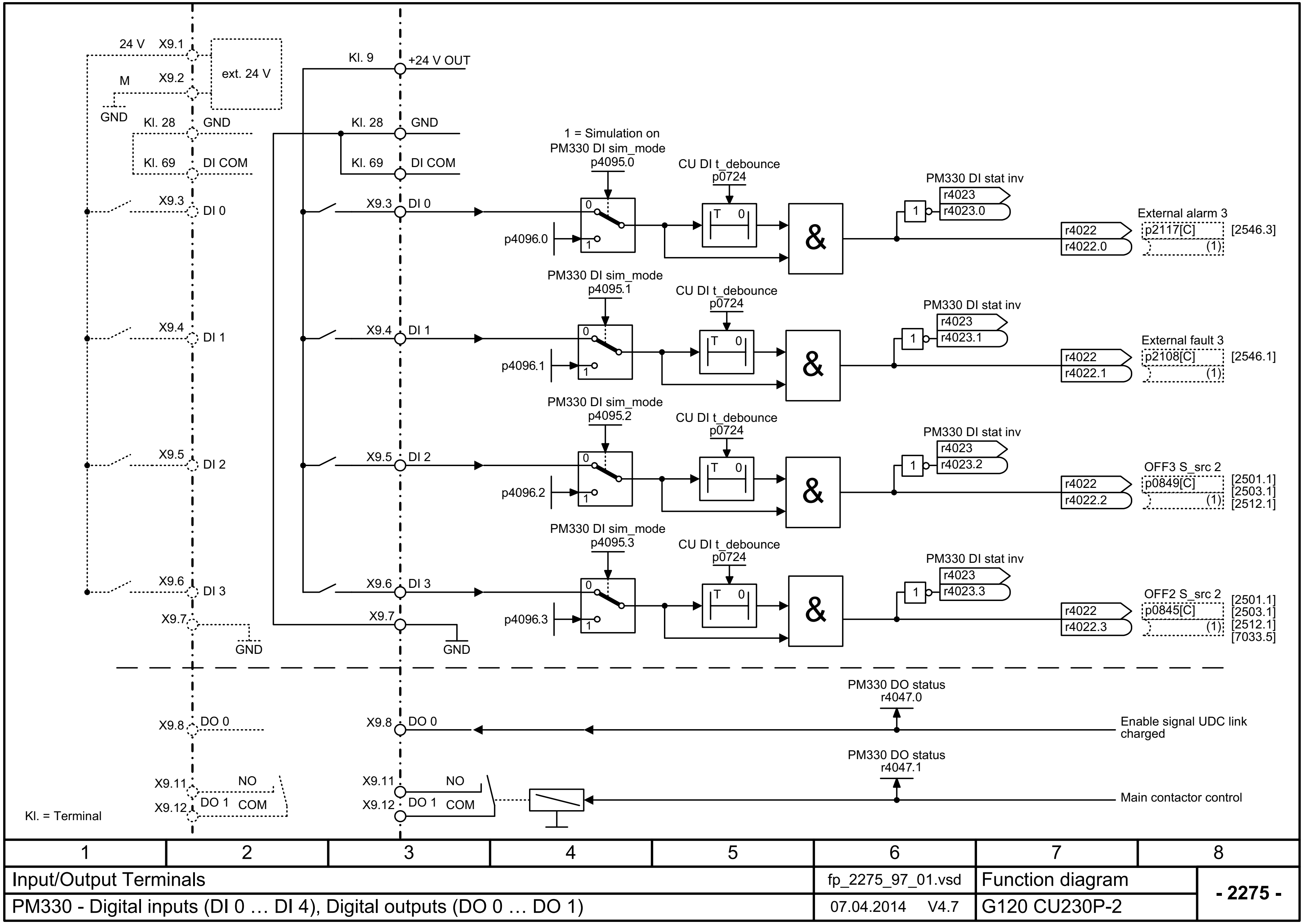
Fig. 3-14 2273 – Three-wire control




<1> Ongoing interconnection is either possible from r3333.0/r3333.1 or from the inverted signals r3333.2/r3333.3.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Input/Output Terminals | | | | | fp_2273_97_62.vsd | Function diagram | - 2273 - |
| Three-wire control | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-15 2275 – PM330 - digital inputs (DI 0 … DI 4), digital outputs (DO 0 … DO 1)



# 3.4 PROFIenergy

## Function diagrams

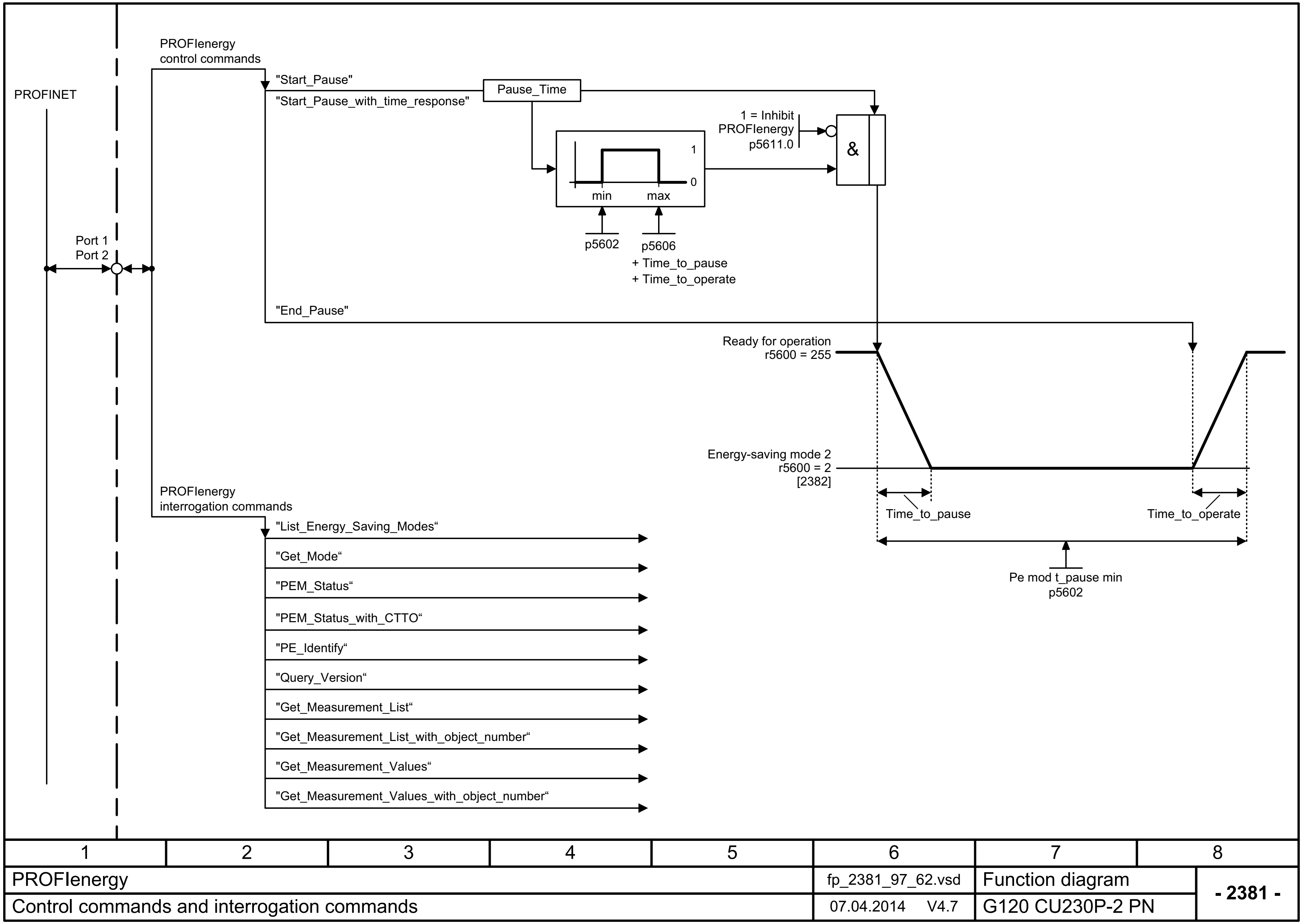
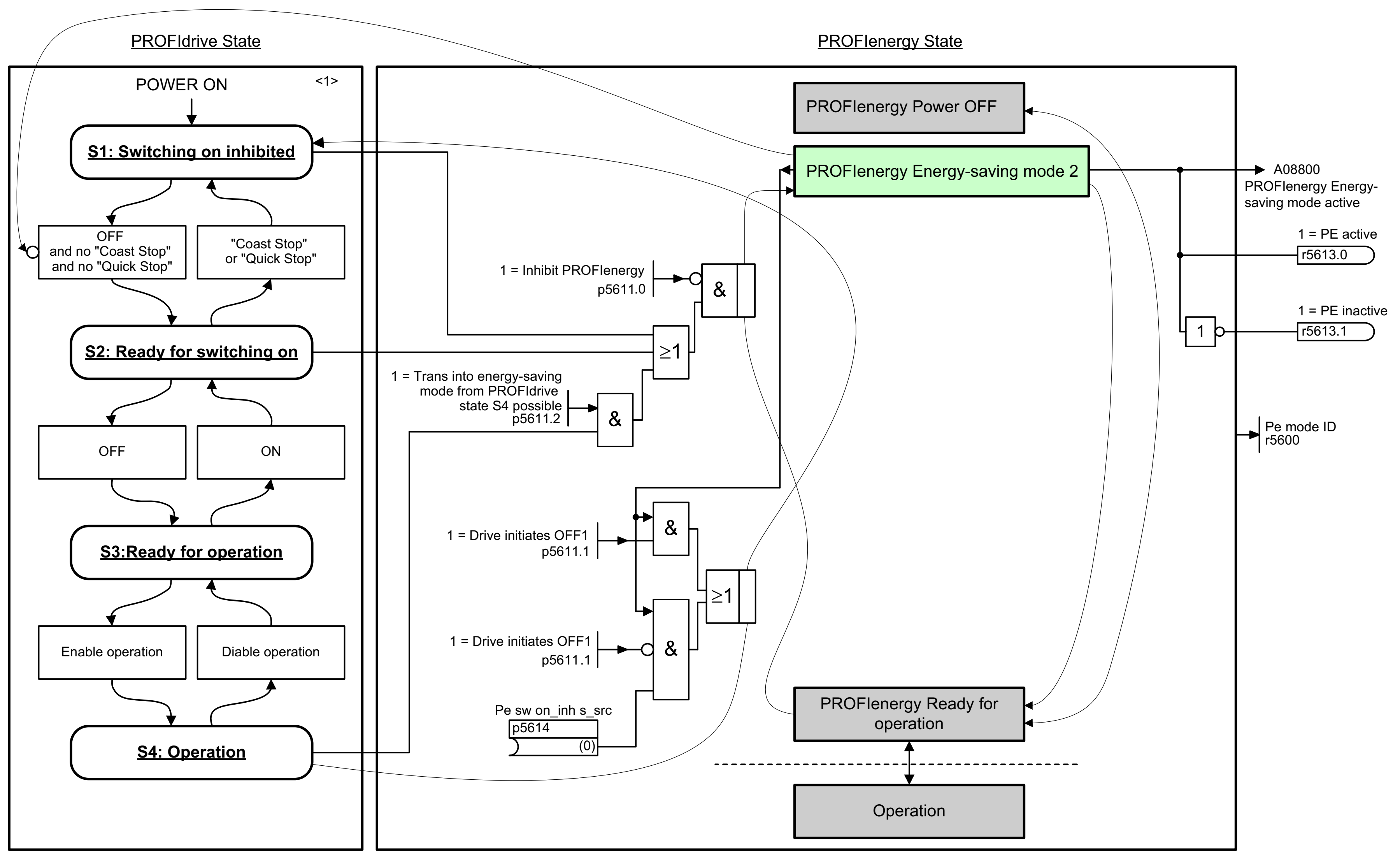



Fig. 3-16 2381 – Control commands and interrogation commands



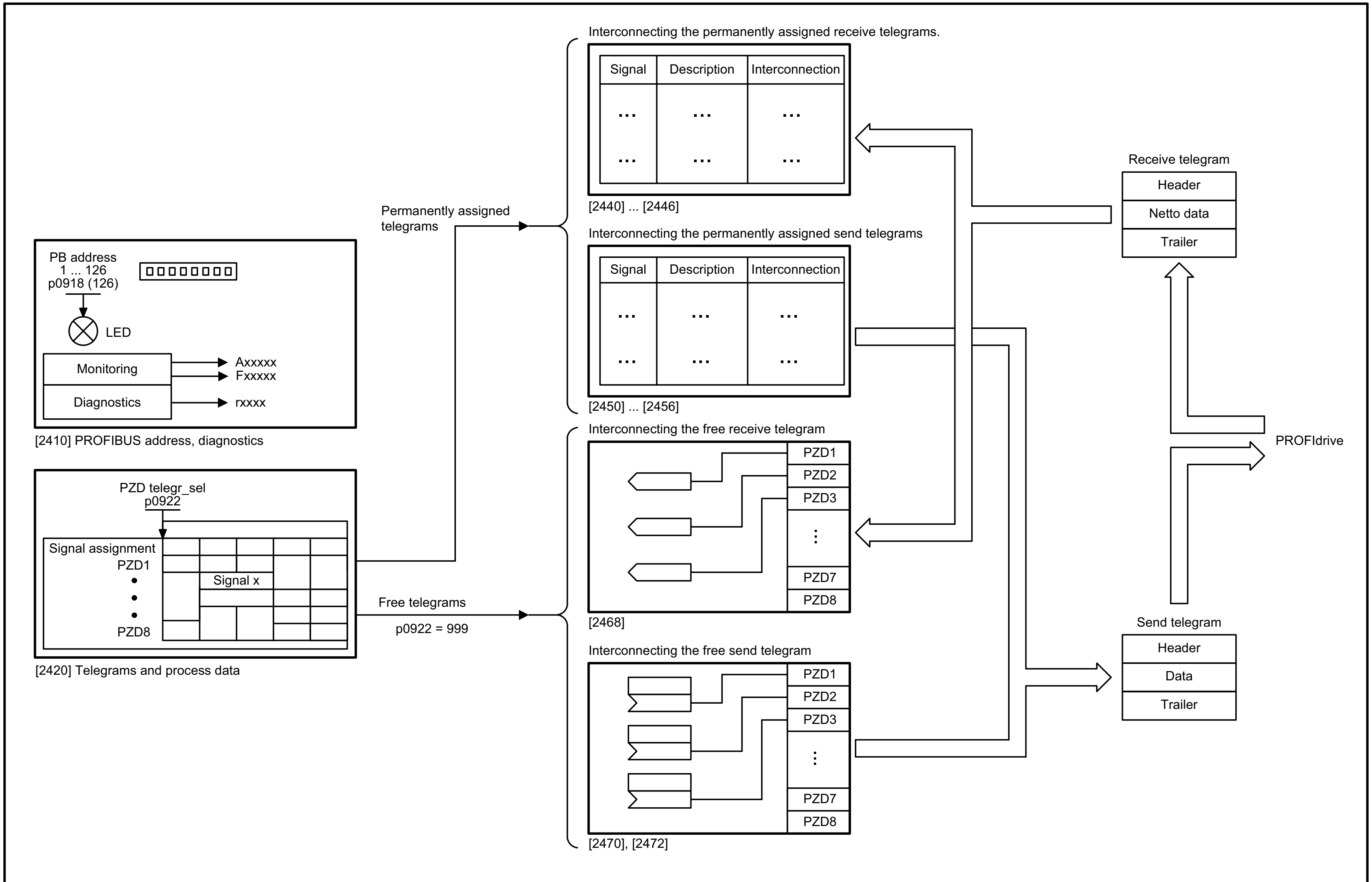

<1> Excerpt from: Basic state machine of a PROFIdrive drive axis, source: PROFIBUS Nutzerorganisation (PNO)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| PROFIenergy | | | | | fp_2382_97_62.vsd | Function diagram | - 2382 - |
| States | | | | | 07.04.2014 V4.7 | G120 CU230P-2 PN | |

Fig. 3-17 2382 – States

# 3.5 PROFIdrive communication (PROFIBUS/PROFINET)

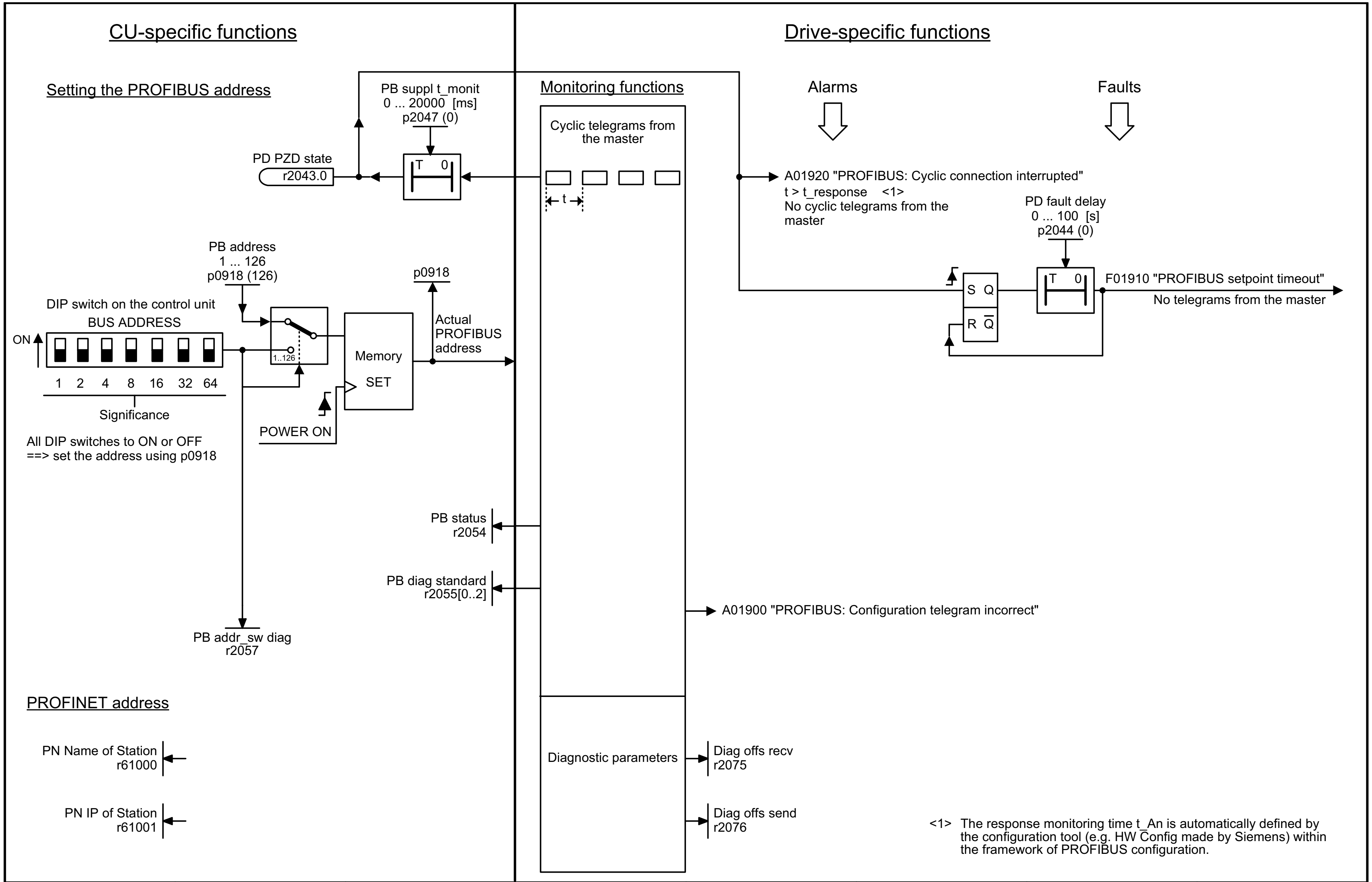
## Function diagrams




| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| PROFIdrive (PROFIBUS/PROFINET) | | | | | fp_2401_97_61.vsd | Function diagram | - 2401 - |
| Overview | | | | | 07.04.2014 V4.7 | G120 CU230P-2_DP | |

Fig. 3-18 2401 – Overview

Fig. 3-19 2410 – PROFIBUS (PB) / PROFINET (PN), addresses and diagnostics




| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| PROFIdrive (PROFIBUS/PROFINET) | fp_2410_97_59.vsd | Function diagram | - 2410 - |
| PROFIBUS (PB) / PROFINET (PN), addresses and diagnostics | 07.04.2014 V4.7 | CU230P-2 DP/PN | |

<1>
PZD telegr_sel
1 ... 999 [ms]
p0922 (1)

| | Standard telegrams | | | | Manufacturer-specific telegrams | | | | | | | | Free telegram | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Interconnection is made according to | [2440], [2450] automatically | | | | | | | | | | | | | |
| Telegram | 1 | | 20 | | 350 | | 352 | | 353 | | 354 | | 999 | |
| PZD1 | STW1 | ZSW1 | STW1 | ZSW1 | STW1 | ZSW1 | STW1 | ZSW1 | STW1 | ZSW1 | STW1 | ZSW1 | STW1 <4> | ZSW1 <4> |
| PZD2 | NSOLL_A | NIST_A | NSOLL_A | NIST_A_GL | NSOLL_A | NIST_A_GL | NSOLL_A | NIST_A_GL | NSOLL_A | NIST_A_GL | NSOLL_A | NIST_A_GL | Receive telegram length freely selectable via central PROFIdrive configuration in the master | Transmit telegram length freely selectable via central PROFIdrive configuration in the master |
| PZD3 | Receive telegram from PROFIBUS/PROFINET | Send telegram to PROFIBUS/PROFINET | | IAIST_GL | M_LIM | IAIST_GL | <3> | IAIST_GL | | | <3> | IAIST_GL | | |
| PZD4 | | | | MIST_GL | STW3 | ZSW3 | <3> | MIST_GL | | | <3> | MIST_GL | | |
| PZD5 | | | | PIST_GL | | | <3> | WARN_CODE | | | <3> | WARN_CODE | | |
| PZD6 | | | | <2> | | | <3> | FAULT_CODE | | | <3> | FAULT_CODE | | |
| PZD7 | | | | | | | | | | | | | | |
| PZD8 | | | | | | | | | | | | | | |
| PZD9 | | | | | | | | | | | | | | |
| PZD10 | | | | | | | | | | | | | | |
| PZD11 | | | | | | | | | | | | | | |
| PZD12 | | | | | | | | | | | | | | |

<1> If p0922 = 999 is changed to another value, the telegram is automatically assigned.
If p0922 unequal 999 is changed to p0922 = 999, the "old" telegram assignment is maintained!

<2> Freely interconnectable (pre-setting: MELD_NAMUR).

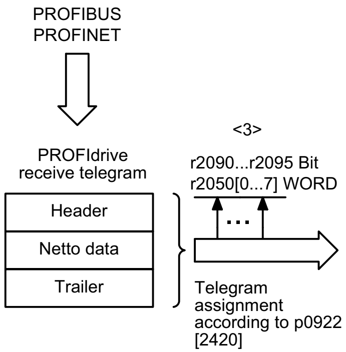
<3> Can be freely connected.

<4> In order to comply with the PROFIdrive profile, PZD1 must be used as control word 1 (STW1) or status word 1 (ZSW1).
p2037 = 2 should be set if STW1 is not transferred with PZD1 as specified in the PROFIdrive profile.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| PROFIdrive (PROFIBUS/PROFINET) | | | | | fp_2420_97_67.vsd | Function diagram | - 2420 - |
| Telegrams and Process Data (PZD) | | | | | 07.04.2014 V4.7 | CU230P-2 DP/PN | |

Fig. 3-20 2420 – Telegrams and process data (PZD)

Fig. 3-21 2440 – PZD receive signals interconnection




**Signal receivers for PZD receive signals**

| Signal | Meaning | PROFIdrive Signal No. | Interconnection parameter <1> | Function diagram | Data type <2> | Scaling |
|---|---|---|---|---|---|---|
| STW1 | Control word 1 | 1 | (bit serial) | [2442] | U16 | - |
| NSOLL_A | Speed setpoint A (16-bit) | 5 | p1070 | [3030.2] | I16 | 4000 hex ≙ p2000 |
| <4> M_LIM | Torque limit | 310 | p1552, p1554 | [6060.1] | U16 | 4000 hex ≙ 100 % |
| <4> STW3 | Control word 3 | 304 | (bit serial) | [2446] | U16 | - |

<1> When selecting a standard telegram or a manufacturer-specific telegram via p0922, these interconnection parameters of the command data set CDS are automatically set to 0.
<2> Data type according to to the PROFIdrive profile: I16 = Integer16, U16 = Unsigned16.
<3> Display parameters for receive data according to [2468].
<4> Only SIEMENS telegram 350

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| PROFIdrive (PROFIBUS/PROFINET) | fp_2440_97_64.vsd | Function diagram | - 2440 - |
| PZD receive signals interconnection | 07.04.2014 V4.7 | CU230P-2 DP/PN | |

## Signal targets for STW1 in Interface Mode VIK-NAMUR (p2038 = 2)

<1>

| Signal | Meaning | Interconnection parameters | [Function diagram] internal control word | [Function diagram] signal target | Inverted |
|---|---|---|---|---|---|
| STW1.0 | ↑ = ON (pulses can be enabled)<br>0 = OFF1 (braking with ramp-function generator, then pulse suppression & ready for switching on) | p0840[0] = r2090.0 | [2501.3] | Sequence control | - |
| STW1.1 | 1 = No OFF2 (enable is possible)<br>0 = OFF2 (immediate pulse suppression and switching on inhibited) | p0844[0] = r2090.1 | [2501.3] | Sequence control | - |
| STW1.2 | 1 = No OFF3 (enable is possible)<br>0 = OFF3 (braking with the OFF3 ramp p1135, then pulse suppression and switching on inhibited) | p0848[0] = r2090.2 | [2501.3] | Sequence control | - |
| STW1.3 | 1 = Enable operation (pulses can be enabled)<br>0 = Inhibit operation (suppress pulses) | p0852[0] = r2090.3 | [2501.3] | Sequence control | - |
| STW1.4 | 1 = Ramp-function generator enable<br>0 = Inhibit ramp-function generator (set the ramp-function generator output to zero) | p1140[0] = r2090.4 | [2501.3] | [3070], [3080] | - |
| STW1.5 | 1 = Continue ramp-function generator<br>0 = Freezes the ramp-function generator | p1141[0] = r2090.5 | [2501.3] | [3070] | - |
| STW1.6 | 1 = Setpoint enable<br>0 = Inhibits the setpoint (the ramp-function generator input is set to zero) | p1142[0] = r2090.6 | [2501.3] | [3070], [3080] | - |
| STW1.7 | ↑ = Acknowledge faults | p2103[0] = r2090.7 | [2546.1] | [8060] | - |
| STW1.8 | Reserved | - | - | - | - |
| STW1.9 | Reserved | - | - | - | - |
| STW1.10 | 1 = Control via PLC <2> | p0854[0] = r2090.10 | [2501.3] | [2501] | - |
| STW1.11 | 1 = Dir of rot reversal <4> | p1113[0] = r2090.11 | [2505.3] | [3040] | - |
| STW1.12 | Reserved | - | - | - | - |
| STW1.13 | Reserved | - | - | - | - |
| STW1.14 | Reserved | - | - | - | - |
| STW1.15 | 1 = CDS selection | p0810[0] = 2090.15 <3> | - | [8565] | - |

<1> Used in telegram 20.
<2> Bit 10 in STW1 must be set to ensure that the drive accepts the process data.
<3> Interconnection is not disabled.
<4> The direction reversal can be locked. See p1110 and p1111.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| PROFIdrive (PROFIBUS/PROFINET) | fp_2441_97_61.vsd | Function diagram | - 2441 - |
| STW1 control word interconnection (p2038 = 2) | 07.04.2014 V4.7 | CU230P-2 DP/PN | |

Fig. 3-22 2441 – STW1 control word interconnection (p2038 = 2)

Fig. 3-23 2442 – STW1 control word interconnection (p2038 = 0)

## Signal targets for STW1 in Interface Mode SINAMICS (p2038 = 0)

| Signal | Meaning | Interconnection parameters | [Function diagram] internal control word | [Function diagram] signal target | Inverted |
|---|---|---|---|---|---|
| STW1.0 | = ON (pulses can be enabled)<br>0 = OFF1 (braking with ramp-function generator, then pulse suppression & ready for switching on) | p0840[0] = r2090.0 | [2501.3] | Sequence control | - |
| STW1.1 | 1 = No OFF2 (enable is possible)<br>0 = OFF2 (immediate pulse suppression and switching on inhibited) | p0844[0] = r2090.1 | [2501.3] | Sequence control | - |
| STW1.2 | 1 = No OFF3 (enable is possible)<br>0 = OFF3 (braking with the OFF3 ramp p1135, then pulse suppression and switching on inhibited) | p0848[0] = r2090.2 | [2501.3] | Sequence control | - |
| STW1.3 | 1 = Enable operation (pulses can be enabled)<br>0 = Inhibit operation (suppress pulses) | p0852[0] = r2090.3 | [2501.3] | Sequence control | - |
| STW1.4 | 1 = Ramp-function generator enable<br>0 = Inhibit ramp-function generator (set the ramp-function generator output to zero) | p1140[0] = r2090.4 | [2501.3] | [3070], [3080] | - |
| STW1.5 | 1 = Continue ramp-function generator<br>0 = Freezes the ramp-function generator | p1141[0] = r2090.5 | [2501.3] | [3070] | - |
| STW1.6 | 1 = Setpoint enable<br>0 = Inhibits the setpoint (the ramp-function generator input is set to zero) | p1142[0] = r2090.6 | [2501.3] | [3070], [3080] | - |
| STW1.7 | = Acknowledge faults | p2103[0] = r2090.7 | [2546.1] | [8060] | - |
| STW1.8 | Reserved | - | - | - | - |
| STW1.9 | Reserved | - | - | - | - |
| STW1.10 | 1 = Control via PLC <1> | p0854[0] = r2090.10 | [2501.3] | [2501] | - |
| STW1.11 | 1 = Dir of rot reversal <2> | p1113[0] = r2090.11 | [2505.3] | [3040] | - |
| STW1.12 | Reserved | - | - | - | - |
| STW1.13 | 1 = Motorized potentiometer, setpoint, raise | p1035[0] = r2090.13 | [2505.3] | [3020] | - |
| STW1.14 | 1 = Motorized potentiometer, setpoint, lower | p1036[0] = r2090.14 | [2505.3] | [3020] | - |
| STW1.15 | Reserved | - | - | - | - |

<1> Bit 10 in STW1 must be set to ensure that the drive accepts the process data.
<2> The direction reversal can be locked. See p1110 and p1111.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| PROFIdrive (PROFIBUS/PROFINET) | fp_2442_97_61.vsd | Function diagram | - 2442 - |
| STW1 control word interconnection (p2038 = 0) | 07.04.2014 V4.7 | CU230P-2 DP/PN | |

## Signal targets for STW3 in Interface Mode SINAMICS <1>

| Signal | Meaning | Interconnection parameters | [Function diagram] internal control word | [Function diagram] signal target | Inverted |
|---|---|---|---|---|---|
| STW3.0 | 1 = Fixed setp bit 0 | p1020[0] = r2093.0 | [3010.2] | [3010.2] | - |
| STW3.1 | 1 = Fixed setp bit 1 | p1021[0] = r2093.1 | [2513.2] | [3010.2] | - |
| STW3.2 | 1 = Fixed setp bit 2 | p1022[0] = r2093.2 | [2513.2] | [3010.2] | - |
| STW3.3 | 1 = Fixed setp bit 3 | p1023[0] = r2093.3 | [2513.2] | [3010.2] | - |
| STW3.4 | 1 = DDS select. bit 0 | p0820 = r2093.4 | [2513.2] | [8565.2] | - |
| STW3.5 | 1 = DDS select. bit 1 | p0821 = r2093.5 | [2513.2] | [8565.2] | - |
| STW3.6 | Reserved | - | - | - | - |
| STW3.7 | Reserved | - | - | - | - |
| STW3.8 | 1 = Technology controller enable | p2200[0] = r2093.8 | [2513.2] | [7958.4] | - |
| STW3.9 | 1 = DC braking active | p1230[0] = r2093.9 | [2513.2] | [7017.1] | - |
| STW3.10 | Reserved | - | - | - | - |
| STW3.11 | 1 = Droop enable | p1492[0] = r2093.11 | [2513.2] | [6030.1] | - |
| STW3.12 | 1 = Torque control | p1501[0] = r2093.12 | [2513.2] | [6060.1] | - |
| STW3.13 | 0 = External fault 1 (F07860) | p2106[0] = r2093.13 | [2513.2] | [8060.1] | - |
| STW3.14 | Reserved | - | - | - | - |
| STW3.15 | 1 = CDS bit 1 | p0811[0] = r2093.15 | [2513.2] | [8560.3] | - |

<1> Used in telegram 350.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

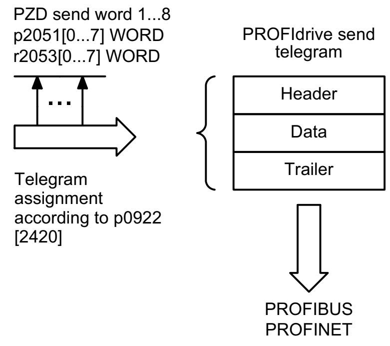
| | | | |
|---|---|---|---|
| PROFIdrive (PROFIBUS/PROFINET) | fp_2446_97_51.vsd | Function diagram | - 2446 - |
| STW3 control word interconnection | 07.04.2014 V4.7 | CU230P-2 DP/PN | |

Fig. 3-24 2446 – STW3 control word interconnection

Fig. 3-25 2450 – PZD send signals interconnection

## Signal sources for PZD send signals

| Signal | Description | PROFIdrive Signal No. | Interconnection parameter | Function diagram | Data type <1> | Scaling |
|---|---|---|---|---|---|---|
| ZSW1 | Status word 1 | 2 | r2089[0] | [2452] | U16 | - |
| NIST_A | Actual speed A (16 bit) | 6 | r0063[0] | - | I16 | 4000 hex ≙ p2000 |
| IAIST_GLATT | Absolute actual current, smoothed | 51 | r0068[1] | [6799] | I16 | 4000 hex ≙ p2002 |
| MIST_GLATT | Actual torque smoothed | 53 | r0080[1] | [6799] | I16 | 4000 hex ≙ p2003 |
| PIST_GLATT | Power factor, smoothed | 54 | r0082[1] | [6799] | I16 | 4000 hex ≙ p2004 |
| NIST_A_GLATT | Actual speed, smoothed | 57 | r0063[1] | - | I16 | 4000 hex ≙ p2000 |
| MELD_NAMUR | VIK-NAMUR message bit bar | 58 | r3113 | - | U16 | |
| FAULT_CODE | Fault code | 301 | r2131 | [8060] | U16 | |
| WARN_CODE | Alarm code | 303 | r2132 | [8065] | U16 | |
| ZSW3 | Status word 3 | 305 | r0053 | [2456] | U16 | |




<1> Data type according to the PROFIdrive profile: I16 = Integer16, U16 = Unsigned16.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| PROFIdrive (PROFIBUS/PROFINET) | fp_2450_97_64.vsd | Function diagram | - 2450 - |
| PZD send signals interconnection | 07.04.2014 V4.7 | CU230P-2 DP/PN | |

## Signal sources for ZSW1 in Interface Mode VIK-NAMUR (p2038 = 2)

| Signal | Meaning | Interconnection parameters | [Function diagram] internal control word | [Function diagram] signal target | Inverted <1> |
|---|---|---|---|---|---|
| ZSW1.0 | 1 = Ready for switching on | p2080[0] = r0899.0 | [2503.7] | Sequence control | - |
| ZSW1.1 | 1 = Ready for operation (DC link loaded, pulses inhibited) | p2080[1] = r0899.1 | [2503.7] | Sequence control | - |
| ZSW1.2 | 1 = Operation enabled (drive follows n_set) | p2080[2] = r0899.2 | [2503.7] | Sequence control | - |
| ZSW1.3 | 1 = Fault present | p2080[3] = r2139.3 | [2548.7] | [8060] | - |
| ZSW1.4 | 1 = No coast down active (OFF2 inactive) | p2080[4] = r0899.4 | [2503.7] | Sequence control | - |
| ZSW1.5 | 1 = No Quick stop active (OFF3 inactive) | p2080[5] = r0899.5 | [2503.7] | Sequence control | - |
| ZSW1.6 | 1 = Switching on inhibited active | p2080[6] = r0899.6 | [2503.7] | Sequence control | - |
| ZSW1.7 | 1 = Alarm present | p2080[7] = r2139.7 | [2548.7] | [8065] | - |
| ZSW1.8 | 1 = Speed setpoint - actual value deviation within tolerance t_off | p2080[8] = r2197.7 | [2534.7] | [8011] | - |
| ZSW1.9 | 1 = Control requested | p2080[9] = r0899.9 | [2503.7] | [2503] | - |
| ZSW1.10 | 1 = f or n comparison value reached/exceeded | p2080[10] = r2199.1 | [2537.7] | [8010] | - |
| ZSW1.11 | 1 = I, M, or P limit not reached | p2080[11] = r0056.13 | [2522.7] | [6060] | ✔ |
| ZSW1.12 | Reserved | - | - | - | - |
| ZSW1.13 | 1 = No motor overtemperature alarm | p2080[13] = r2135.14 | [2548.7] | [8016] | ✔ |
| ZSW1.14 | 1 = Motor rotates forwards (n_act ≥ 0)<br>0 = Motor rotates backwards (n_act < 0) | p2080[14] = r2197.3 | [2534.7] | [8011] | - |
| ZSW1.15 | 1 = Display CDS | p2080[15] = r0836.0 <2> | - | - | - |

<1> The ZSW1 is generated using the binector-connector converter (BI: p2080[0..15], inversion: p2088[0].0 … p2088[0].15).
<2> Interconnection is not disabled.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| PROFIdrive (PROFIBUS/PROFINET) | fp_2451_97_61.vsd | Function diagram | - 2451 - |
| ZSW1 status word interconnection (p2038 = 2) | 07.04.2014 V4.7 | CU230P-2 DP/PN | |

Fig. 3-26 2451 – ZSW1 status word interconnection (p2038 = 2)

## Signal sources for ZSW1 im Interface Mode SINAMICS (p2038 = 0)

| Signal | Meaning | Interconnection parameters | [Function diagram] internal control word | [Function diagram] signal target | Inverted <1> |
|---|---|---|---|---|---|
| ZSW1.0 | 1 = Ready for switching on | p2080[0] = r0899.0 | [2503.7] | Sequence control | - |
| ZSW1.1 | 1 = Ready for operation (DC link loaded, pulses inhibited) | p2080[1] = r0899.1 | [2503.7] | Sequence control | - |
| ZSW1.2 | 1 = Operation enabled (drive follows n_set) | p2080[2] = r0899.2 | [2503.7] | Sequence control | - |
| ZSW1.3 | 1 = Fault present | p2080[3] = r2139.3 | [2548.7] | [8060] | - |
| ZSW1.4 | 1 = No coast down active (OFF2 inactive) | p2080[4] = r0899.4 | [2503.7] | Sequence control | - |
| ZSW1.5 | 1 = No Quick stop active (OFF3 inactive) | p2080[5] = r0899.5 | [2503.7] | Sequence control | - |
| ZSW1.6 | 1 = Switching on inhibited active | p2080[6] = r0899.6 | [2503.7] | Sequence control | - |
| ZSW1.7 | 1 = Alarm present | p2080[7] = r2139.7 | [2548.7] | [8065] | - |
| ZSW1.8 | 1 = Speed setpoint - actual value deviation within tolerance t_off | p2080[8] = r2197.7 | [2534.7] | [8011] | - |
| ZSW1.9 | 1 = Control requested <2> | p2080[9] = r0899.9 | [2503.7] | [2503] | - |
| ZSW1.10 | 1 = f or n comparison value reached/exceeded | p2080[10] = r2199.1 | [2536.7] | [8010] | - |
| ZSW1.11 | 1 = I, M, or P limit not reached | p2080[11] = r1407.7 | [2522.7] | [6060] | ✔ |
| ZSW1.12 | Reserved | p2080[12] = r0899.12 | [2503.7] | [2701] | - |
| ZSW1.13 | 1 = No motor overtemperature alarm | p2080[13] = r2135.14 | [2548.7] | [8016] | ✔ |
| ZSW1.14 | 1 = Motor rotates forwards (n_act ≥ 0)<br>0 = Motor rotates backwards (n_act < 0) | p2080[14] = r2197.3 | [2534.7] | [8011] | - |
| ZSW1.15 | 1 = No alarm, thermal overload, power unit | p2080[15] = r2135.15 | [2548.7] | [8014] | ✔ |

<1> The ZSW1 is generated using the binector-connector converter (BI: p2080[0..15], inversion: p2088[0].0 … p2088[0].15).
<2> The drive is ready to accept data.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| PROFIdrive (PROFIBUS/PROFINET) | fp_2452_97_61.vsd | Function diagram | - 2452 - |
| ZSW1 status word interconnection (p2038 = 0) | 07.04.2014 V4.7 | CU230P-2 DP/PN | |

Fig. 3-27 2452 – ZSW1 status word interconnection (p2038 = 0)

## Signal sources for ZSW3 im Interface Mode SINAMICS <1>

| Signal | Meaning | Interconnection parameters | [Function diagram] internal status word | [Function diagram] signal source | Inverted |
|---|---|---|---|---|---|
| ZSW3.0 | 1 = DC braking active | p2051[3] = r0053 | [2511.7] | [7017.5] | - |
| ZSW3.1 | 1 = \|n_act\| > p1226 (n_standstill) | | [2511.7] | [2534.7] | - |
| ZSW3.2 | 1 = \|n_act\| > p1080 (n_min) | | [2511.7] | [2534.7] | - |
| ZSW3.3 | 1 = I_act >= p2170 | | [2511.7] | [2534.7] | - |
| ZSW3.4 | 1 = \|n_act\| > p2155 | | [2511.7] | [2534.7] | - |
| ZSW3.5 | 1 = \|n_act\| <= p2155 | | [2511.7] | [2534.7] | - |
| ZSW3.6 | 1 = \|n_act\| >= r1119 (n_set) | | [2511.7] | [2534.7] | - |
| ZSW3.7 | 1 = Vdc <= p2172 | | [2511.7] | [2534.7] | - |
| ZSW3.8 | 1 = Vdc > p2172 | | [2511.7] | [2534.7] | - |
| ZSW3.9 | 1 = Ramping finished | | [2511.7] | [3080.7] | - |
| ZSW3.10 | 1 = Technology controller output at the lower limit | | [2511.7] | [7958.7] | - |
| ZSW3.11 | 1 = Technology controller output at the upper limit | | [2511.7] | [7958.7] | - |
| ZSW3.12 | Reserved | | - | - | - |
| ZSW3.13 | Reserved | | - | - | - |
| ZSW3.14 | Reserved | | - | - | - |
| ZSW3.15 | Reserved | | - | - | - |

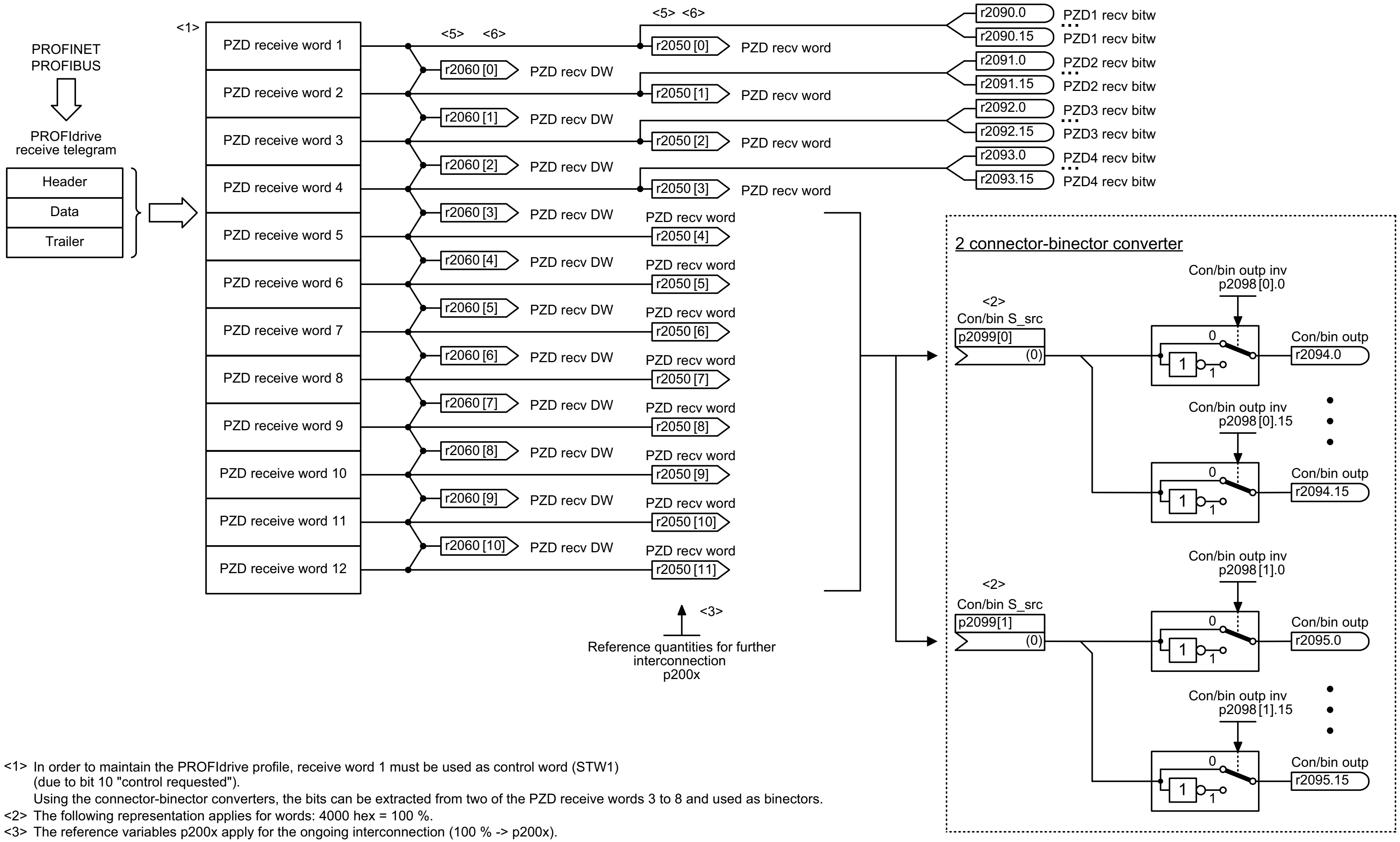
<1> Used in telegram 350.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| PROFIdrive (PROFIBUS/PROFINET) | fp_2456_97_61.vsd | Function diagram | - 2456 - |
| ZSW3 status word interconnection | 07.04.2014 V4.7 | CU230P-2 DP/PN | |

Fig. 3-28 2456 – ZSW3 status word interconnection

Fig. 3-29 2468 – Receive telegram, free interconnection via BICO (p0922 = 999)




<1> In order to maintain the PROFIdrive profile, receive word 1 must be used as control word (STW1) (due to bit 10 "control requested").
Using the connector-binector converters, the bits can be extracted from two of the PZD receive words 3 to 8 and used as binectors.

<2> The following representation applies for words: 4000 hex = 100 %.

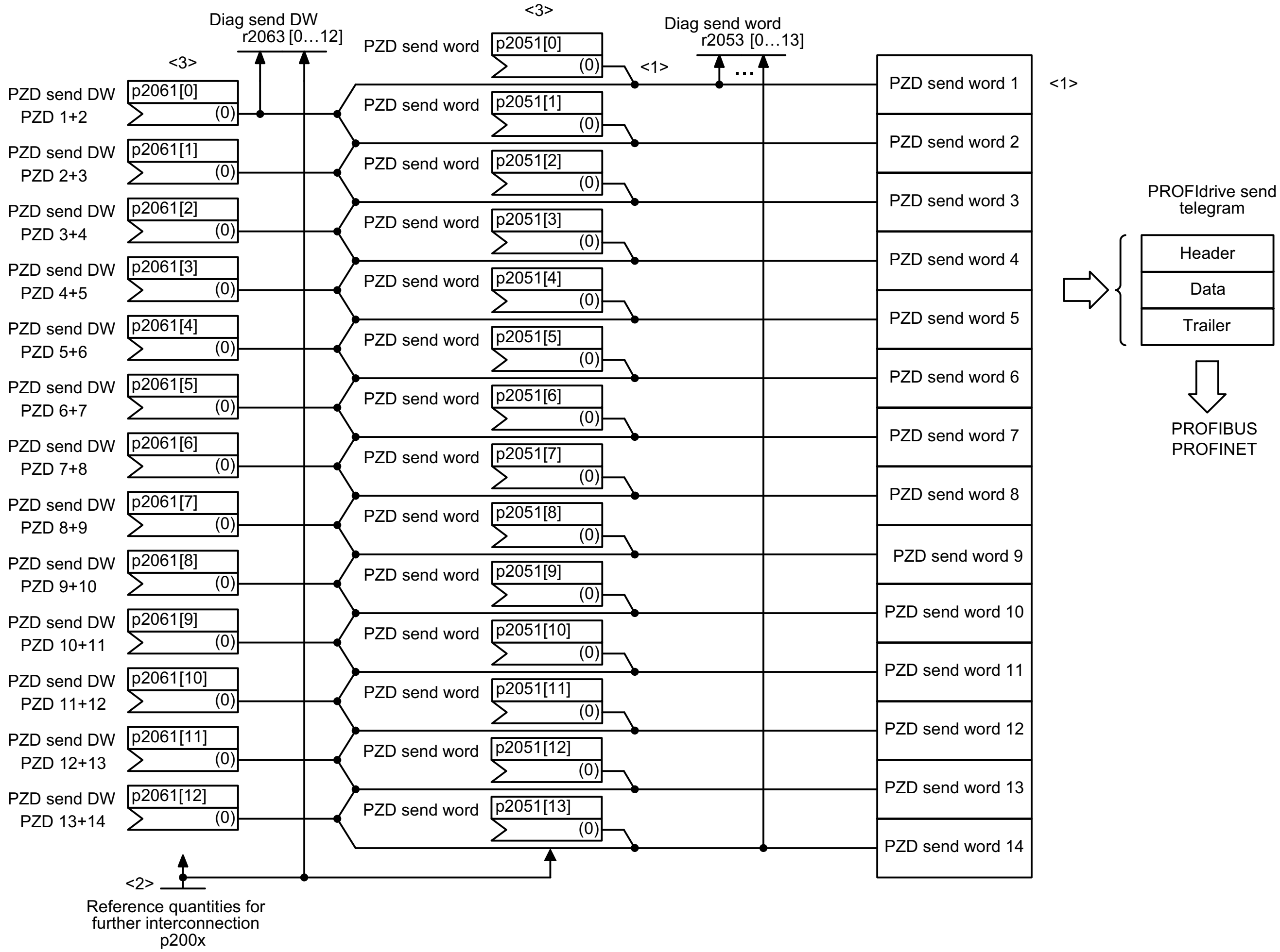
<3> The reference variables p200x apply for the ongoing interconnection (100 % -> p200x).

<4> The following applies for temperature values: 100 °C -> 100 % = 4000 hex, 0 °C -> 0 %.

<5> Every PZD word can be assigned a word or a double word. Only one of the 2 interconnection parameters r2050 or r2060 can have a value <> 0 for a PZD word.

<6> When interconnecting a connector output multiple times all the connector inputs must have either Integer or FloatingPoint data type.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| PROFIdrive (PROFIBUS/PROFINET) | | | | | fp_2468_97_61.vsd | Function diagram | - 2468 - |
| Receive telegram, free interconnection via BICO (p0922 = 999) | | | | | 07.04.2014 V4.7 | CU230P-2 DP/PN | |




<1> To comply with the PROFIdrive profile, send word 1 must be used as status word 1 (ZSW1).

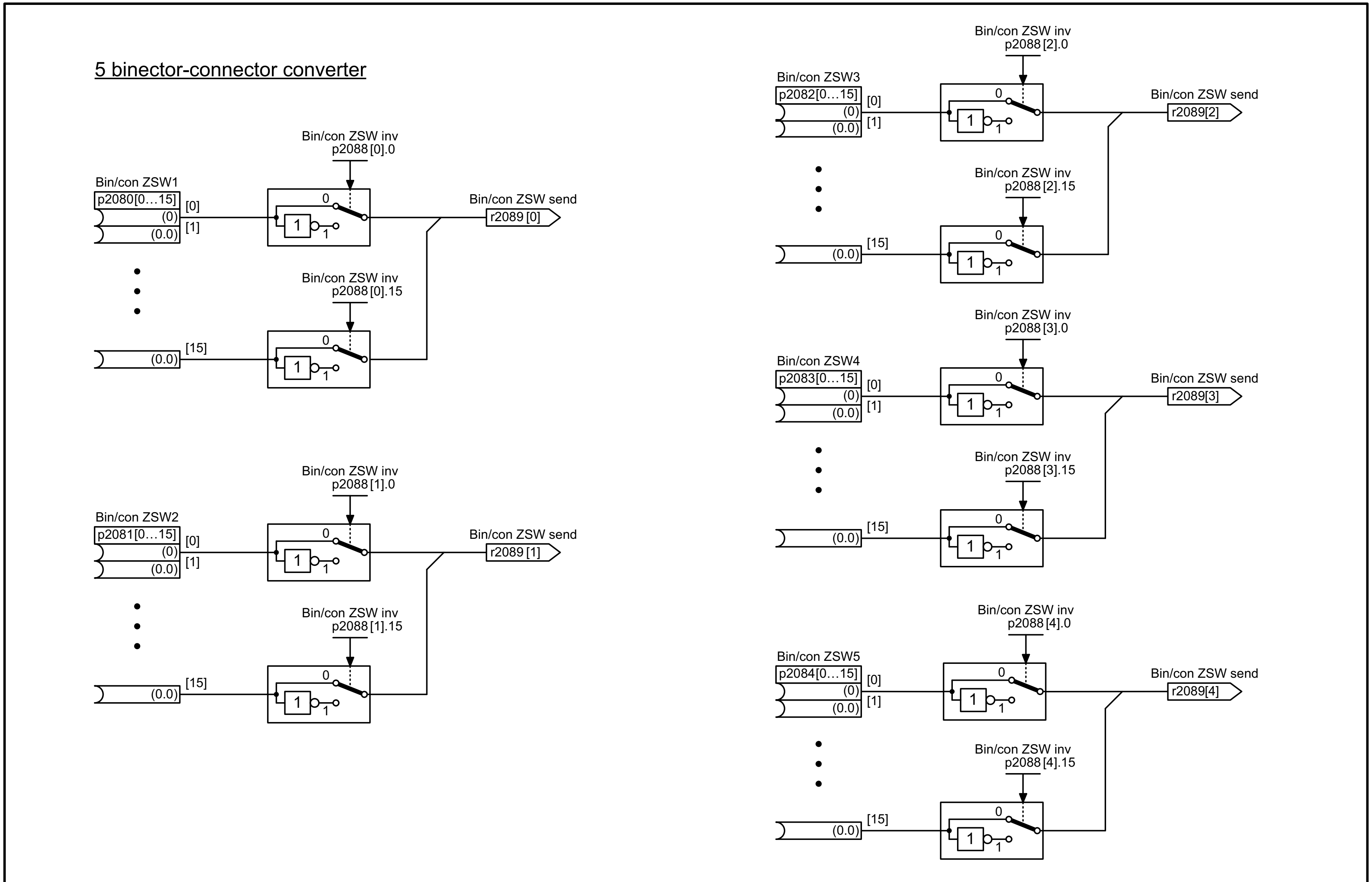
<2> Physical word values are inserted in the telegram as referenced variables. p200x apply as reference variables (telegram contents = 4000 hex, if the input variable has the value p200x).
The following applies for temperature values: 100 °C -> 100 % = 4000

<3> A PZD send word can either be supplied via connector input p2051[x] (WORD) or via p2061[x] (DWORD).
The two corresponding connector inputs cannot be interconnected.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| PROFIdrive (PROFIBUS/PROFINET) | | | | | fp_2470_97_61.vsd | Function diagram | - 2470 - |
| Send telegram, free interconnection via BICO (p0922 = 999) | | | | | 07.04.2014 V4.7 | CU230P-2 DP/PN | |

Fig. 3-30 2470 – Send telegram, free interconnection via BICO (p0922 = 999)

Fig. 3-31 2472 – Status words, free interconnection

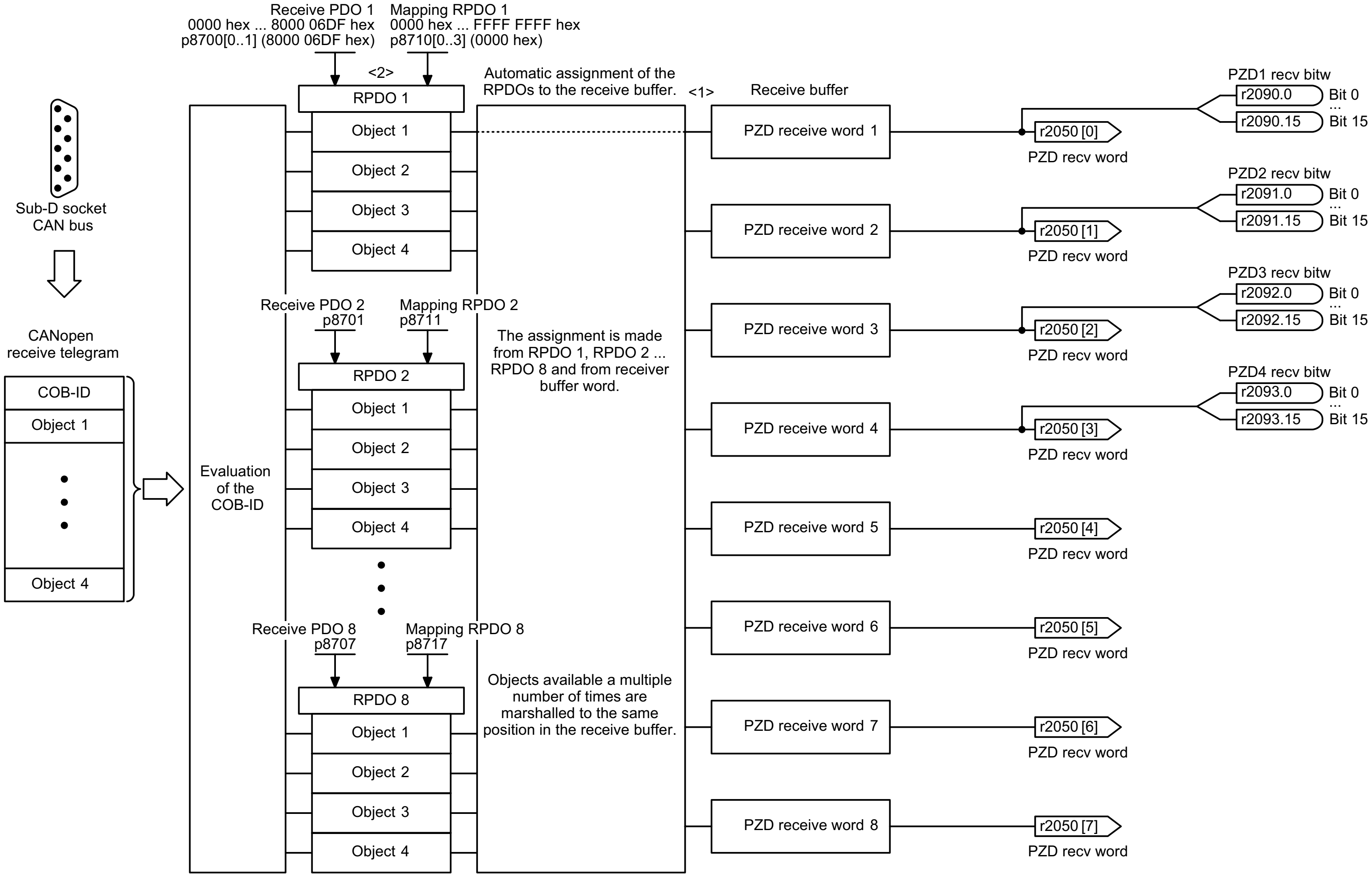



| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| PROFIdrive (PROFIBUS/PROFINET) | | | | | fp_2472_97_51.vsd | Function diagram | - 2472 - |
| Status words, free interconnection | | | | | 07.04.2014 V4.7 | CU230P-2 DP/PN | |

## 3.6 CANopen communication

### Function diagrams

Fig. 3-32 9204 – Receive telegram, free PDO mapping (p8744 = 2)



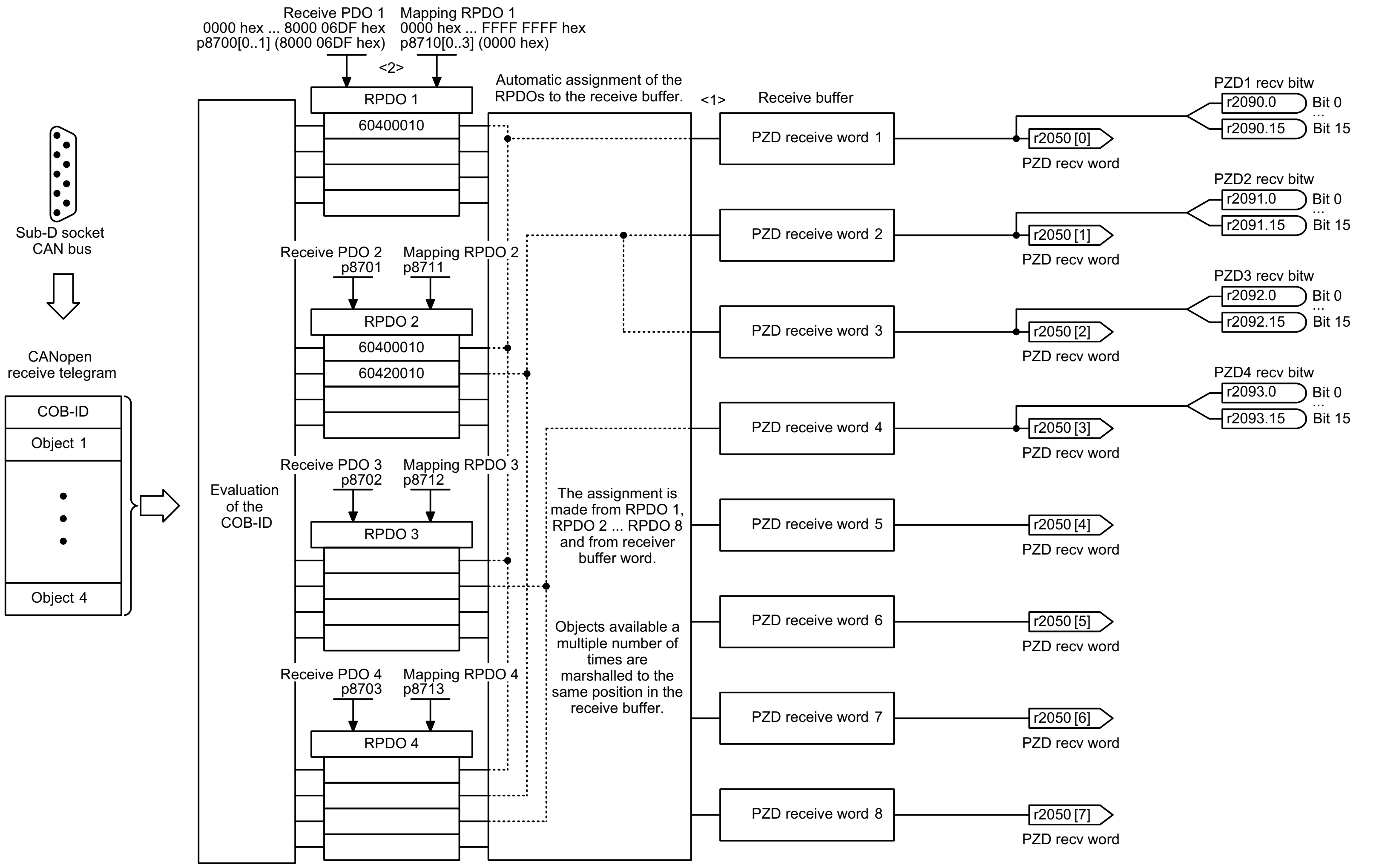

<1> To use automatic BICO interconnection (p8790 = 1), one of the receive words 1 - 4 must be used as control word 1 (STW1).
<2> Telegram: up to 4 words or 64 bits. The sum of the various objects must not exceed 8 words.

RPDO: Receive Process Data Object
COB-ID: CAN object identification

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| CANopen | fp_9204_97_68.vsd | Function diagram | - 9204 - |
| Receive telegram, free PDO mapping (p8744 = 2) | 07.04.2014 V4.7 | G120 CU230P-2 CAN | |

Fig. 3-33 9206 – Receive telegram, Predefined Connection Set (p8744 = 1)



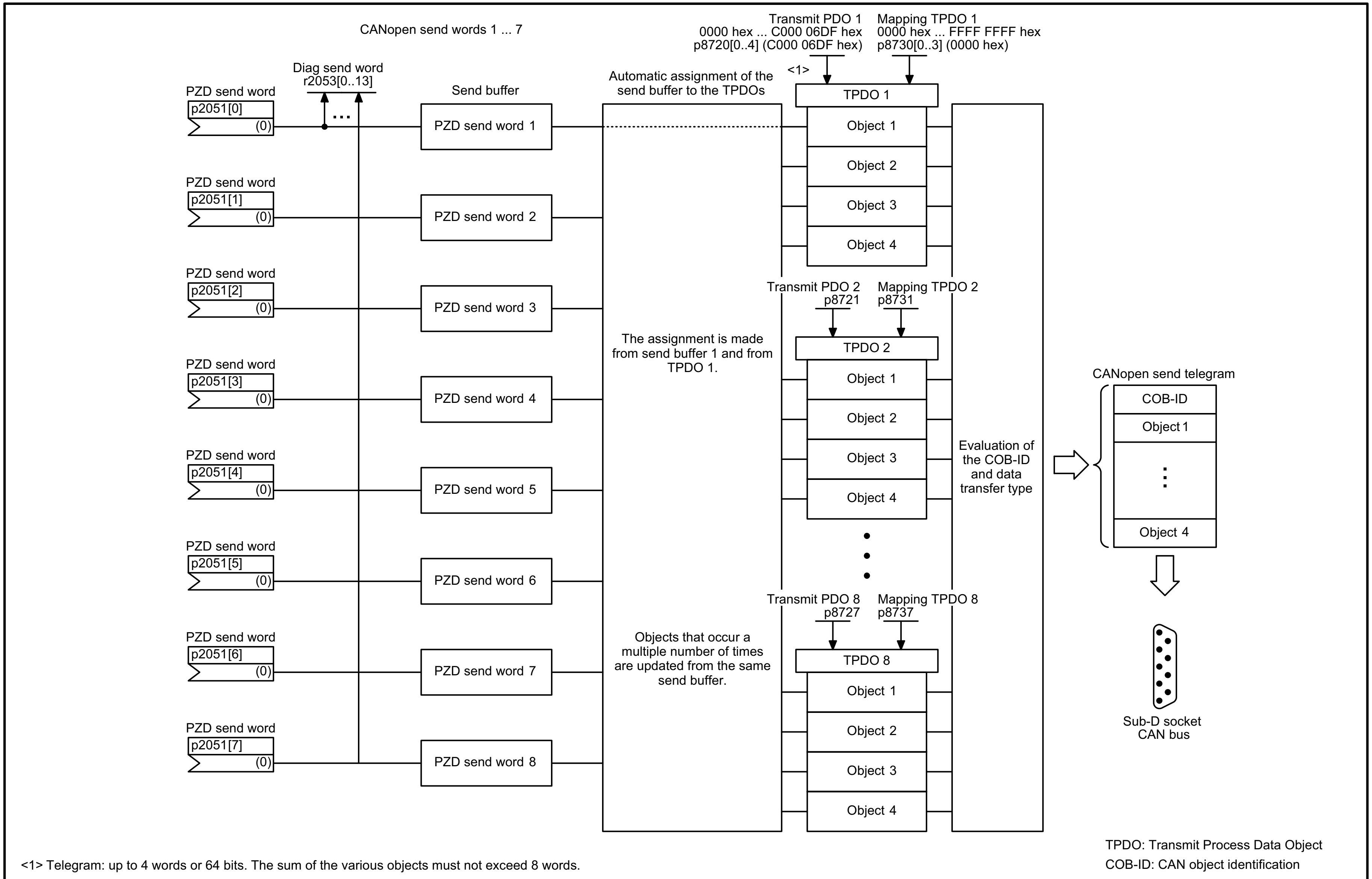

<1> To use automatic BICO interconnection (p8790 = 1), one of the receive words 1 - 4 must be used as control word 1 (STW1).
<2> Telegram: up to 4 words or 64 bits. The sum of the various objects must not exceed 8 words.

RPDO: Receive Process Data Object
COB-ID: CAN object identification

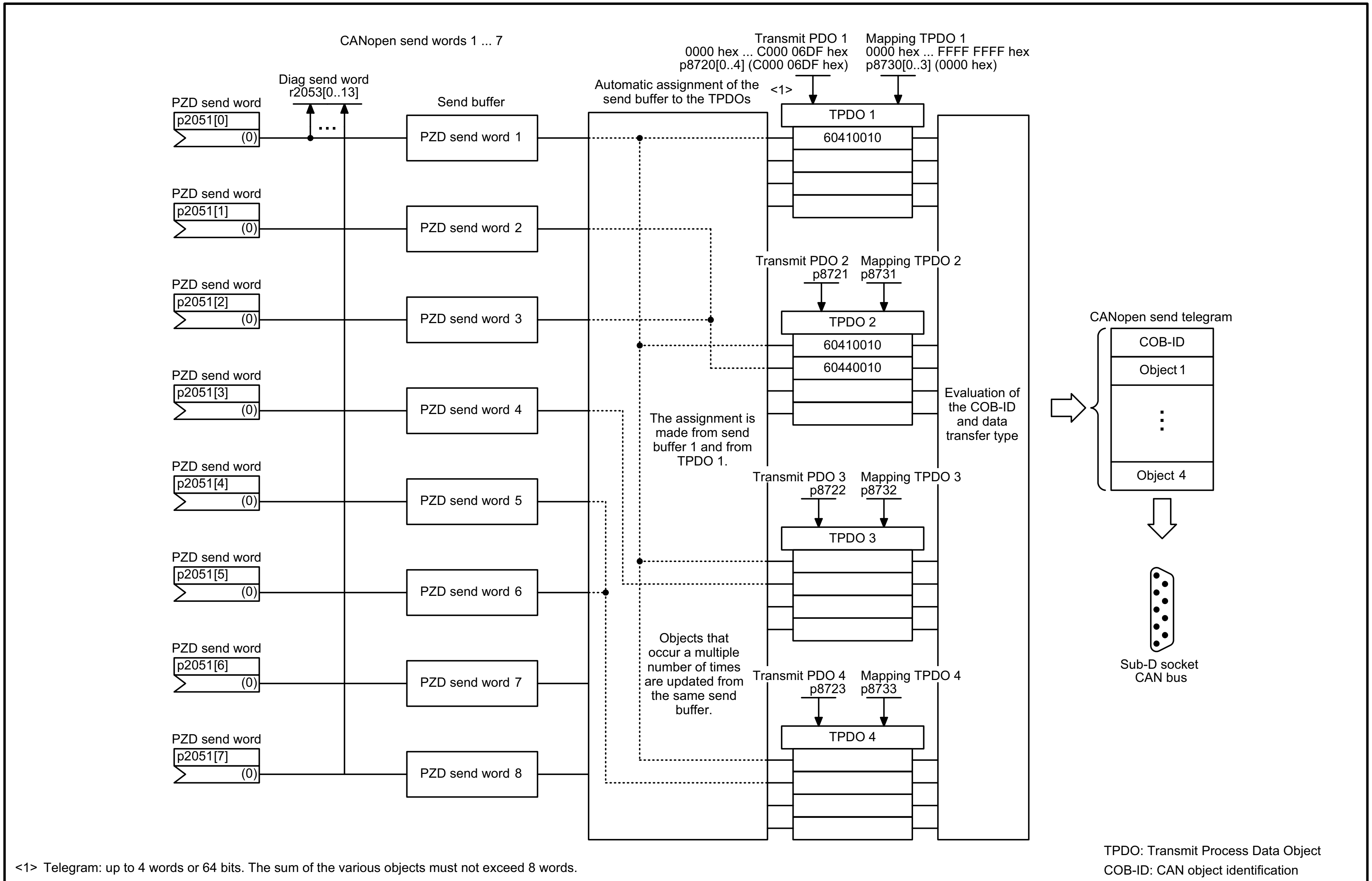
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| CANopen | fp_9206_97_68.vsd | Function diagram | - 9206 - |
| Receive telegram, Predefined Connection Set (p8744 = 1) | 07.04.2014 V4.7 | G120 CU230P-2 CAN | |

Fig. 3-34 9208 – Send telegram, free PDO mapping (p8744 = 2)




| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| CANopen | | | | | fp_9208_97_68.vsd | Function diagram | - 9208 - |
| Send telegram, free PDO mapping (p8744 = 2) | | | | | 07.04.2014 V4.7 | G120 CU230P-2 CAN | |




| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| CANopen | fp_9210_97_68.vsd | Function diagram | - 9210 - |
| Send telegram, Predefined Connection Set (p8744 = 1) | 07.04.2014 V4.7 | G120 CU230P-2 CAN | |

Fig. 3-35 9210 – Send telegram, Predefined Connection Set (p8744 = 1)

Fig. 3-36 9220 – Control word, CANopen

## Signal targets for control word CANopen (r8795)

| Signal | Meaning | Interconnection parameters <1> | [Function diagram] internal control word | [Function diagram] signal target |
|---|---|---|---|---|
| STW.0 | _/¯ = ON (pulses can be enabled)<br>0 = OFF1 (braking with RFG, then pulse suppression and ready for switching on) | p0840[0] = r2090.0 | [2501.3] | Sequence control |
| STW.1 | 1 = No coast-down activated (enable possible)<br>0 = Activate coast-down (immediate pulse suppression and switching on inhibited) | p0844[0] = r2090.1 | [2501.3] | Sequence control |
| STW.2 | 1 = No Quick stop activated (enable possible)<br>0 = Activate Quick stop (OFF3 ramp p1135, then pulse suppression and switching on inhibited) | p0848[0] = r2090.2 | [2501.3] | Sequence control |
| STW.3 | 1 = Enable operation (pulses can be enabled)<br>0 = Inhibit operation (suppress pulses) | p0852[0] = r2090.3 | [2501.3] | Sequence control |
| STW.4 | 1 = Enable ramp-function generator<br>0 = Inhibit ramp-function generator | <2><br>p1140[0] = r2090.4 | [2501.3] | [3070] |
| STW.5 | 1 = Continue ramp-function generator<br>0 = Freeze ramp-function generator | <2><br>p1141[0] = r2090.5 | [2501.3] | [3070] |
| STW.6 | 1 = Enable setpoint<br>0 = Inhibit setpoint (set the ramp-function generator input to zero) | <2><br>p1142[0] = r2090.6 | [2501.3] | [3070] |
| STW.7 | _/¯ = Acknowledge fault | p2103[0] = r2090.7 | [2546.1] | [8060] |
| STW.8 | 1 = Stop | <2><br><3> | - | [3070] |
| STW.9 | Reserved | - | - | - |
| STW.10 | Reserved | - | - | - |
| STW.11 | Can be freely connected | pxxxx[y] = r2090.11 | - | - |
| STW.12 | Can be freely connected | pxxxx[y] = r2090.12 | - | - |
| STW.13 | Can be freely connected | pxxxx[y] = r2090.13 | - | - |
| STW.14 | Can be freely connected | pxxxx[y] = r2090.14 | - | - |
| STW.15 | Can be freely connected | pxxxx[y] = r2090.15 | - | - |

<1> Depending on the position of the CANopen control word in p8750, the number of the binector to be connected changes.
<2> Not taken into account for the automatic control word interconnection (p8790).
<3> Interconnection via p8791.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| CANopen | fp_9220_97_68.vsd | Function diagram | - 9220 - |
| Control word, CANopen | 07.04.2014 V4.7 | G120 CU230P-2 CAN | |

Status word r8784

| Source | Bit No. | Status word CANopen |
|---|---|---|
| From sequence control | 0 | 1 = Ready for switching on |
| From sequence control | 1 | 1 = Ready for operation (DC link loaded, pulses inhibited) |
| From sequence control | 2 | 1 = Operation enabled (drive follows n_set) |
| From fault buffer [8060] | 3 | 1 = Fault present |
| From sequence control | 4 | 1 = No coast down active |
| From sequence control | 5 | 1 = No Quick stop active |
| From sequence control | 6 | 1 = Switching on inhibited active |
| From alarm buffer [8065] | 7 | 1 = Alarm present |
| Status word bit 8 p8785 (0) | 8 | Freely interconnectable (BI: p8785) |
| Bit 9 = 1 --> Ready to exchange process data | 9 | 1 = Control requested |
| CANopen control word bit 8 = 0: from speed signals [8011.8] (r2197.7)<br>CANopen control word bit 8 = 1: from speed signals [8010.8] (r2199.0) <2> | 10 | 1 = Target reached <1> |
| From status word speed controller [2522] | 11 | 1 = Torque limit reached |
| From speed signals [8010.8] (r2199.0) | 12 | 1 = Velocity equal to zero |
| | 13 | Reserved |
| Status word bit 14 p8786 (0) | 14 | Freely interconnectable (BI: p8786) |
| Status word bit 15 p8787 (0) | 15 | Freely interconnectable (BI: p8787) |

<1> With setpoint channel: connect p2151 with r1119 [8011.3].
<2> Only if p8791 = 1 or 3.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| CANopen | fp_9226_97_68.vsd | Function diagram | - 9226 - |
| Status word, CANopen | 07.04.2014 V4.7 | G120 CU230P-2 CAN | |

Fig. 3-37 9226 – Status word, CANopen

## 3.7 Communication, fieldbus interface (USS, MODBUS, BACnet)

### Function diagrams

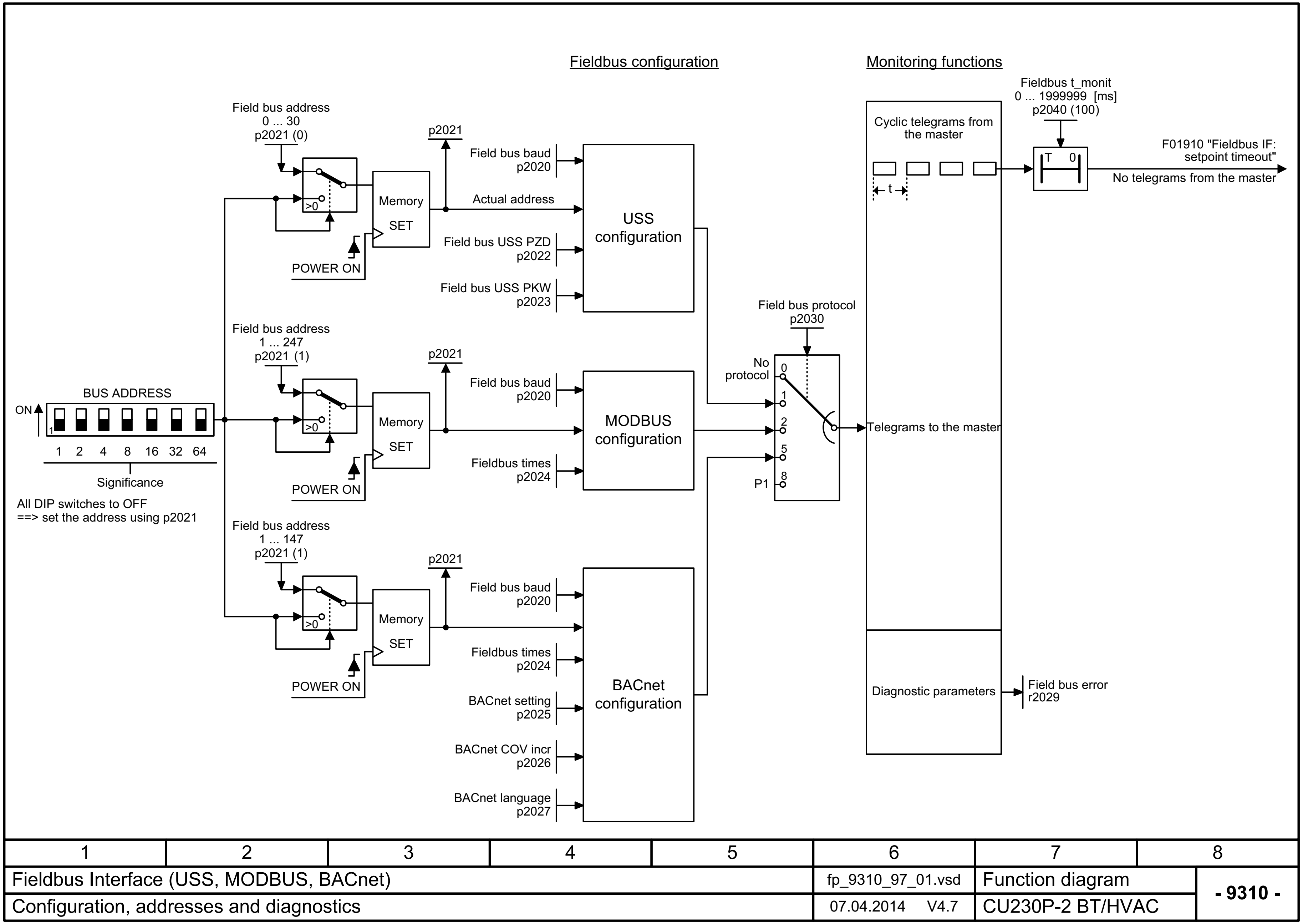



Fig. 3-38 9310 – Configuration, addresses and diagnostics

Fig. 3-39 9342 – STW1 control word interconnection

## Signal targets for fieldbus STW1

| Signal | Meaning | Interconnection parameters | [Function diagram] internal control word | [Function diagram] signal target | Inverted |
|---|---|---|---|---|---|
| STW1.0 | ↑ = ON (pulses can be enabled)<br>0 = OFF1 (braking with ramp-function generator, then pulse suppression & ready for switching on) | p0840[0] = r2090.0 | [2501.3] | Sequence control | - |
| STW1.1 | 1 = No OFF2 (enable is possible)<br>0 = OFF2 (immediate pulse suppression and switching on inhibited) | p0844[0] = r2090.1 | [2501.3] | Sequence control | - |
| STW1.2 | 1 = No OFF3 (enable is possible)<br>0 = OFF3 (braking with the OFF3 ramp p1135, then pulse suppression and switching on inhibited) | p0848[0] = r2090.2 | [2501.3] | Sequence control | - |
| STW1.3 | 1 = Enable operation (pulses can be enabled)<br>0 = Inhibit operation (suppress pulses) | p0852[0] = r2090.3 | [2501.3] | Sequence control | - |
| STW1.4 | 1 = Ramp-function generator enable<br>0 = Inhibit ramp-function generator (set the ramp-function generator output to zero) | p1140[0] = r2090.4 | [2501.3] | [3070], [3080] | - |
| STW1.5 | 1 = Continue ramp-function generator<br>0 = Freezes the ramp-function generator | p1141[0] = r2090.5 | [2501.3] | [3070] | - |
| STW1.6 | 1 = Setpoint enable<br>0 = Inhibits the setpoint (the ramp-function generator input is set to zero) | p1142[0] = r2090.6 | [2501.3] | [3070], [3080] | - |
| STW1.7 | ↑ = Acknowledge faults | p2103[0] = r2090.7 | [2546.1] | [8060] | - |
| STW1.8 | Reserved | - | - | - | - |
| STW1.9 | Reserved | - | - | - | - |
| STW1.10 | 1 = Control via PLC <1> | p0854[0] = r2090.10 | [2501.3] | [2501] | - |
| STW1.11 | 1 = Dir of rot reversal <2> | p1113[0] = r2090.11 | [2505.3] | [3040] | - |
| STW1.12 | Reserved | - | - | - | - |
| STW1.13 | 1 = Motorized potentiometer, setpoint, raise | p1035[0] = r2090.13 | [2505.3] | [3020] | - |
| STW1.14 | 1 = Motorized potentiometer, setpoint, lower | p1036[0] = r2090.14 | [2505.3] | [3020] | - |
| STW1.15 | Reserved | - | - | - | - |

<1> Bit 10 in STW1 must be set to ensure that the drive accepts the process data.
<2> The direction reversal can be locked. See p1110 and p1111.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| Fieldbus Interface (USS, MODBUS, BACnet) | fp_9342_97_62.vsd | Function diagram | - 9342 - |
| STW1 control word interconnection | 07.04.2014 V4.7 | CU230P-2 BT/HVAC | |

## Signal sources for fieldbus ZSW1

| Signal | Meaning | Interconnection parameters | [Function diagram] internal control word | [Function diagram] signal target | Inverted <1> |
|---|---|---|---|---|---|
| ZSW1.0 | 1 = Ready for switching on | p2080[0] = r0899.0 | [2503.7] | Sequence control | - |
| ZSW1.1 | 1 = Ready for operation (DC link loaded, pulses inhibited) | p2080[1] = r0899.1 | [2503.7] | Sequence control | - |
| ZSW1.2 | 1 = Operation enabled (drive follows n_set) | p2080[2] = r0899.2 | [2503.7] | Sequence control | - |
| ZSW1.3 | 1 = Fault present | p2080[3] = r2139.3 | [2548.7] | [8060] | - |
| ZSW1.4 | 1 = No coast down active (OFF2 inactive) | p2080[4] = r0899.4 | [2503.7] | Sequence control | - |
| ZSW1.5 | 1 = No Quick stop active (OFF3 inactive) | p2080[5] = r0899.5 | [2503.7] | Sequence control | - |
| ZSW1.6 | 1 = Switching on inhibited active | p2080[6] = r0899.6 | [2503.7] | Sequence control | - |
| ZSW1.7 | 1 = Alarm present | p2080[7] = r2139.7 | [2548.7] | [8065] | - |
| ZSW1.8 | 1 = Speed setpoint - actual value deviation within tolerance t_off | p2080[8] = r2197.7 | [2534.7] | [8011] | - |
| ZSW1.9 | 1 = Control requested <2> | p2080[9] = r0899.9 | [2503.7] | [2503] | - |
| ZSW1.10 | 1 = f or n comparison value reached/exceeded | p2080[10] = r2199.1 | [2536.7] | [8010] | - |
| ZSW1.11 | 1 = I, M, or P limit not reached | p2080[11] = r1407.7 | [2522.7] | [6060] | ✔ |
| ZSW1.12 | Reserved | p2080[12] = r0899.12 | [2503.7] | [2701] | - |
| ZSW1.13 | 1 = No motor overtemperature alarm | p2080[13] = r2135.14 | [2548.7] | [8016] | ✔ |
| ZSW1.14 | 1 = Motor rotates forwards (n_act ≥ 0)<br>0 = Motor rotates backwards (n_act < 0) | p2080[14] = r2197.3 | [2534.7] | [8011] | - |
| ZSW1.15 | 1 = No alarm, thermal overload, power unit | p2080[15] = r2135.15 | [2548.7] | [8014] | ✔ |

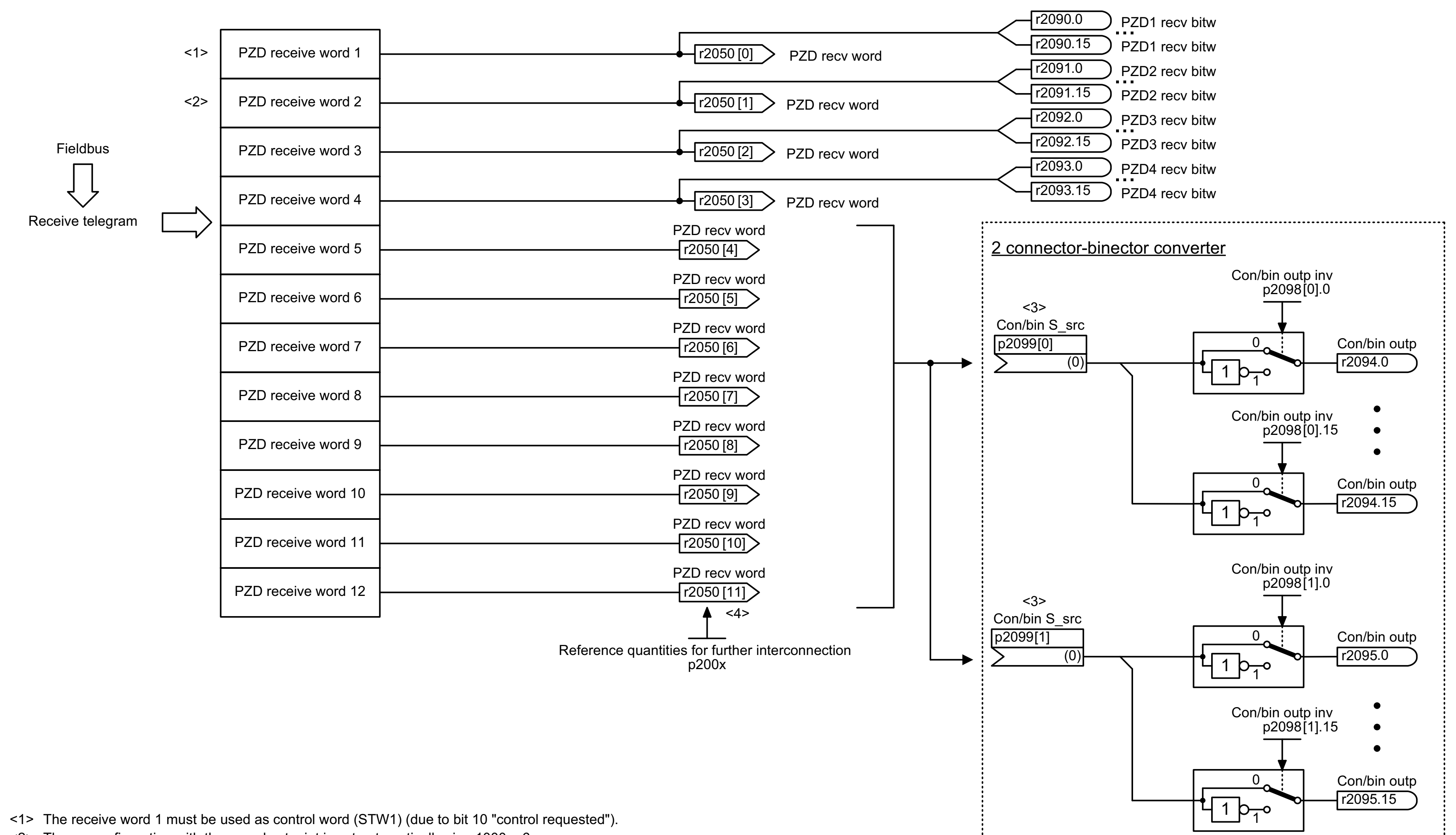
<1> The ZSW1 is generated using the binector-connector converter (BI: p2080[0..15], inversion: p2088[0].0 … p2088[0].15).
<2> The drive is ready to accept data.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| Fieldbus Interface (USS, MODBUS, BACnet) | fp_9352_97_62.vsd | Function diagram | - 9352 - |
| ZSW1 status word interconnection | 07.04.2014 V4.7 | CU230P-2 BT/HVAC | |

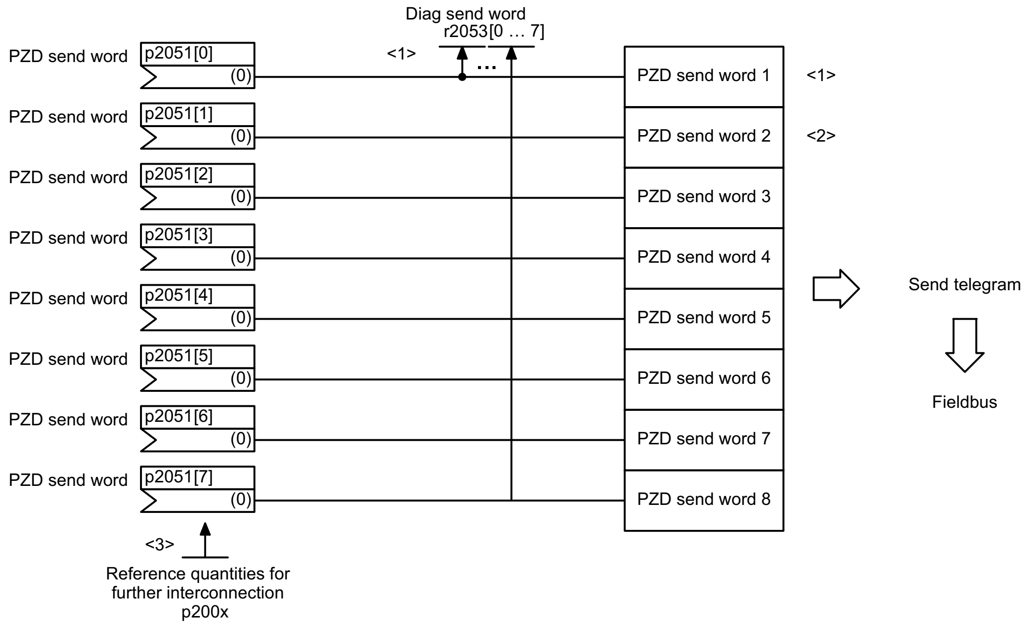
Fig. 3-40 9352 – ZSW1 status word interconnection

Fig. 3-41 9360 – Receive telegram, free interconnection via BICO (p0922 = 999)




<1> The receive word 1 must be used as control word (STW1) (due to bit 10 "control requested").
<2> The preconfiguration with the speed setpoint is set automatically via p1000 = 6.
<3> Using the connector-binector converters, the bits can be extracted from two of the PZD receive words 3 to 8 and used as binectors.
<4> The following representation applies for words: 4000 hex = 100 %.
The reference variables p200x apply for the ongoing interconnection (100 % -> p200x).
The following applies for temperature values: 100 °C -> 100 % = 4000 hex, 0 °C -> 0 %.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Fieldbus Interface (USS, MODBUS, BACnet) | | | | | fp_9360_97_52.vsd | Function diagram | - 9360 - |
| Receive telegram, free interconnection via BICO (p0922 = 999) | | | | | 07.04.2014 V4.7 | CU230P-2 BT/HVAC | |




<1> The send word 1 must be used as status word (ZSW1).

<2> The preconfiguration with the speed setpoint is set automatically via p1000 = 6.

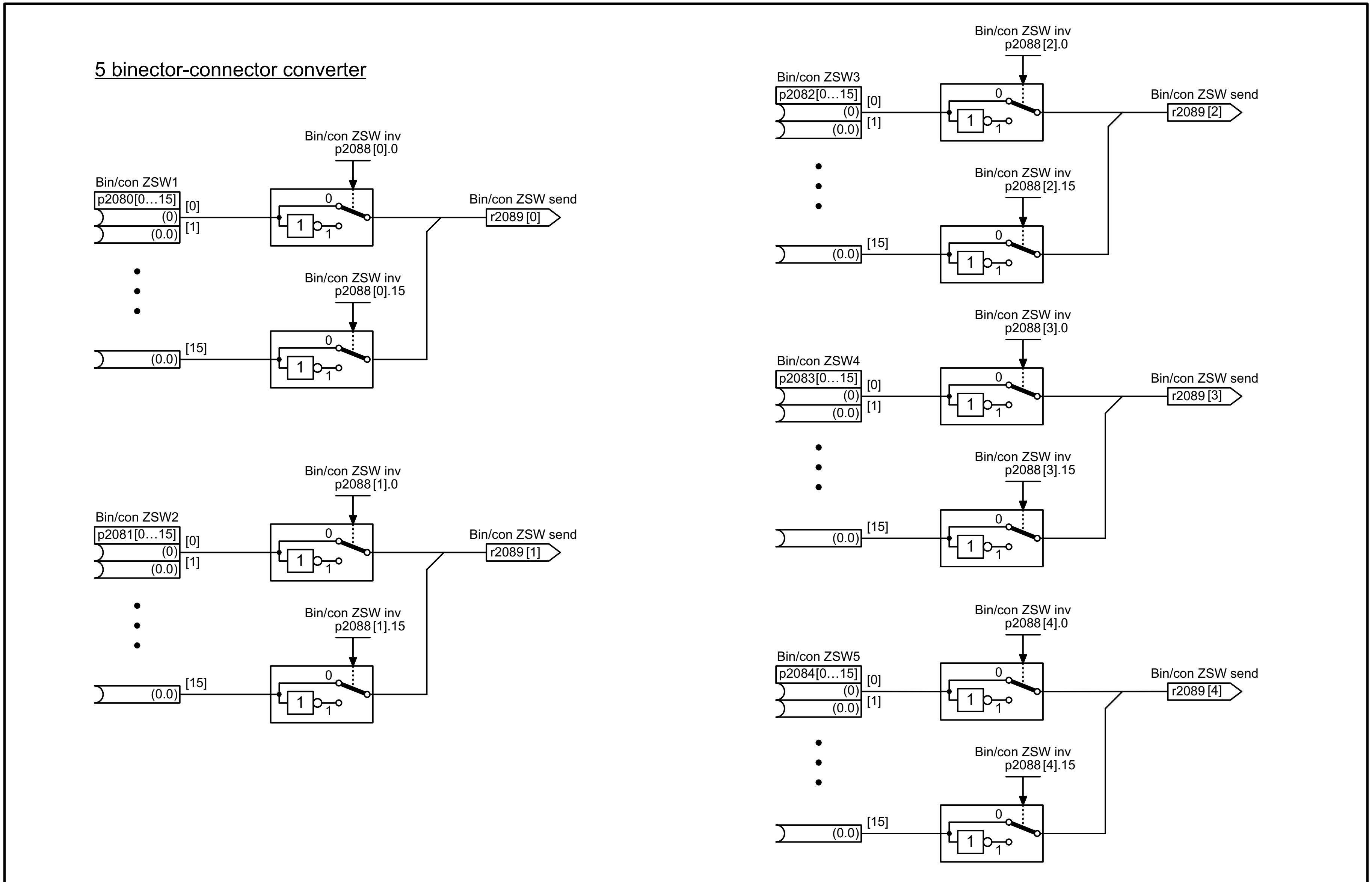
<3> Physical word values are inserted in the telegram as referenced variables. p200x apply as reference variables (telegram contents = 4000 hex, if the input variable has the value p200x).
The following applies for temperature values: 100 °C -> 100 % = 4000

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| Fieldbus Interface (USS, MODBUS, BACnet) | fp_9370_97_62.vsd | Function diagram | - 9370 - |
| Send telegram, free interconnection via BICO (p0922 = 999) | 07.04.2014 V4.7 | CU230P-2 BT/HVAC | |

Fig. 3-42 9370 – Send telegram, free interconnection via BICO (p0922 = 999)

Fig. 3-43 9372 – Status words, free interconnection



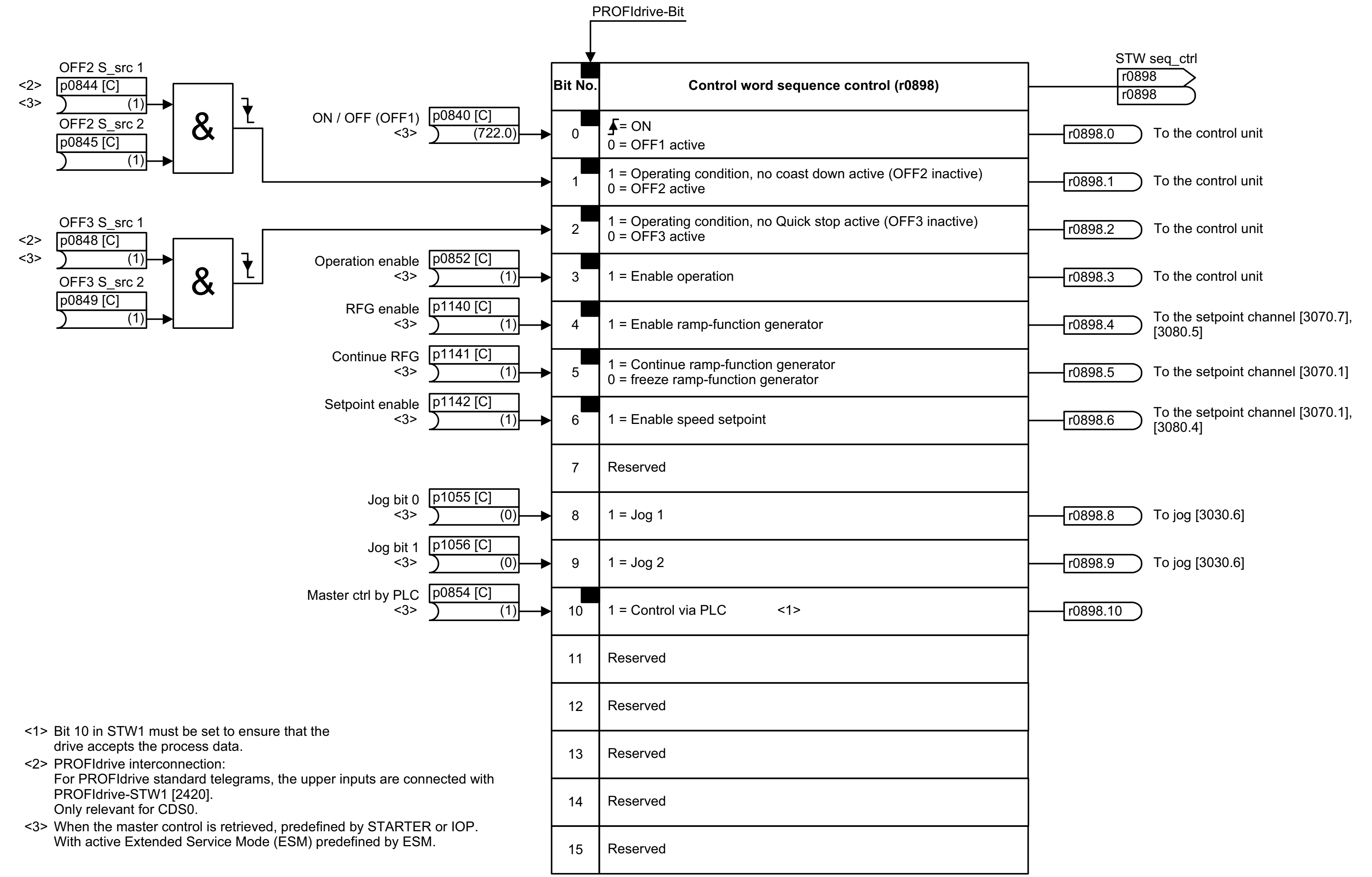

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| Fieldbus Interface (USS, MODBUS, BACnet) | fp_9372_97_52.vsd | Function diagram | - 9372 - |
| Status words, free interconnection | 07.04.2014 V4.7 | CU230P-2 BT/HVAC | |

# 3.8 Internal control/status words

## Function diagrams

Fig. 3-44 2501 – Control word, sequence control

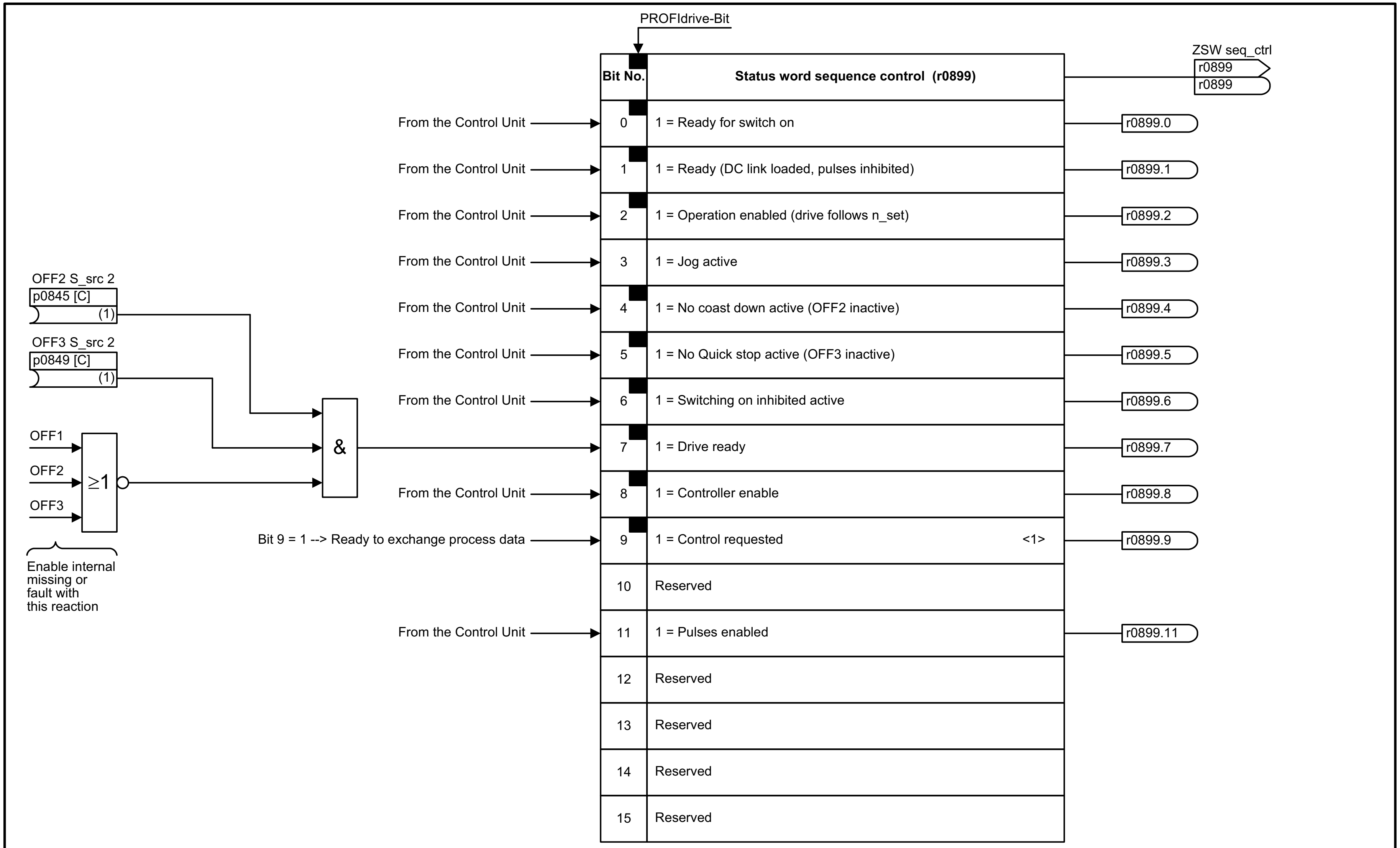



<1> Bit 10 in STW1 must be set to ensure that the drive accepts the process data.

<2> PROFIdrive interconnection:
For PROFIdrive standard telegrams, the upper inputs are connected with PROFIdrive-STW1 [2420].
Only relevant for CDS0.

<3> When the master control is retrieved, predefined by STARTER or IOP.
With active Extended Service Mode (ESM) predefined by ESM.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Internal control/status words | | | | | fp_2501_97_01.vsd | Function diagram | - 2501 - |
| Control word, sequence control | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |




<1> The drive is ready to accept data.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Internal control/status words | | | | | fp_2503_97_01.vsd | Function diagram | - 2503 - |
| Status word, sequence control | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-45 2503 – Status word, sequence control

STW setpoint chan: r1198 / r1198

| Signal | Parameter (default) | Bit No. | Control word setpoint channel (r1198) | Output | Destination |
|---|---|---|---|---|---|
| n_set_fixed Bit 0 | p1020 [C] (0) | 0 | 1 = Fixed setpoint, bit 0 | r1198.0 | To fixed speed setpoints [3010.2], [3011.2]<br>To control word 2 [2513.2] |
| n_set_fixed Bit 1 | p1021 [C] (0) | 1 | 1 = Fixed setpoint, bit 1 | r1198.1 | To fixed speed setpoints [3010.2], [3011.2]<br>To control word 2 [2513.2] |
| n_set_fixed Bit 2 | p1022 [C] (0) | 2 | 1 = Fixed setpoint, bit 2 | r1198.2 | To fixed speed setpoints [3010.2], [3011.2]<br>To control word 2 [2513.2] |
| n_set_fixed Bit 3 | p1023 [C] (0) | 3 | 1 = Fixed setpoint, bit 3 | r1198.3 | To fixed speed setpoints [3010.2], [3011.2]<br>To control word 2 [2513.2] |
| | | 4 | Reserved | | |
| Inhib neg dir | p1110 [C] (1) | 5 | 1 = Inhibit negative direction of rotation | r1198.5 | To direction of rotation limiting and direction of rotation reversal [3040.3] |
| Inhib pos dir | p1111 [C] (0) | 6 | 1 = Inhibit positive direction of rotation | r1198.6 | To direction of rotation limiting and direction of rotation reversal [3040.5] |
| | | 7 | Reserved | | |
| | | 8 | Reserved | | |
| | | 9 | Reserved | | |
| | | 10 | Reserved | | |
| Setp inv | p1113 [C] (722.1) | 11 | 1 = Setpoint inversion | r1198.11 | To direction of rotation limiting and direction of rotation reversal [3040.2] |
| | | 12 | Reserved | | |
| Mop raise | p1035 [C] (0) | 13 | 1 = Motorized potentiometer, raise | r1198.13 | To control word 1 [2512.4]<br>To the motorized potentiometer [3020.1] |
| Mop lower | p1036 [C] (0) | 14 | 1 = Motorized potentiometer, lower | r1198.14 | To control word 1 [2512.4]<br>To the motorized potentiometer [3020.1] |
| Bypass RFG | p1122 [C] (0) | 15 | 1 = Bypass ramp-function generator | r1198.15 | To the ramp-function generator [3070.3] |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Internal control/status words | | | | | fp_2505_97_51.vsd | Function diagram | - 2505 - |
| Control word, setpoint channel | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-46 2505 – Control word, setpoint channel

ZSW 1 → r0052

| Source | Parameter | Signal | Bit No. | Status word 1 (r0052) | Output |
|---|---|---|---|---|---|
| [2503.7] | r0899 / r0899.0 | ZSW seq_ctrl | 0 | 1 = Ready for switch on | r0052.0 |
| [2503.7] | r0899 / r0899.1 | ZSW seq_ctrl | 1 | 1 = Ready (DC link loaded, pulses inhibited) | r0052.1 |
| [2503.7] | r0899 / r0899.2 | ZSW seq_ctrl | 2 | 1 = Operation enabled | r0052.2 |
| [2548.7] | r2139 / r2139.3 | ZSW fault/alarm 1 | 3 | 1 = Fault present (pulses inhibited) <1> | r0052.3 |
| [2503.7] | r0899 / r0899.4 | ZSW seq_ctrl | 4 | 1 = No coast down active (OFF2 inactive) | r0052.4 |
| [2503.7] | r0899 / r0899.5 | ZSW seq_ctrl | 5 | 1 = No Quick stop active (OFF3 inactive) | r0052.5 |
| [2503.7] | r0899 / r0899.6 | ZSW seq_ctrl | 6 | 1 = Switching on inhibited active | r0052.6 |
| [2548.7] | r2139 / r2139.7 | ZSW fault/alarm 1 | 7 | 1 = Alarm present | r0052.7 |
| [2534.7] | r2197 / r2197.7 | ZSW monitor 1 | 8 | 1 = No deviation setpoint/actual speed | r0052.8 |
| [2503.7] | r0899 / r0899.7 | ZSW seq_ctrl | 9 | 1 = Control request | r0052.9 |
| [2534.7] | r2197 / r2197.6 | ZSW monitor 1 | 10 | 1 = Maximum speed reached (f_act >= p1082 (f_max))<br>0 = f_act < p1082 (f_max) | r0052.10 |
| [2526.7] | r0056 / r0056.13 | ZSW cl-loop ctrl | 11 | 0 = I,M,P limit reached | r0052.11 |
| | | | 12 | Reserved | |
| [2548.7] | r2135 / r2135.14 | ZSW fault/alarm 2 | 13 | 0 = Alarm motor overtemperature | r0052.13 |
| [2534.7] | r2197 / r2197.3 | ZSW monitor 1 | 14 | 1 = Motor rotates forwards | r0052.14 |
| [2548.7] | r2135 / r2135.15 | ZSW fault/alarm 2 | 15 | 0 = Alarm drive converter overload | r0052.15 |

Signal is inverted if connected to a Digital Output.

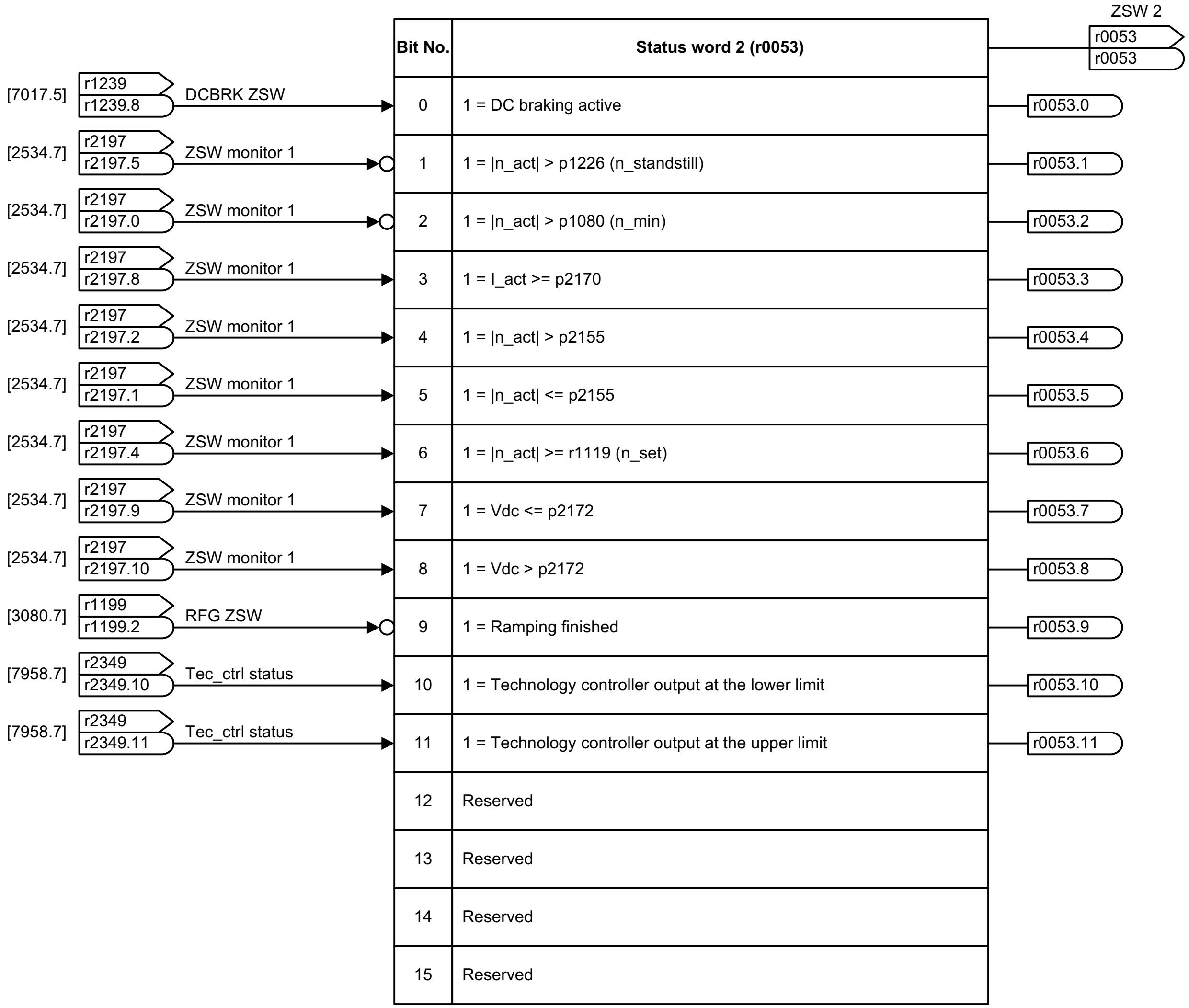
<1> When p1210 > 0, the source is r1214.10.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

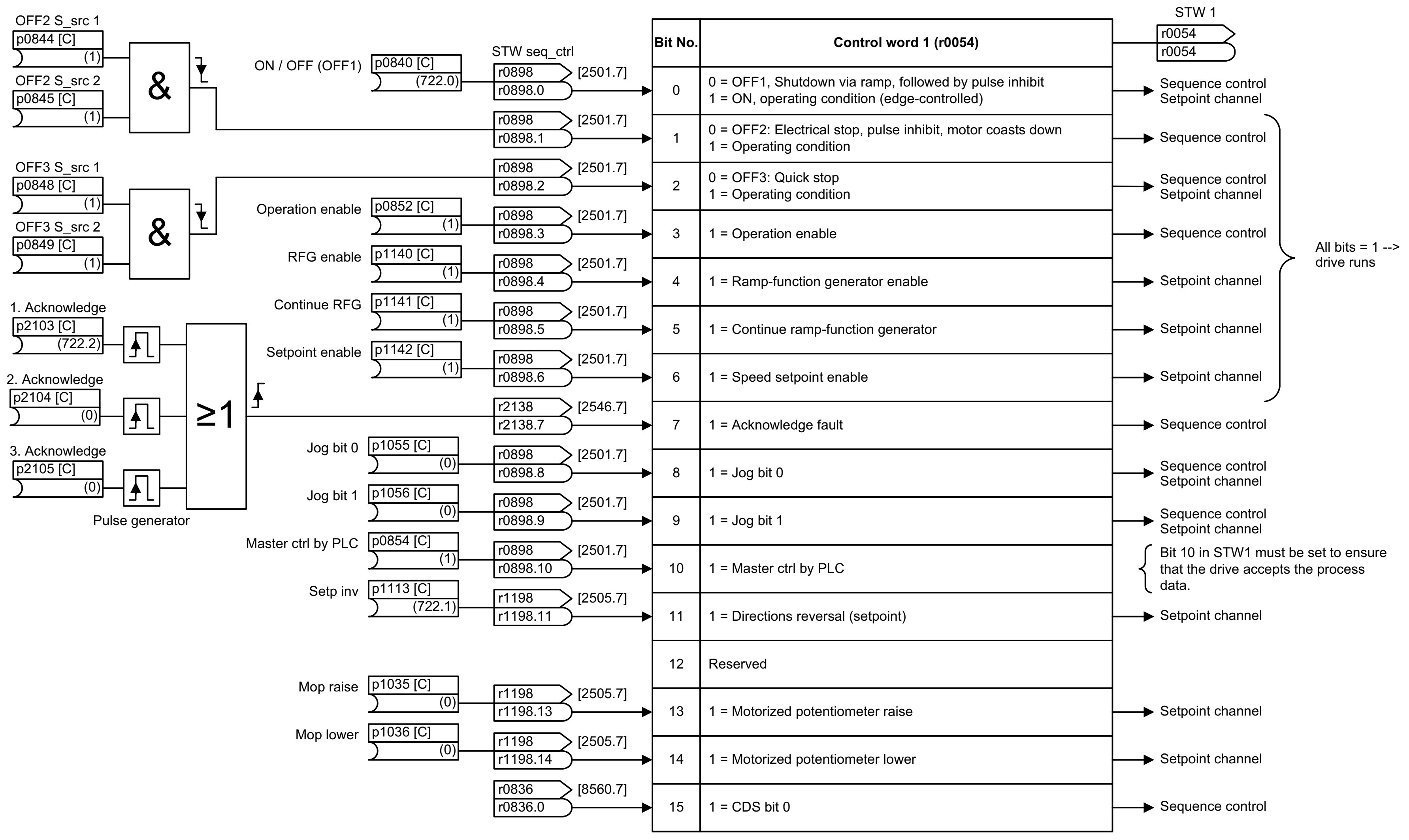
| | | | |
|---|---|---|---|
| Internal control/status words | fp_2510_97_01.vsd | Function diagram | - 2510 - |
| Status word 1 (r0052) | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-47 2510 – Status word 1 (r0052)

Fig. 3-48 2511 – Status word 2 (r0053)




| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Internal control/status words | | | | | fp_2511_97_51.vsd | Function diagram | - 2511 - |
| Status word 2 (r0053) | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |




| Bit No. | Control word 1 (r0054) | |
|---|---|---|
| 0 | 0 = OFF1, Shutdown via ramp, followed by pulse inhibit<br>1 = ON, operating condition (edge-controlled) | Sequence control<br>Setpoint channel |
| 1 | 0 = OFF2: Electrical stop, pulse inhibit, motor coasts down<br>1 = Operating condition | Sequence control |
| 2 | 0 = OFF3: Quick stop<br>1 = Operating condition | Sequence control<br>Setpoint channel |
| 3 | 1 = Operation enable | Sequence control |
| 4 | 1 = Ramp-function generator enable | Setpoint channel |
| 5 | 1 = Continue ramp-function generator | Setpoint channel |
| 6 | 1 = Speed setpoint enable | Setpoint channel |
| 7 | 1 = Acknowledge fault | Sequence control |
| 8 | 1 = Jog bit 0 | Sequence control<br>Setpoint channel |
| 9 | 1 = Jog bit 1 | Sequence control<br>Setpoint channel |
| 10 | 1 = Master ctrl by PLC | |
| 11 | 1 = Directions reversal (setpoint) | Setpoint channel |
| 12 | Reserved | |
| 13 | 1 = Motorized potentiometer raise | Setpoint channel |
| 14 | 1 = Motorized potentiometer lower | Setpoint channel |
| 15 | 1 = CDS bit 0 | Sequence control |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Internal control/status words | | | | | fp_2512_97_51.vsd | Function diagram | - 2512 - |
| Control word 1 (r0054) | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-49 2512 – Control word 1 (r0054)

Fig. 3-50 2513 – Control word 2 (r0055)

Suppl STW: r0055 / r0055

| Reference | Source | Signal | Bit No. | Control word 2 (r0055) | Destination |
|---|---|---|---|---|---|
| [2505.7] | r1198 / r1198.0 | STW setpoint chan | 0 | 1 = Fixed setp bit 0 | Fixed frequencies |
| [2505.7] | r1198 / r1198.1 | STW setpoint chan | 1 | 1 = Fixed setp bit 1 | Fixed frequencies |
| [2505.7] | r1198 / r1198.2 | STW setpoint chan | 2 | 1 = Fixed setp bit 2 | Fixed frequencies |
| [2505.7] | r1198 / r1198.3 | STW setpoint chan | 3 | 1 = Fixed setp bit 3 | Fixed frequencies |
| [8565.7] | r0837 / r0837.0 | DDS selected | 4 | 1 = DDS select. bit 0 | Sequence control |
| [8565.7] | r0837 / r0837.1 | DDS selected | 5 | 1 = DDS select. bit 1 | Sequence control |
| | | | 6 | Reserved | |
| | | | 7 | Reserved | |
| [7958.6] | r2349 / r2349.0 | Tec_ctrl status | 8 | 1 = Technology controller enable | Technology controller |
| [7017.7] | r1239 / r1239.11 | DCBRK ZSW | 9 | 1 = DC brake enable | DC braking control |
| | | | 10 | Reserved | |
| | | | 11 | 1 = Droop enable | Speed control |
| | | | 12 | 1 = Torque control active | Speed/torque control |
| [2546.7] | r2138 / r2138.13 | STW fault/alarm | 13 | 0 = External fault 1 (F07860) | Sequence control |
| | | | 14 | Reserved | |
| [8560.7] | r0836 / r0836.0 | CDS selected | 15 | 1 = CDS bit 1 | Sequence control |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| Internal control/status words | fp_2513_97_01.vsd | Function diagram | - 2513 - |
| Control word 2 (r0055) | 07.04.2014 V4.7 | G120 CU230P-2 | |

ZSW n_ctrl
r1407
r1407

| Source | Bit No. | Status word speed controller (r1407) | Output |
|---|---|---|---|
| | 0 | 1 = U/f control active | r1407.0 |
| From the changeover, closed-loop control types | 1 | 1 = Sensorless operation active | r1407.1 |
| | 2 | 1 = Torque control active | r1407.2 |
| From the control unit<br>From the speed controller [6040.7] | 3 | 1 = Speed control active | r1407.3 |
| | 4 | Reserved | |
| From the speed controller [6040.7] | 5 | 1 = Speed controller, I component held | r1407.5 |
| From the speed controller [6040.7] | 6 | 1 = Speed controller, I component set | r1407.6 |
| From the torque setpoint [6060.8] | 7 | 1 = Torque limit reached | r1407.7 |
| From the torque setpoint [6060.5], [6060.7] | 8 | 1 = Torque limiting, upper, active | r1407.8 |
| From the torque setpoint [6060.5], [6060.7] | 9 | 1 = Torque limiting, lower, active | r1407.9 |
| | 10 | 1 = Droop enabled | r1407.10 |
| From the speed setpoint, droop [6030.4], [6030.5] | 11 | 1 = Speed setpoint limited | r1407.11 |
| | 12 | 1 = Ramp-function generator set | r1407.12 |
| | 13 | 1 = Sensorless operation due to a fault | r1407.13 |
| | 14 | 1 = I/f control active | r1407.14 |
| From the torque setpoint [6060.5] | 15 | 1 = Torque limit reached | r1407.15 |
| | 16 | Reserved | |
| From the speed limiting [6640.8] | 17 | 1 = Speed limiting control active | r1407.17 |

Ramp-function generator tracking [3080.1]
Speed controller [6040.4]
Motor locked/stalled [8012.2]

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| Internal control/status words | fp_2522_97_01.vsd | Function diagram | - 2522 - |
| Status word, speed controller (r1407) | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-51 2522 – Status word, speed controller

Fig. 3-52 2526 – Status word, closed-loop control

ZSW cl-loop ctrl: r0056, r0056

| Input | Bit No. | Status word closed-loop control (r0056) | Note | Output | Reference |
|---|---|---|---|---|---|
| | 0 | 1 = Initialization completed | | r0056.0 | |
| | 1 | 1 = De-magnetization completed | | r0056.1 | |
| | 2 | 1 = Pulse enable available | | r0056.2 | |
| | 3 | Reserved | | | |
| [6722.6] | 4 | 1 = Magnetization completed | | r0056.4 | |
| [6301.4] | 5 | 1 = Starting boost active | | r0056.5 | |
| [6301.2] | 6 | 1 = Acceleration voltage active | <1> | r0056.6 | |
| [6730.5] | 7 | 1 = Frequency, negative | | r0056.7 | [6710.1] |
| [6722.3] | 8 | 1 = Field weakening active | | r0056.8 | |
| [6714.8] | 9 | 1 = Voltage limit active | | r0056.9 | |
| [6310.8] | 10 | 1 = Slip limiting active | <1> | r0056.10 | |
| [6730.5] | 11 | 1 = Frequency limit active | | r0056.11 | |
| | 12 | 1 = Current limiting controller, voltage output active | <1> | r0056.12 | [8012.5] |
| [6060.7] | 13 | 1 = Current/torque limiting active | <1> | r0056.13 | [8012.5] |
| [6220.8], [6320.8] | 14 | 1 = Vdc_max controller active | <2> | r0056.14 | [6031.6], [6710.2] |
| [6220.8], [6320.8] | 15 | 1 = Vdc_min controller active | <2> | r0056.15 | [6710.1] |

<1> Only for U/f control.
<2> Only for Power Modules PM230/PM240/PM330.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| Internal control/status words | fp_2526_97_01.vsd | Function diagram | - 2526 - |
| Status word, closed-loop control | 07.04.2014 V4.7 | G120 CU230P-2 | |

ZSW I_ctrl: r1408, r1408

| Input | Bit No. | Status word current control (r1408) | Output |
|---|---|---|---|
| | 0 | 1 = Closed-loop current control active | r1408.0 |
| [6714.5] | 1 | 1 = Id controller I comp. limitation | r1408.1 |
| | 2 | Reserved | |
| [6714.8] | 3 | 1 = Voltage limitation | r1408.3 |
| | 4 | Reserved | |
| | 5 | Reserved | |
| | 6 | Reserved | |
| | 7 | Reserved | |
| | 8 | Reserved | |
| | 9 | Reserved | |
| [6730.3] | 10 | 1 = Speed adaptation limitation | r1408.10 |
| | 11 | Reserved | |
| [2536.7] r2198 / r2198.7 ZSW monitor 2 | 12 | 1 = Motor stalled | r1408.12 |
| | 13 | 1 = Separately-excited synchronous motor is excited | r1408.13 |
| | 14 | 1 = Current model FEM: Magnetizing excitation current set to 0 | r1408.14 |
| | 15 | Reserved | |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| Internal control/status words | fp_2530_97_64.vsd | Function diagram | - 2530 - |
| Status word, closed-loop current control | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-53 2530 – Status word, closed-loop current control

Fig. 3-54 2534 – Status word, monitoring functions 1

ZSW monitor 1
r2197
r2197

| Source | Bit No. | Status word, monitoring functions 1 (r2197) | |
|---|---|---|---|
| From extended signals [8020.8] | 0 | 1 = \|n_act\| <= n_min p1080 | r2197.0 |
| From speed signals [8010.8] | 1 | 1 = \|n_act\| <= speed threshold value 2 (p2155) <1> | r2197.1 |
| | 2 | 1 = \|n_act\| > speed threshold value 2 (p2155) <1> | r2197.2 |
| From speed signals [8011.8] | 3 | 1 = n_act >= 0 | r2197.3 |
| From extended signals [8020.8] | 4 | 1 = \|n_act\| >= n_set | r2197.4 |
| From extended signals [8020.8] | 5 | 1 = \|n_act\| <= n_standstill p1226 | r2197.5 |
| From speed signals [8010.8] | 6 | 1 = \|n_act\| > n_max | r2197.6 |
| From speed signals [8011.8] | 7 | 1 = Speed setpoint - actual value deviation within tolerance t_off | r2197.7 |
| From extended signals [8020.8] | 8 | 1 = I_act >= I_threshold p2170 | r2197.8 |
| From extended signals [8020.8] | 9 | 1 = Vdc_act <= Vdc_threshold p2172 | r2197.9 |
| From extended signals [8020.8] | 10 | 1 = Vdc_act > Vdc_threshold p2172 | r2197.10 |
| From extended signals [8020.8] | 11 | 1 = Load missing | r2197.11 |
| | 12 | Reserved | |
| | 13 | 1 = \|n_act\| > n_max (F07901) | r2197.13 |
| | 14 | Reserved | |
| | 15 | Reserved | |

<1> n_act = smoothed speed actual value r2169 [8010.2].

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| Internal control/status words | fp_2534_97_01.vsd | Function diagram | - 2534 - |
| Status word, monitoring functions 1 | 07.04.2014 V4.7 | G120 CU230P-2 | |

ZSW monitor 2
r2198
r2198

| Input | Bit No. | Status word, monitoring functions 2 (r2198) | Output |
|---|---|---|---|
| | 0 | Reserved | |
| | 1 | Reserved | |
| | 2 | Reserved | |
| | 3 | Reserved | |
| From speed signals [8011.8] | 4 | 1 = \|n_set\| < p2161 | r2198.4 |
| From speed signals [8011.8] | 5 | 1 = n_set > 0 | r2198.5 |
| From torque messages, motor locked/stalled [8012.7] | 6 | 1 = Motor blocked | r2198.6 |
| From torque messages, motor locked/stalled [8012.8] | 7 | 1 = Motor stalled | r2198.7 [2530.2] |
| From extended signals [8020.8] | 8 | 1 = \|I_act\| < I_threshold p2170 | r2198.8 |
| | 9 | Reserved | |
| | 10 | Reserved | |
| From load monitoring [8013.8] | 11 | 1 = Load monitoring signals an alarm | r2198.11 |
| From load monitoring [8013.8] | 12 | 1 = Load monitoring signals a fault | r2198.12 |
| | 13 | Reserved | |
| | 14 | Reserved | |
| | 15 | Reserved | |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| Internal control/status words | fp_2536_97_01.vsd | Function diagram | - 2536 - |
| Status word, monitoring functions 2 | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-55 2536 – Status word, monitoring functions 2

Fig. 3-56 2537 – Status word, monitoring functions 3

PROFIdrive-Bit

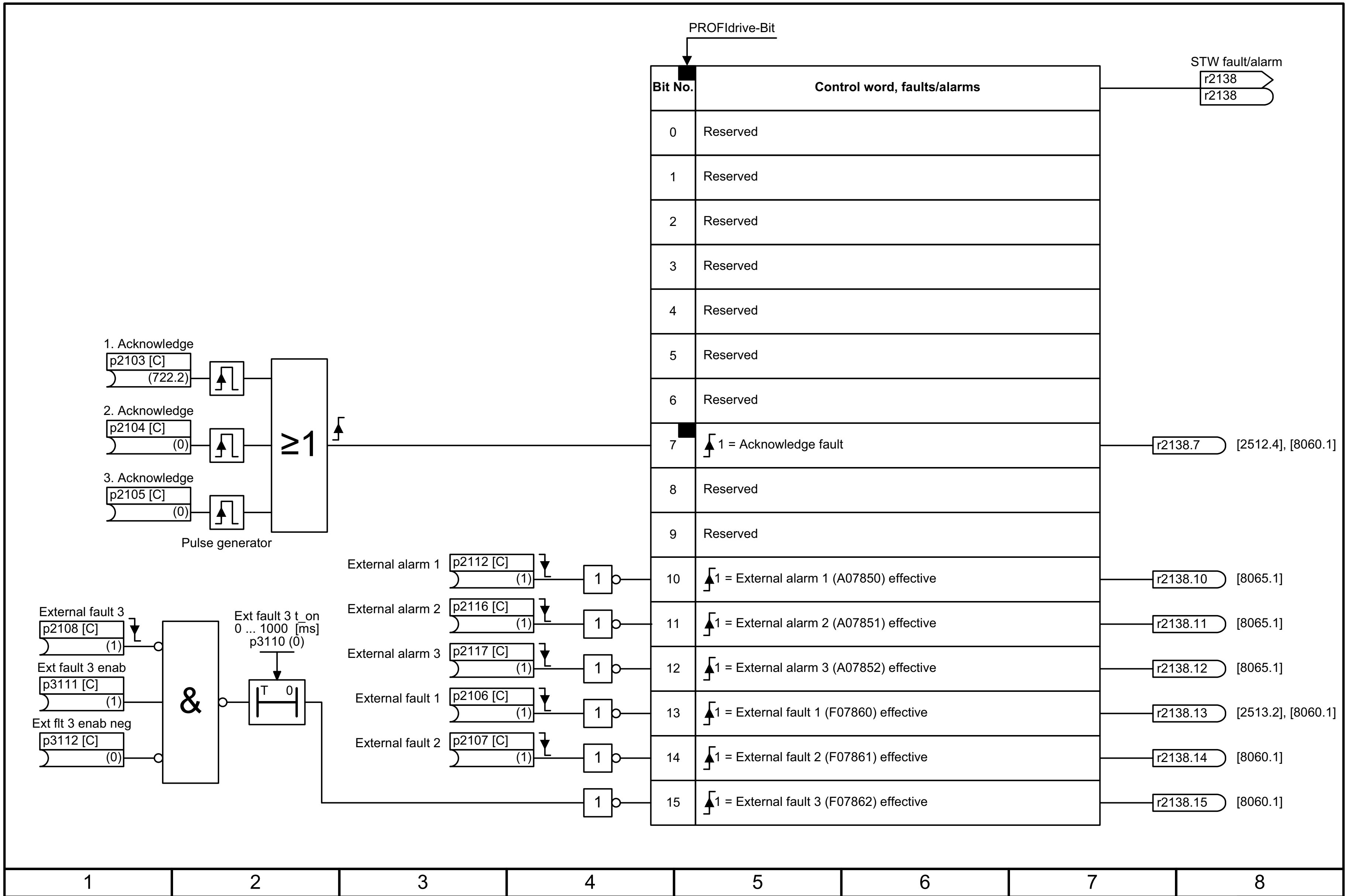
ZSW monitor 3: r2199, r2199

| Input | Bit No. | Status word, monitoring functions 3 (r2199) | Output |
|---|---|---|---|
| From speed signals [8010.8] | 0 | 1 = \|n_act\| < speed threshold value 3 (p2161) <1> | r2199.0 |
| From speed signals [8010.8] | 1 | 1 = f or n comparison value reached or exceeded (p2141) | r2199.1 |
| | 2 | Reserved | |
| | 3 | Reserved | |
| From speed signals [8011.8] | 4 | 1 = Speed setpoint - actual value deviation within tolerance t_on | r2199.4 |
| From speed signals [8011.8] | 5 | 1 = Ramp-up/ramp-down completed<br>0 = Ramp-function generator active | r2199.5 [8012.1] |
| | 6 | Reserved | |
| | 7 | Reserved | |
| | 8 | Reserved | |
| | 9 | Reserved | |
| | 10 | Reserved | |
| | 11 | Reserved | |
| | 12 | Reserved | |
| | 13 | Reserved | |
| | 14 | Reserved | |
| | 15 | Reserved | |

<1> n_act = smoothed speed actual value r2169 [8010.2].

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| Internal control/status words | fp_2537_97_01.vsd | Function diagram | - 2537 - |
| Status word, monitoring functions 3 | 07.04.2014 V4.7 | G120 CU230P-2 | |




| | | | |
|---|---|---|---|
| Internal control/status words | fp_2546_97_51.vsd | Function diagram | - 2546 - |
| Control word, faults/alarms | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-57 2546 – Control word, faults/alarms

ZSW fault/alarm 1: r2139

| Input | Bit No. | Status word, faults/alarms 1 | Output | Ref. |
|---|---|---|---|---|
| | 0 | 1 = Acknowledgement running | r2139.0 | |
| | 1 | 1 = Acknowledgement required | r2139.1 | |
| | ... | Reserved | | |
| From the fault buffer [8060.6] | 3 | 1 = Fault present | r2139.3 | [2510.2] |
| | ... | Reserved | | |
| | 6 | 1 = Internal signal 1 present | r2139.6 | |
| From the alarm buffer [8065.4] | 7 | 1 = Alarm present | r2139.7 | [2510.2] |
| | 8 | 1 = Internal signal 2 present | r2139.8 | |
| | ... | Reserved | | |
| From the alarm buffer [8065.4] | 11 | 1 = Alarm class bit 0 | r2139.11 | |
| From the alarm buffer [8065.4] | 12 | 1 = Alarm class bit 1 | r2139.12 | |
| From the alarm buffer [8065.4] | 13 | 1 = Maintenance required | r2139.13 | |
| From the alarm buffer [8065.4] | 14 | 1 = Maintenance urgently required | r2139.14 | |
| From the fault buffer [8060.6] | 15 | 1 = Fault gone/can be acknowledged | r2139.15 | |

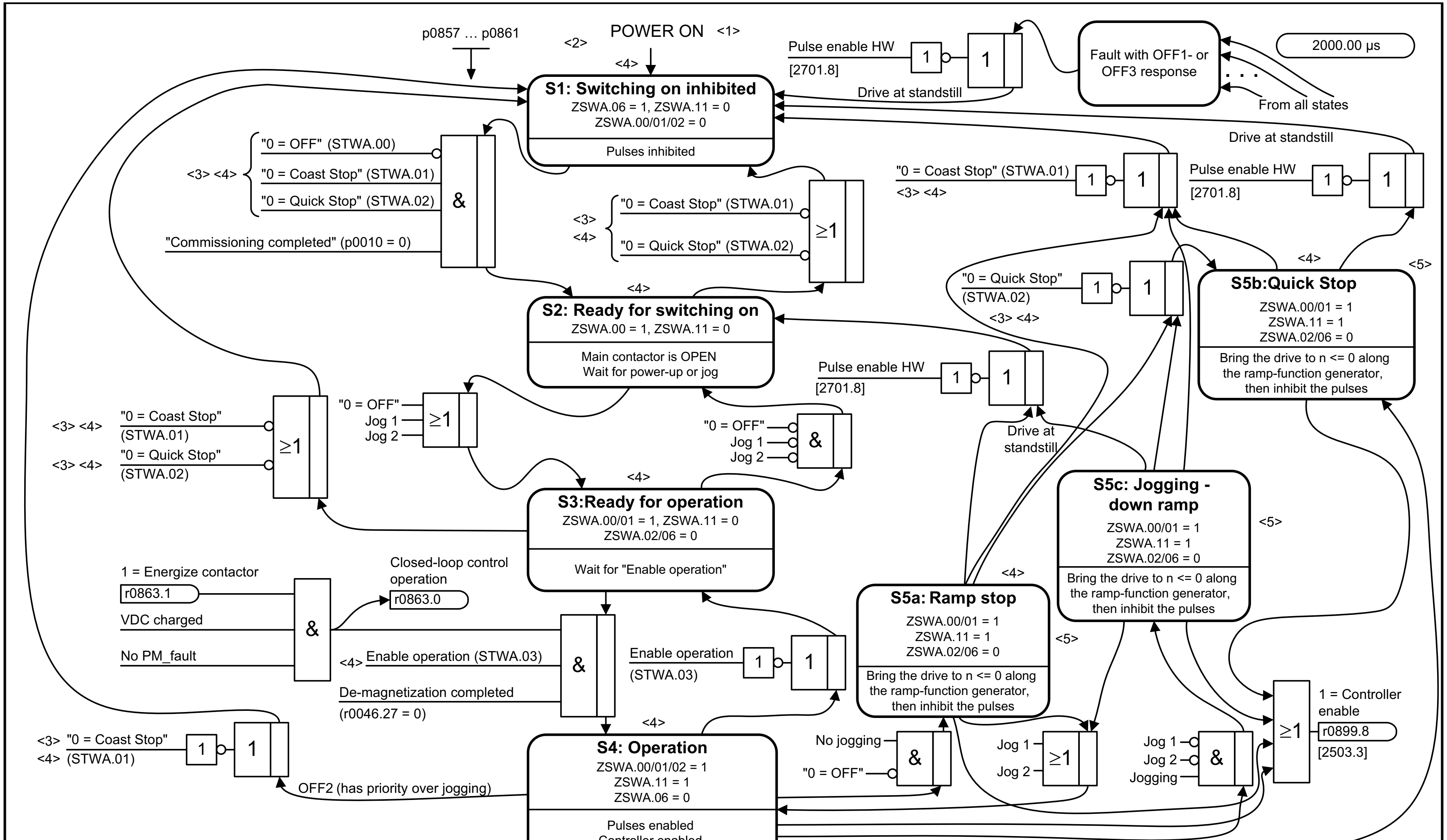
ZSW fault/alarm 2: r2135

| Input | Bit No. | Status word, faults/alarms 2 | Output | Ref. |
|---|---|---|---|---|
| | 0 ... 11 | Reserved | | |
| From the thermal monitoring, motor [8016.8] | 12 | 1 = Fault motor overtemperature | r2135.12 | |
| From the thermal monitoring, power module [8014.8] | 13 | 1 = Fault, thermal overload, power module | r2135.13 | |
| From the thermal monitoring, motor [8016.8] | 14 | 1 = Alarm motor overtemperature | r2135.14 | [2510.2] |
| From the thermal monitoring, motor [8016.8] | 15 | 1 = Alarm, thermal overload, power module | r2135.15 | [2510.2] |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| Internal control/status words | fp_2548_97_61.vsd | Function diagram | - 2548 - |
| Status word, faults/alarms 1 and 2 | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-58 2548 – Status word, faults/alarms 1 and 2



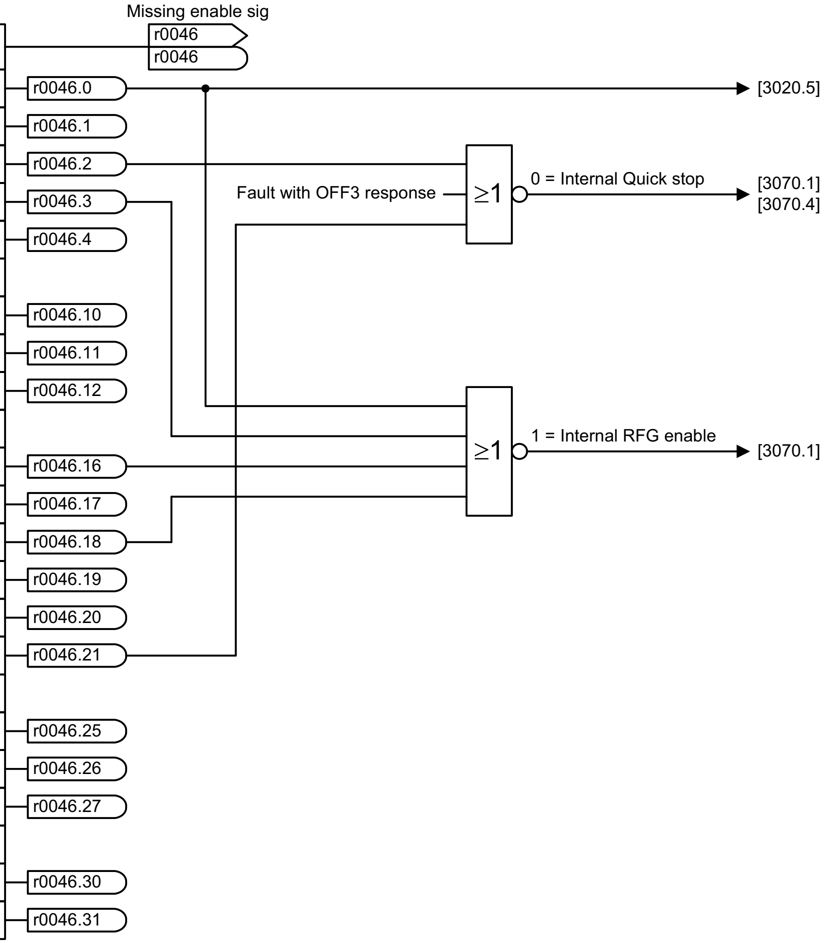

<1> POWER ON = 24 V electronics supply OFF --> ON or RESET button.
<2> The sequence control is implemented according to the PROFIdrive profile.
<3> These control commands can also be triggered by a fault response.
<4> STWA.xx = control word, sequence control, bit xx (r0898) [2501]; ZSWA.xx = status word, sequence control bit xx (r0899) [2503].
<5> The parameters p1226, p1227 and p1228 influence this status.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Internal control/status words | | | | | fp_2610_97_01.vsd | Function diagram | - 2610 - |
| Sequence control - Sequencer | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-59 2610 – Sequence control - Sequencer

Fig. 3-60 2634 – Sequence control - Missing enable signals

| Bit No. | Missing enable signals (r0046) |
|---|---|
| 0 | 1 = OFF1 enable missing |
| 1 | 1 = OFF2 enable missing |
| 2 | 1 = OFF3 enable missing |
| 3 | 1 = Operation enable missing |
| 4 | 1 = DC current brake, enable missing |
| ... | Reserved |
| 10 | 1 = Ramp-function generator enable missing |
| 11 | 1 = Ramp-function generator start missing |
| 12 | 1 = Setpoint enable missing |
| ... | Reserved |
| 16 | 1 = OFF1 enable internal missing |
| 17 | 1 = OFF2 enable internal missing |
| 18 | 1 = OFF3 enable internal missing |
| 19 | 1 = Pulse enable internal missing |
| 20 | 1 = DC current brake, internal enable missing |
| 21 | 1 = PU enable missing |
| ... | Reserved |
| 25 | 1 = Function Bypass active |
| 26 | 1 = Drive inactive or not operational |
| 27 | 1 = Demagnetizing not completed |
| ... | Reserved |
| 30 | 1 = Speed controller inhibited |
| 31 | 1 = Jog setpoint active |



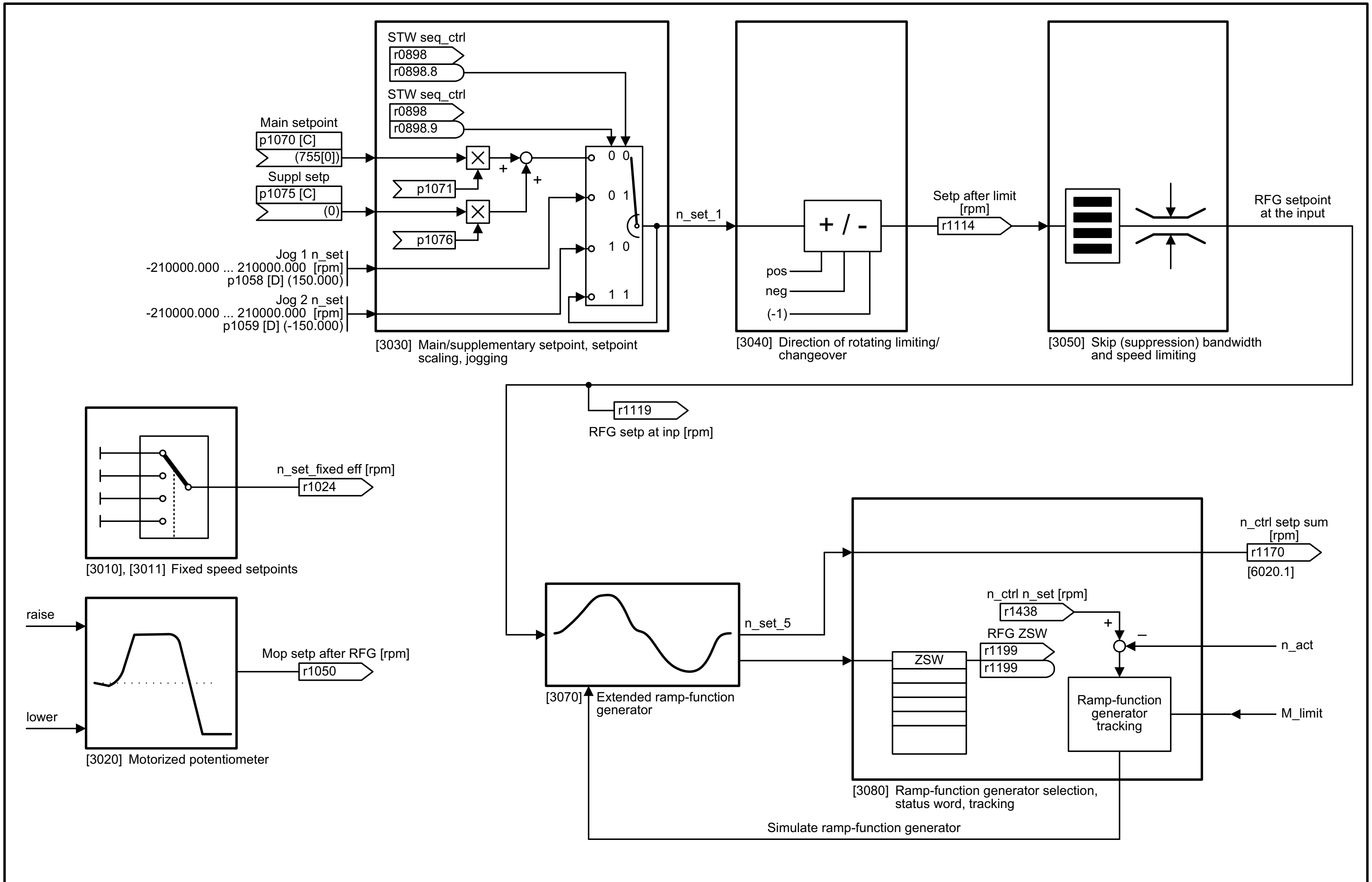

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| Internal control/status words | fp_2634_97_01.vsd | Function diagram | - 2634 - |
| Sequence control - Missing enable signals | 07.04.2014 V4.7 | G120 CU230P-2 | |

## 3.9 Setpoint channel

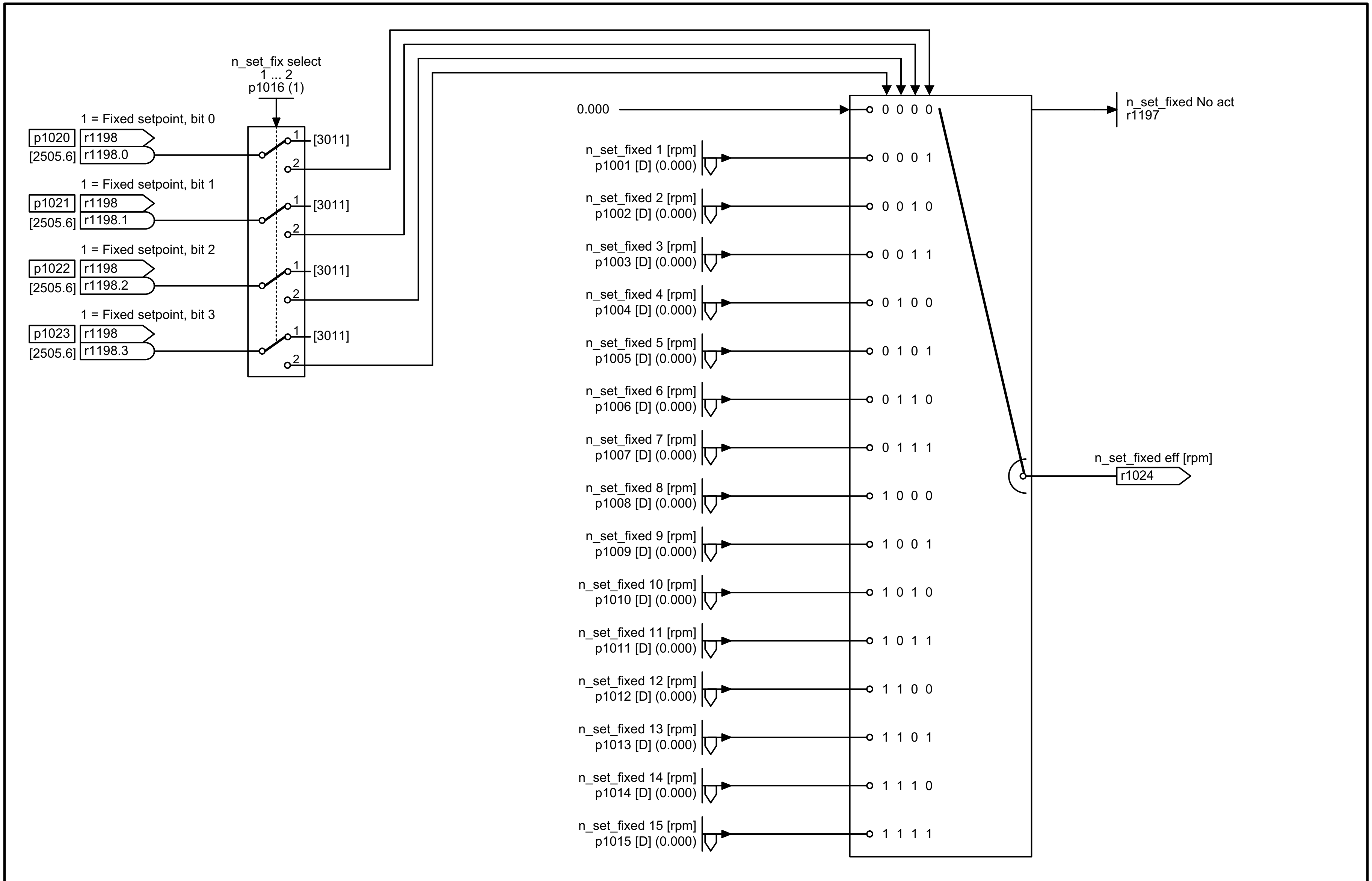
### Function diagrams

Fig. 3-61 3001 – Overview



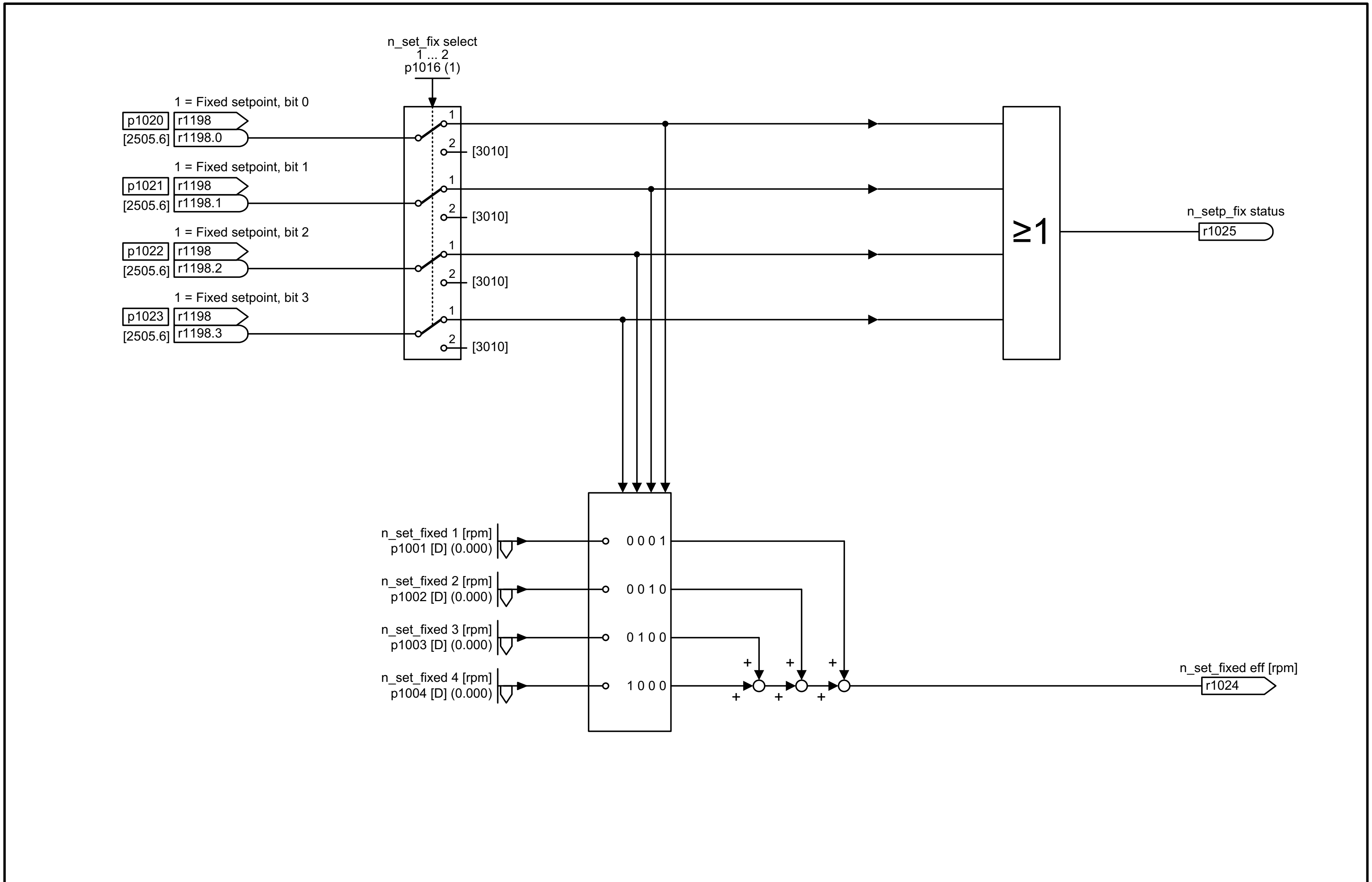

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| Setpoint channel | fp_3001_97_01.vsd | Function diagram | - 3001 - |
| Overview | 07.04.2014 V4.7 | G120 CU230P-2 | |




| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Setpoint channel | | | | | fp_3010_97_51.vsd | Function diagram | - 3010 - |
| Fixed speed setpoints, binary selection (p1016 = 2) | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

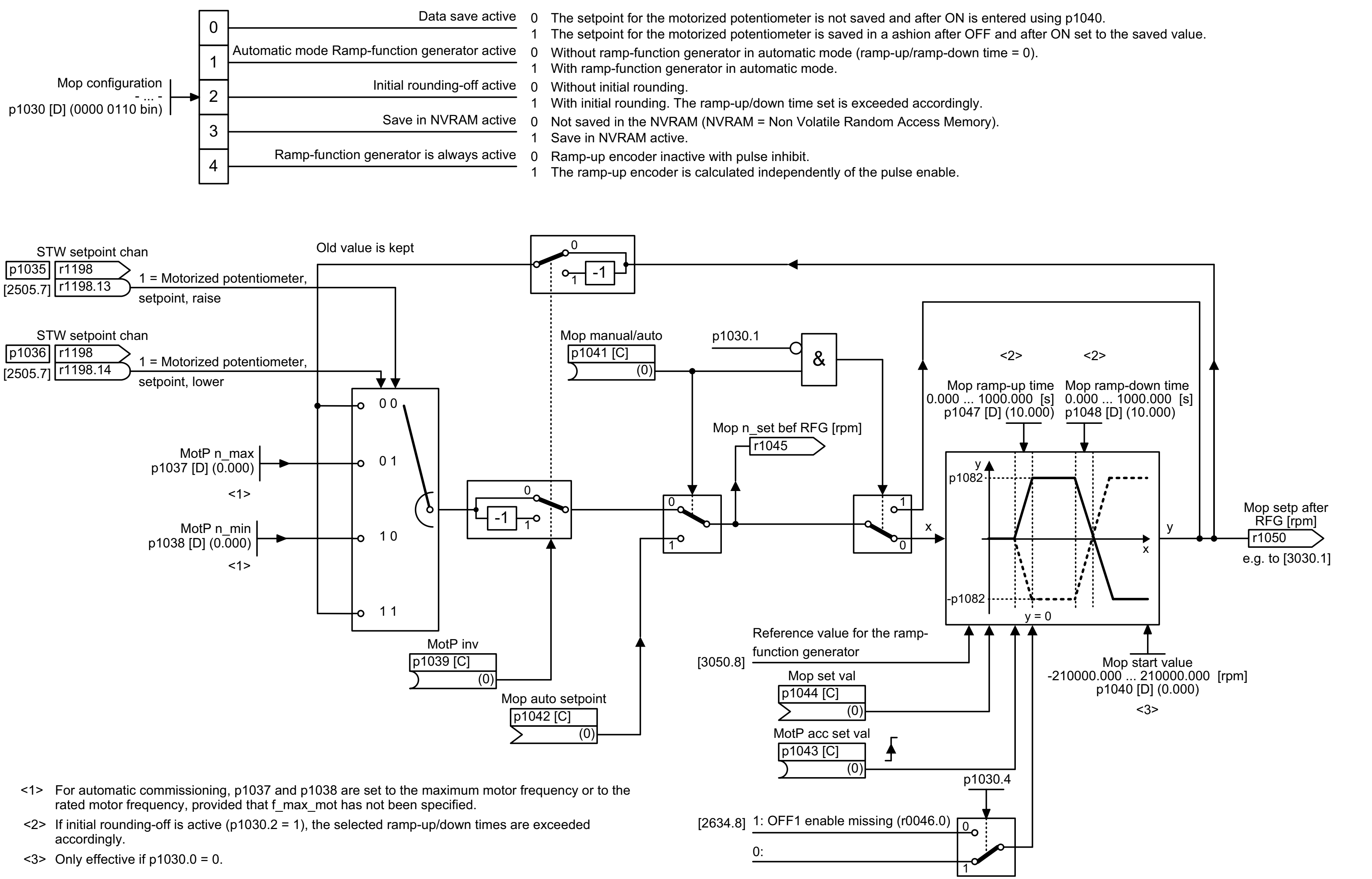
Fig. 3-62 3010 – Fixed speed setpoints, binary selection (p1016 = 2)




| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Setpoint channel | | | | | fp_3011_97_51.vsd | Function diagram | - 3011 - |
| Fixed speed setpoints, direct selection (p1016 = 1) | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-63 3011 – Fixed speed setpoints, direct selection (p1016 = 1)

Fig. 3-64 3020 – Motorized potentiometer



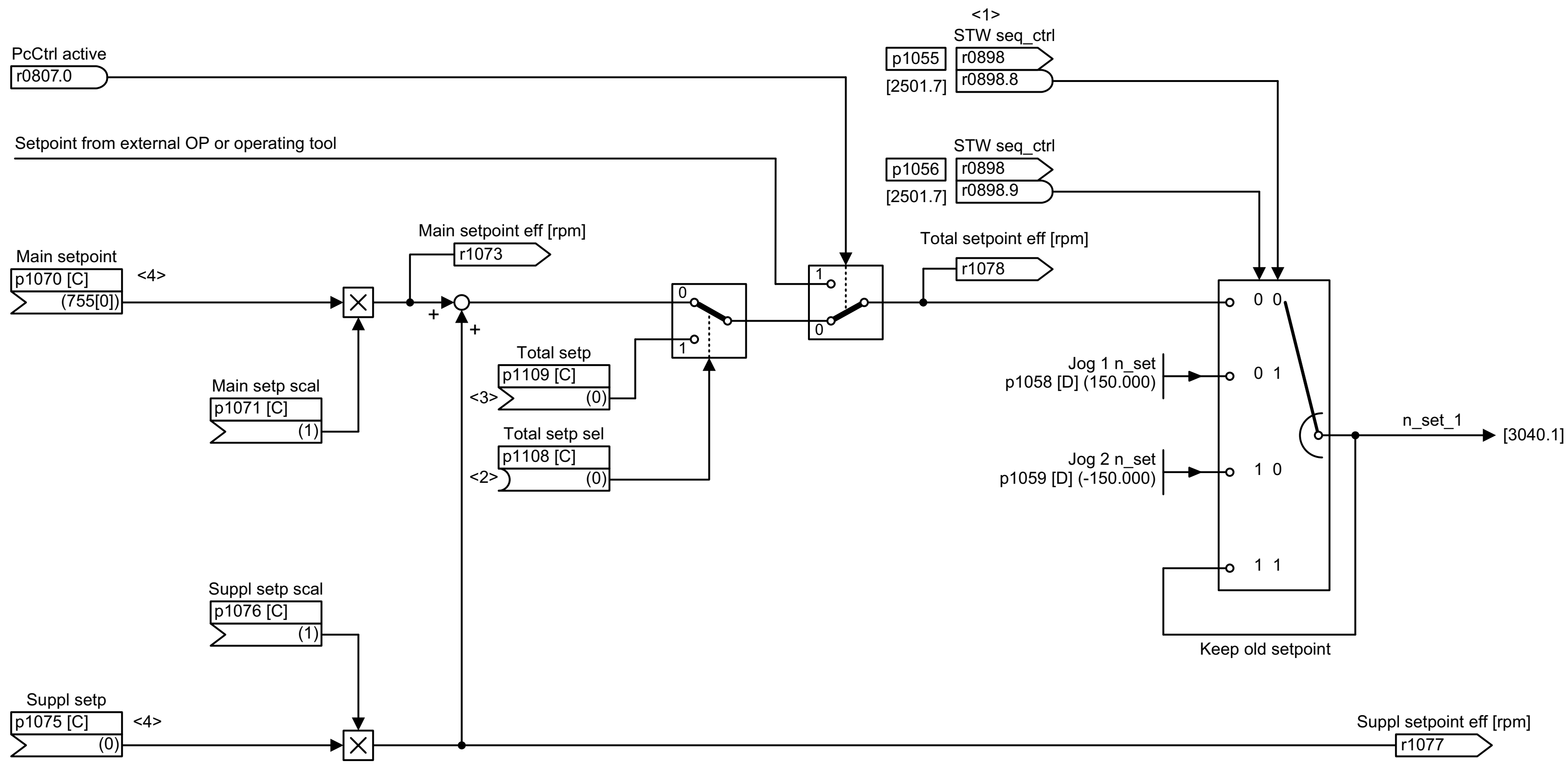

<1> For automatic commissioning, p1037 and p1038 are set to the maximum motor frequency or to the rated motor frequency, provided that f_max_mot has not been specified.

<2> If initial rounding-off is active (p1030.2 = 1), the selected ramp-up/down times are exceeded accordingly.

<3> Only effective if p1030.0 = 0.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Setpoint channel | | | | | fp_3020_97_51.vsd | Function diagram | - 3020 - |
| Motorized potentiometer | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-65 3030 – Main/supplementary setpoint, setpoint scaling, jogging




<1> Jogging can only be activated in the operating state “Ready for operation (S2)“.
<2> If technology controller is activated (p2200 > 0, p2251 = 0) connected with r2349.4.
<3> If technology controller is activated (p2200 > 0, p2251 = 0) connected with r2294.
<4> The connection to the source for the main and additional setpoint is estabished automatically via the setting in p1000.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Setpoint channel | | | | | fp_3030_97_51.vsd | Function diagram | - 3030 - |
| Main/supplementary setpoint, setpoint scaling, jogging | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

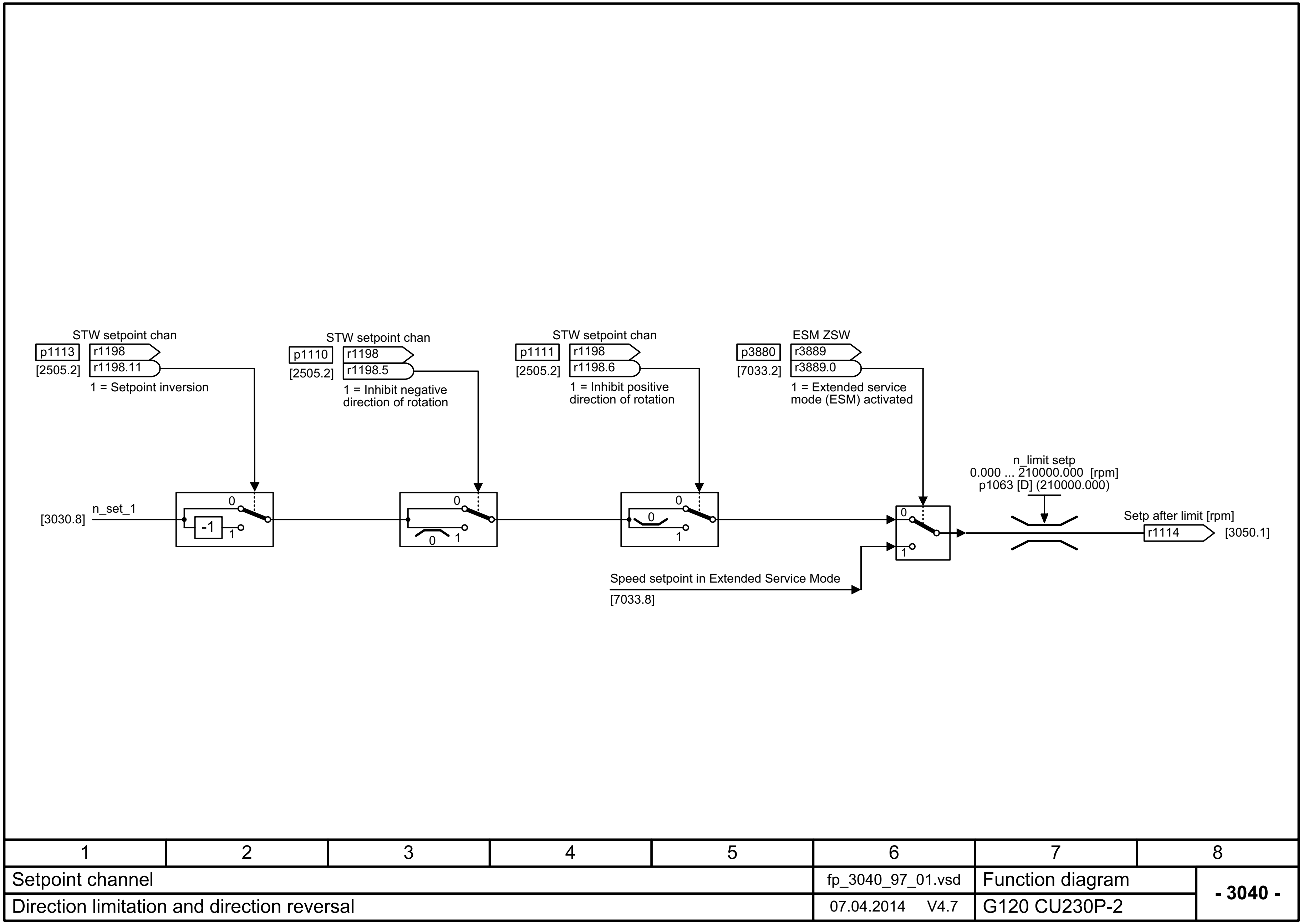
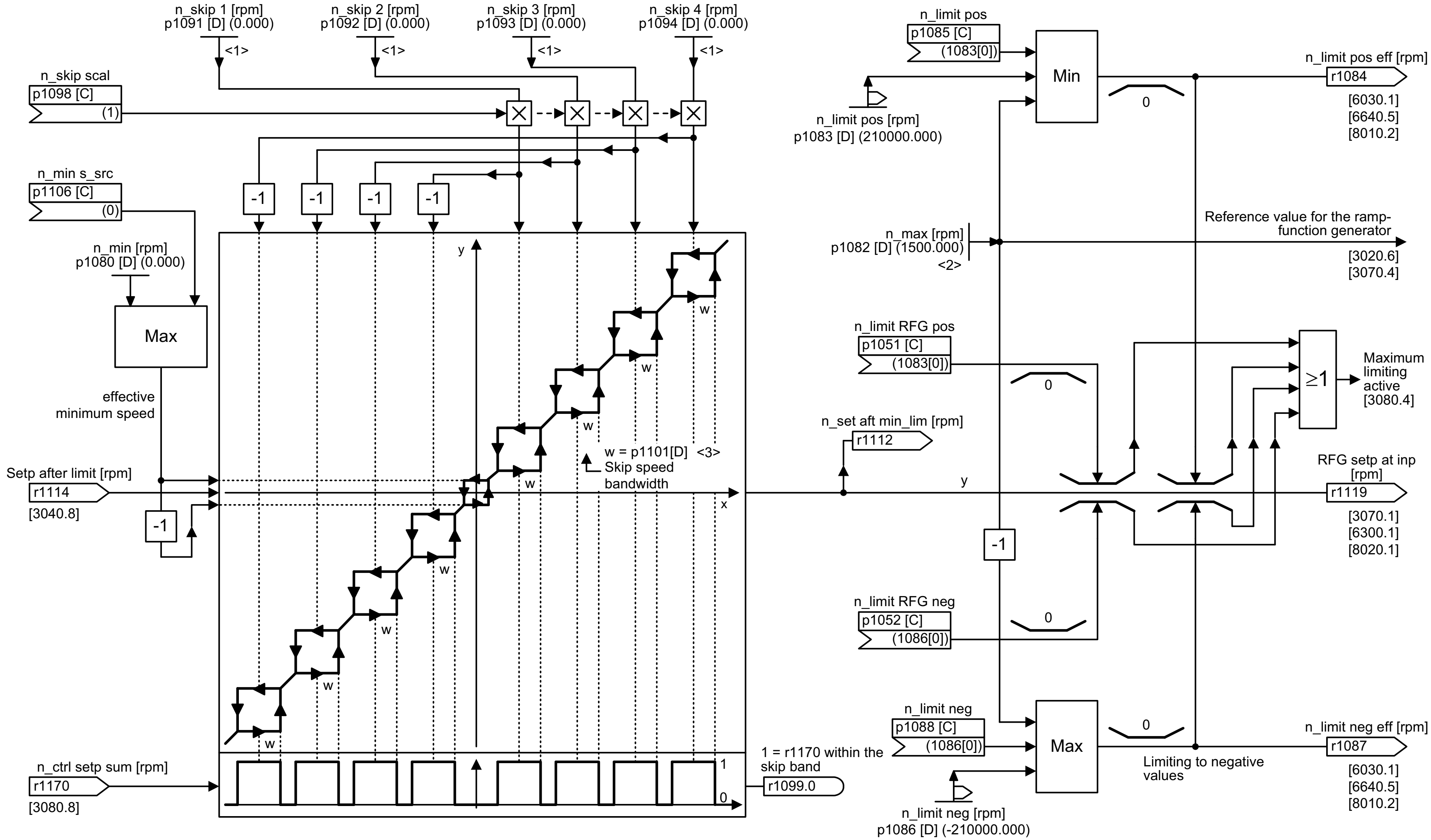



Fig. 3-66 3040 – Direction limitation and direction reversal

Fig. 3-67 3050 – Skip frequency bands and speed limitations

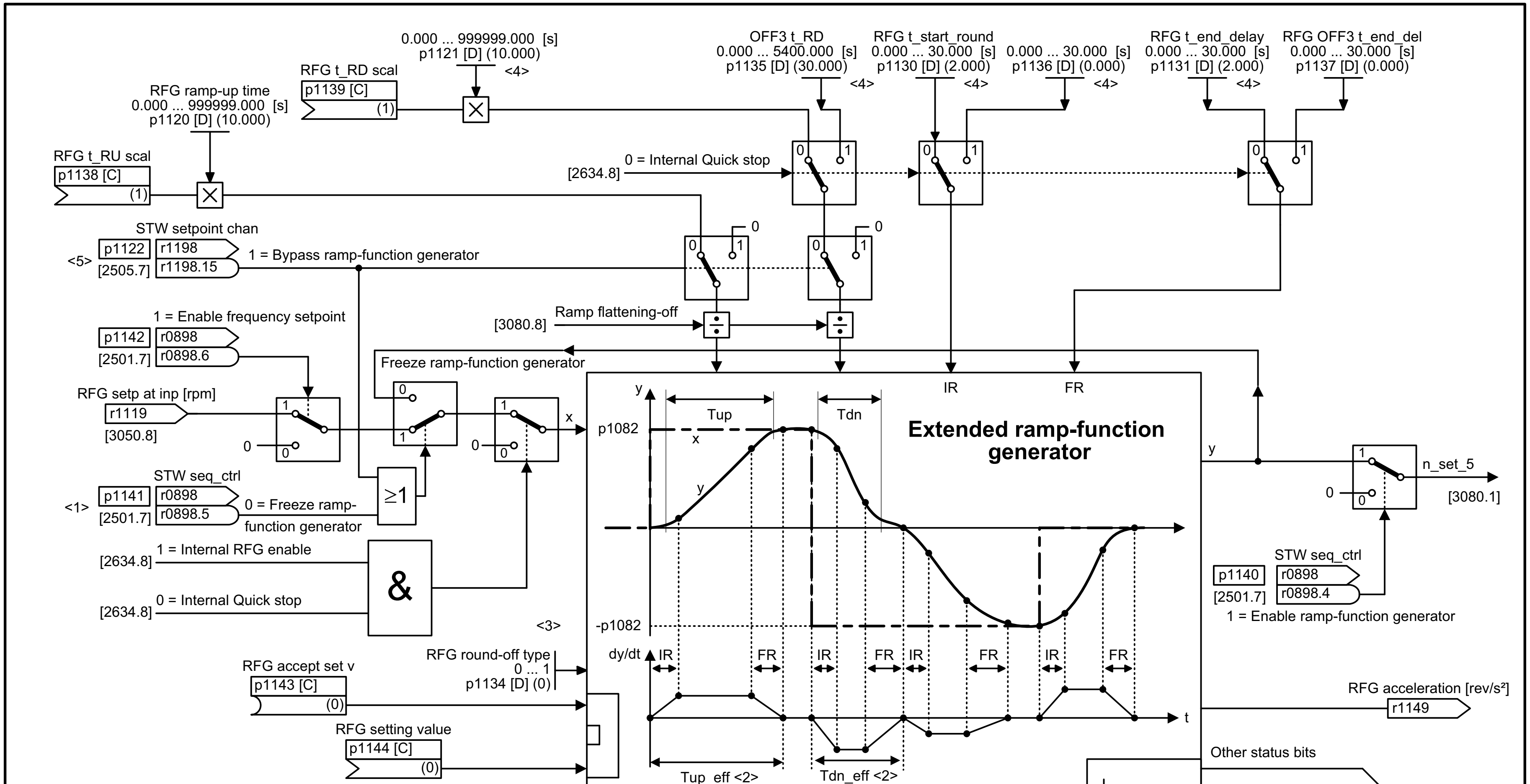



<1> A skip speed of "0" deactivates the skip band.

<2> The setting range of p1082 is limited to n_max_mot.

<3> If the drive is not stopped via the input setpoint, but via controlled intervention, the lower hysteresis branch is relevant after a subsequent run-up.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Setpoint channel | | | | | fp_3050_97_51.vsd | Function diagram | - 3050 - |
| Skip frequency bands and speed limitations | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

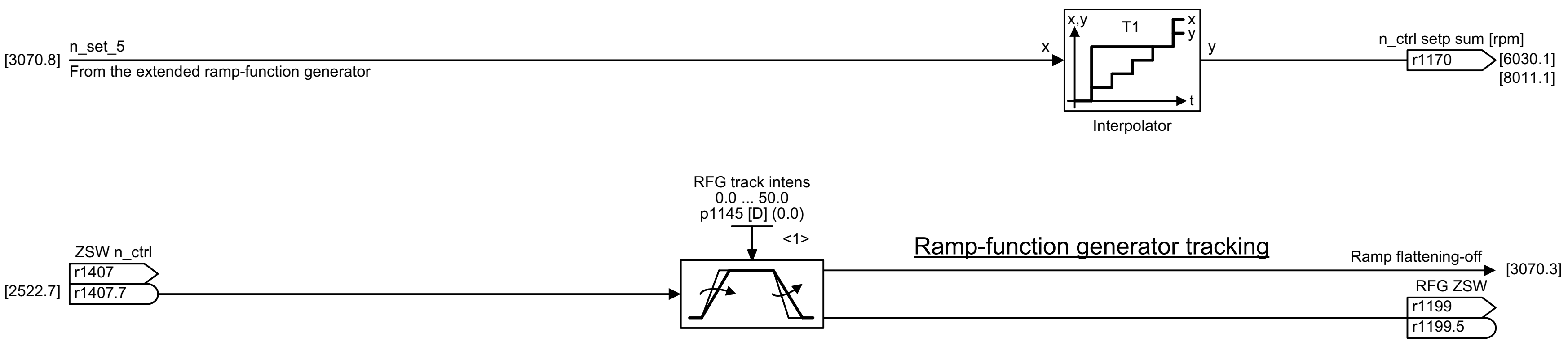



<1> Inhibited during jogging.
<2> Effective ramp-up time: Tup_eff = Tup + (IR/2 + FR/2)
Effective ramp-down time: Tdn_eff = Tdn + (IR/2 + FR/2)
<3> p1134 = 0: Rounding-off is always active.
Overshoots can occur.
p1134 = 1: Final rounding-off is not effective when the setpoint is suddenly reduced during ramp-up.
<4> Value range and/or factory setting depend on Power Module.
<5> With activated Technology controller (p2200 > 0, p2251 = 0) the ramp-function generator is bypassed (r2349.5).

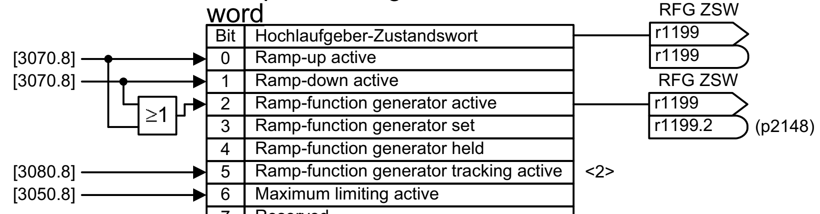
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Setpoint channel | | | | | fp_3070_97_51.vsd | Function diagram | - 3070 - |
| Extended ramp-function generator | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-68 3070 – Extended ramp-function generator

## Ramp-function generator selection




## Ramp-function generator status word




| Bit | Hochlaufgeber-Zustandswort |
|---|---|
| 0 | Ramp-up active |
| 1 | Ramp-down active |
| 2 | Ramp-function generator active |
| 3 | Ramp-function generator set |
| 4 | Ramp-function generator held |
| 5 | Ramp-function generator tracking active |
| 6 | Maximum limiting active |
| 7 | Reserved |
| 8 | Reserved |
| 9 | Reserved |
| 10 | Reserved |
| 11 | Reserved |
| 12 | Reserved |
| 13 | Reserved |
| 14 | Reserved |
| 15 | Reserved |

<1> Behavior of the response ramp of the torque limiting:
p1145 = 0.0: No ramp-function generator tracking. The ramp-function generator ramp is no longer in the range of the frequency actual value.
p1145 = 1.0: The ramp-function generator ramp remains as close as possible to the speed actual value.
p1145 > 1.0: The ramp-function generator ramp is steeper than for p1145 = 1.0 (higher "speed following error").

<2> For p1145 > 0, ramp-function generator tracking is activated when the torque limiting responds. This means that the speed controller output only exceeds the torque limit by a deviation that can be set via p1145.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

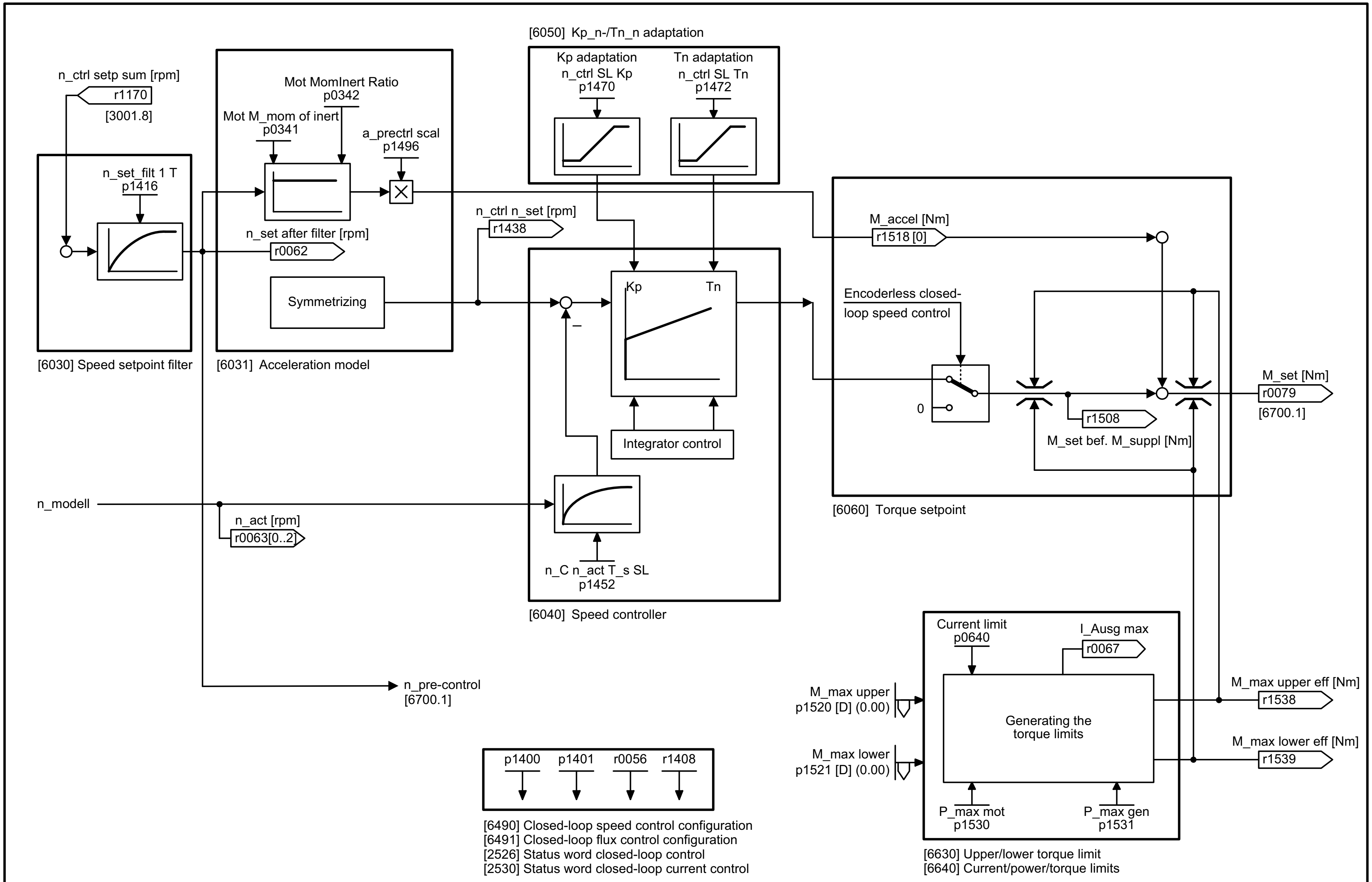
| | | | |
|---|---|---|---|
| Setpoint channel | fp_3080_97_01.vsd | Function diagram | - 3080 - |
| Ramp-function generator selection, status word, tracking | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-69 3080 – Ramp-function generator selection, status word, tracking

# 3.10 Vector control

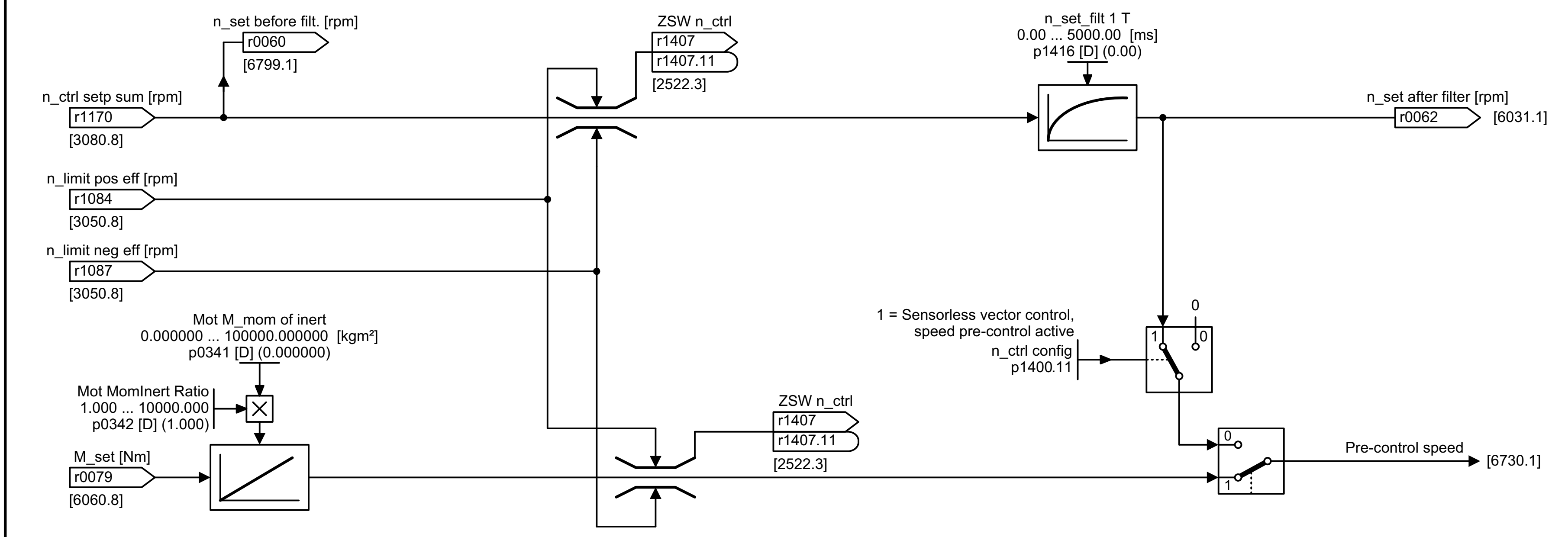
## Function diagrams

Fig. 3-70 6020 – Speed control and generation of the torque limits, overview




| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| Vector control | fp_6020_97_01.vsd | Function diagram | - 6020 - |
| Speed control and generation of the torque limits, overview | 07.04.2014 V4.7 | G120 CU230P-2 | |




| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| Vector control | fp_6030_97_01.vsd | Function diagram | - 6030 - |
| Speed setpoint, droop | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-71 6030 – Speed setpoint, droop

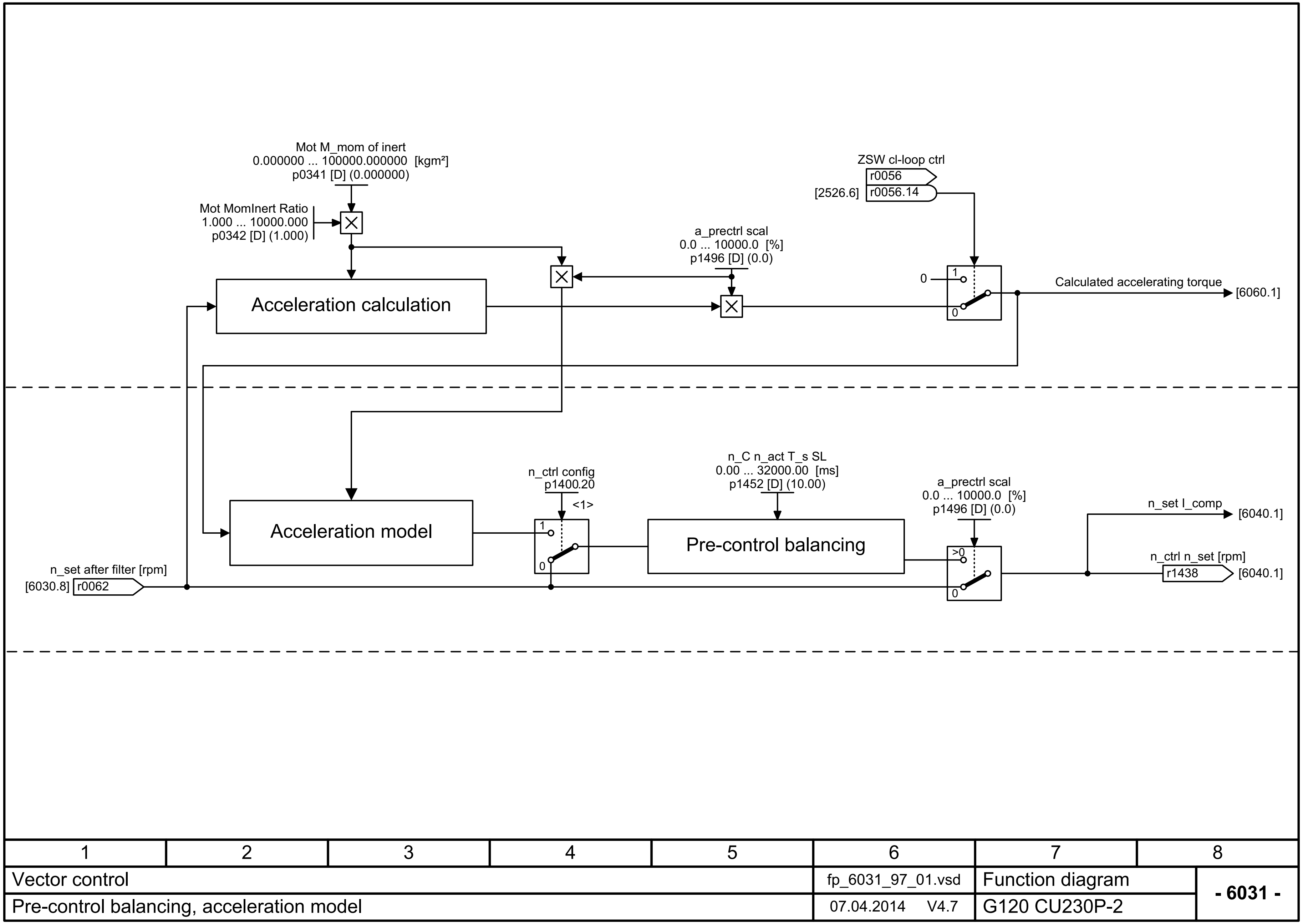
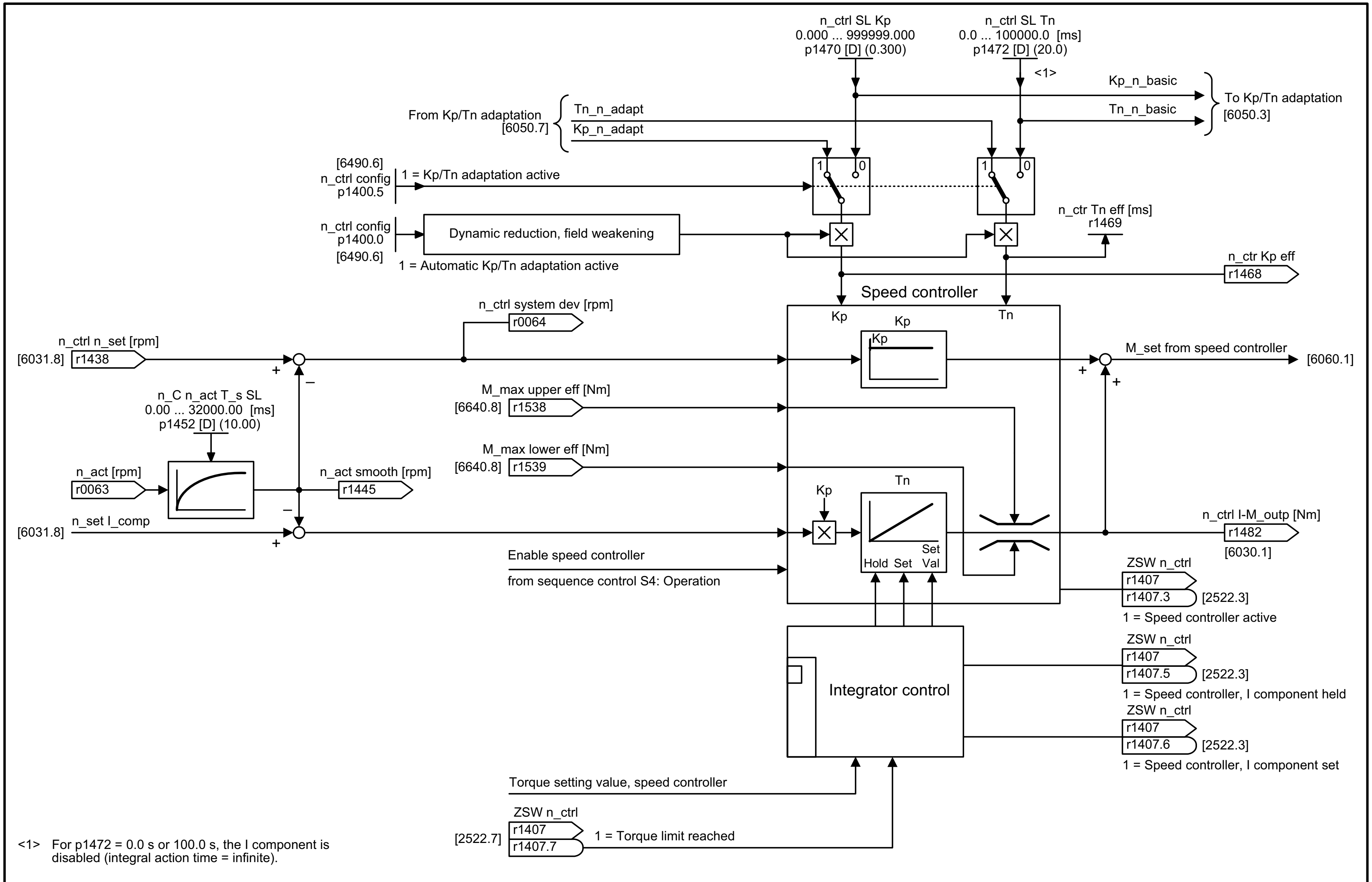



Fig. 3-72 6031 – Pre-control balancing, acceleration model

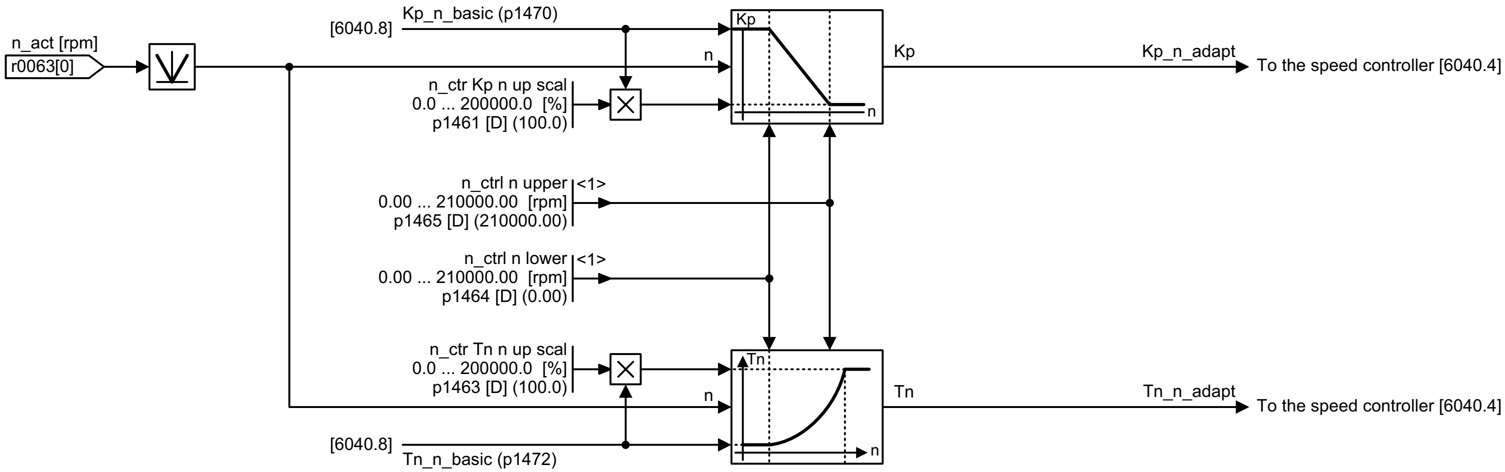
Fig. 3-73 6040 – Speed controller




| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Vector control | | | | | fp_6040_97_01.vsd | Function diagram | - 6040 - |
| Speed controller | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

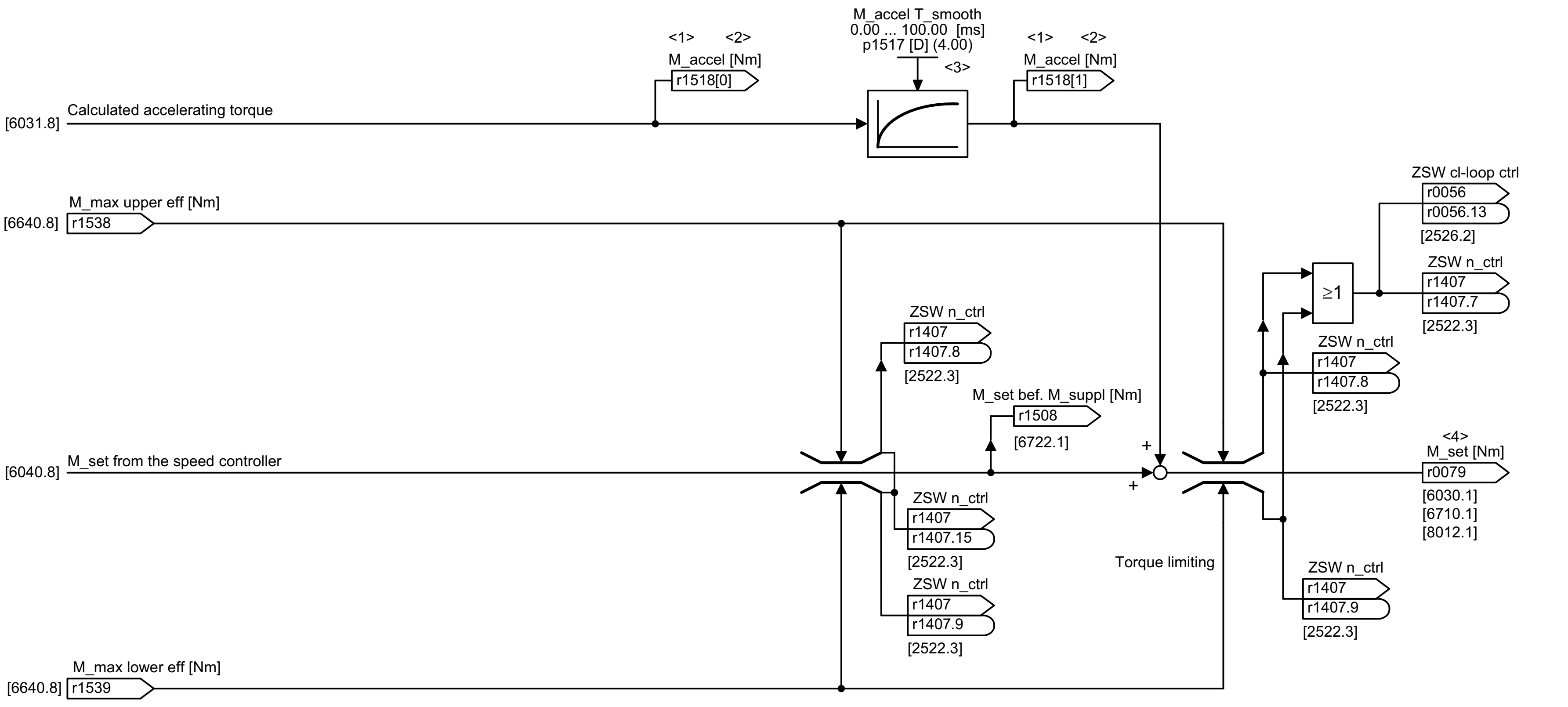
Fig. 3-74 6050 – Kp_n-/Tn_n adaptation

## Speed-dependent Kp_n/Tn_n adaptation




<1> If the lower transition point exceeds the upper transition point, the Kp-adaptation also changes over.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Vector control | | | | | fp_6050_97_01.vsd | Function diagram | - 6050 - |
| Kp_n/Tn_n adaptation | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

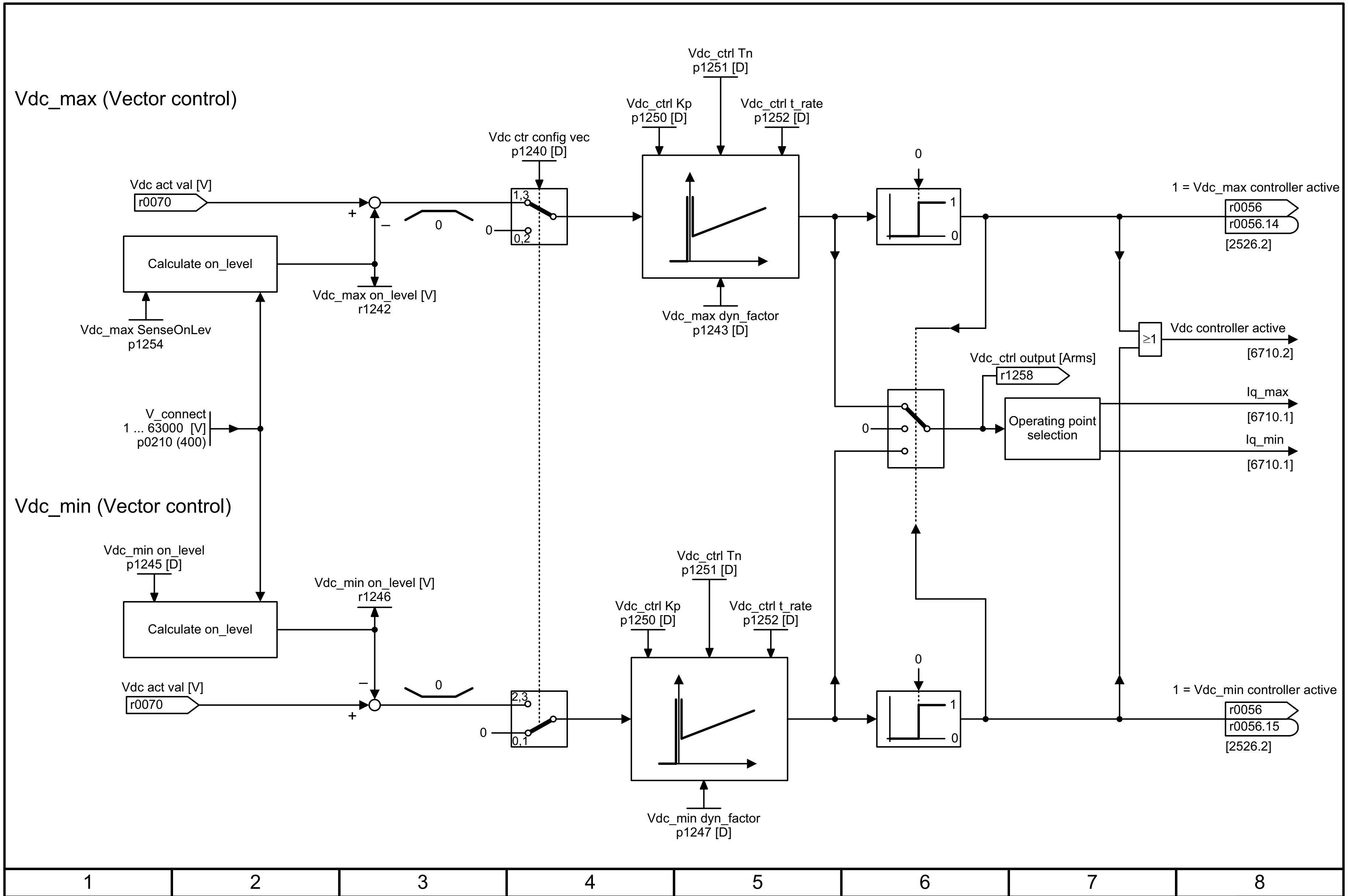



<1> The signal is only effective after magnetization has been completed (r0056.4 = 1).
<2> No pre-control if the Vdc controller is active [6220.8].
<3> Acceleration control is inhibited for p1517 = 100 ms.
<4> M_set is also influenced by the speed limit controller.

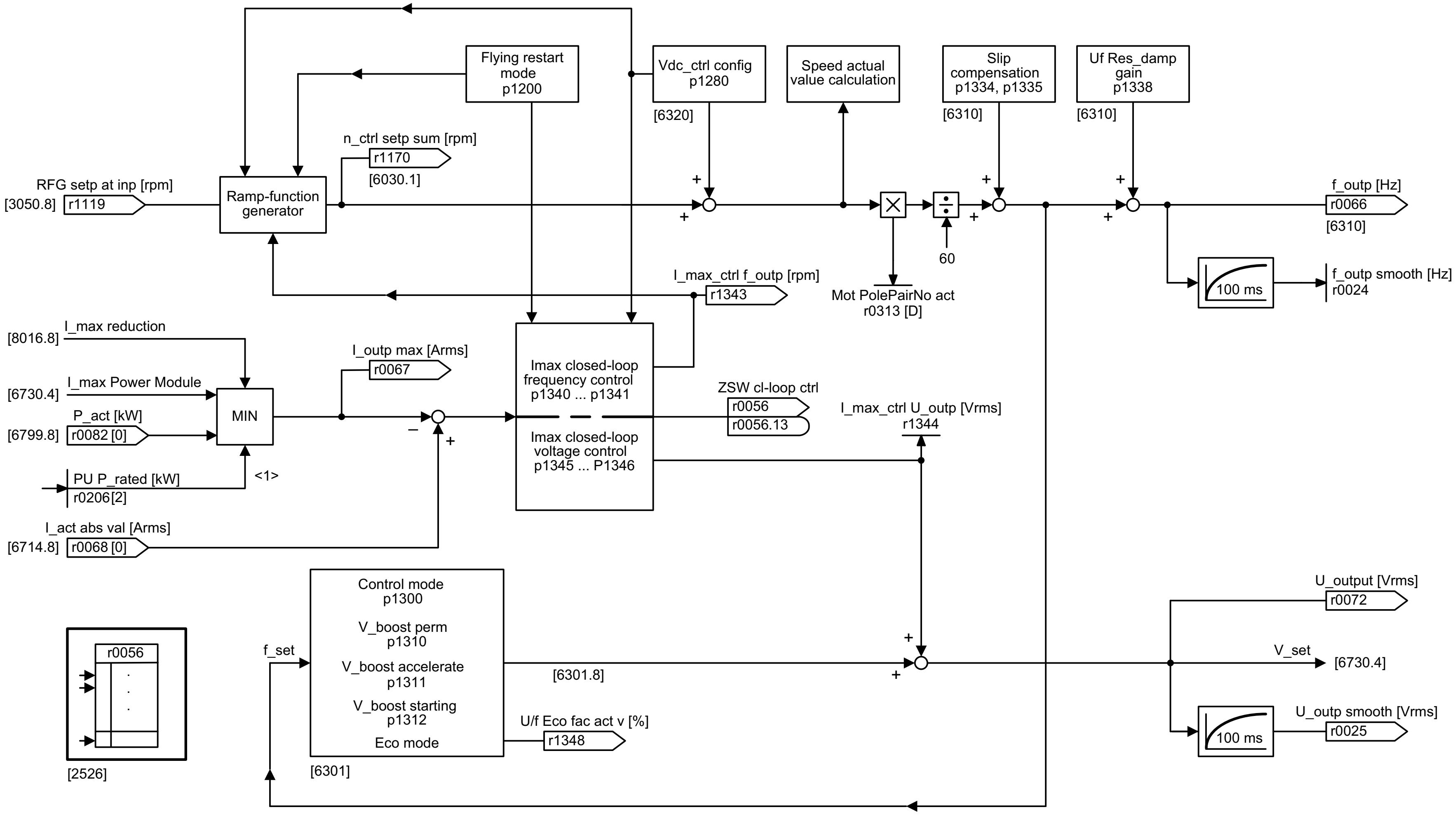
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Vector control | | | | | fp_6060_97_01.vsd | Function diagram | - 6060 - |
| Torque setpoint | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-75 6060 – Torque setpoint

Fig. 3-76 6220 – Vdc_max controller and Vdc_min controller (vector control, PM230/PM240/PM330)




| | | | |
|---|---|---|---|
| Vector control | fp_6220_97_52.vsd | Function diagram | - 6220 - |
| Vdc_max controller and Vdc_min controller (PM230/PM240/PM330) | 07.04.2014 V4.7 | G120 CU230P-2 | |

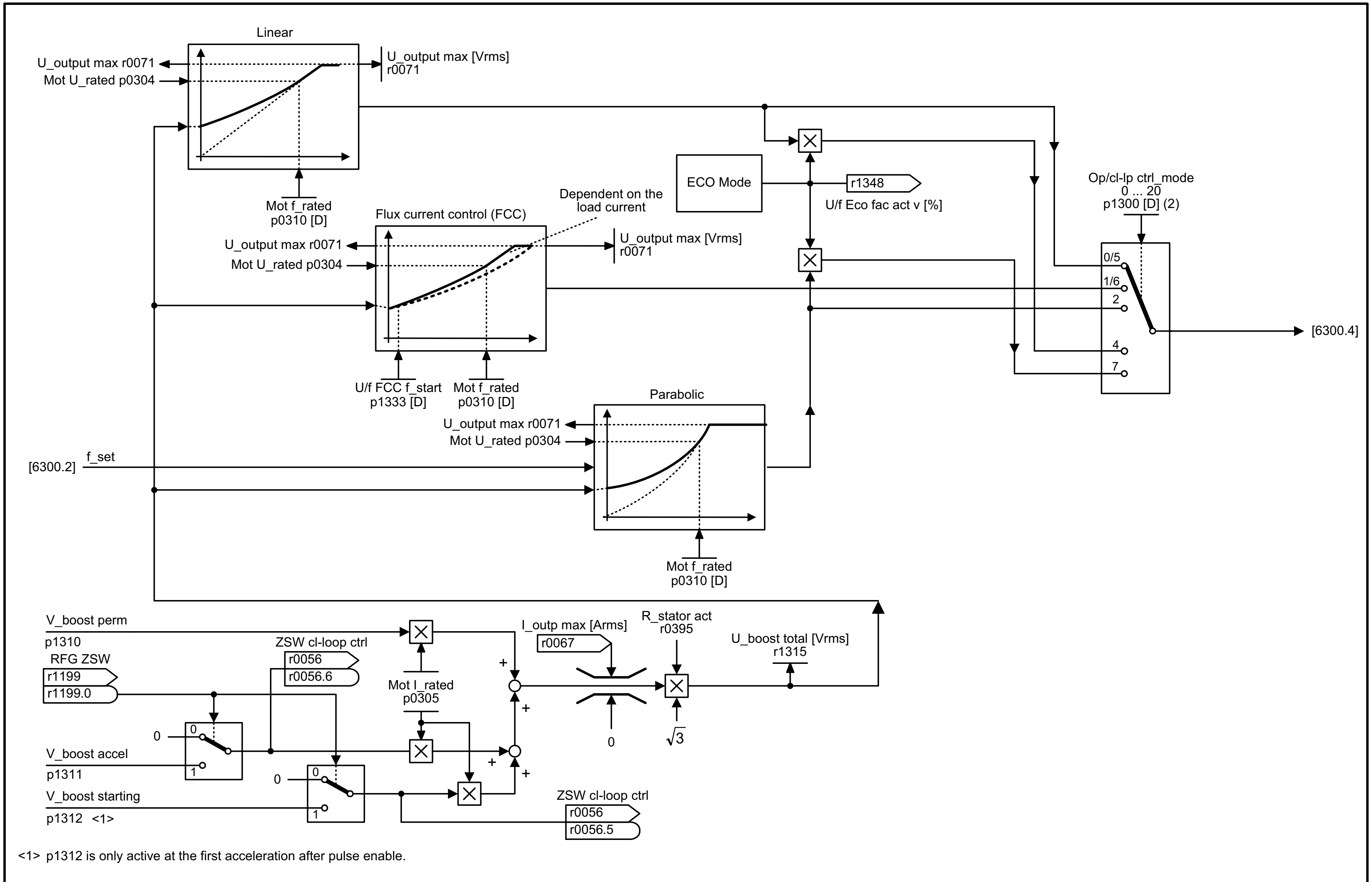



<1> PM250, PM260: The current limit is calculated out of r0206 [2] in generative operation.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Vector control | | | | | fp_6300_97_01.vsd | Function diagram | - 6300 - |
| U/f control, overview | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-77 6300 – U/f control, overview

Fig. 3-78 6301 – U/f characteristic and voltage boost




| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| Vector control | fp_6301_97_01.vsd | Function diagram | - 6301 - |
| U/f characteristic and voltage boost | 07.04.2014 V4.7 | G120 CU230P-2 | |

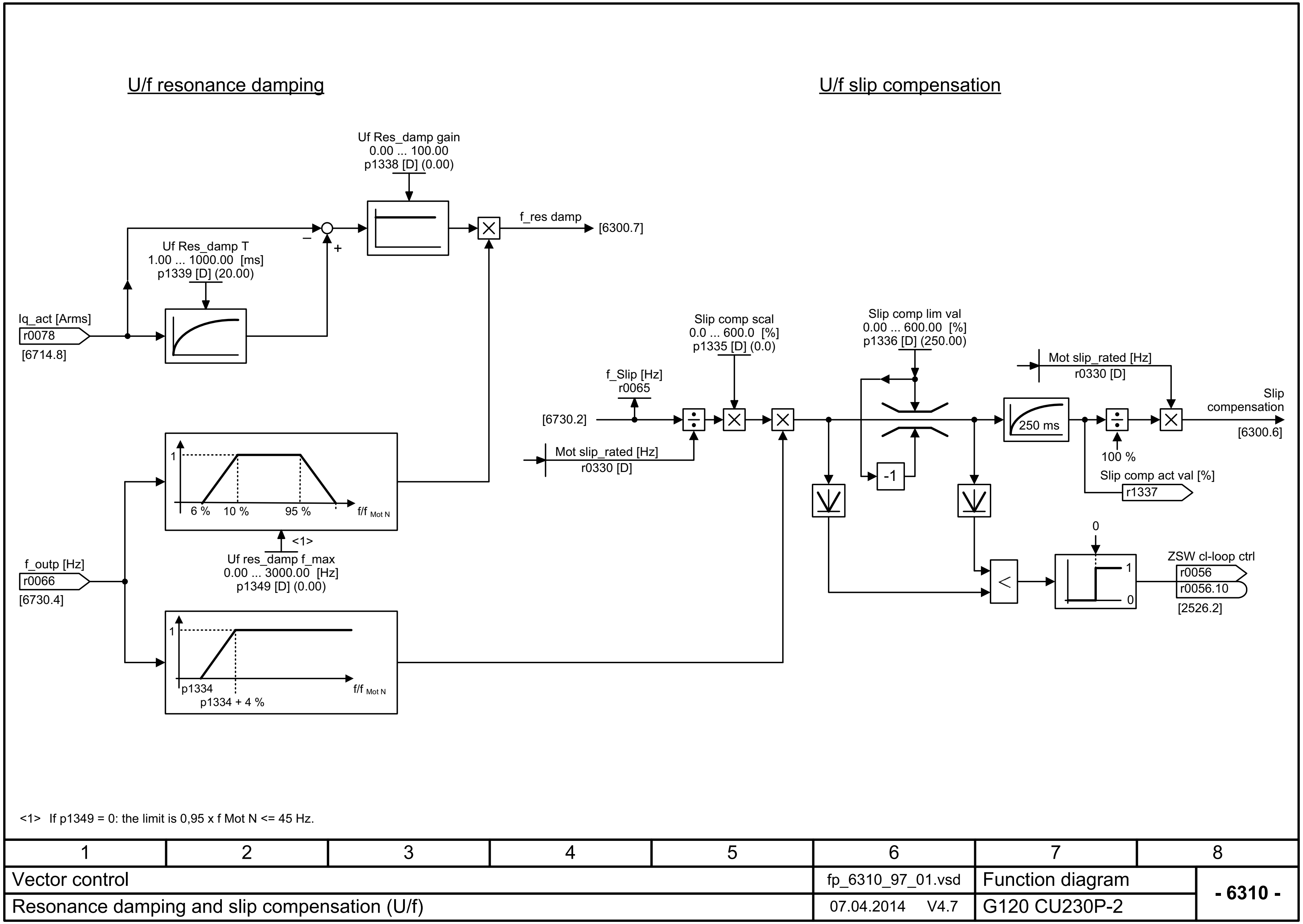
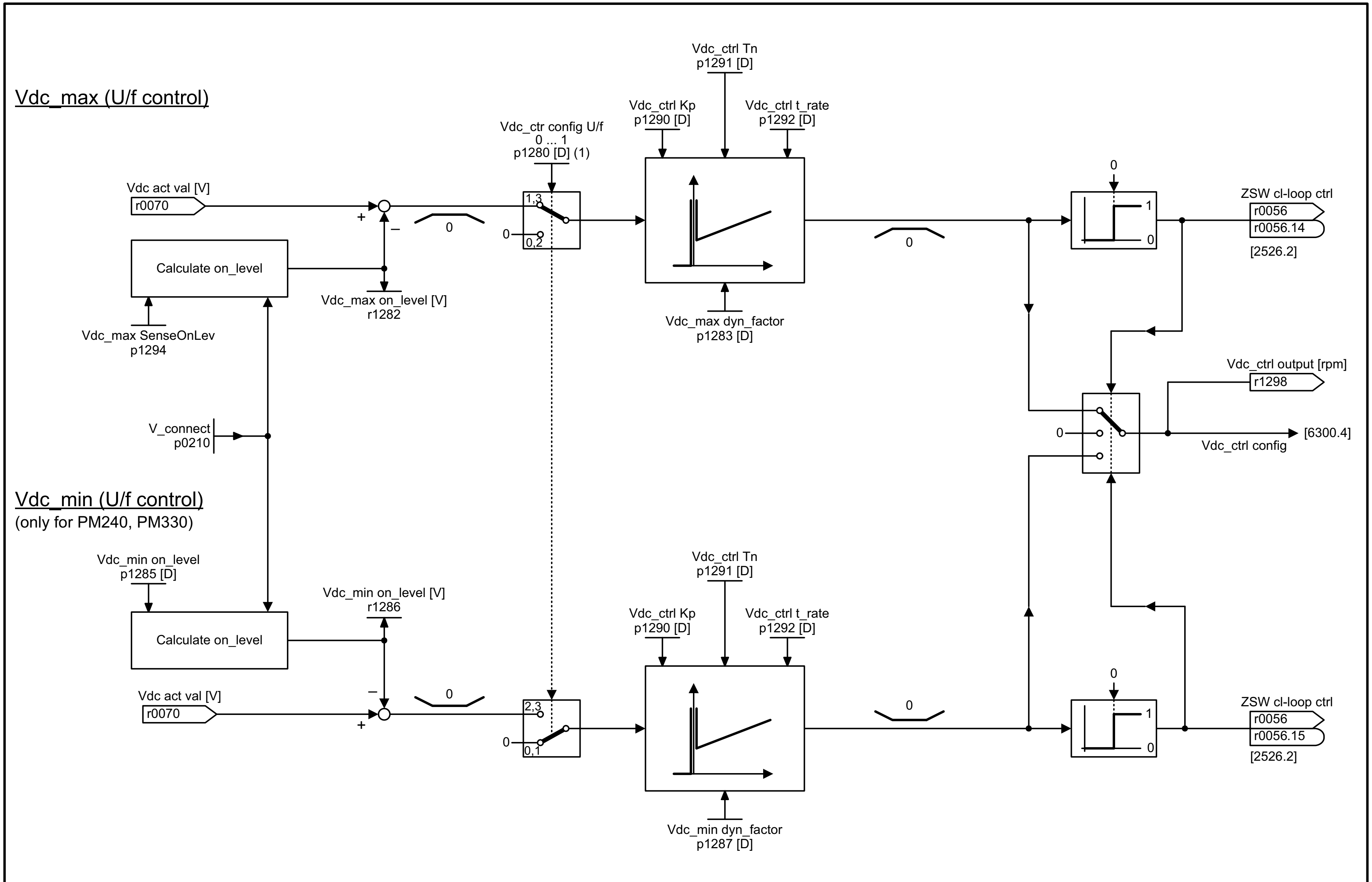



Fig. 3-79 6310 – Resonance damping and slip compensation (U/f)




| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| Vector control | fp_6320_97_01.vsd | Function diagram | - 6320 - |
| Vdc_max controller and Vdc_min controller (PM230/PM240/PM330), (U/f) | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-80 6320 – Vdc_max controller and Vdc_min controller (PM230/PM240/PM330), (U/f)

n_reg Konfig
p1400[D]
<3>

## Speed control configuration

| Bit No. | Meaning | | |
|---|---|---|---|
| 00 | 1 = Automatic Kp/Tn adaptation active | | [6040.3] |
| ... | Reserved | | |
| 05 | 1 = Kp/Tn adaptation active | | [6040.3] |
| ... | Reserved | | |
| 15 | 1 = Sensorless vector control, speed pre-control active | | [6030.6] |
| ... | Reserved | | |
| 18 | 1 = Moment of inertia estimator active | <1> | |
| 19 | 1 = Anti-windup for integral component | | |
| 20 | 1 = Acceleration model | | [6031.4] |
| 21 | 1 = Free Tn reduction active | <2> | |
| 22 | 1 = Obtain moment of inertia estimator value for pulse inhibit | <1> | |

<1> Only with Power Modules PM240, PM250, PM260, PM330.
<2> Only with Power Module PM330.
<3> Value range and/or factory setting depend on Power Module.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Vector control | | | | | fp_6490_97_01.vsd | Function diagram | - 6490 - |
| Speed control configuration | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-81 6490 – Speed control configuration

Fig. 3-82 6491 – Flux control configuration

Flux ctrl config
p1401 [D]

## Flux control, configuration

Factory setting

| Bit No. | Meaning | Factory setting | |
|---|---|---|---|
| 00 | Reserved | | |
| 01 | 1 = Flux setpoint, differentiation active | 1 | [6723.6] |
| 02 | 1 = Flux build-up control active | 1 | [6723.6] |
| 03 | 1 = Flux characteristic load-dependent | 1 | |
| 04 | Reserved | | |
| 05 | Reserved | | |
| 06 | Quick magnetizing active | 0 | |
| 07 | Reserved | | |
| 08 | Reserved | | |
| 09 | 1 = flux boost under no load conditions | 0 | |
| 10 | 1 = flux boost at low speed | 0 | |
| 11 | Reserved | | |
| 12 | Reserved | | |
| 13 | Reserved | | |
| 14 | Reserved | | |
| 15 | Reserved | | |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| Vector control | fp_6491_97_01.vsd | Function diagram | - 6491 - |
| Flux control configuration | 07.04.2014 V4.7 | G120 CU230P-2 | |

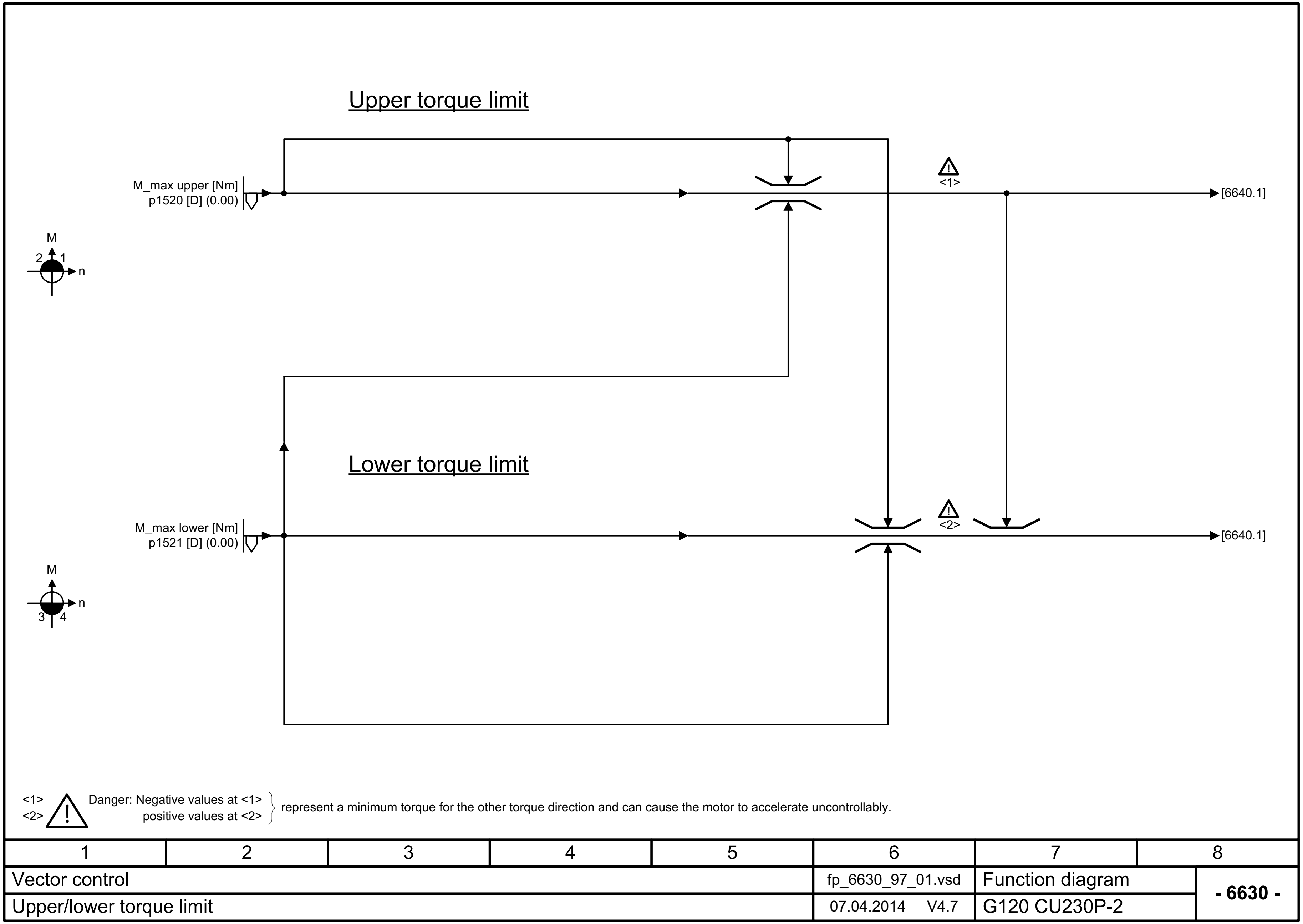
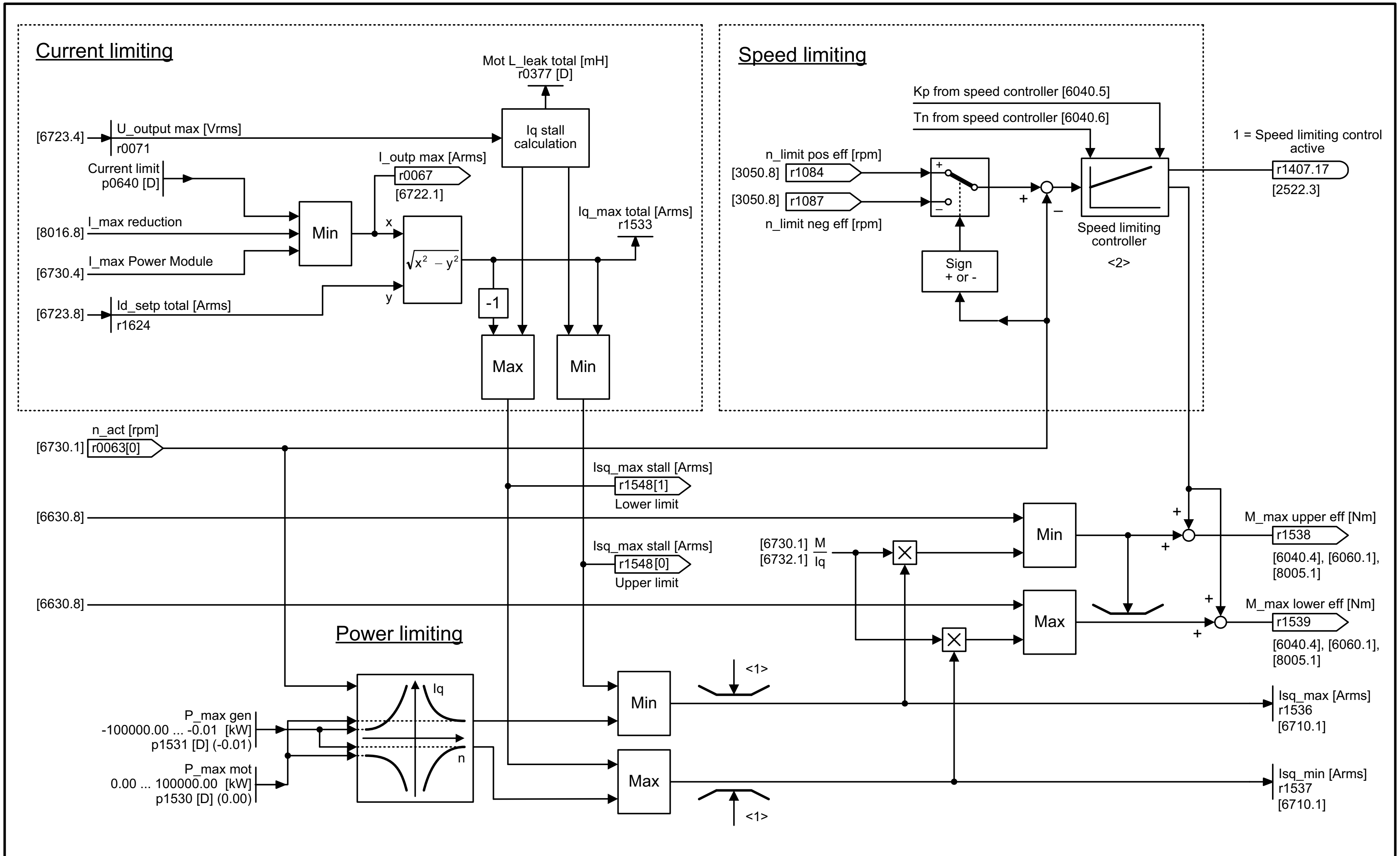



Fig. 3-83 6630 – Upper/lower torque limit

Fig. 3-84 6640 – Current/power/torque limits




<1> Intervention by the Vdc controller.
<2> Intervention when the speed limit is exceeded + 2 % n_rated.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| Vector control | fp_6640_97_01.vsd | Function diagram | - 6640 - |
| Current/power/torque limits | 07.04.2014 V4.7 | G120 CU230P-2 | |

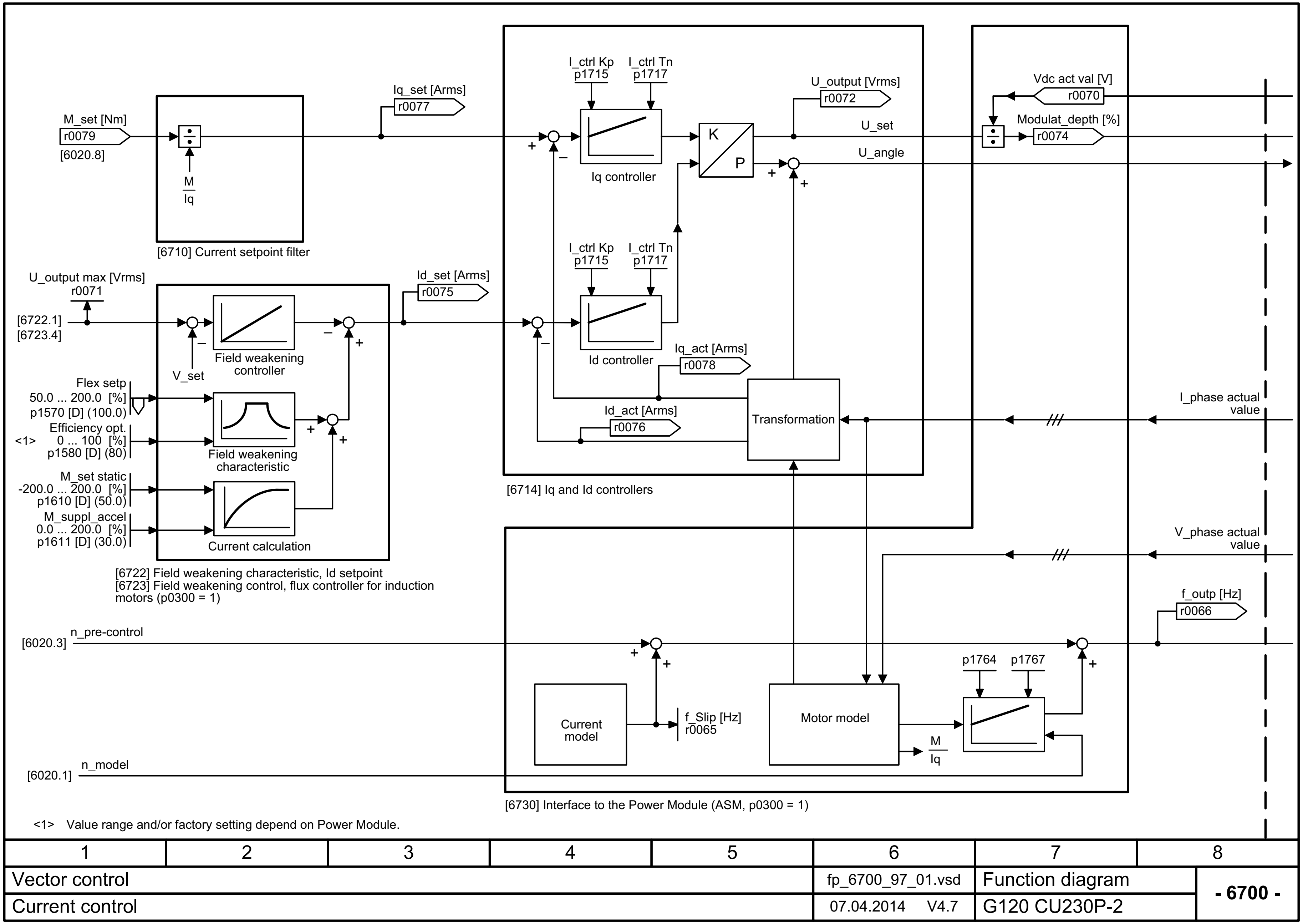
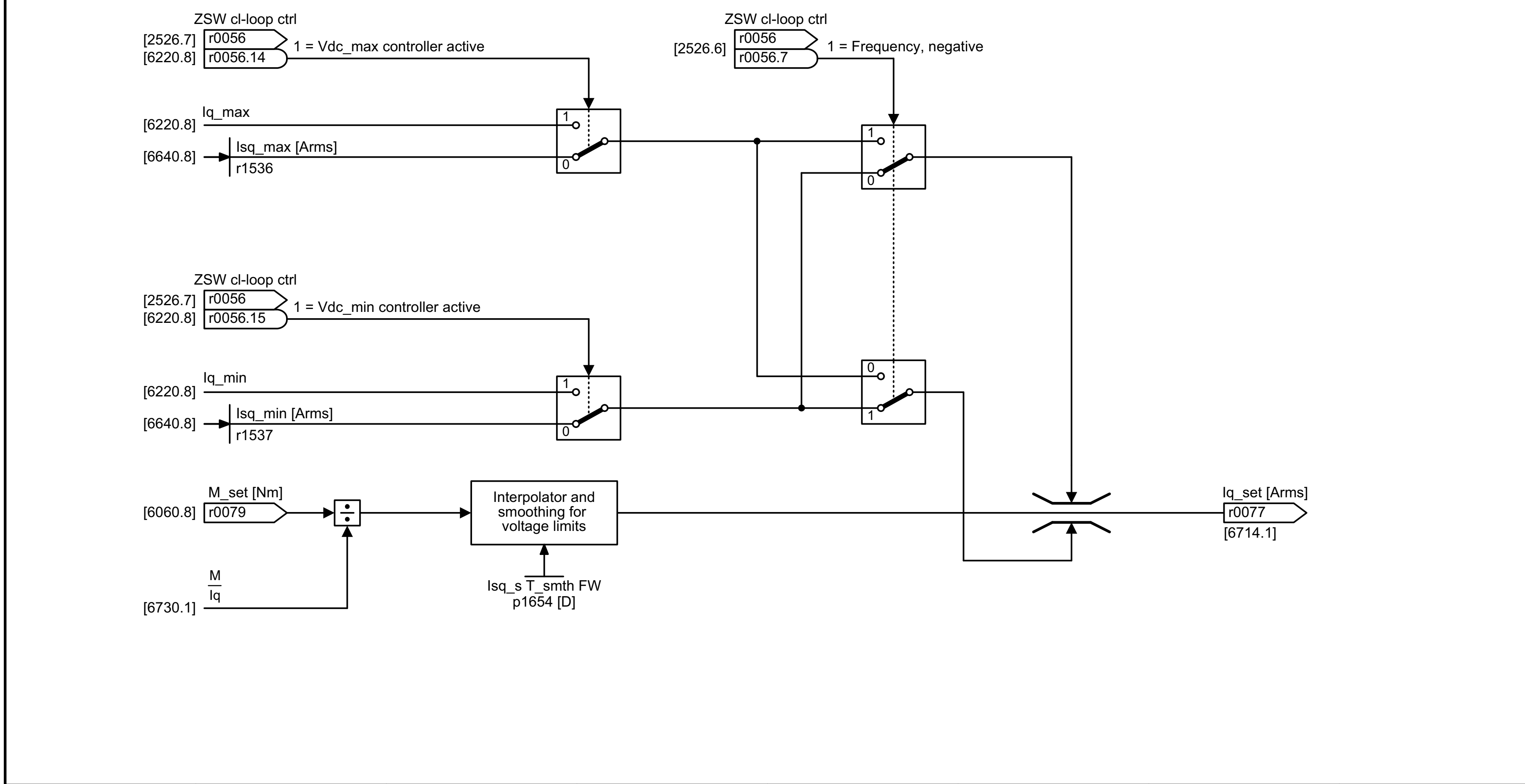


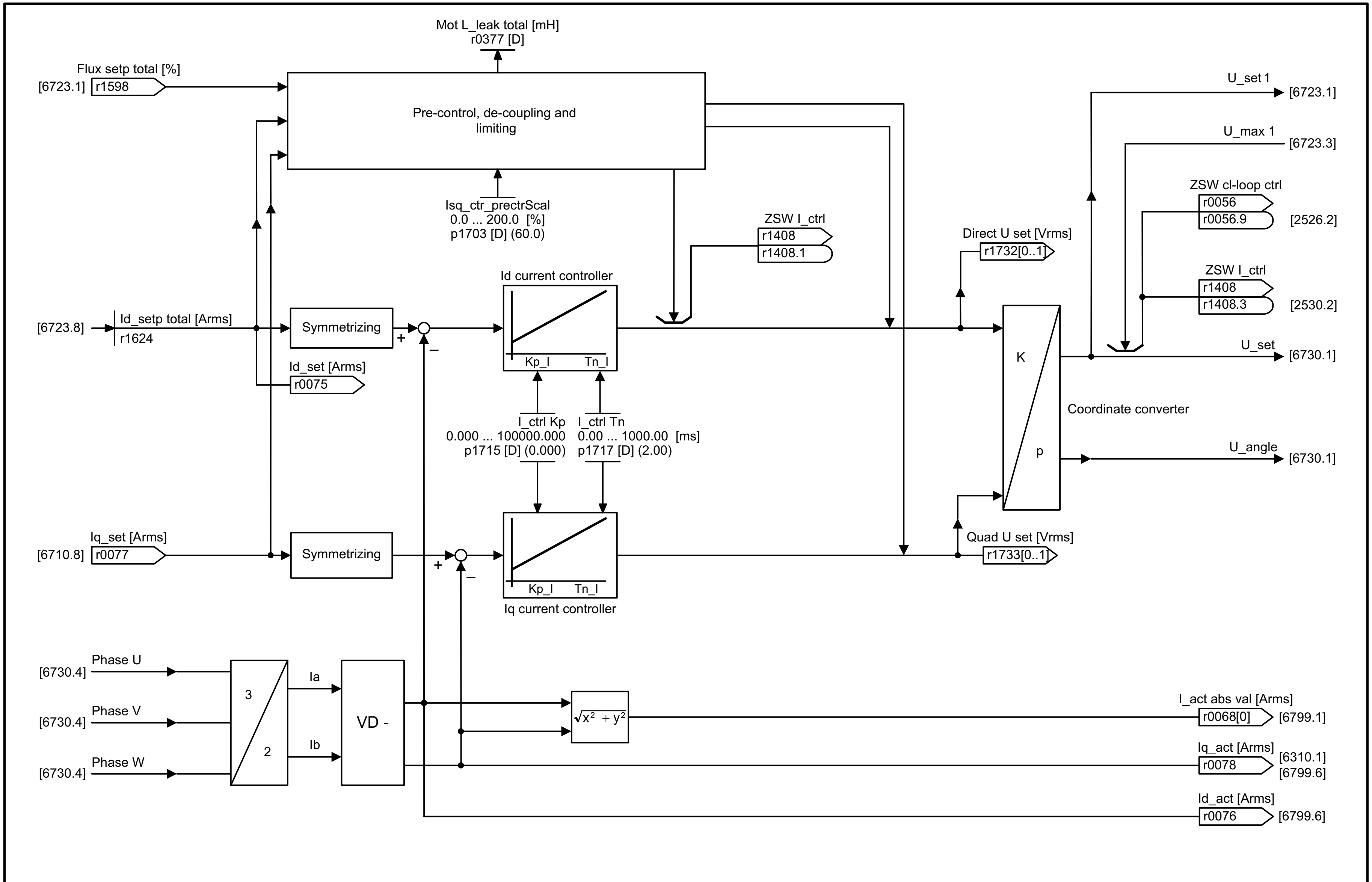

Fig. 3-85 6700 – Current control, overview



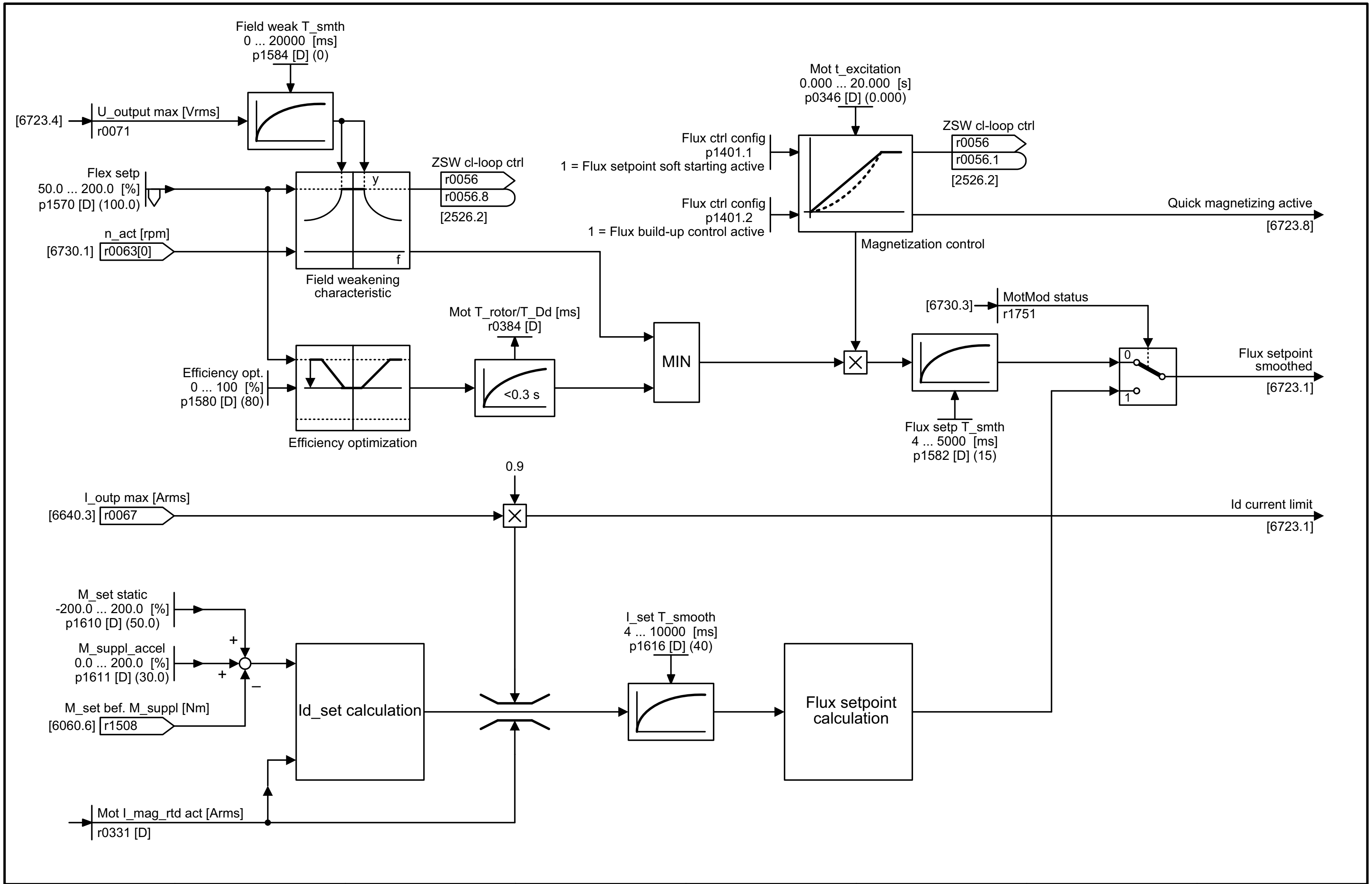

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Vector control | | | | | fp_6710_97_51.vsd | Function diagram | - 6710 - |
| Current setpoint filter | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-86 6710 – Current setpoint filter

Fig. 3-87 6714 – Iq and Id controllers



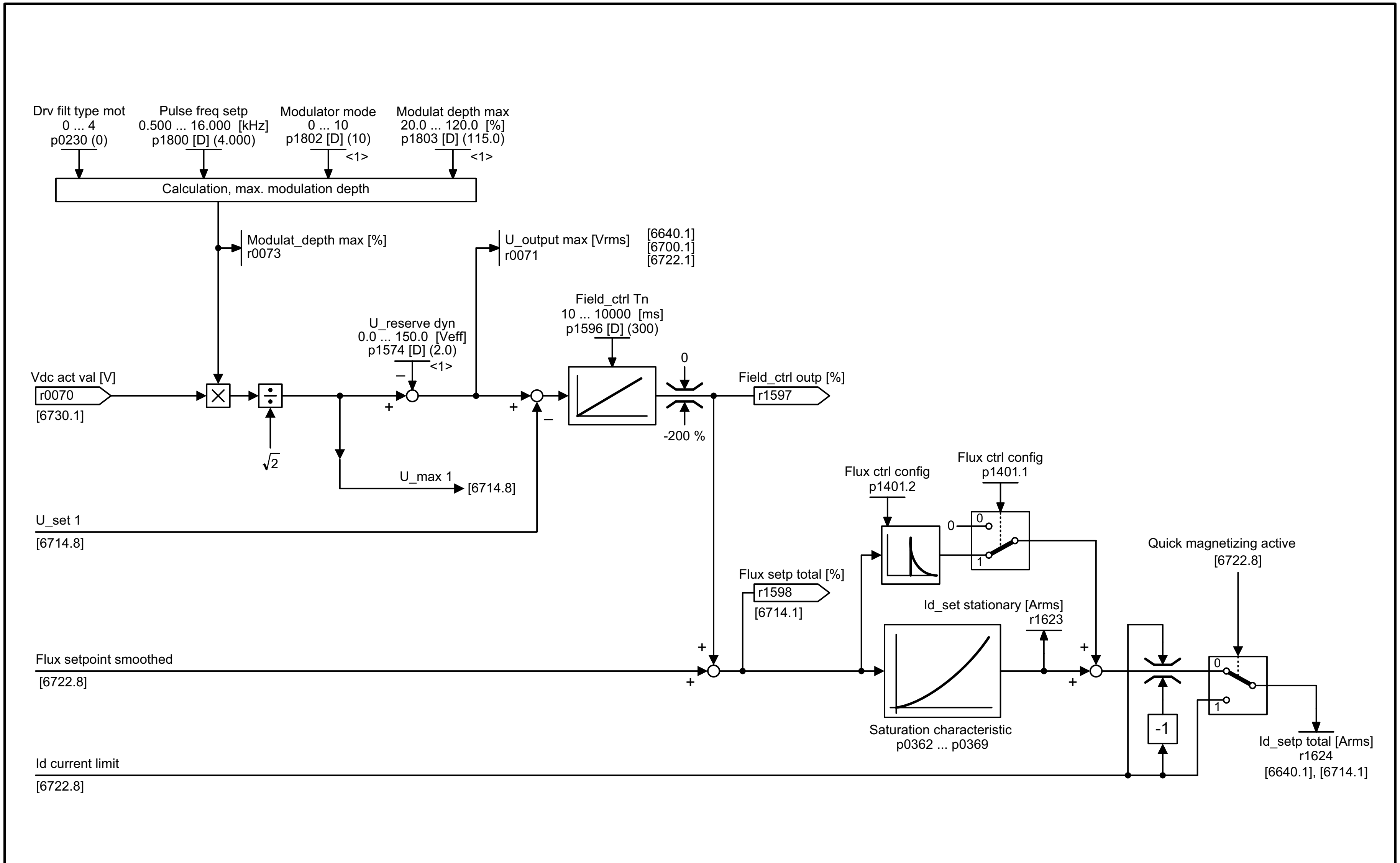

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Vector control | | | | | fp_6714_97_01.vsd | Function diagram | - 6714 - |
| Iq and Id controllers | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |




| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| Vector control | fp_6722_97_01.vsd | Function diagram | - 6722 - |
| Field weakening characteristic, Id setpoint (ASM, p0300 = 1) | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-88 6722 – Field weakening characteristic, Id setpoint (ASM, p0300 = 1)

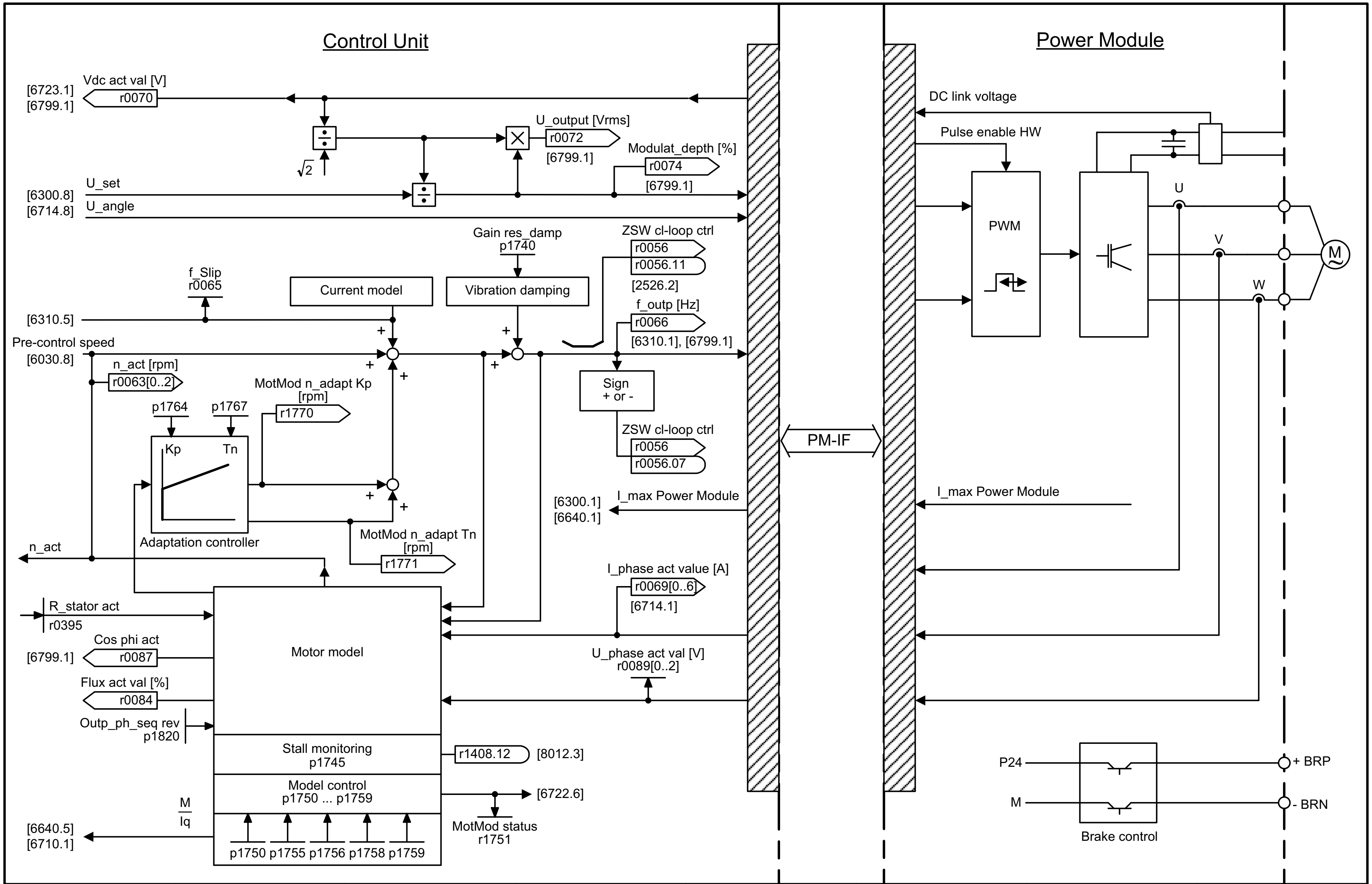



<1> Value range and/or factory setting depend on p0500.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| Vector control | fp_6723_97_01.vsd | Function diagram | - 6723 - |
| Field weakening controller, flux controller (ASM, p0300 = 1) | 07.04.2014 V4.7 | G120 CU230P-2 | |

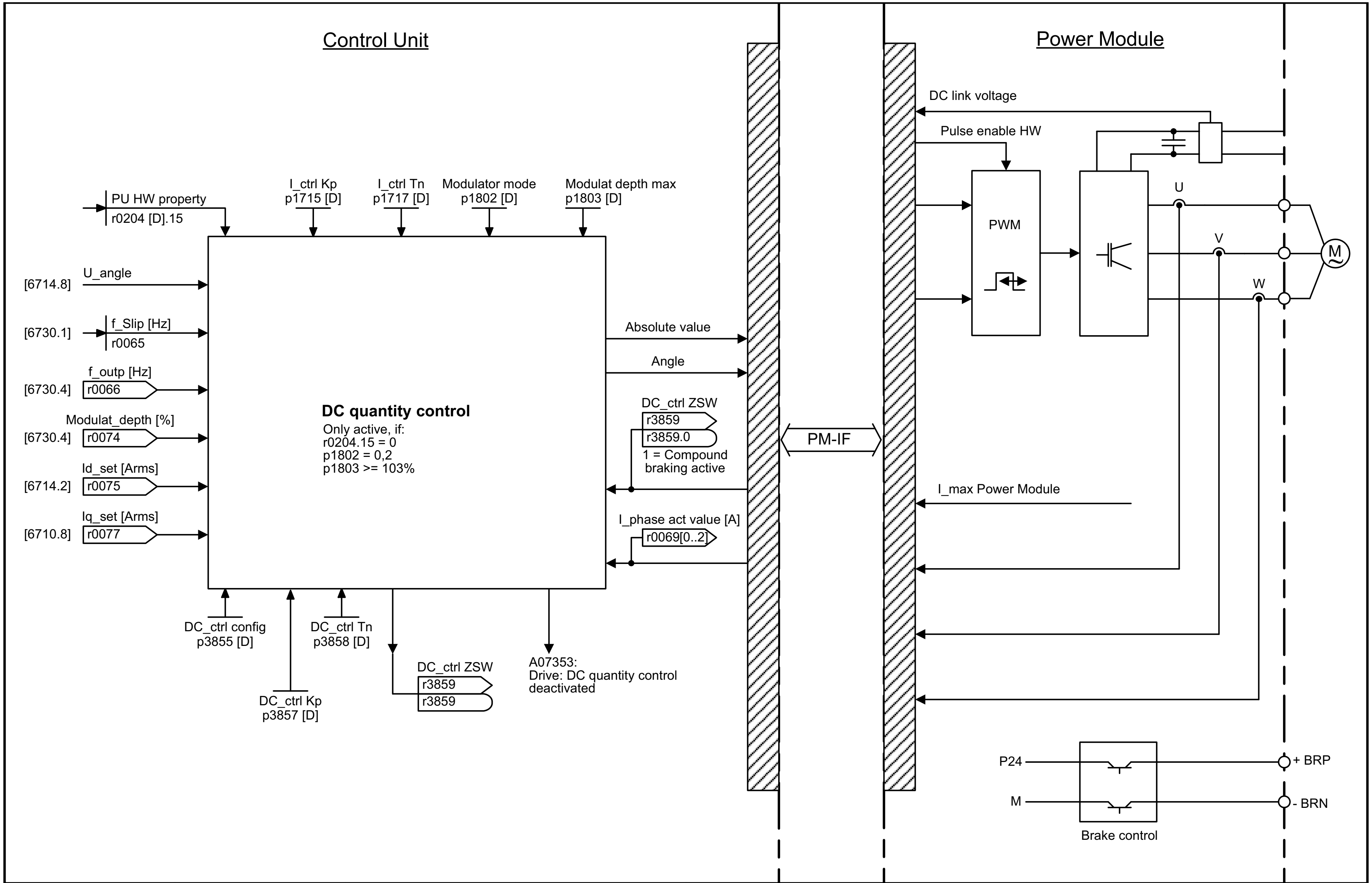
Fig. 3-89 6723 – Field weakening controller, flux controller (ASM, p0300 = 1)




| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| Vector control | fp_6730_97_01.vsd | Function diagram | - 6730 - |
| Interface to the Power Module (ASM, p0300 = 1) | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-90 6730 – Interface to the Power Module (ASM, p0300 = 1)

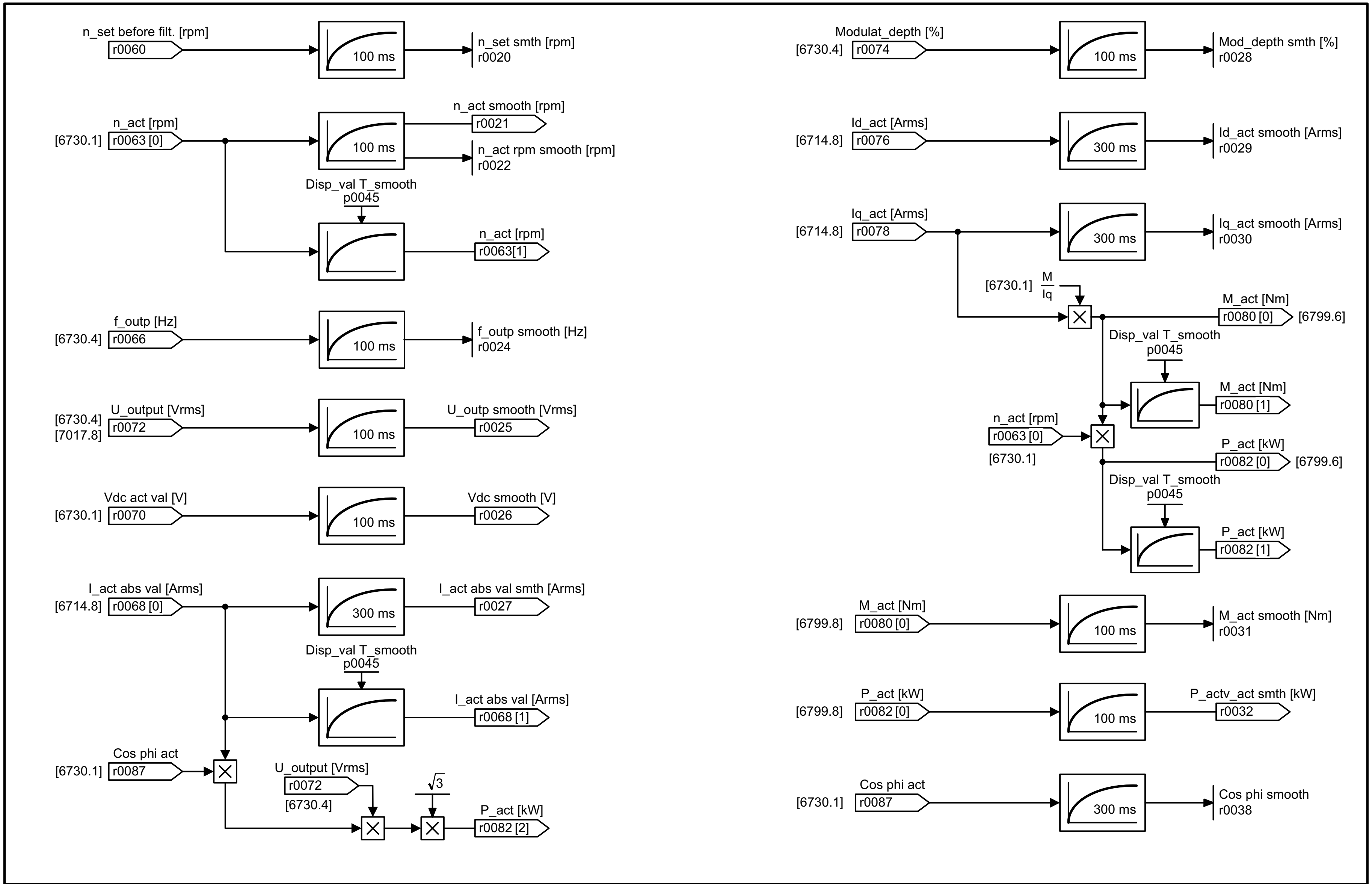



| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| Vector control | fp_6797_97_01.vsd | Function diagram | - 6797 - |
| Closed-loop DC quantity control (ASM, p0300=1; PM230/PM240) | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-91 6797 – Closed-loop DC quantity control

Fig. 3-92 6799 – Display signals



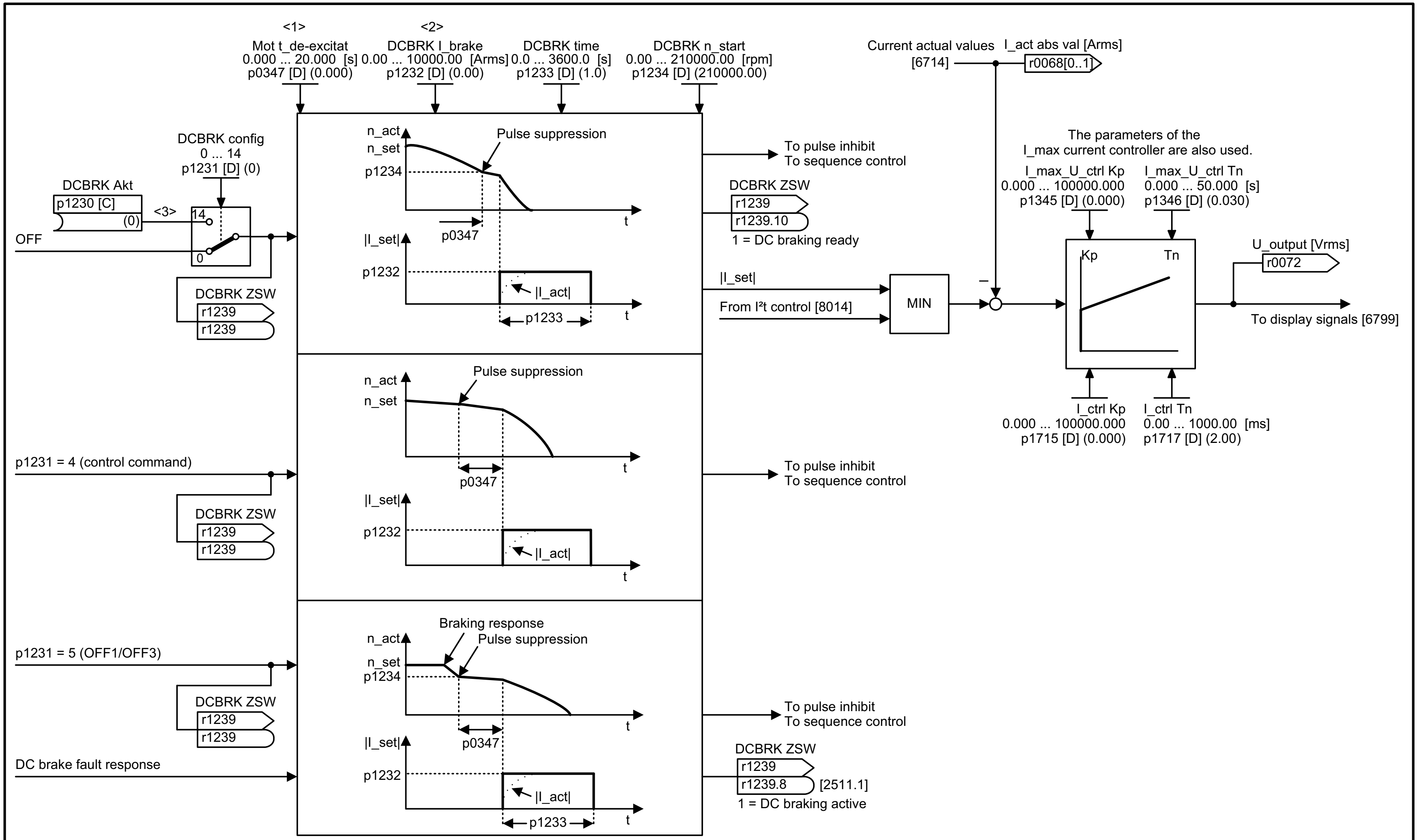

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| Vector control | fp_6799_97_01.vsd | Function diagram | - 6799 - |
| Display signals | 07.04.2014 V4.7 | G120 CU230P-2 | |

# 3.11 Technology functions

## Function diagrams

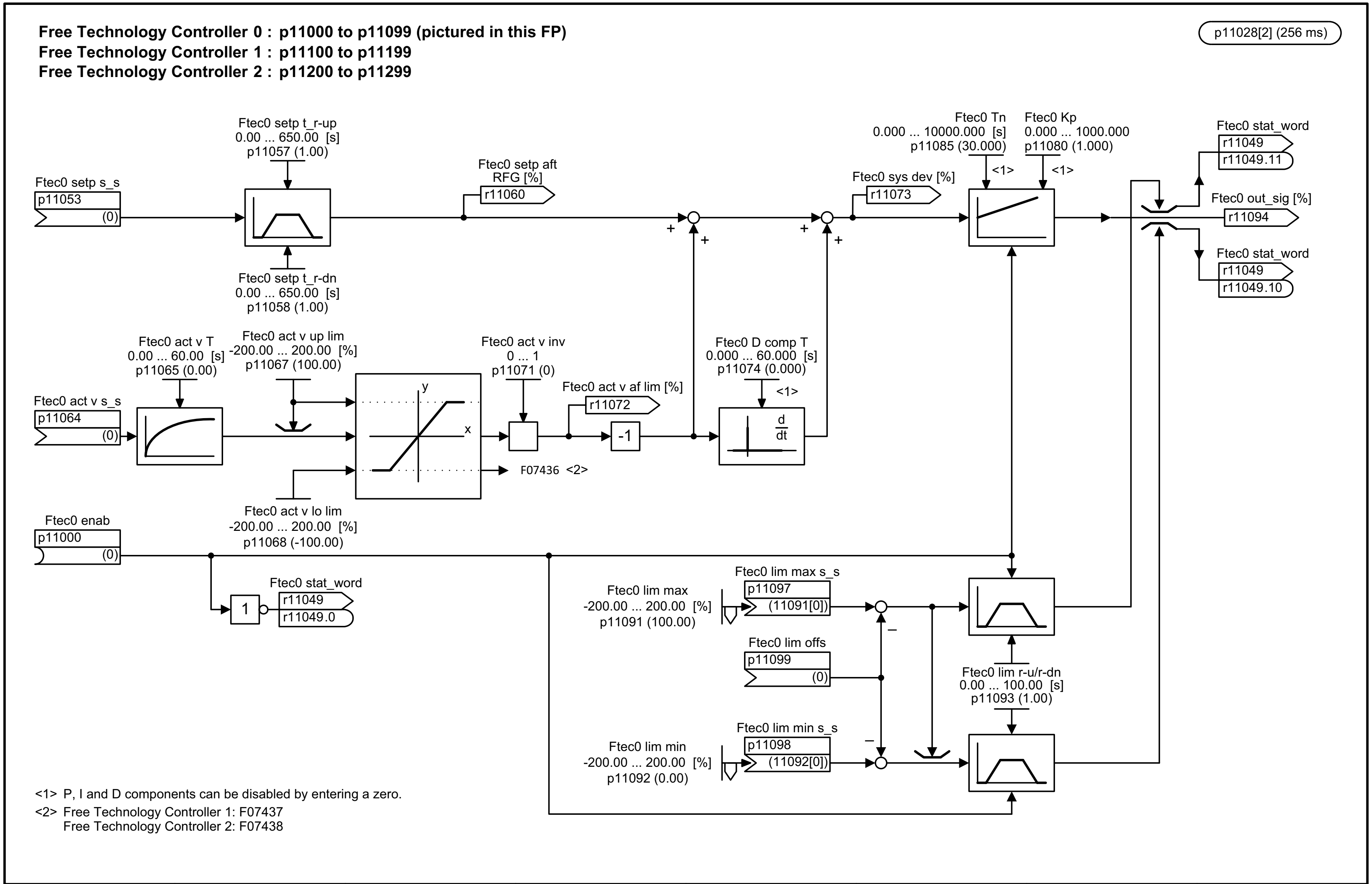
Fig. 3-93 7017 – DC brake (p0300 = 1)




<1> The de-magnetization time is determined during automatic calculation (p0340 = 1, 3).
<2> The DC braking current is determined during automatic calculation (p0340 = 1).
<3> DC braking when starting speed for DC braking (p1234) is fallen below.

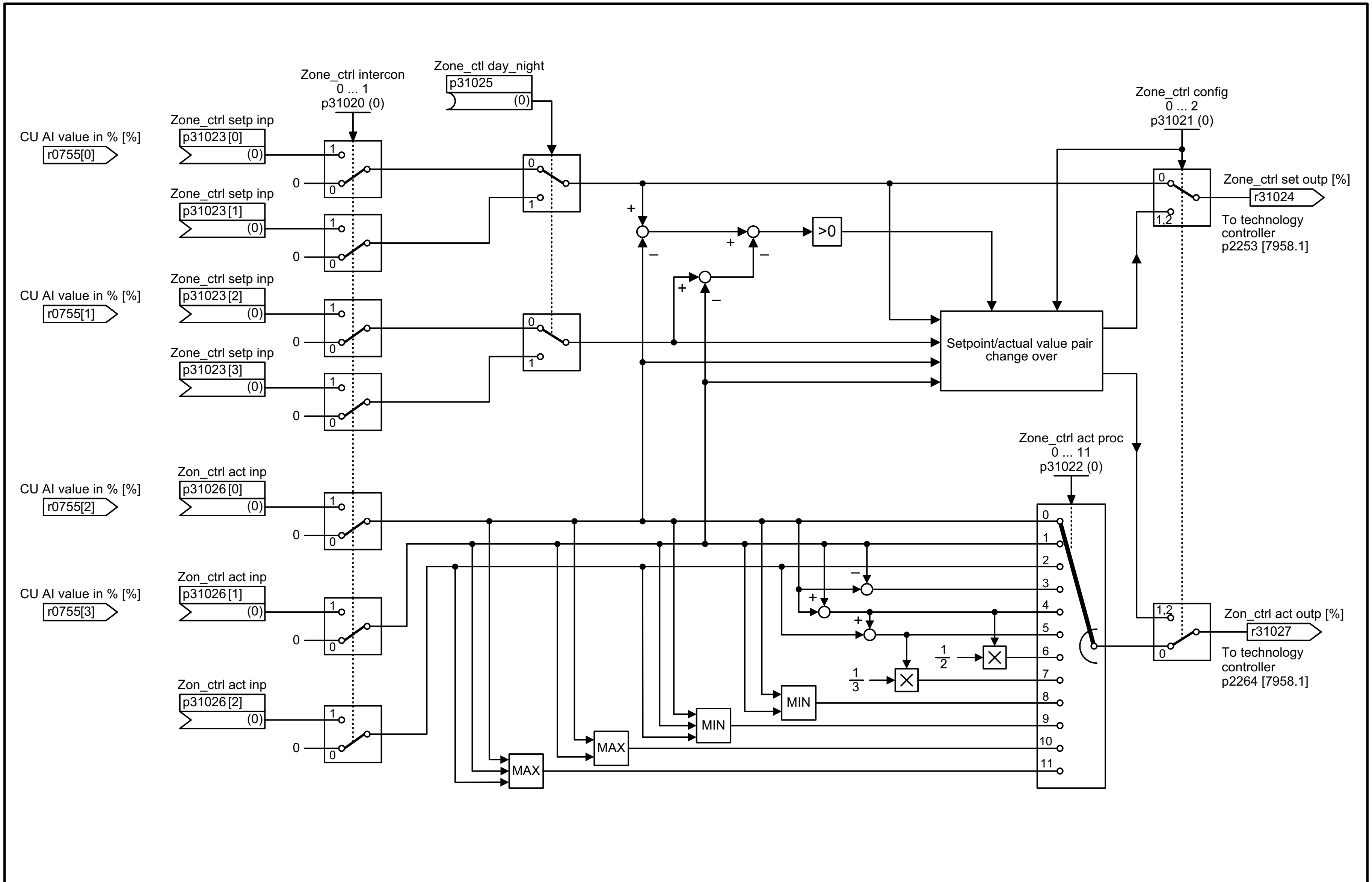
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Technology functions | | | | | fp_7017_97_51.vsd | Function diagram | - 7017 - |
| DC brake (ASM, p0300 = 1) | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-94 7030 – Free technology controller 0, 1, 2

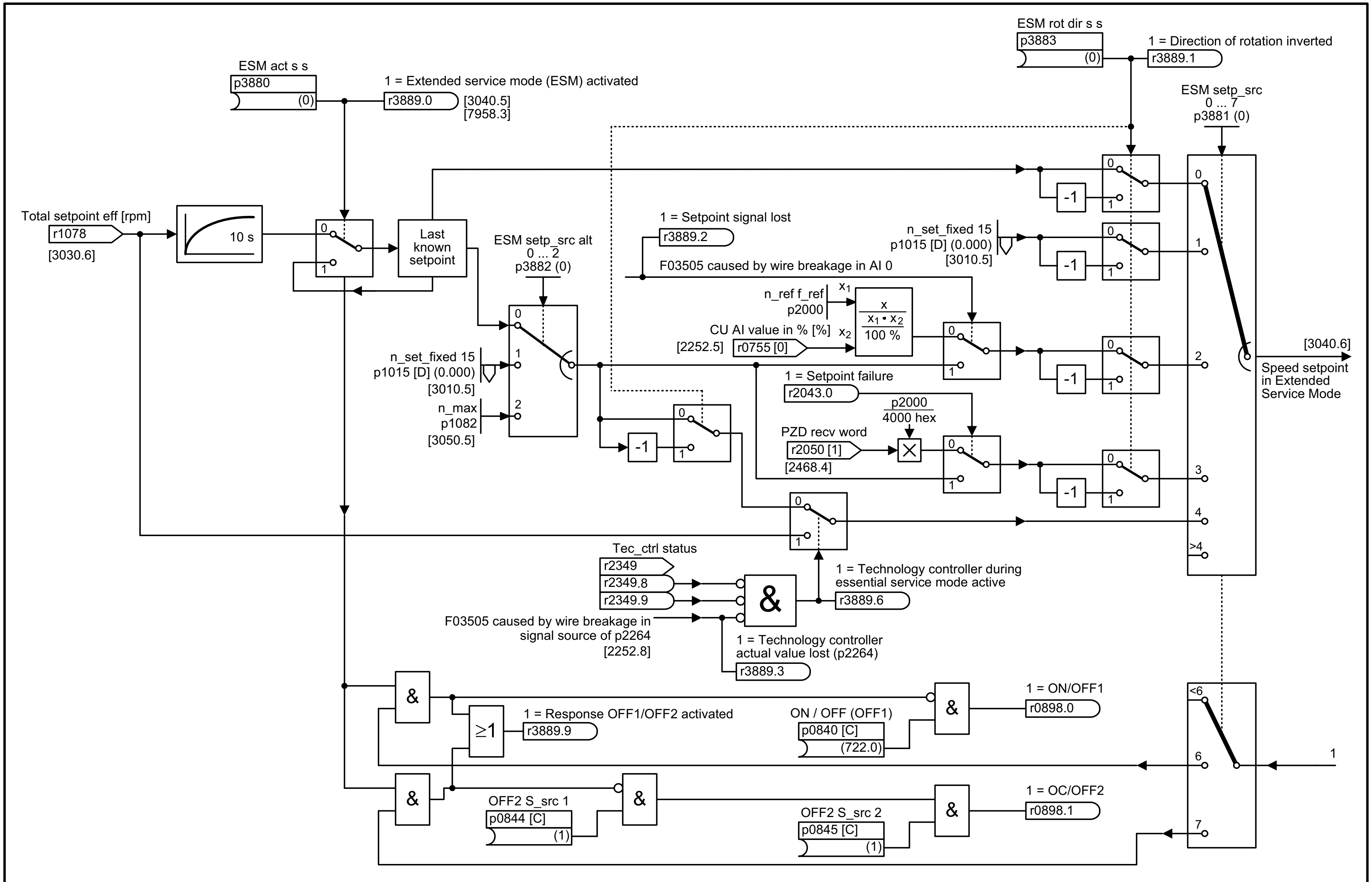



| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Technology functions | | | | | fp_7030_97_01.vsd | Function diagram | - 7030 - |
| Free Technology controller 0, 1, 2 | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-95 7032 – Multi-zone control




| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Technology functions | | | | | fp_7032_97_01.vsd | Function diagram | - 7032 - |
| Multi Zone Control | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

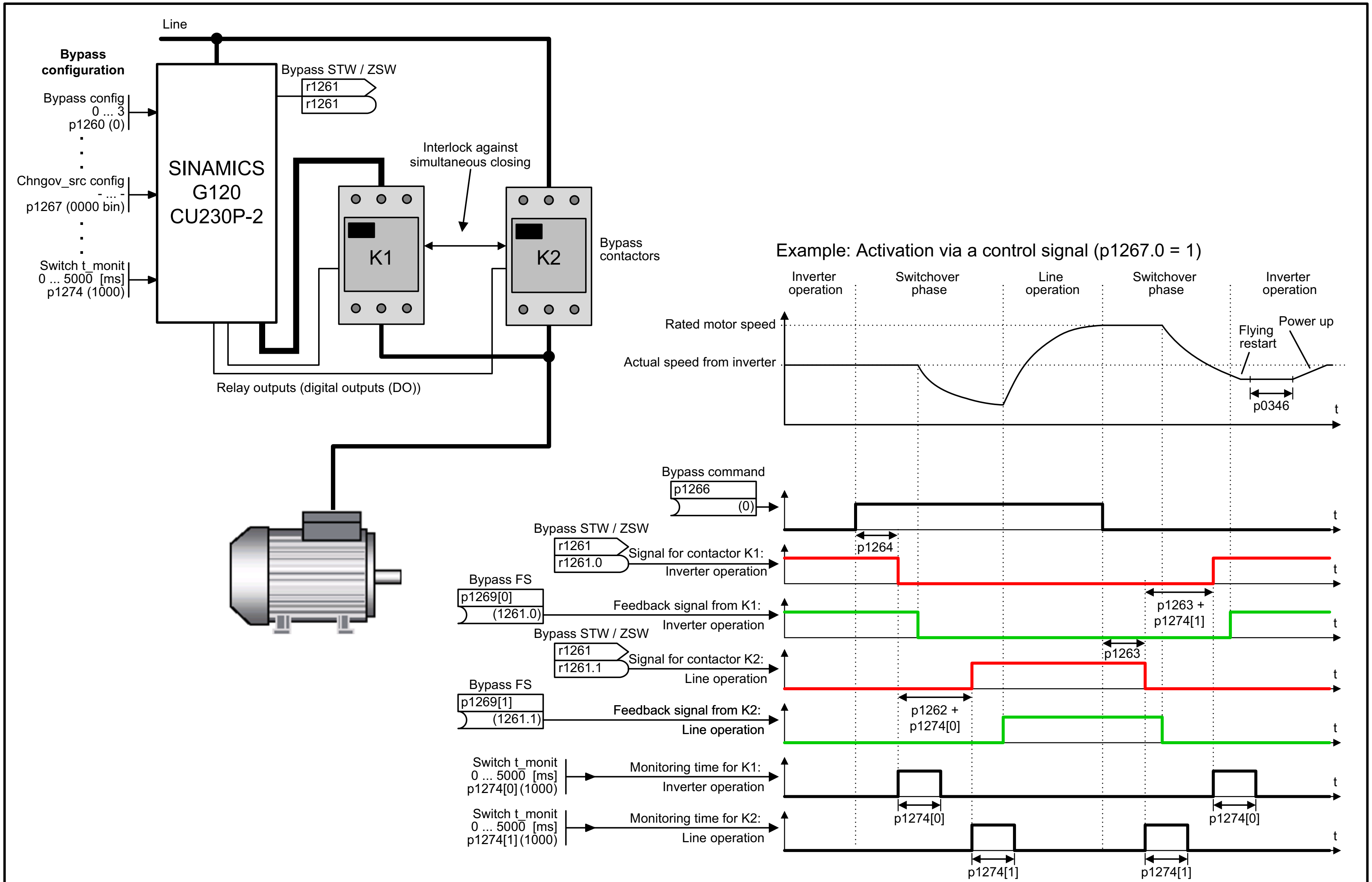



| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

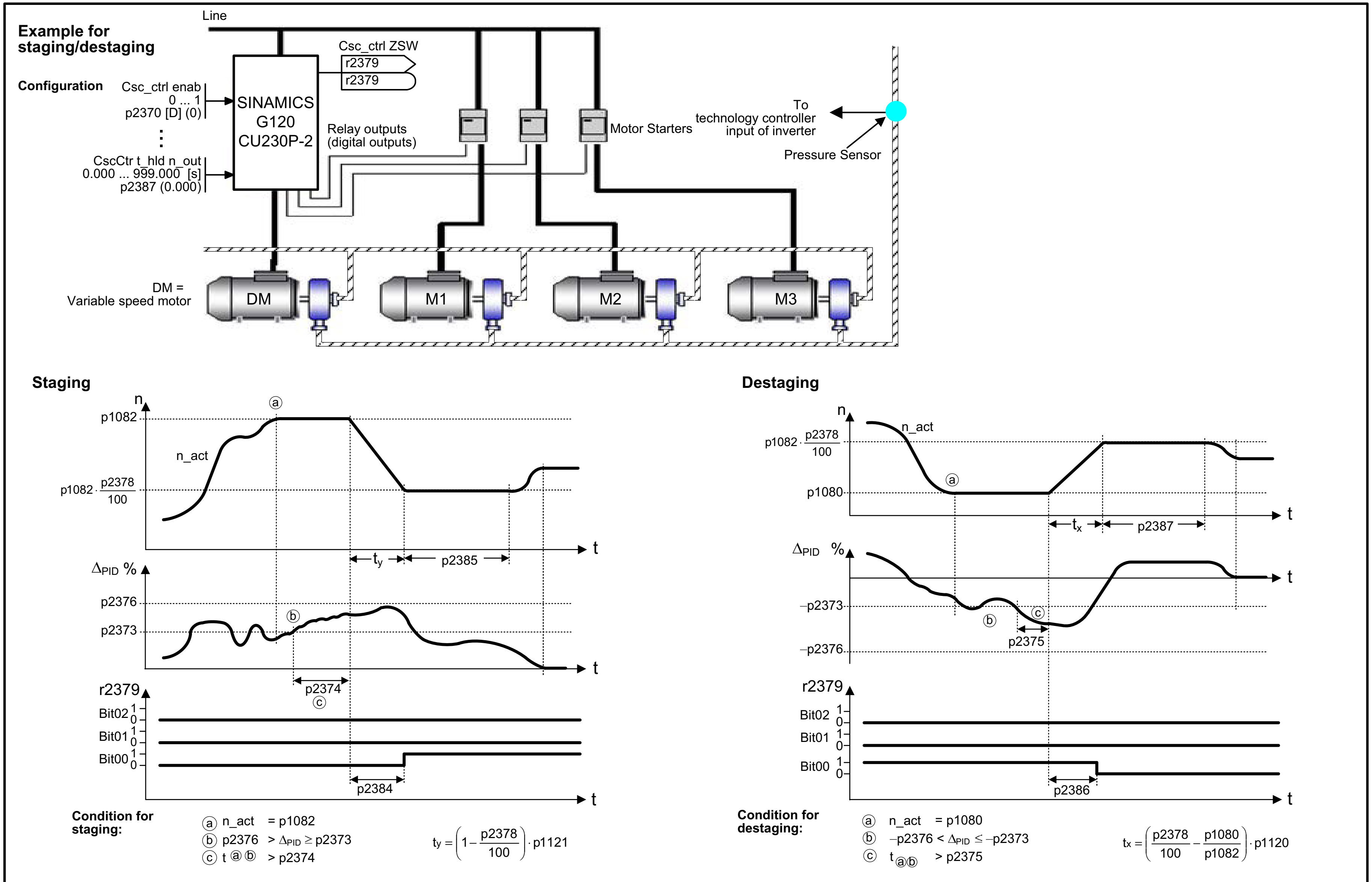
| | | | |
|---|---|---|---|
| Technology functions | fp_7033_97_01.vsd | Function diagram | - 7033 - |
| Essential Service Mode (ESM) | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-96 7033 – Essential service mode (ESM)

Fig. 3-97 7035 – Bypass



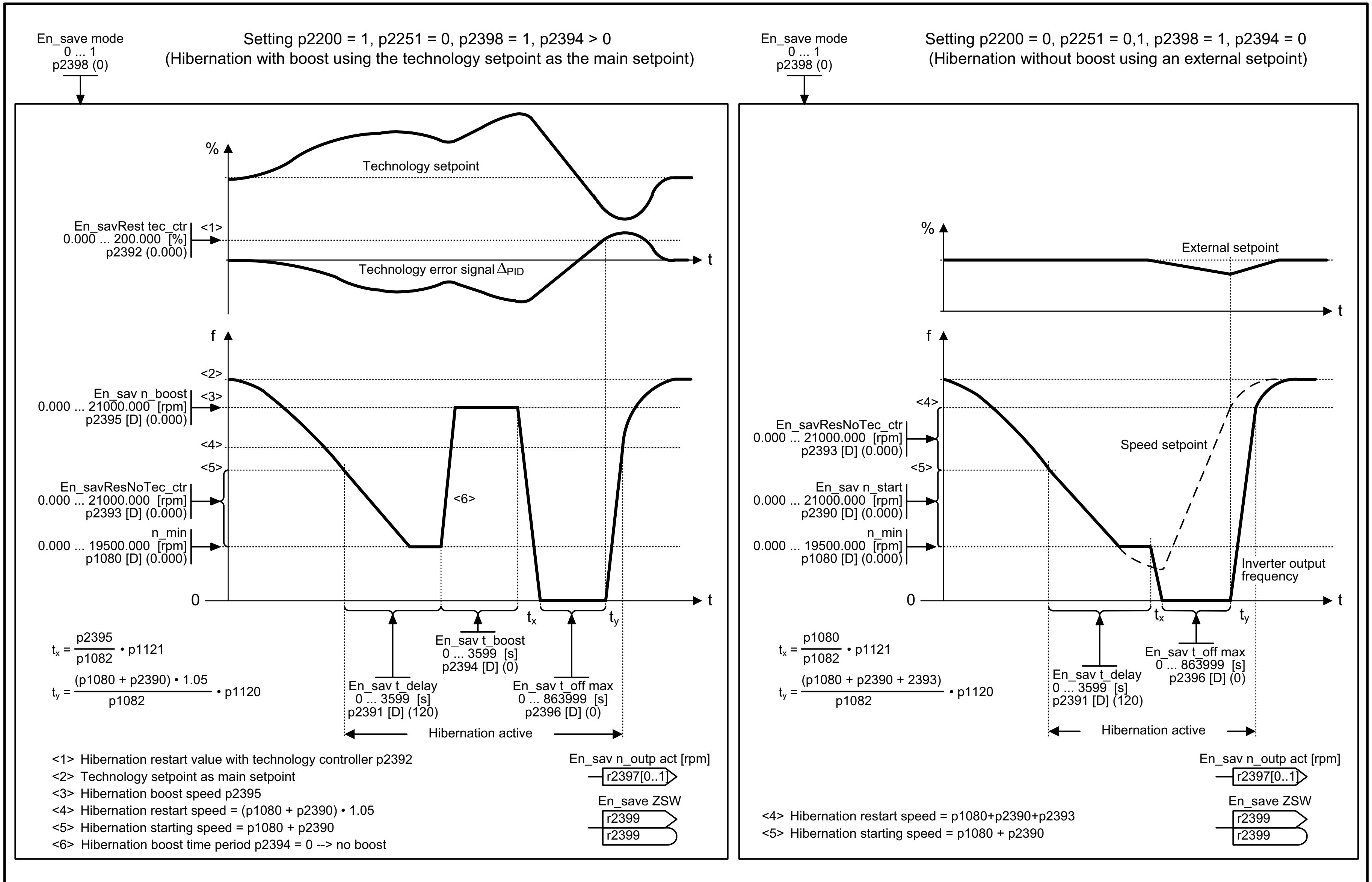

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Technology functions | | | | | fp_7035_97_01.vsd | Function diagram | - 7035 - |
| Bypass | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |




| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Technology functions | | | | | fp_7036_97_01.vsd | Function diagram | - 7036 - |
| Staging | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-98 7036 – Cascade control

Fig. 3-99 7038 – Energy-saving mode




| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Technology functions | | | | | fp_7038_97_01.vsd | Function diagram | - 7038 - |
| Hibernation | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

## 3.12 Free function blocks

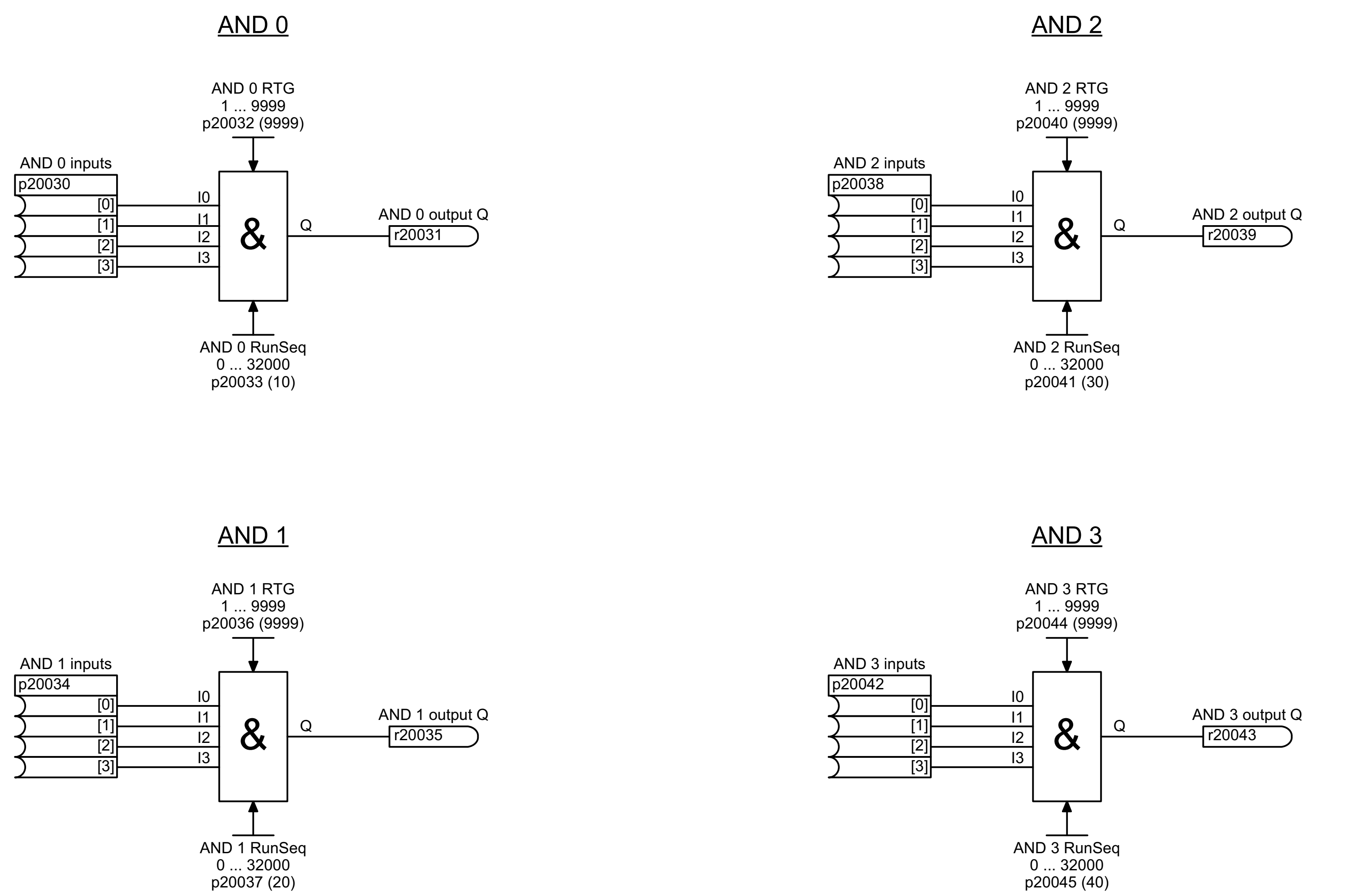
### Function diagrams

| | Run-time group | | | | | |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| | r20001[1] = 8 ms | r20001[2] = 16 ms | r20001[3] = 32 ms | r20001[4] = 64 ms | r20001[5] = 128 ms | r20001[6] = 256 ms |
| Logic function blocks<br>AND, OR, XOR, NOT | X | X | X | X | X | X |
| Arithmetic function blocks<br>ADD, SUB, MUL, DIV, AVA, NCM, PLI | - | - | - | - | X | X |
| Time function blocks<br>MFP, PCL, PDE, PDF, PST | - | - | - | - | X | X |
| Memory function blocks<br>RSR, DSR | X | X | X | X | X | X |
| Switch function block<br>NSW | - | - | - | - | X | X |
| Switch function block<br>BSW | X | X | X | X | X | X |
| Control function blocks<br>LIM, PT1, INT, DIF | - | - | - | - | X | X |
| Complex function blocks<br>LVM | - | - | - | - | X | X |

RTG sampling time [ms]
r20001[0..9]

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Free Function Blocks | | | | | fp_7200_97_51.vsd | Function diagram | - 7200 - |
| Sampling times of the runtime groups | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

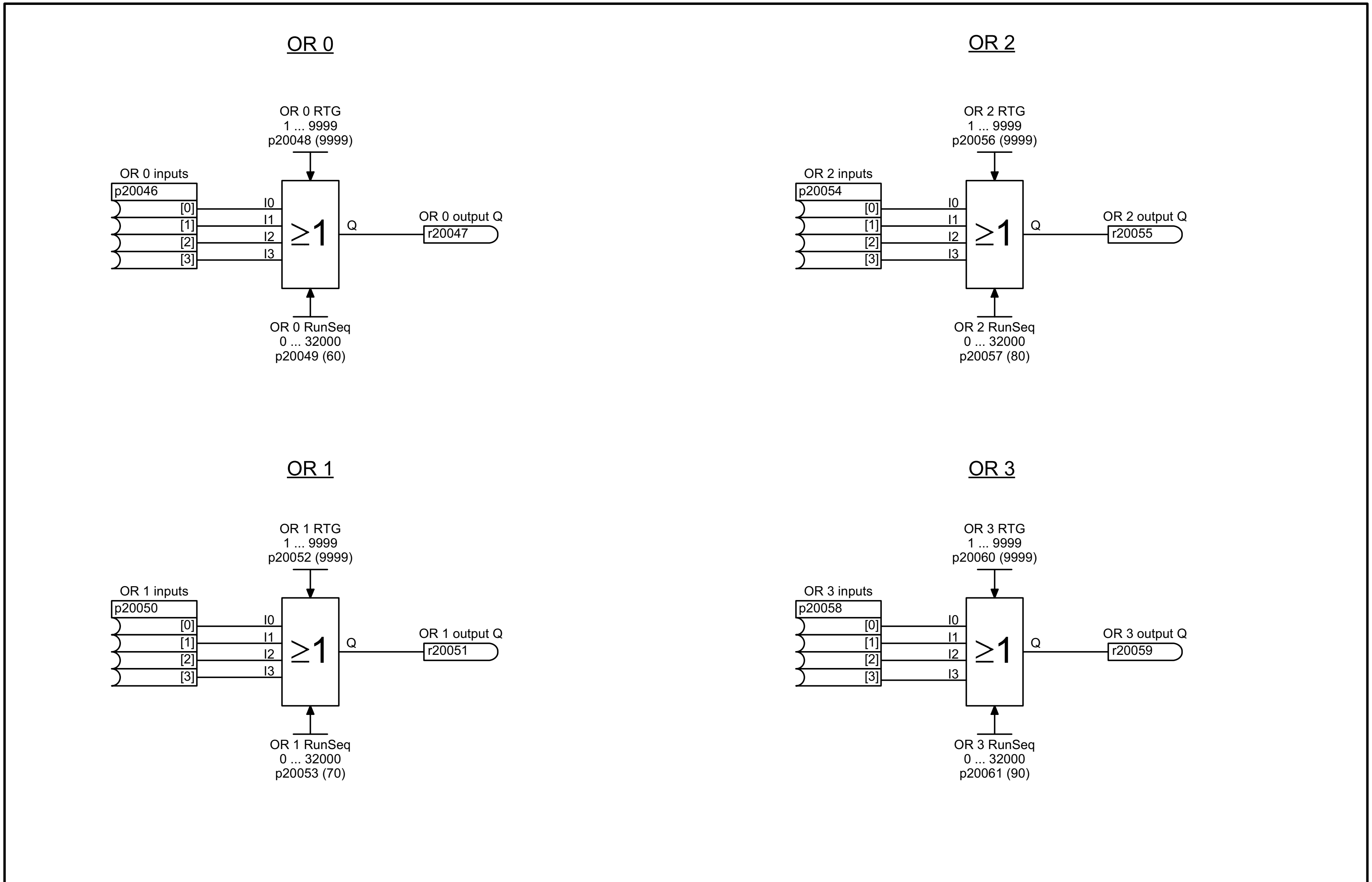
Fig. 3-100 7200 – Sampling times of the runtime groups



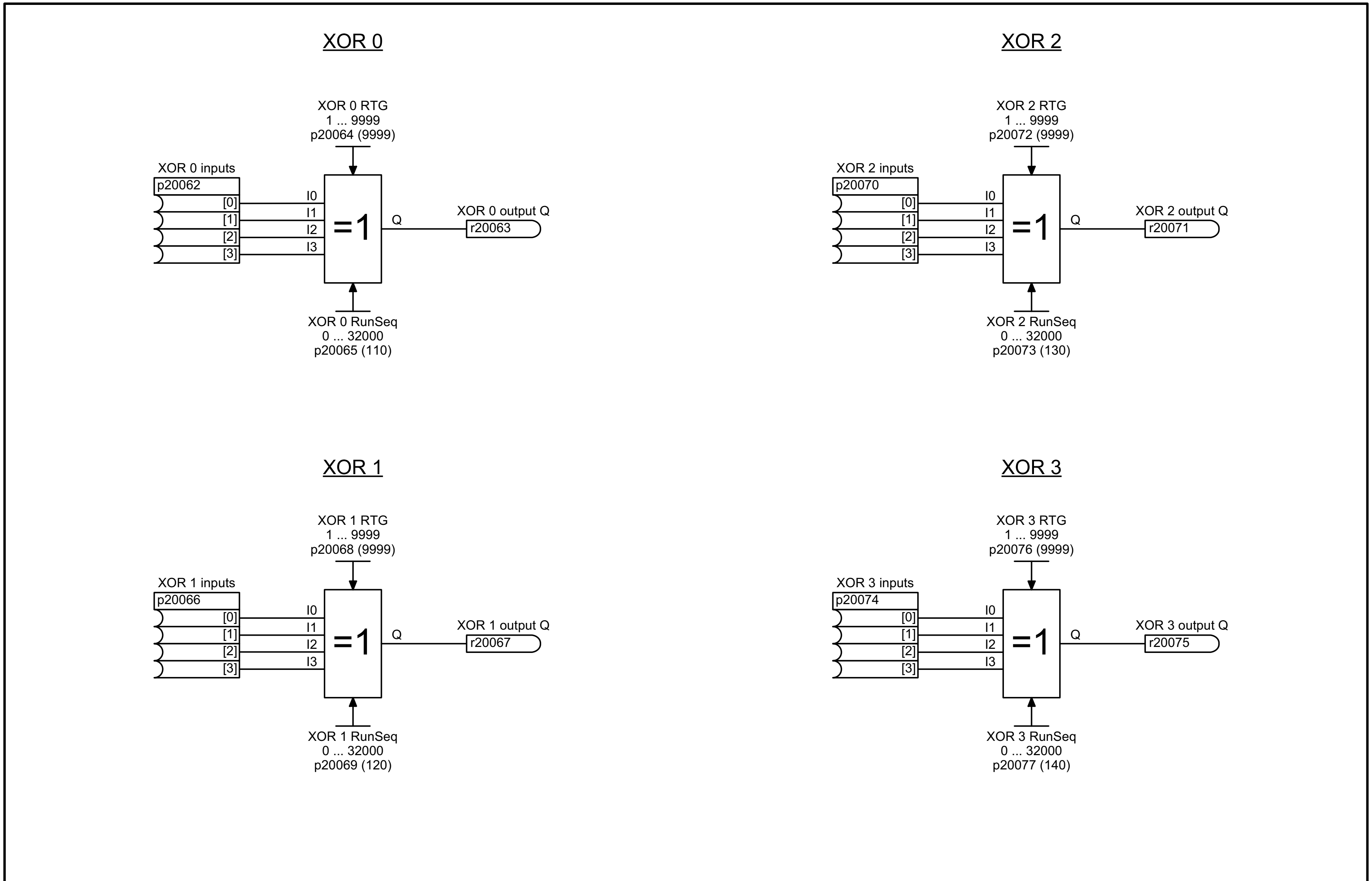

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Free function blocks - Logic function blocks | | | | | fp_7210_97_51.vsd | Function diagram | - 7210 - |
| AND (AND function blocks with 4 inputs) | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-101 7210 – AND (AND function blocks with 4 inputs)

Fig. 3-102 7212 – OR (OR function blocks with 4 inputs)



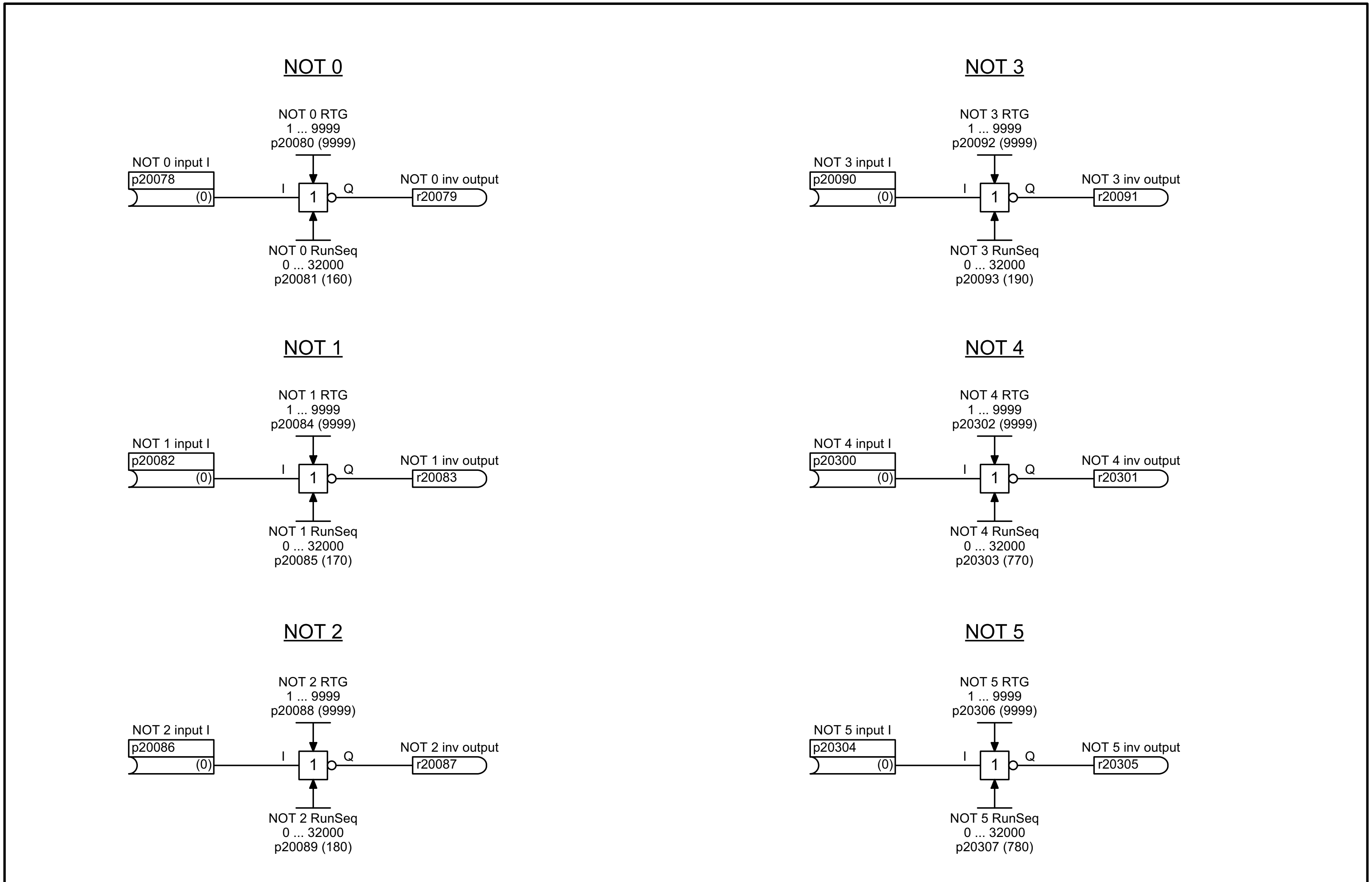

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Free function blocks - Logic function blocks | | | | | fp_7212_97_51.vsd | Function diagram | - 7212 - |
| OR (OR function blocks with 4 inputs) | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |



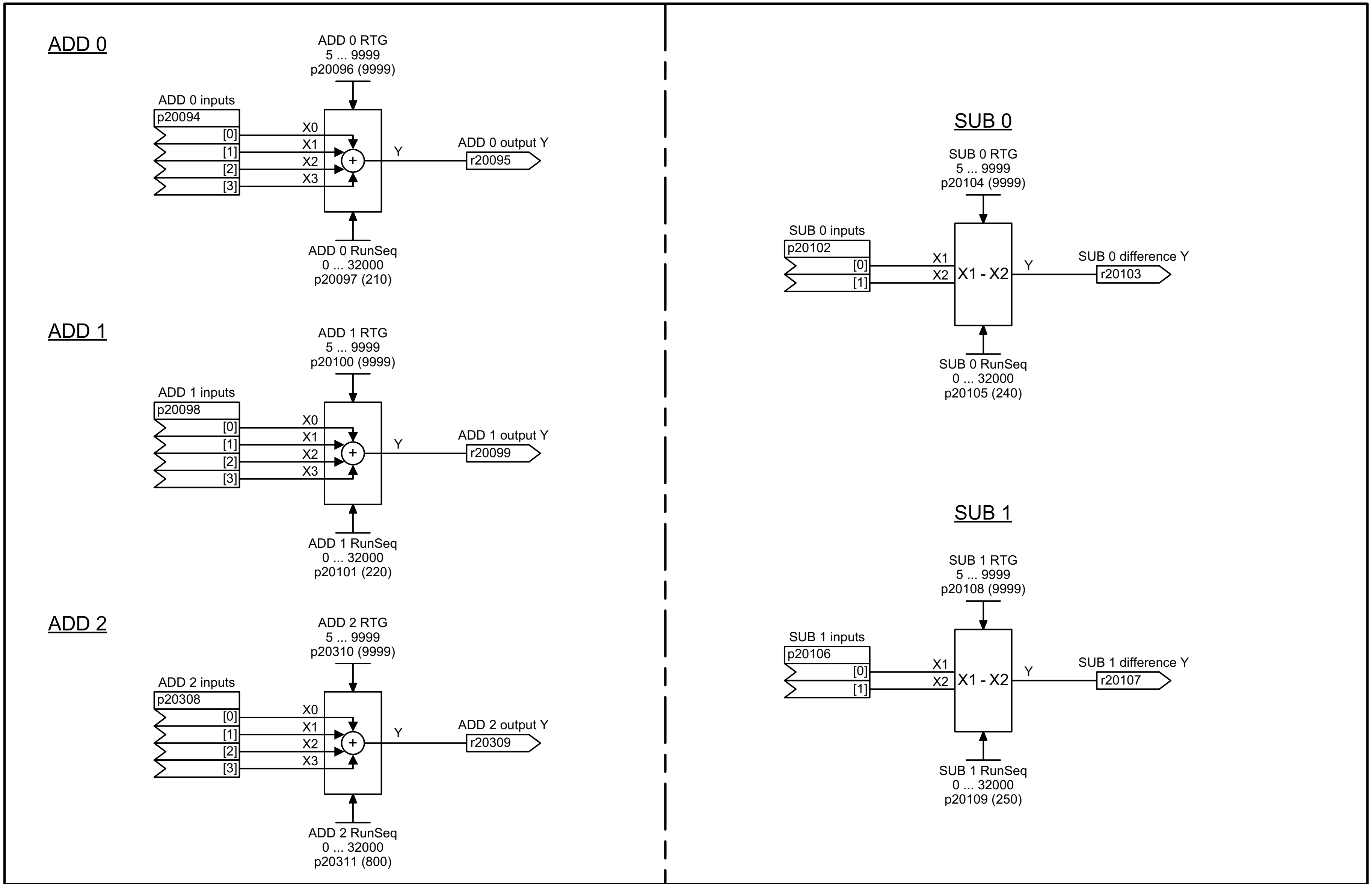

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Free function blocks - Logic function blocks | | | | | fp_7214_97_51.vsd | Function diagram | - 7214 - |
| XOR (XOR function blocks with 4 inputs) | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-103 7214 – XOR (XOR function blocks with 4 inputs)

Fig. 3-104 7216 – NOT (inverter)

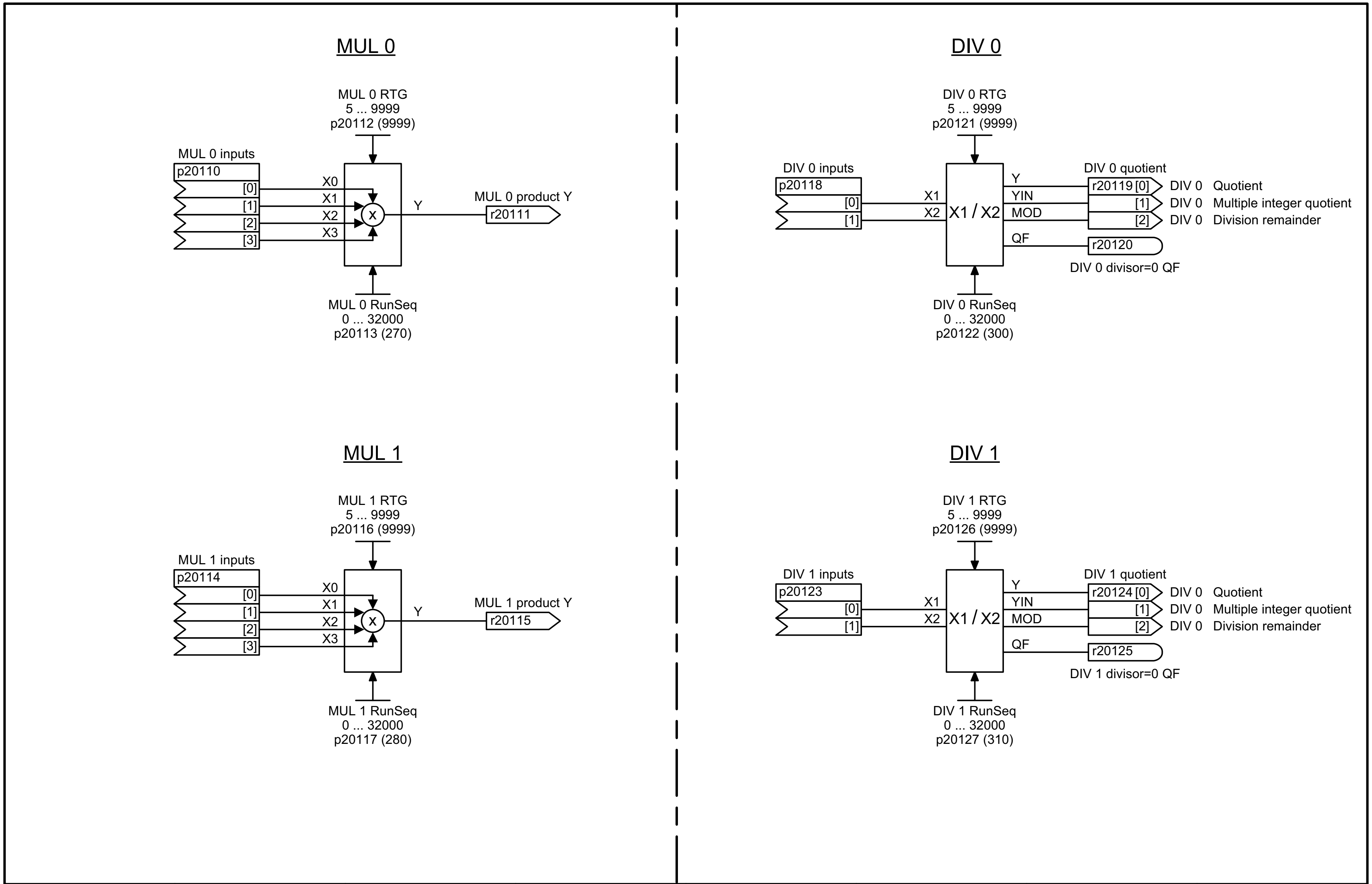



| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Free function blocks - Logic function blocks | | | | | fp_7216_97_51.vsd | Function diagram | - 7216 - |
| NOT (inverter) | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |




| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Free function blocks - Arithmetic function blocks | | | | | fp_7220_97_51.vsd | Function diagram | - 7220 - |
| ADD (adder with 4 inputs), SUB (subtracter) | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-105 7220 – ADD (adder with 4 inputs), SUB (subtracter)




| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Free function blocks - Arithmetic function blocks | | | | | fp_7222_97_51.vsd | Function diagram | - 7222 - |
| MUL (multiplier), DIV (divider) | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-106 7222 – MUL (multiplier), DIV (divider)

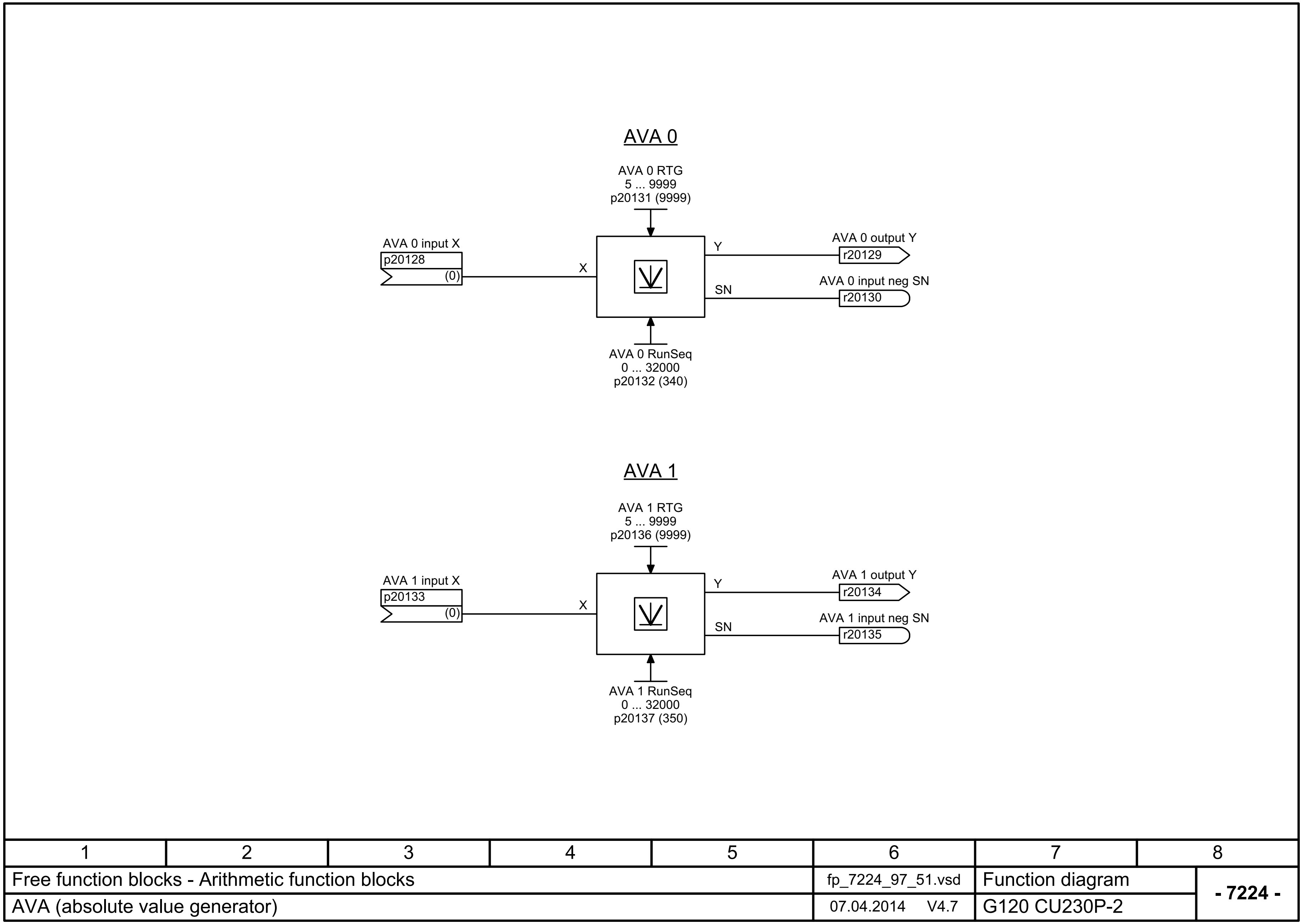
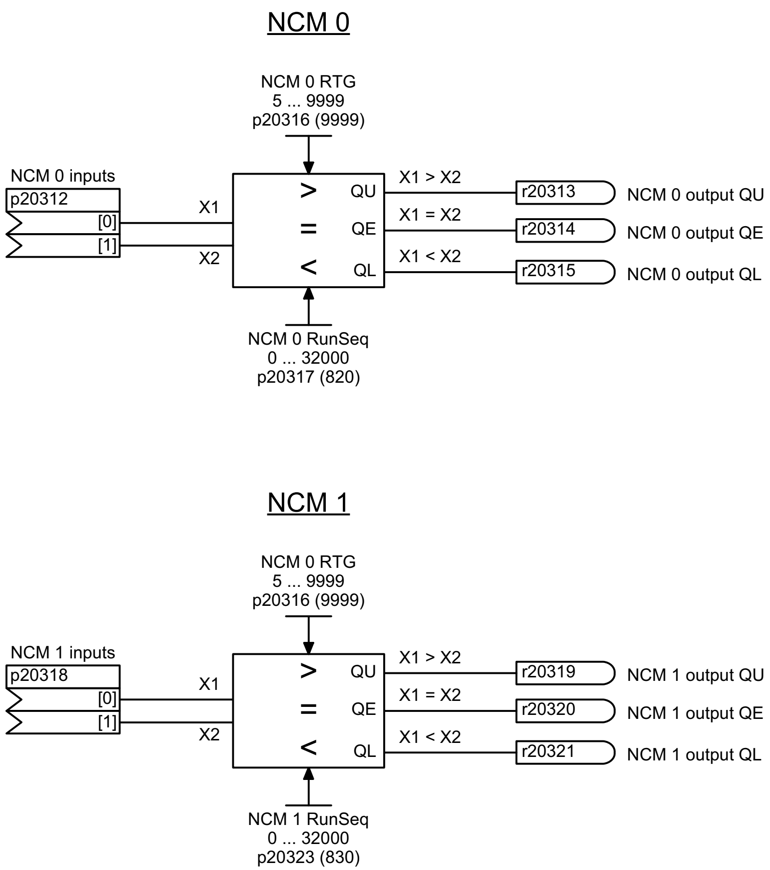
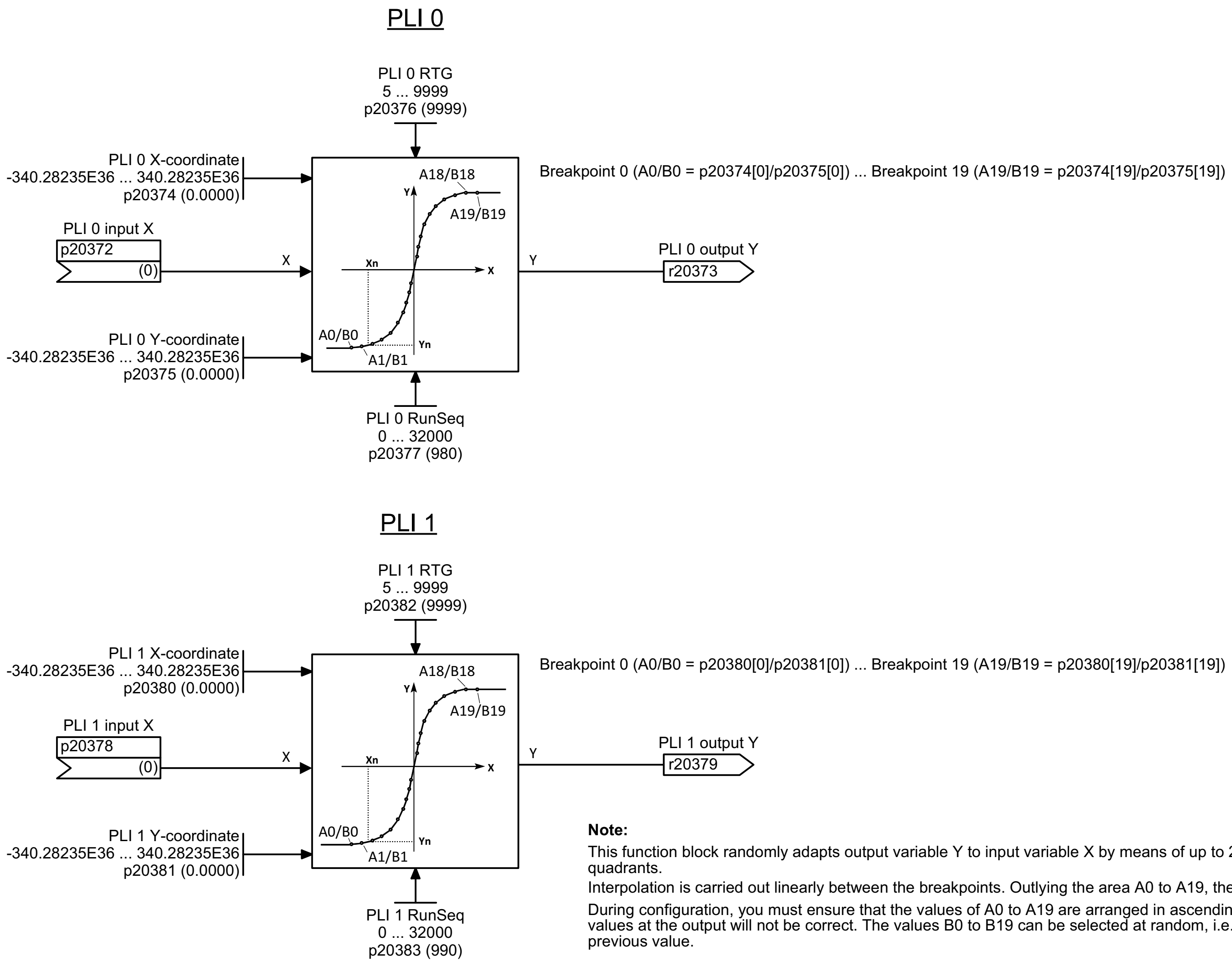



Fig. 3-107 7224 – AVA (absolute value generator)

Fig. 3-108 7225 – NCM (numeric comparator)




| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Free function blocks - Arithmetic function blocks | | | | | fp_7225_97_51.vsd | Function diagram | - 7225 - |
| NCM (numeric comparator) | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |




**Note:**

This function block randomly adapts output variable Y to input variable X by means of up to 20 breakpoints in 4 quadrants.

Interpolation is carried out linearly between the breakpoints. Outlying the area A0 to A19, the characteristic curve runs horizontally.

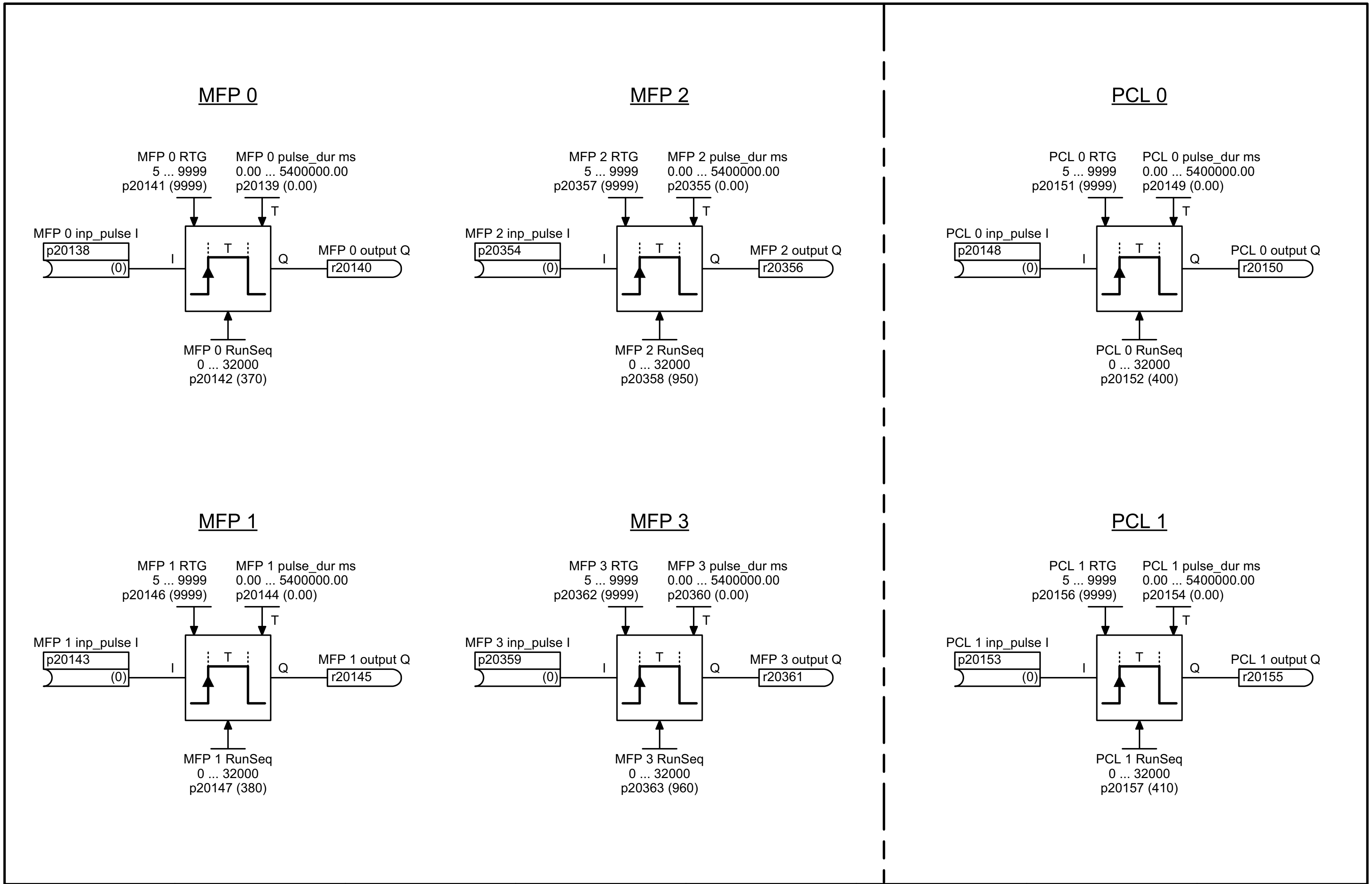
During configuration, you must ensure that the values of A0 to A19 are arranged in ascending order. Otherwise the values at the output will not be correct. The values B0 to B19 can be selected at random, i.e., independently of the previous value.

If breakpoints are not needed (e.g., A16/B16 and higher), the following values of the X- and Y-coordinates (A16/B16 to A19/B19) must be assigned the same values as A15/B15.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Free function blocks - Arithmetic function blocks | | | | | fp_7226_97_51.vsd | Function diagram | - 7226 - |
| PLI (polyline scaling) | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

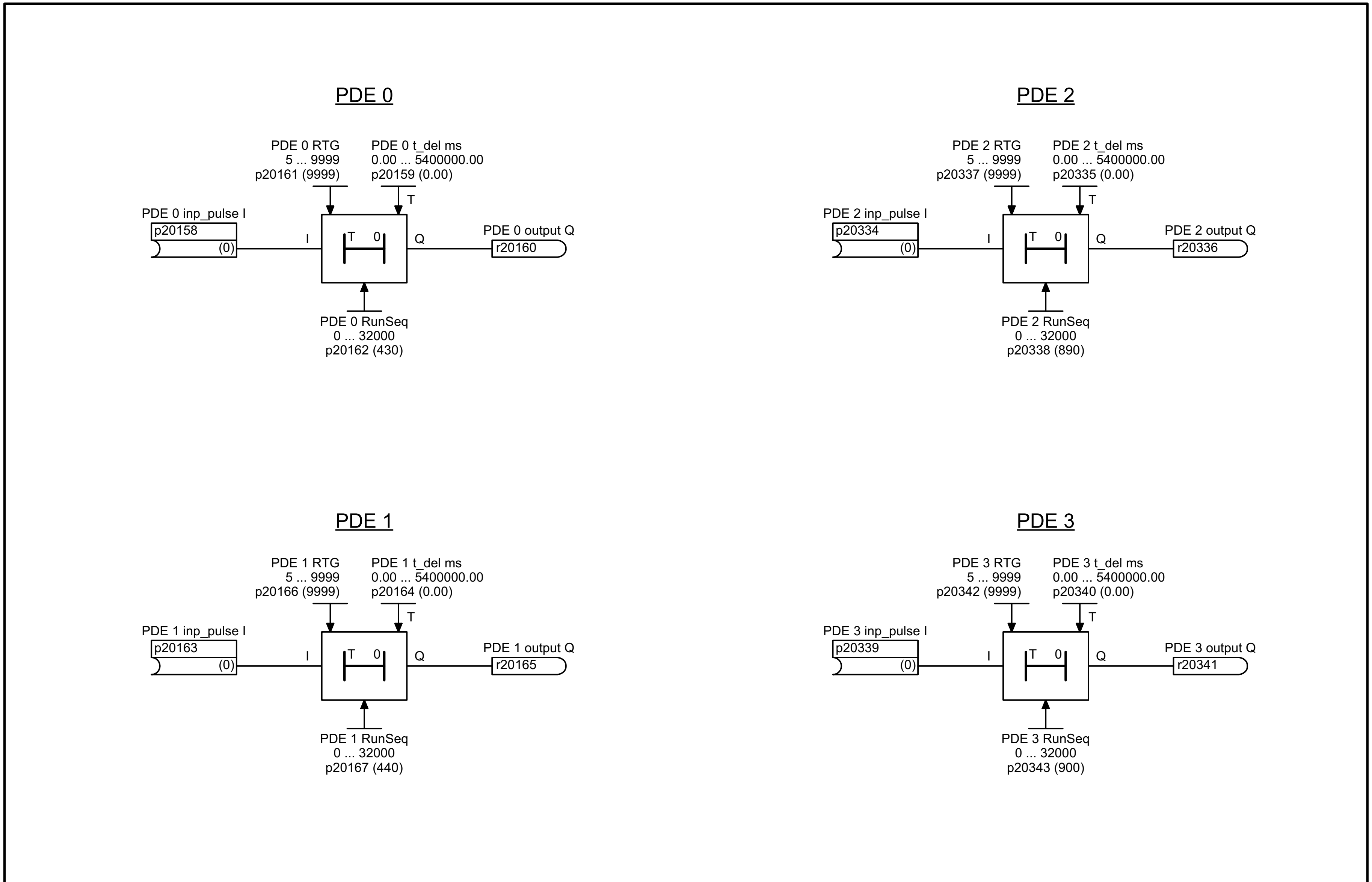
Fig. 3-109 7226 – PLI (polyline scaling)

Fig. 3-110 7230 – MFP (pulse generator), PCL (pulse contractor)




| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

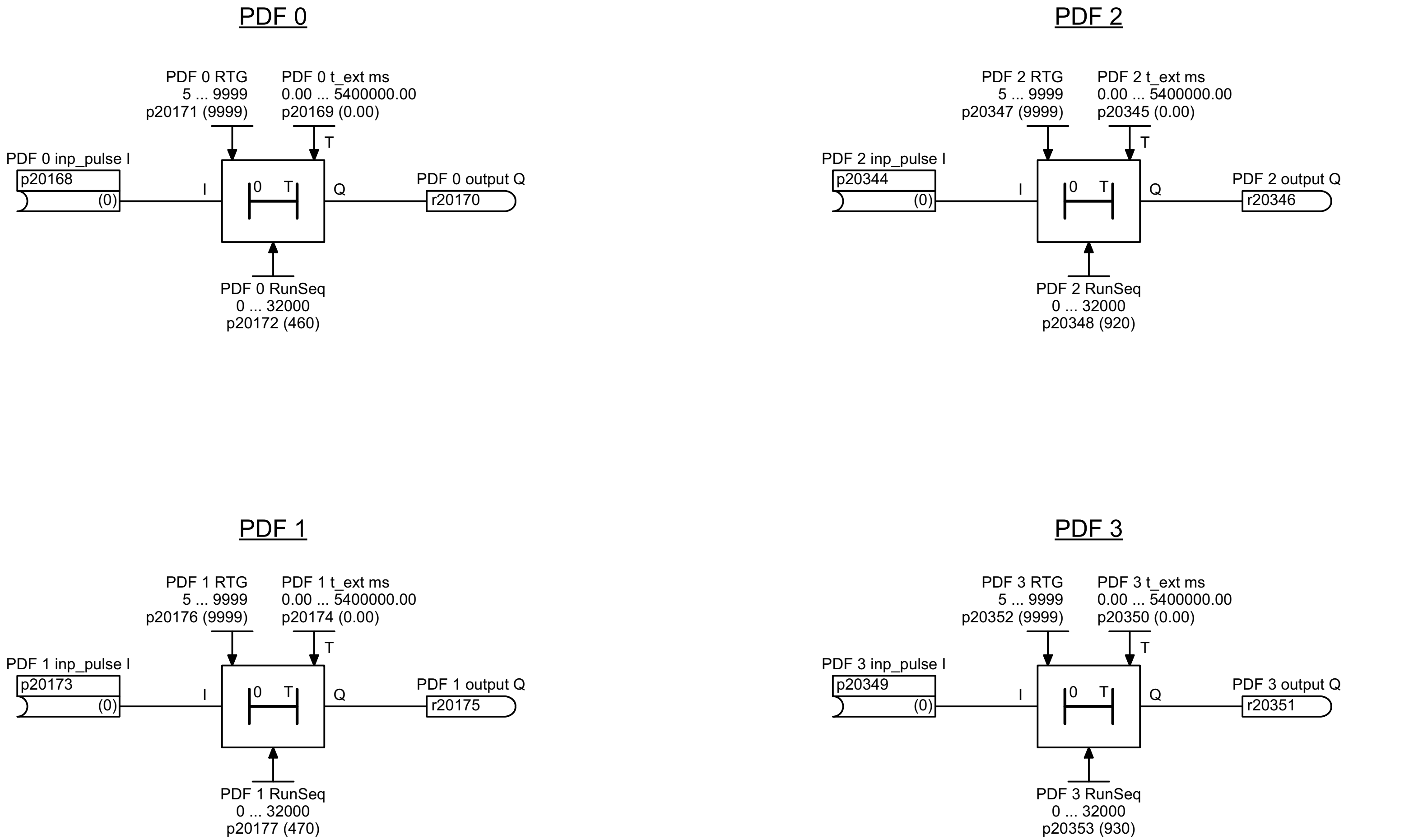
| | | | |
|---|---|---|---|
| Free function blocks - Time function blocks | fp_7230_97_51.vsd | Function diagram | - 7230 - |
| MFP (pulse generator), PCL (pulse contractor) | 07.04.2014 V4.7 | G120 CU230P-2 | |




| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Free function blocks - Time function blocks | | | | | fp_7232_97_51.vsd | Function diagram | - 7232 - |
| PDE (ON delay) | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-111 7232 – PDE (ON delay)

Fig. 3-112 7233 – PDF (OFF delay)




| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Free function blocks - Time function blocks | | | | | fp_7233_97_51.vsd | Function diagram | - 7233 - |
| PDF (OFF delay) | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

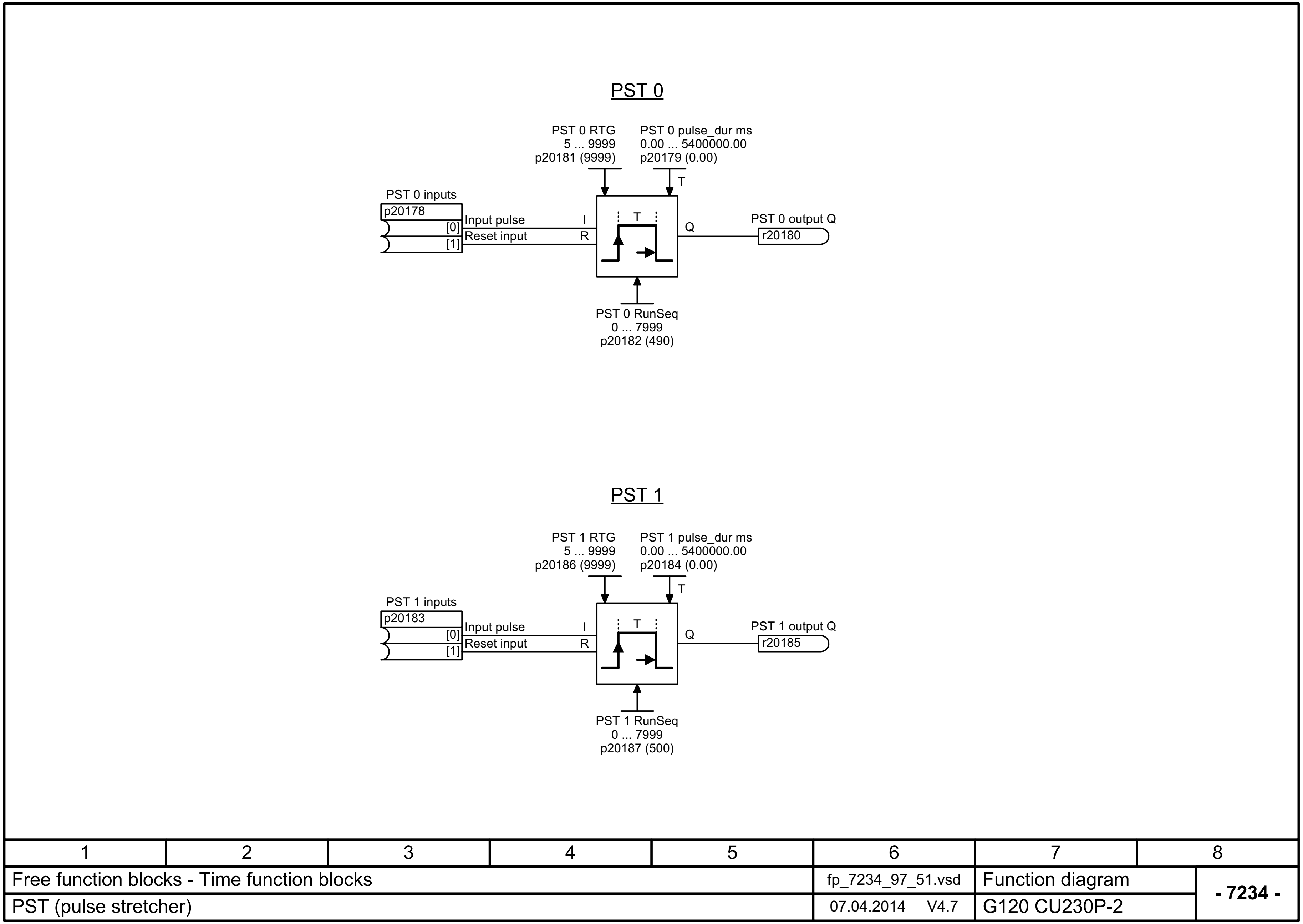
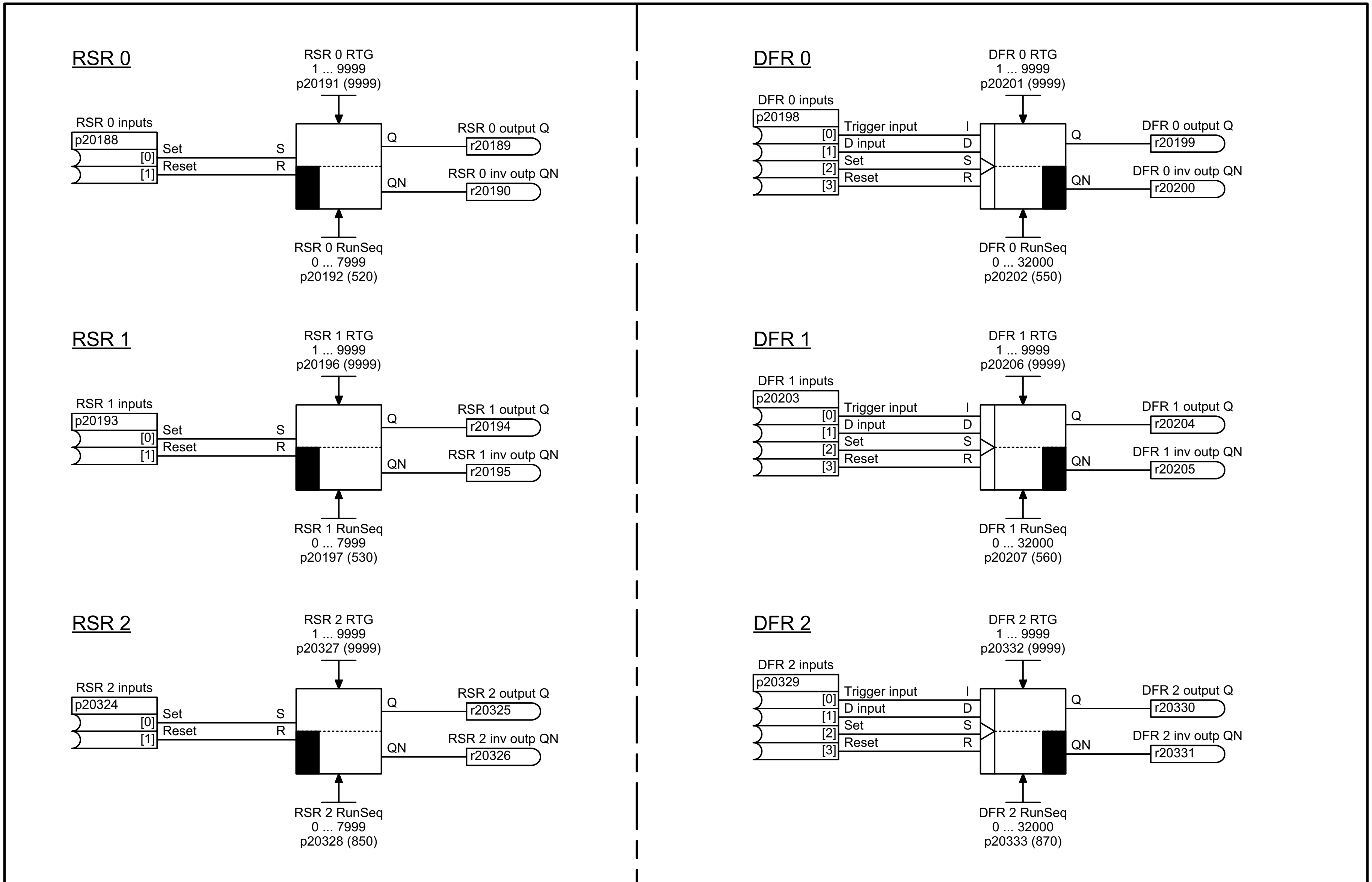


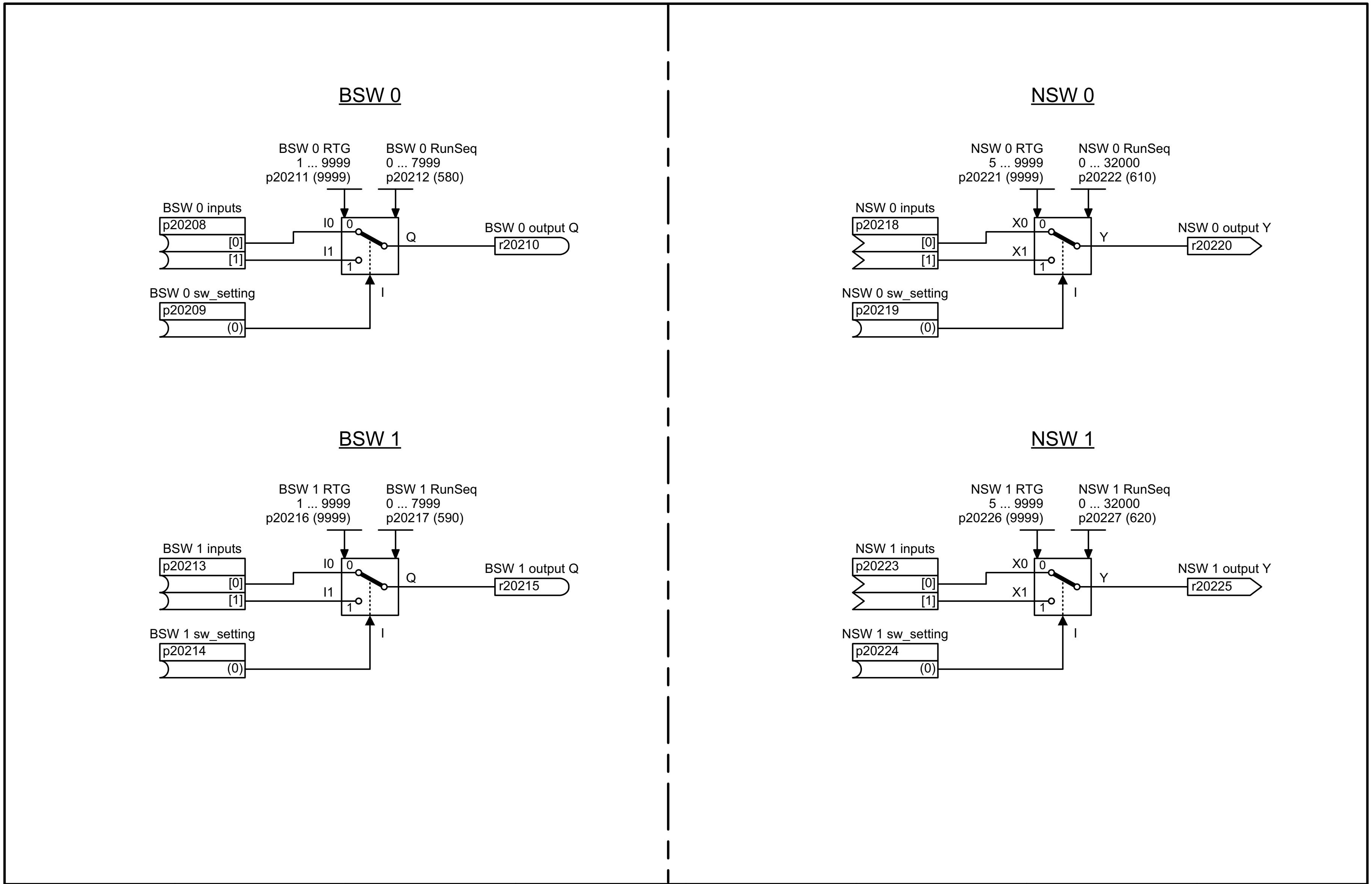

Fig. 3-113 7234 – PST (pulse stretcher)

Fig. 3-114 7240 – RSR (RS flip-flop), DFR (D flip-flop)




| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

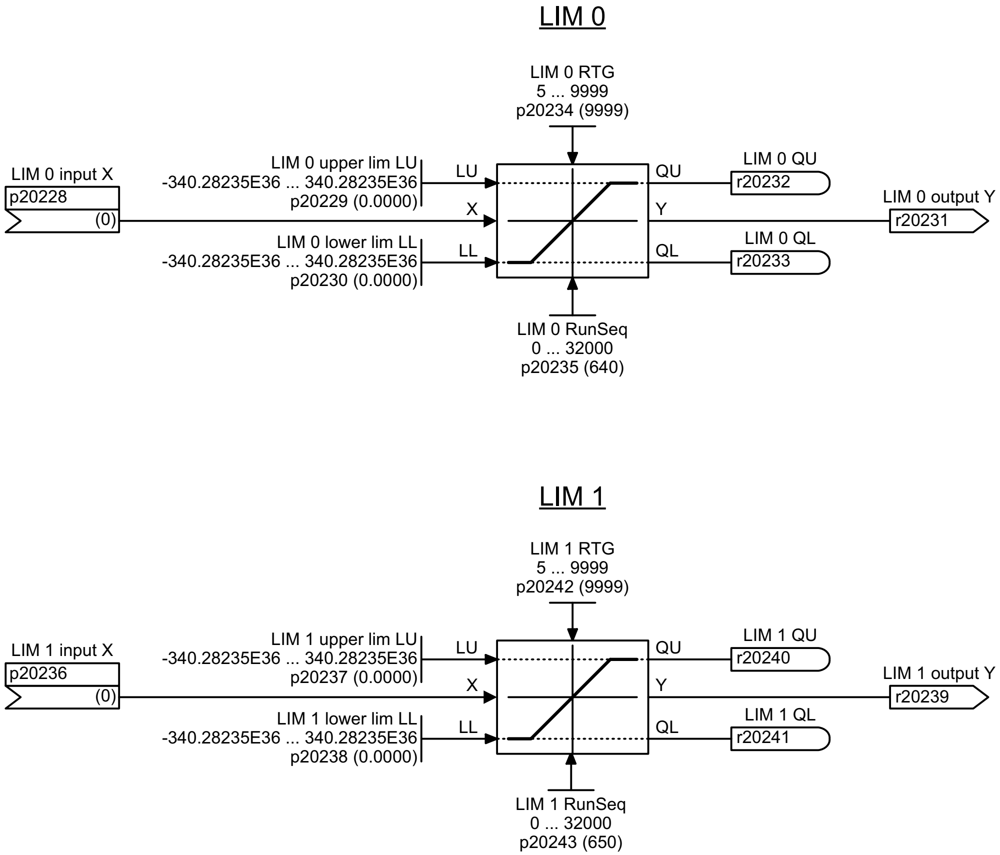
| | | | |
|---|---|---|---|
| Free function blocks - Flipflop function blocks | fp_7240_97_51.vsd | Function diagram | - 7240 - |
| RSR (RS flip-flop), DFR (D flip-flop) | 07.04.2014 V4.7 | G120 CU230P-2 | |



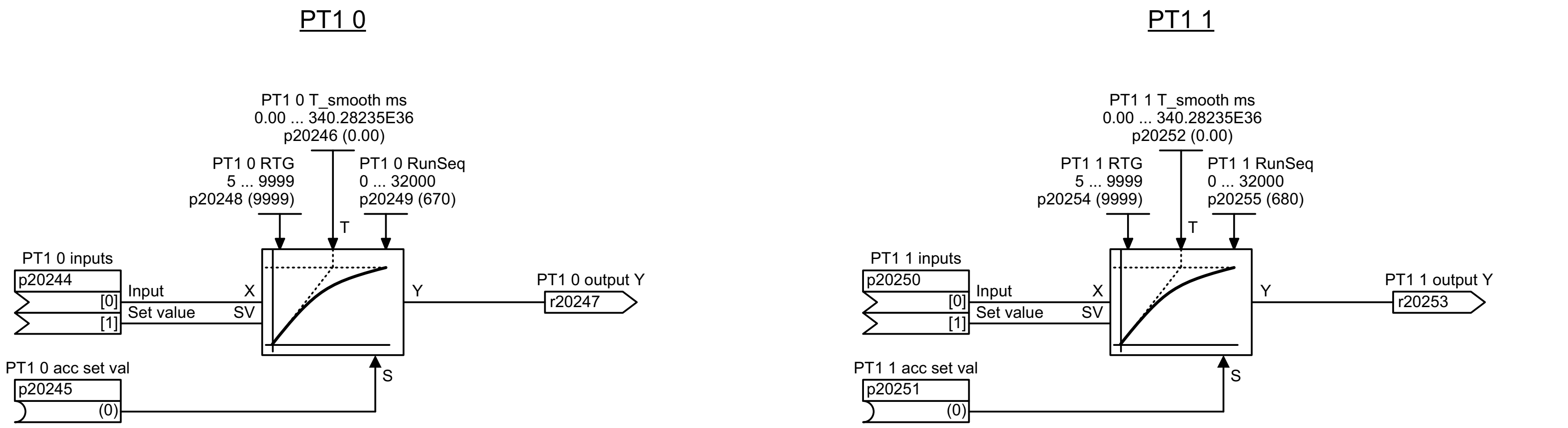

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Free function blocks - Switch function blocks | | | | | fp_7250_97_51.vsd | Function diagram | - 7250 - |
| BSW (binary change-over switch), NSW (numeric change-over switch) | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-115 7250 – BSW (binary change-over switch), NSW (numeric change-over switch)

Fig. 3-116 7260 – LIM (limiter)




| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Free function blocks - Control function blocks | | | | | fp_7260_97_51.vsd | Function diagram | - 7260 - |
| LIM (limiter) | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

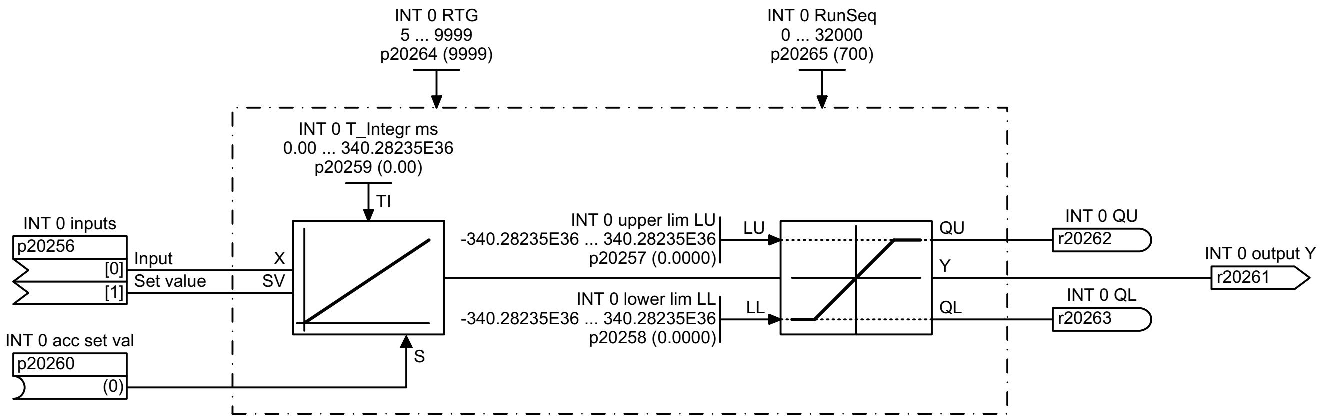



| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Free function blocks - Control function blocks | | | | | fp_7262_97_51.vsd | Function diagram | - 7262 - |
| PT1 (smoothing element) | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-117 7262 – PT1 (smoothing element)

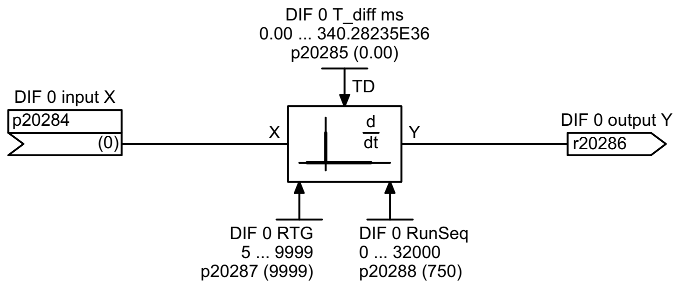
Fig. 3-118 7264 – INT (integrator), DIF (derivative-action element)

## INT 0



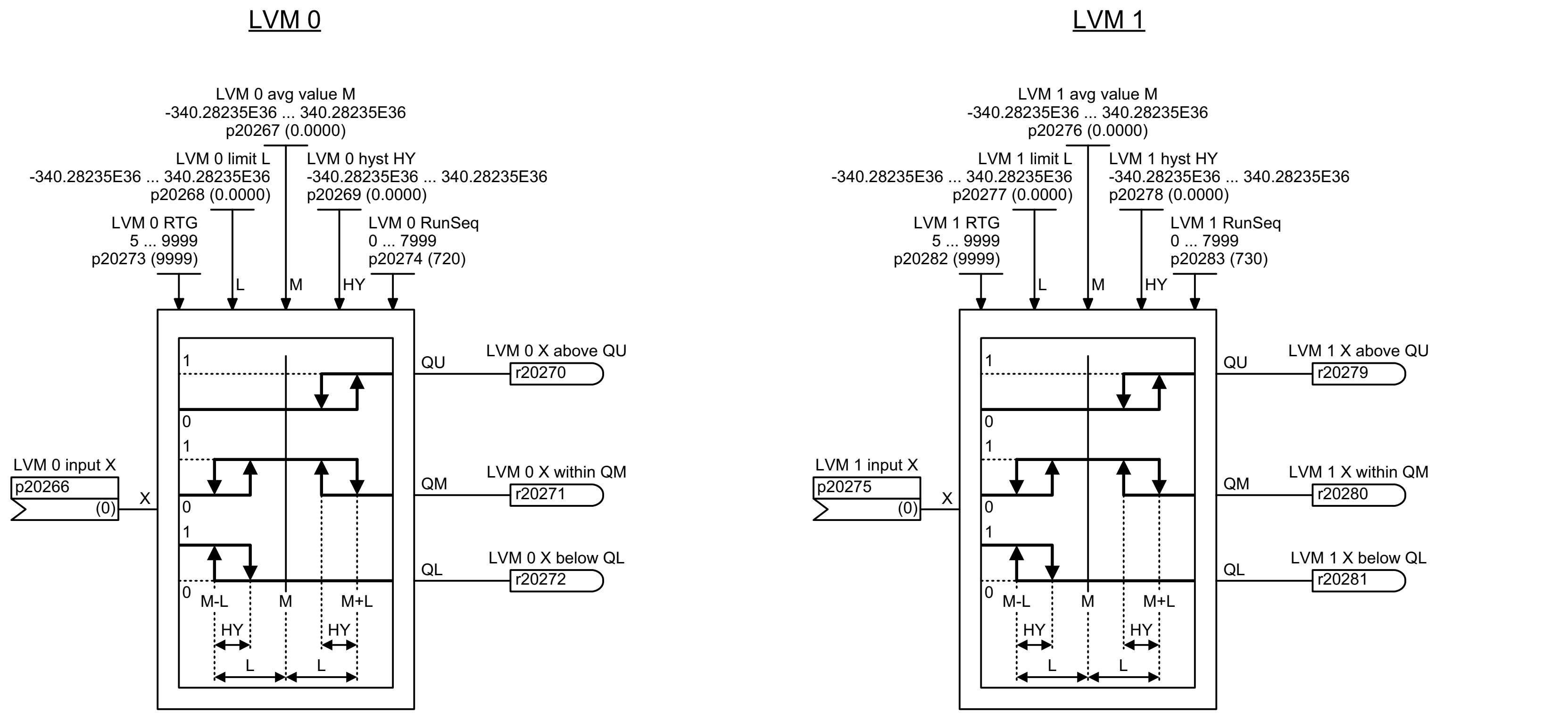

Integrating algorithm: Y(n) = Y(n-1) + (T_sample / Ti) • X(n)

## DIF 0




Differentiating algorithm: Y(n) = (X(n) - X(n-1)) • (TD / T_sample)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Free function blocks -Control function blocks | | | | | fp_7264_97_51.vsd | Function diagram | - 7264 - |
| INT (integrator), DIF (derivative-action element) | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

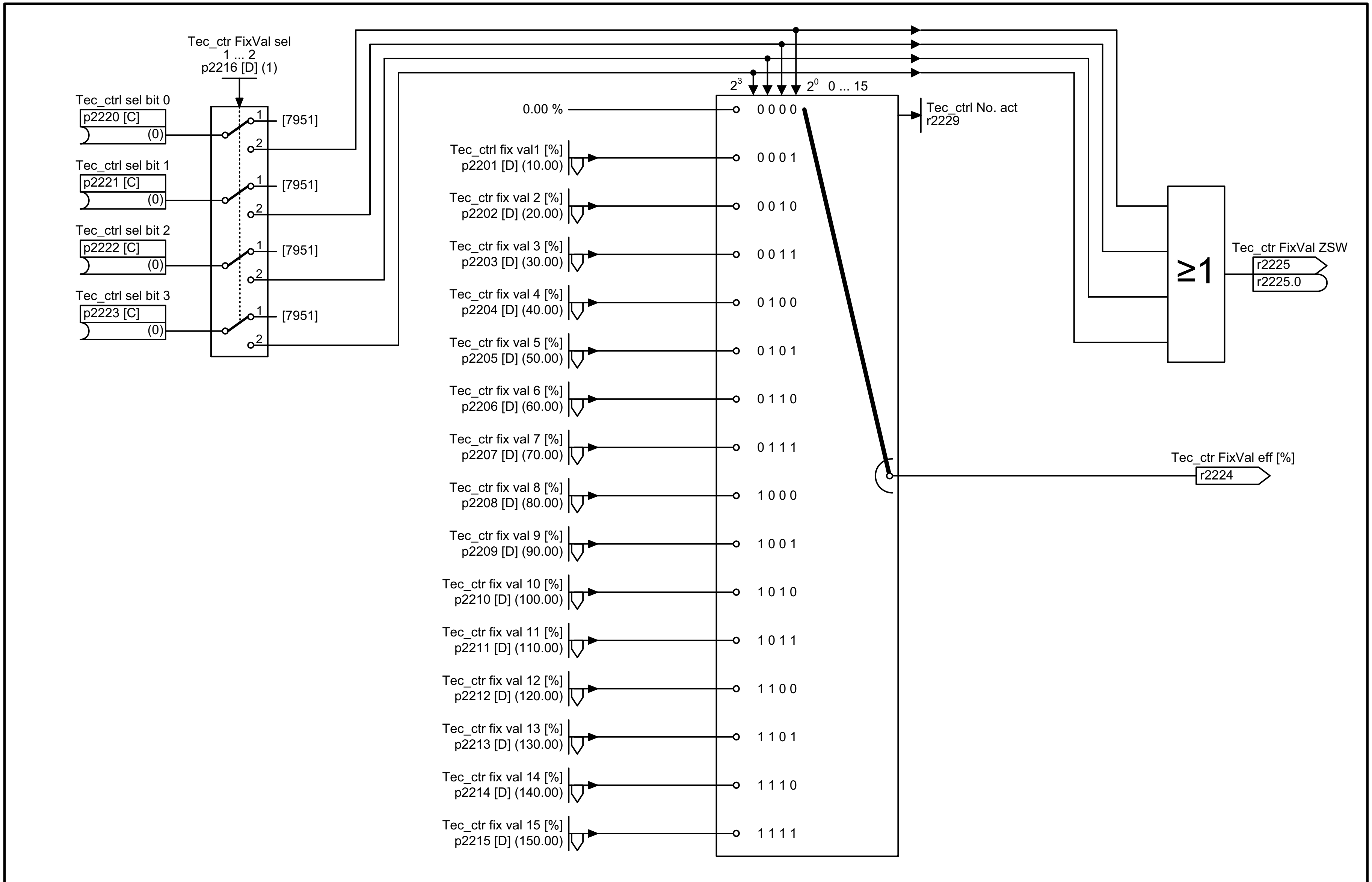



| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Free function blocks - Complex function blocks | | | | | fp_7270_97_51.vsd | Function diagram | - 7270 - |
| LVM (double-sided limit monitor with hysteresis) | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-119 7270 – LVM (double-sided limit monitor with hysteresis)

# 3.13 Technology controller

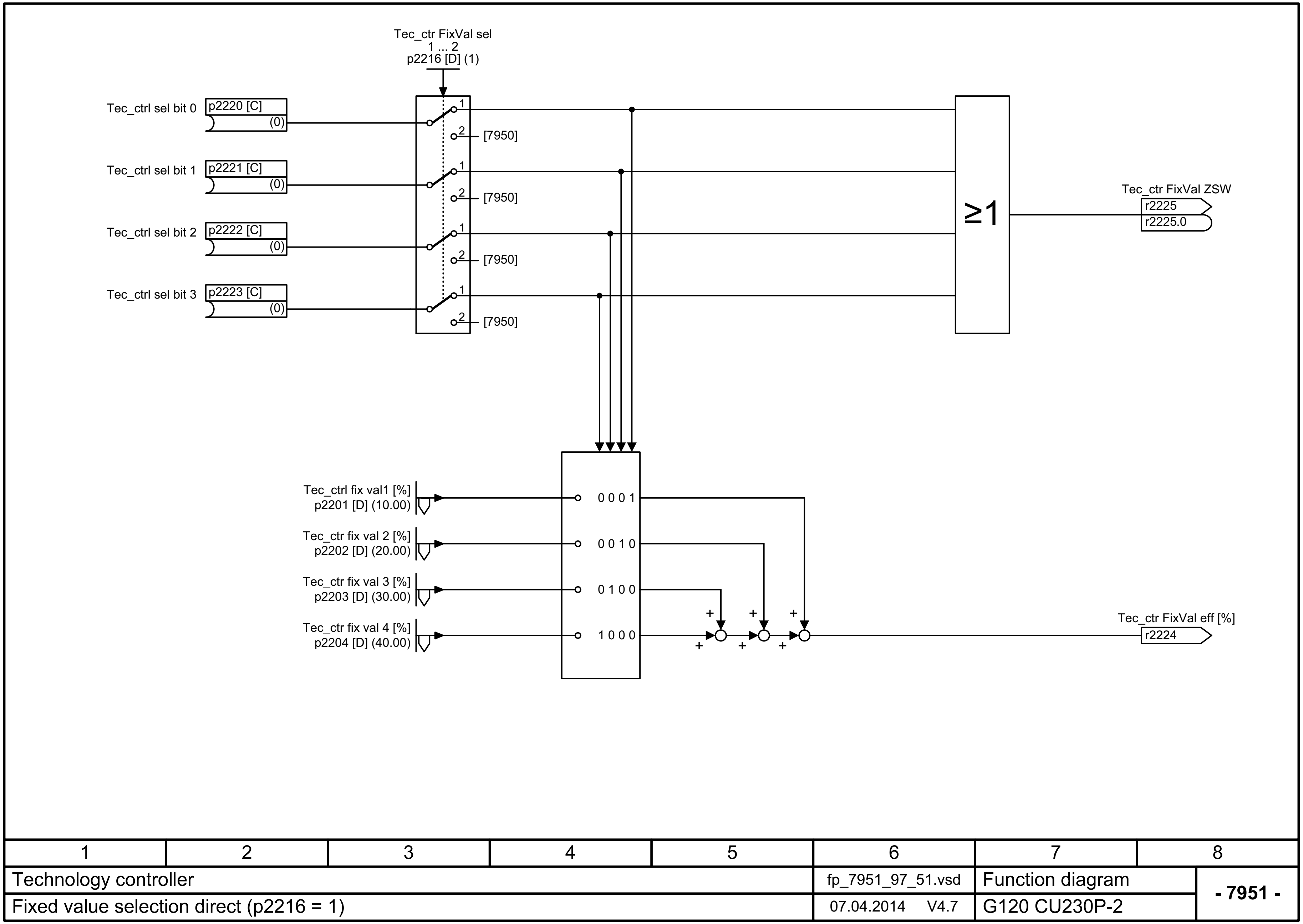
## Function diagrams

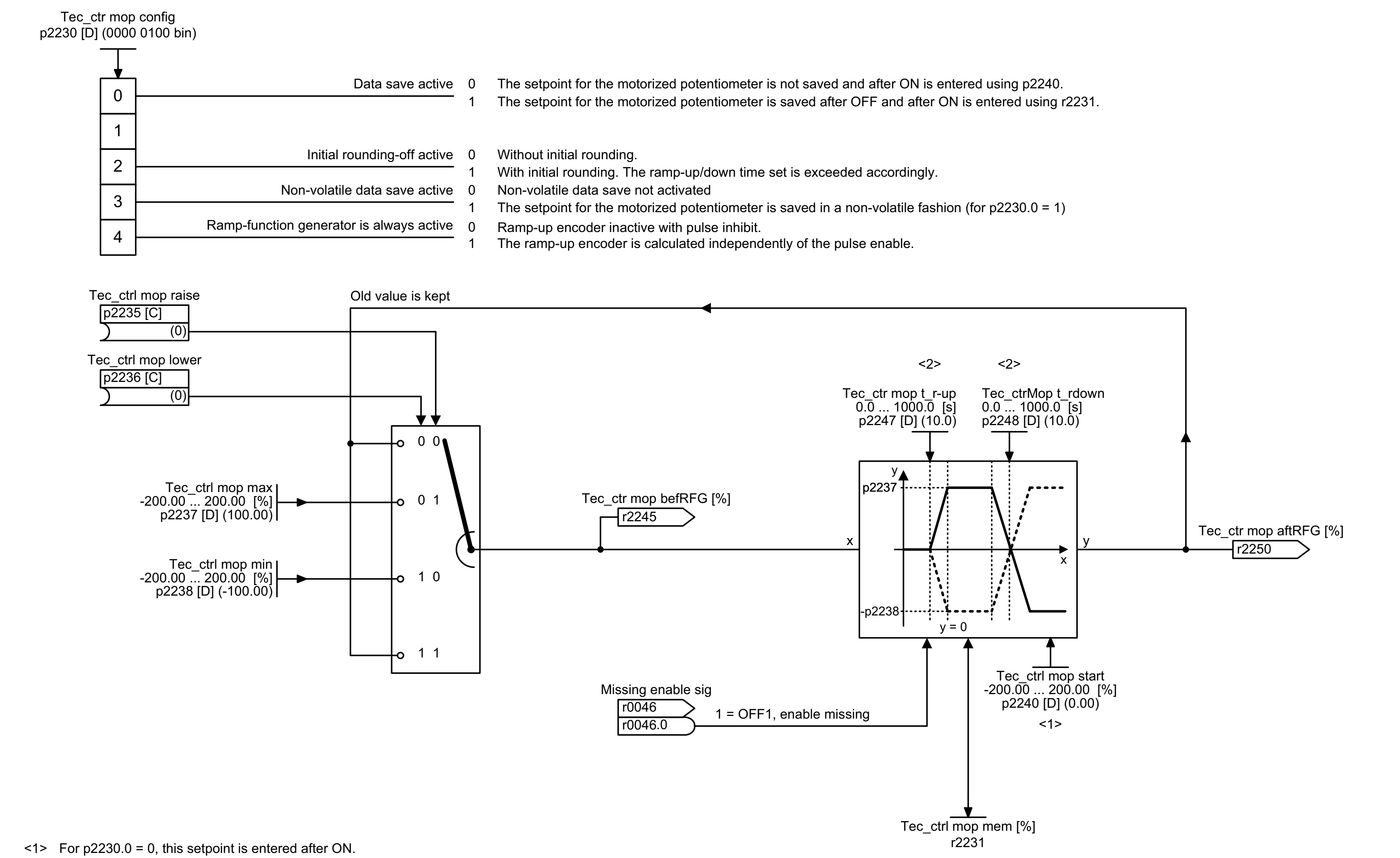



| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Technology controller | | | | | fp_7950_97_51.vsd | Function diagram | - 7950 - |
| Fixed value selection binary (p2216 = 2) | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-120 7950 – Fixed value selection binary (p2216 = 2)

Fig. 3-121 7951 – Fixed value selection direct (p2216 = 1)





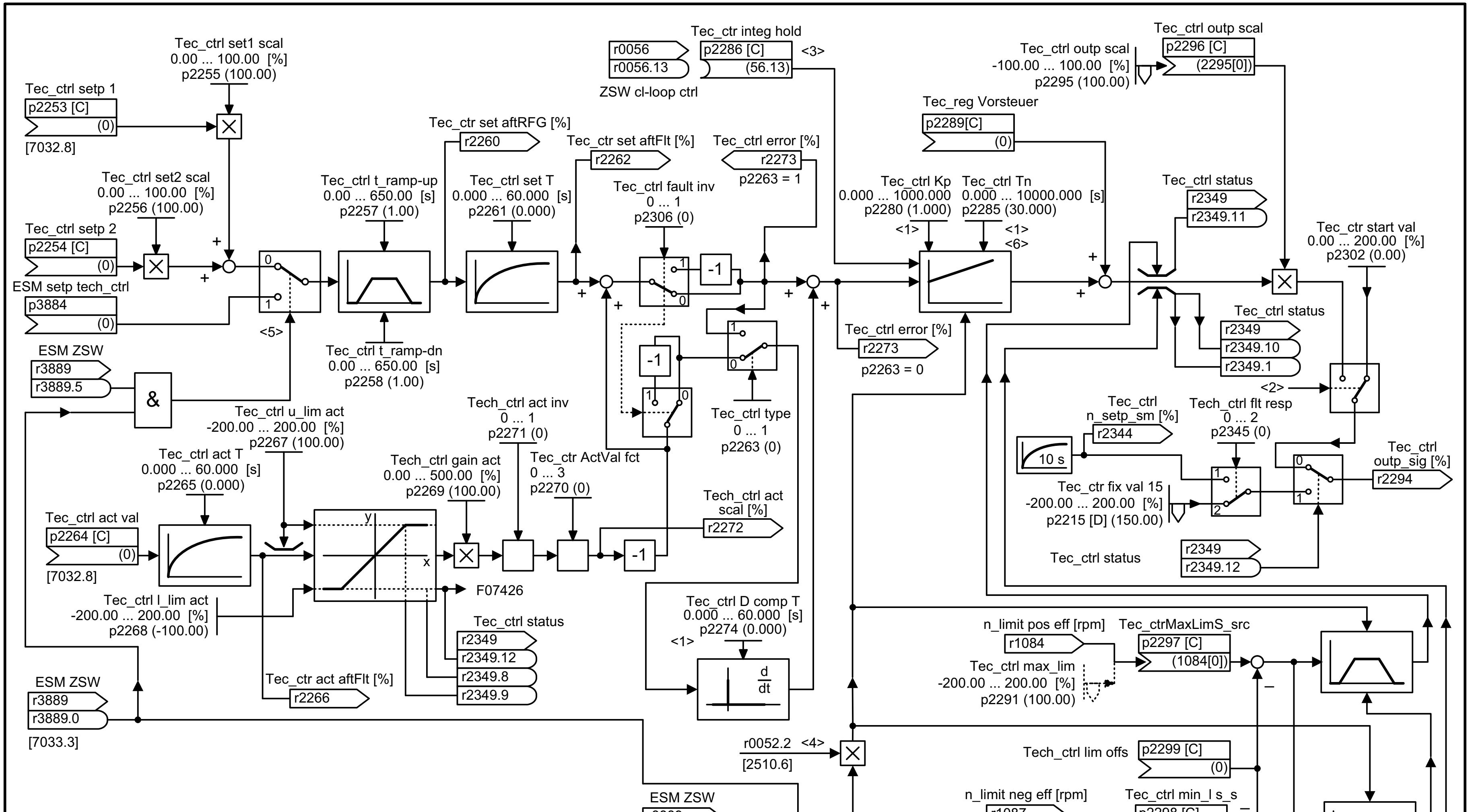

<1> For p2230.0 = 0, this setpoint is entered after ON.

<2> If initial rounding-off is active (p2230.2 = 1), the selected ramp-up/down times are exceeded accordingly.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Technology controller | | | | | fp_7954_97_61.vsd | Function diagram | - 7954 - |
| Motorized potentiometer | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-122 7954 – Motorized potentiometer

Fig. 3-123 7958 – Closed-loop control



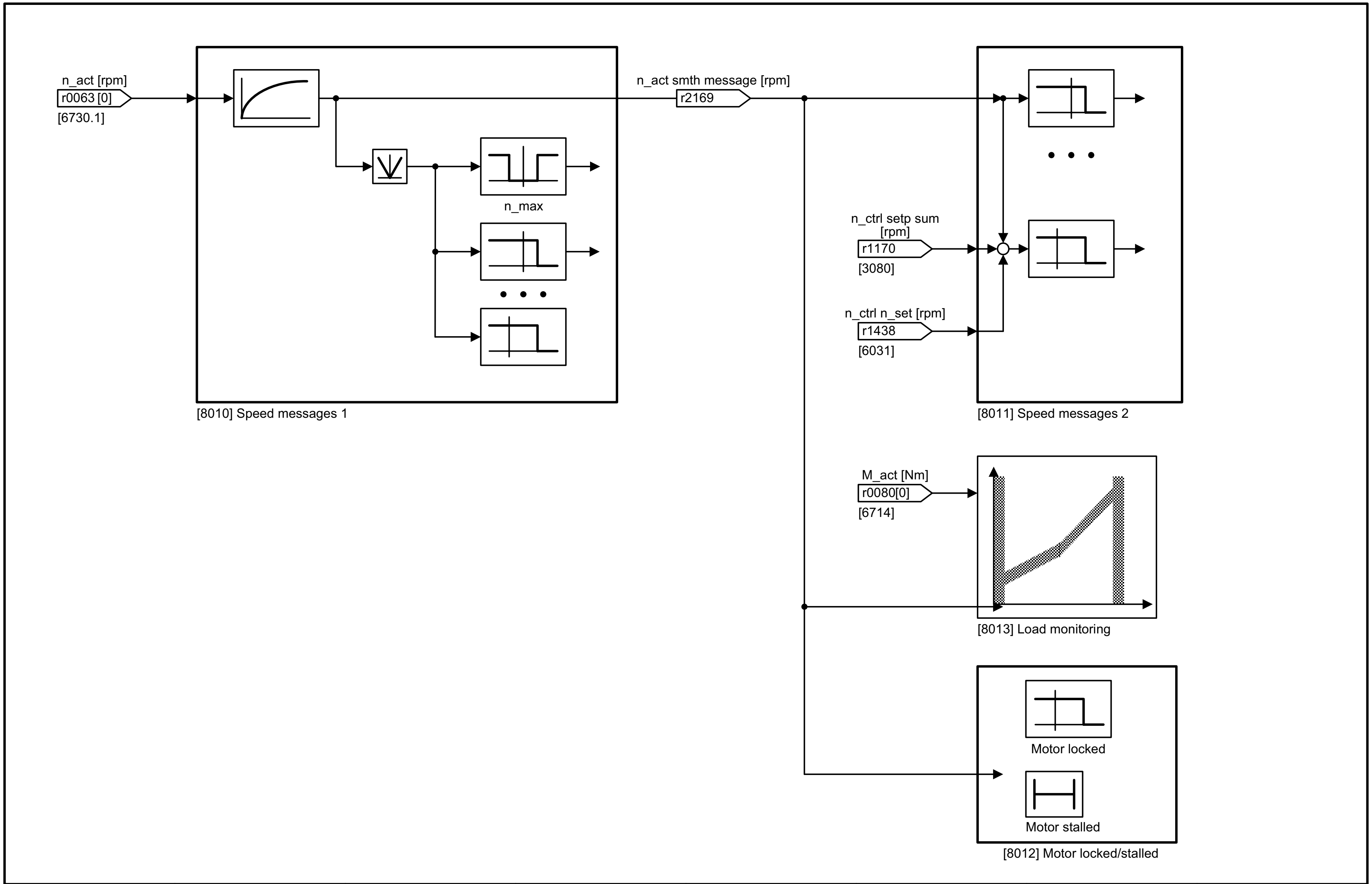

<1> P, I and D components can be disabled by entering a zero.
<2> After enable of technology controller the start value is present as long as the RFG output reaches this value.
<3> I component stop, only when r2273 and r2294 in same direction.
<4> Signal = 0 --> factor = 0, when setpoint from external OP or operating tool.
<5> Change over only if p2251 = 0 (Technology controller as speed main setpoint).
<6> I component is stopped, when r2294 is below the minimum speed or within a suppression bandwidth.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Technology controller | | | | | fp_7958_97_01.vsd | Function diagram | - 7958 - |
| Closed-loop control | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

## 3.14 Signals and monitoring functions

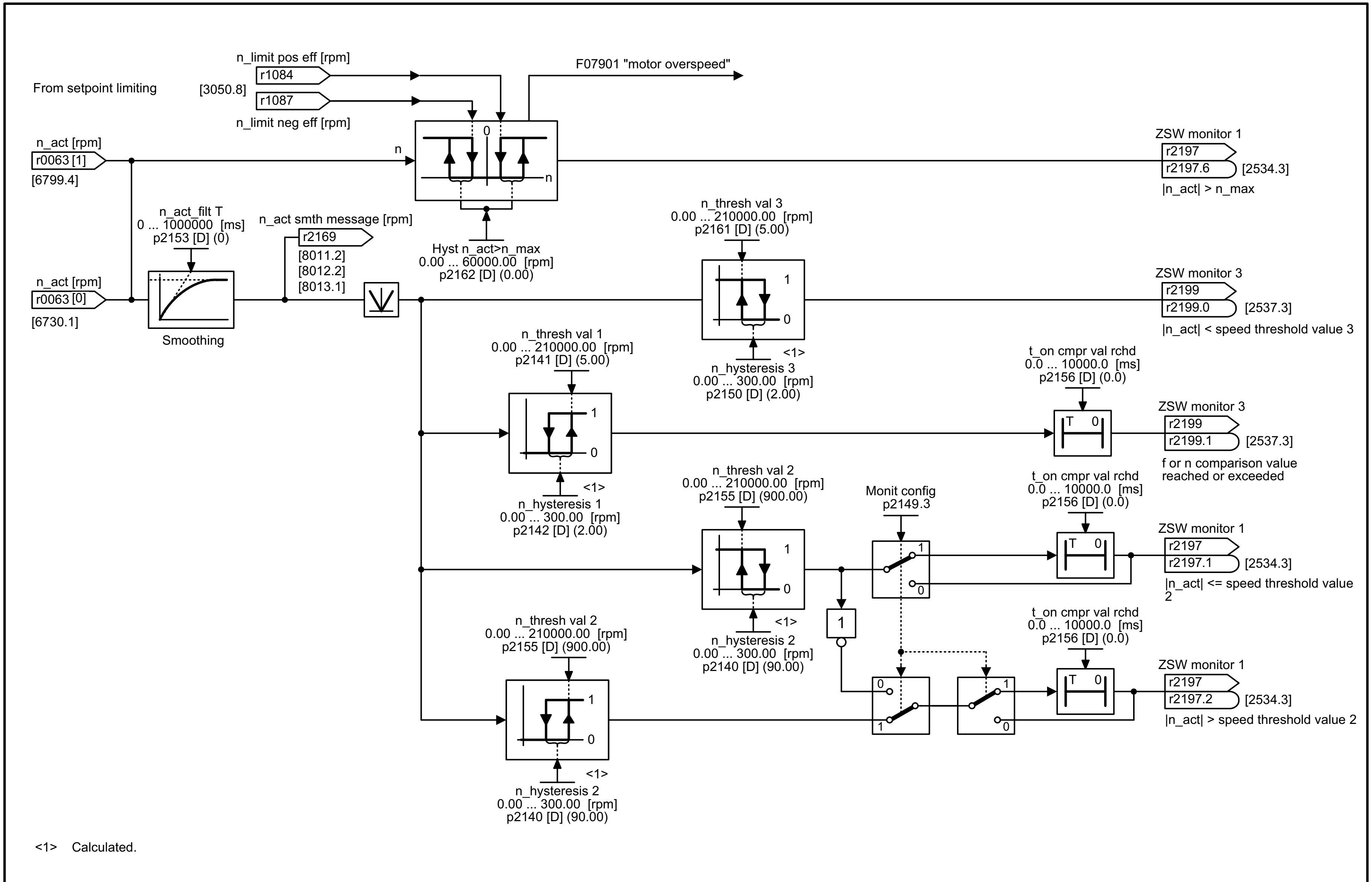
### Function diagrams

Fig. 3-124 8005 – Overview



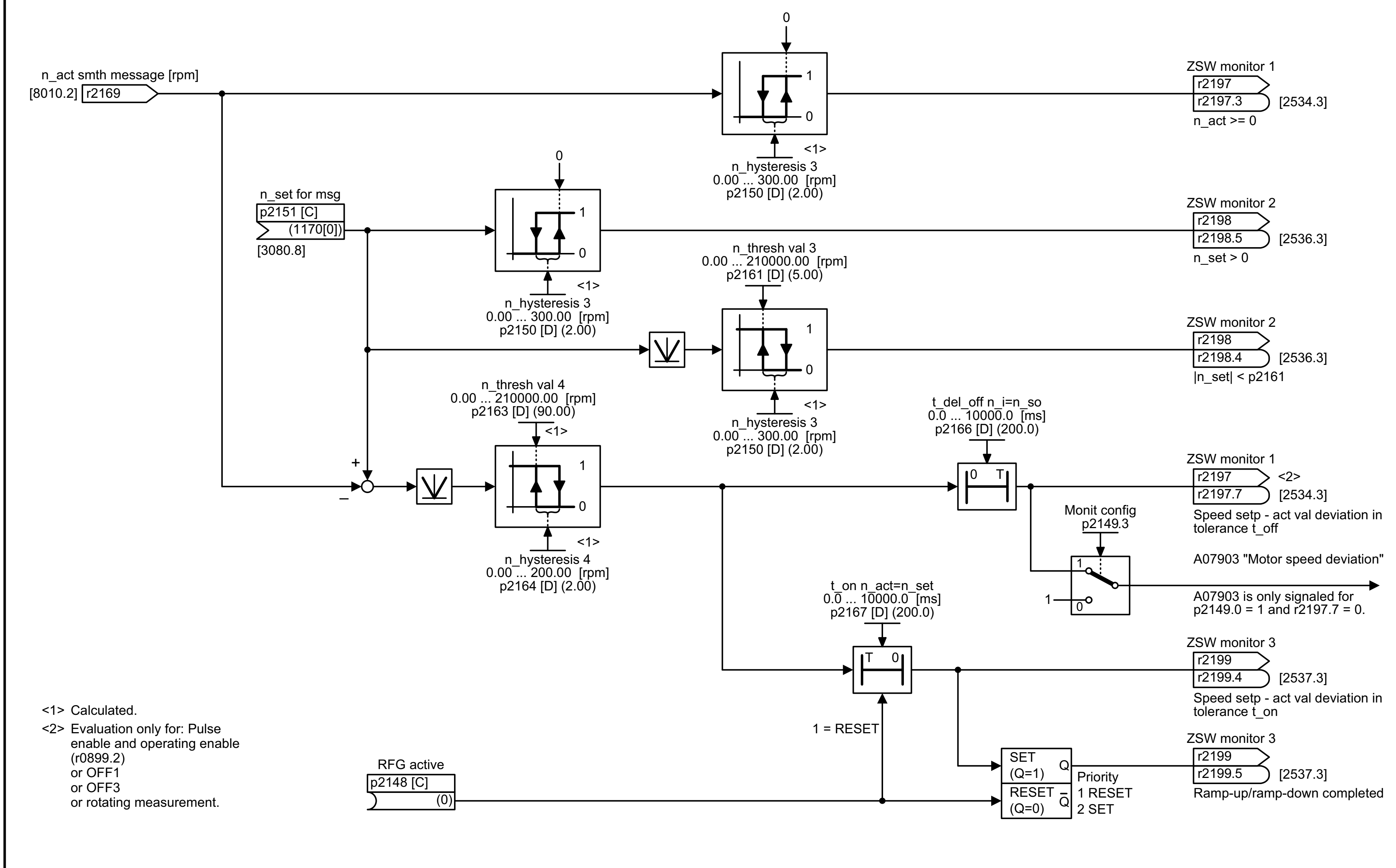

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Signals and monitoring functions | | | | | fp_8005_97_01.vsd | Function diagram | - 8005 - |
| Overview | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-125 8010 – Speed signals 1

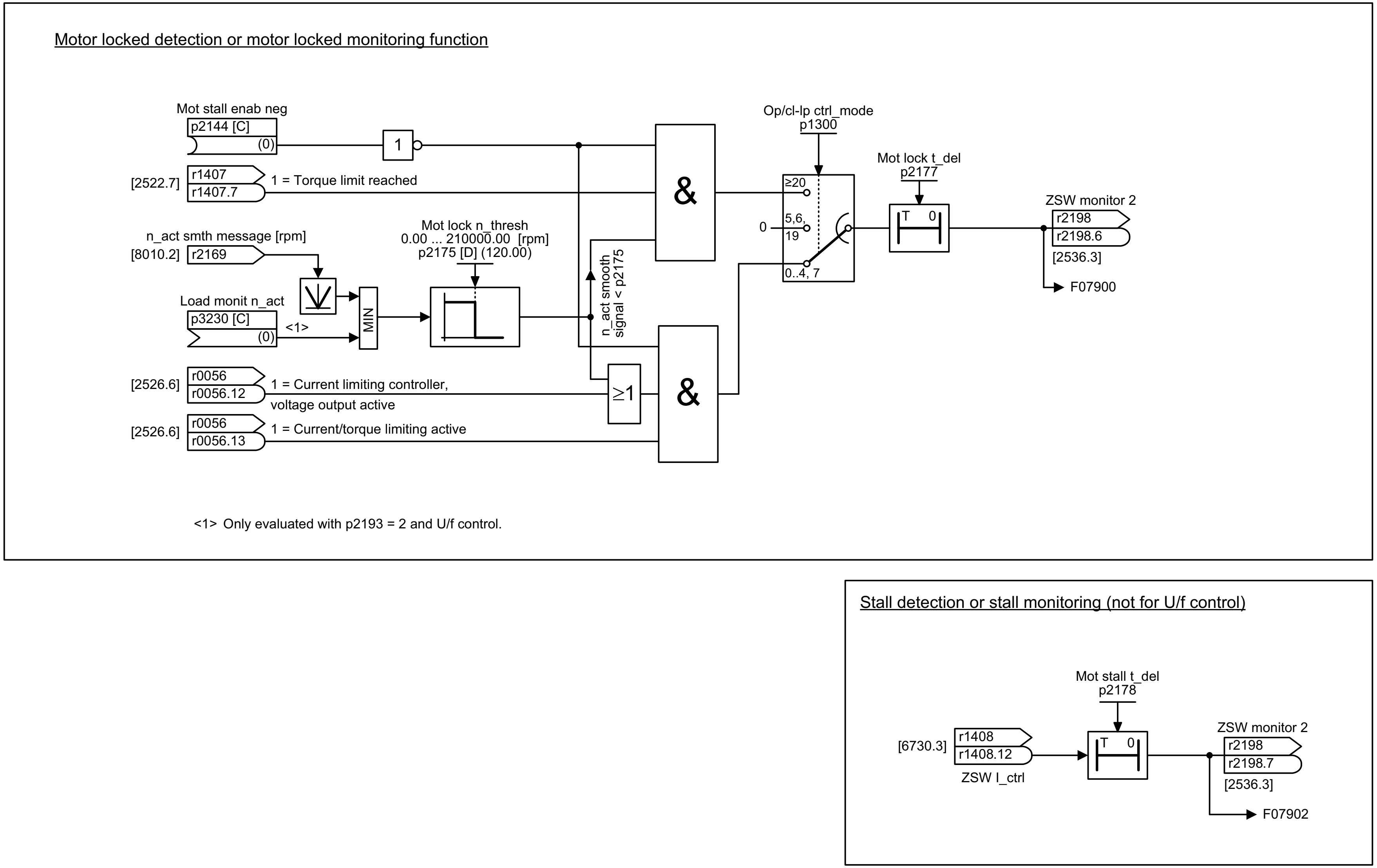



| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Signals and monitoring functions | | | | | fp_8010_97_01.vsd | Function diagram | - 8010 - |
| Speed signals 1 | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-126 8011 – Speed signals 2



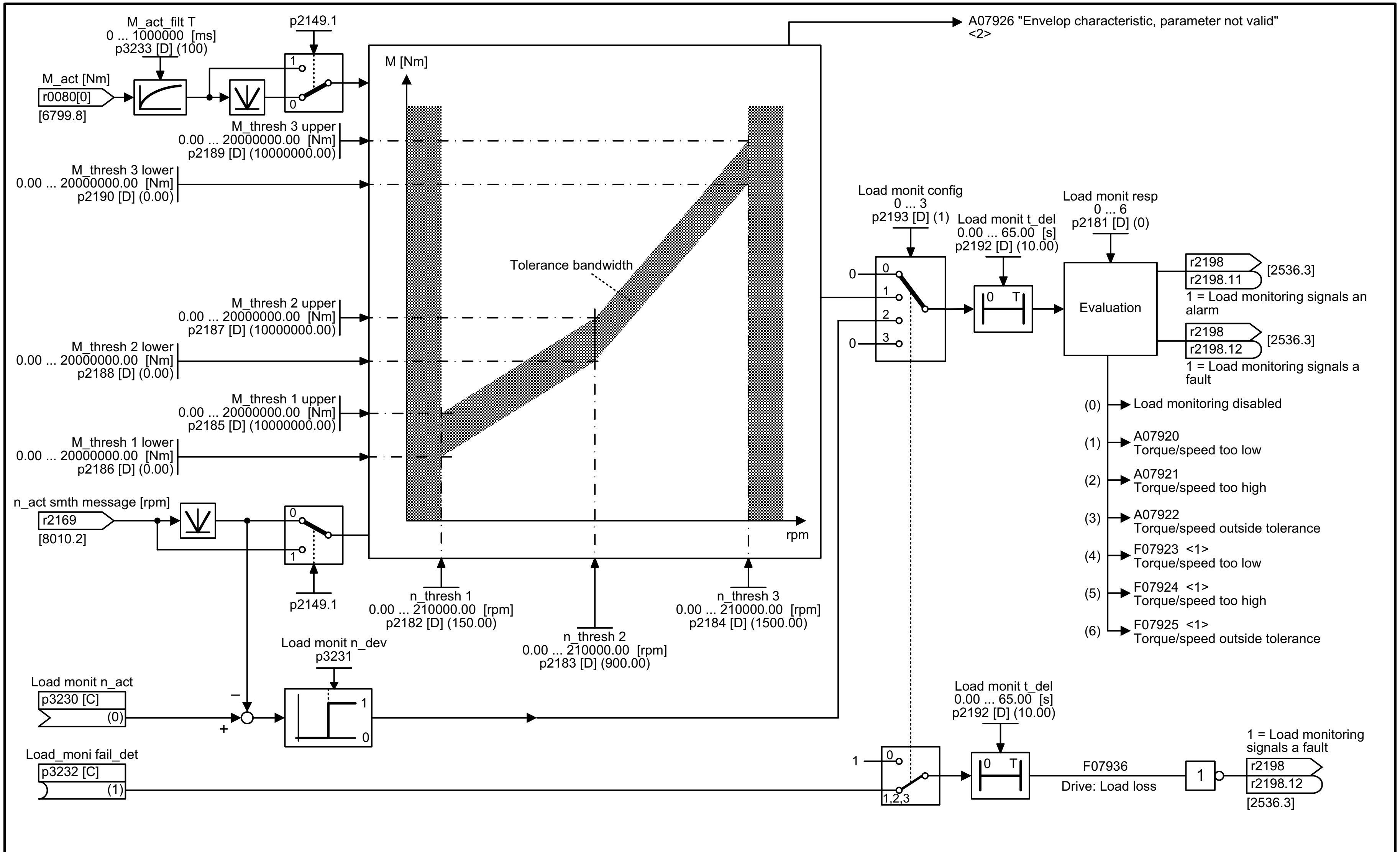

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Signals and monitoring functions | | | | | fp_8011_97_01.vsd | Function diagram | - 8011 - |
| Speed signals 2 | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |




| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Signals and monitoring functions | | | | | fp_8012_97_01.vsd | Function diagram | - 8012 - |
| Motor blocked/stalled | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-127 8012 – Torque signals, motor blocked/stalled

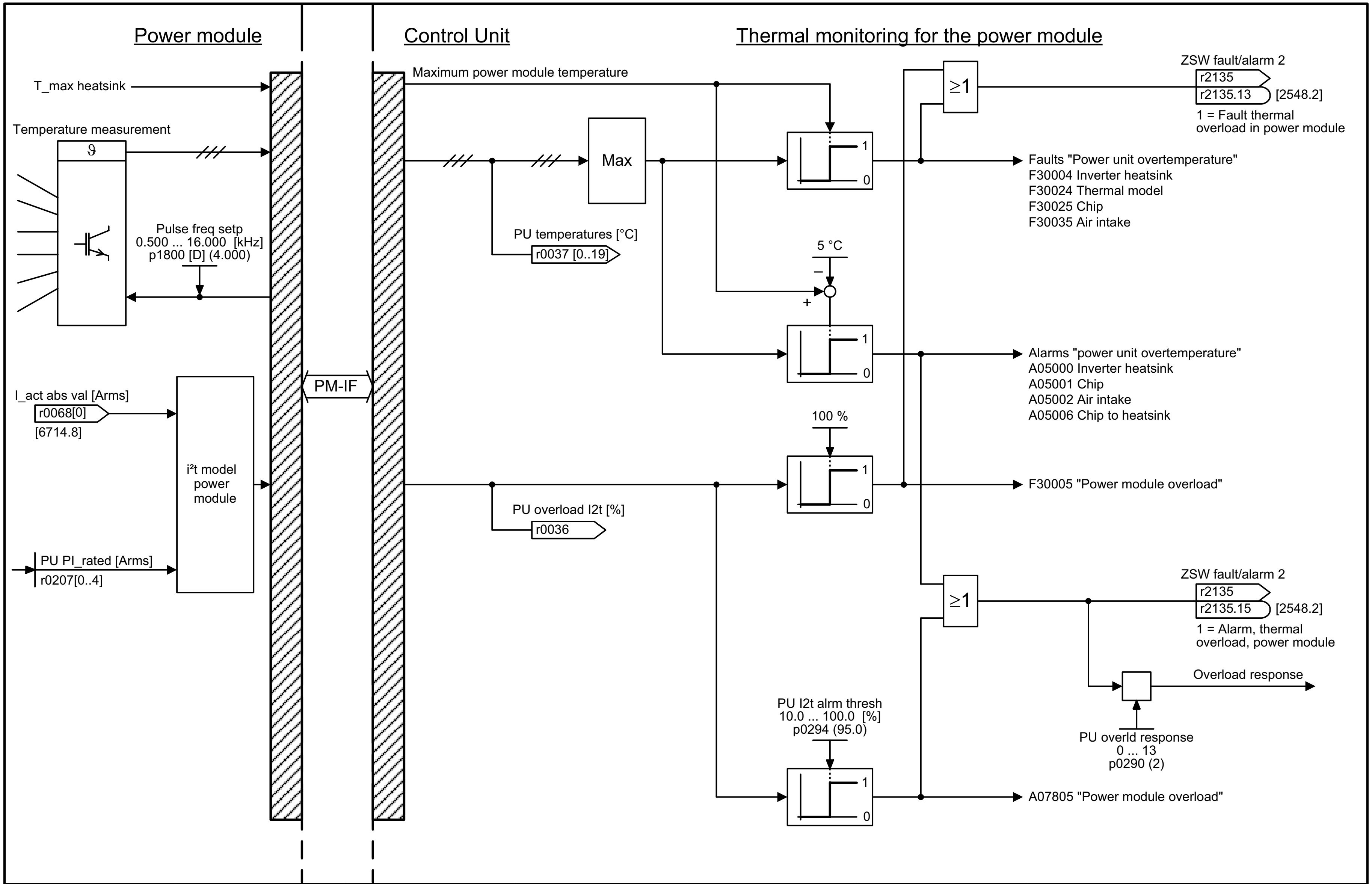
Fig. 3-128 8013 – Load monitoring




<1> The response to these faults can be defined.
<2> Fault evaluation only with p2181 > 0 and p2193 > 0.

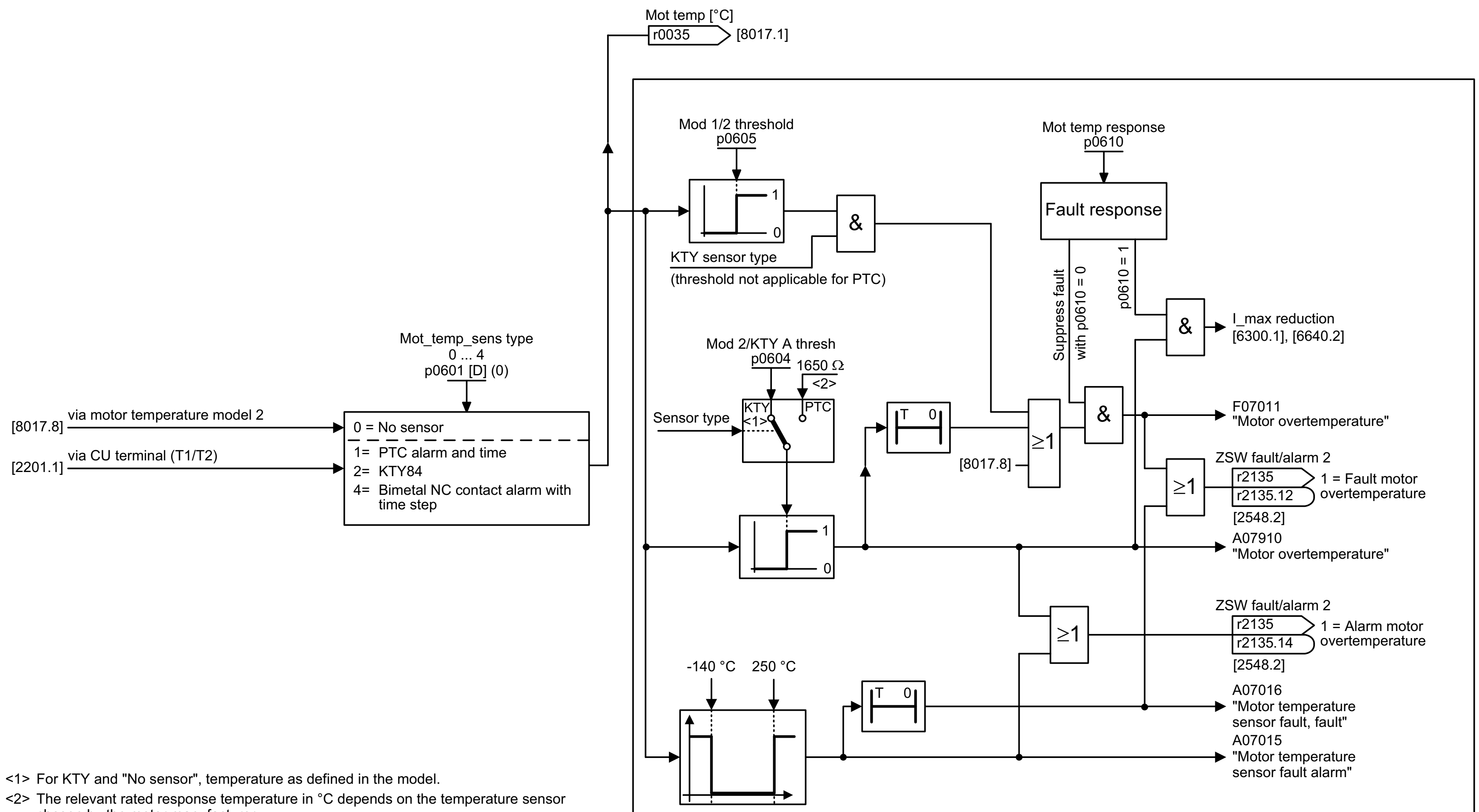
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Signals and monitoring functions | | | | | fp_8013_97_54.vsd | Function diagram | - 8013 - |
| Load monitoring | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-129 8014 – Thermal monitoring, power unit




| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Signals and monitoring functions | | | | | fp_8014_97_51.vsd | Function diagram | - 8014 - |
| Thermal monitoring, power module | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-130 8016 – Thermal monitoring, motor

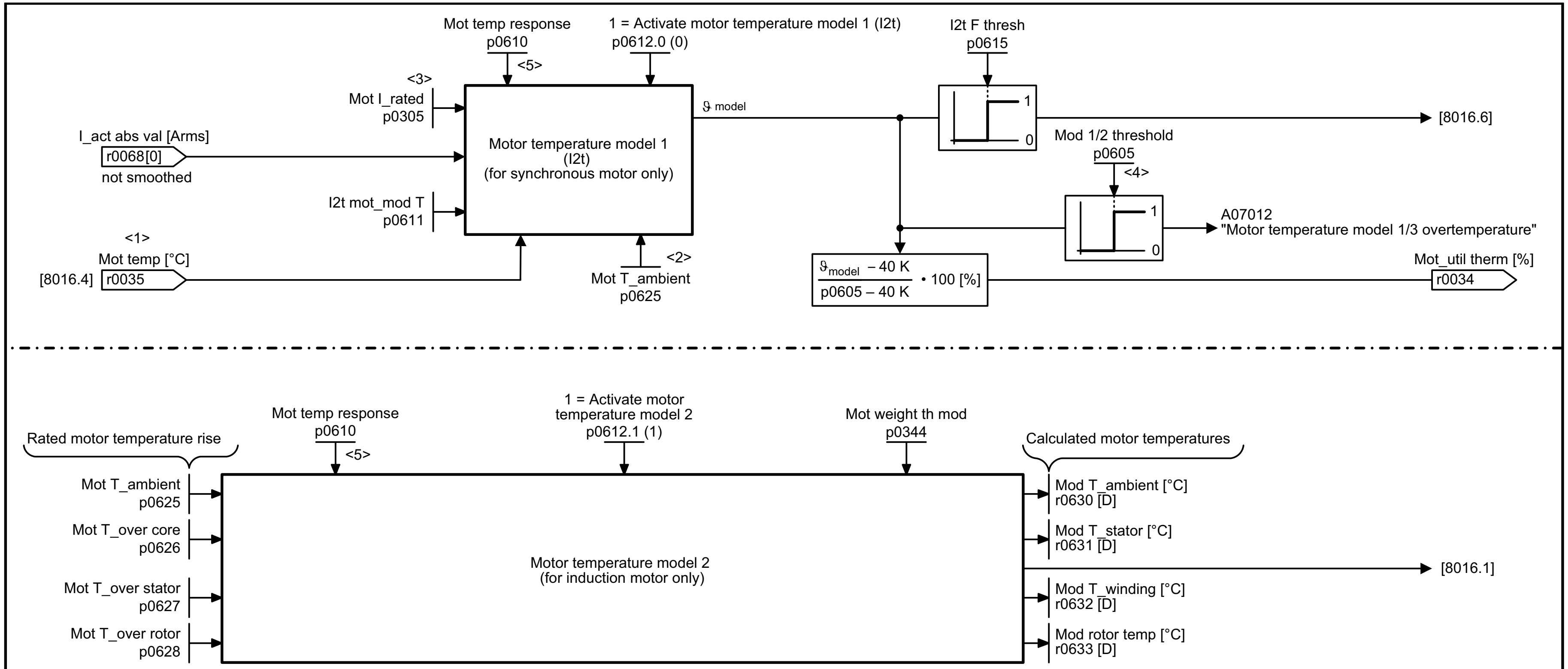



<1> For KTY and "No sensor", temperature as defined in the model.
<2> The relevant rated response temperature in °C depends on the temperature sensor chosen by the motor manufacturer.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

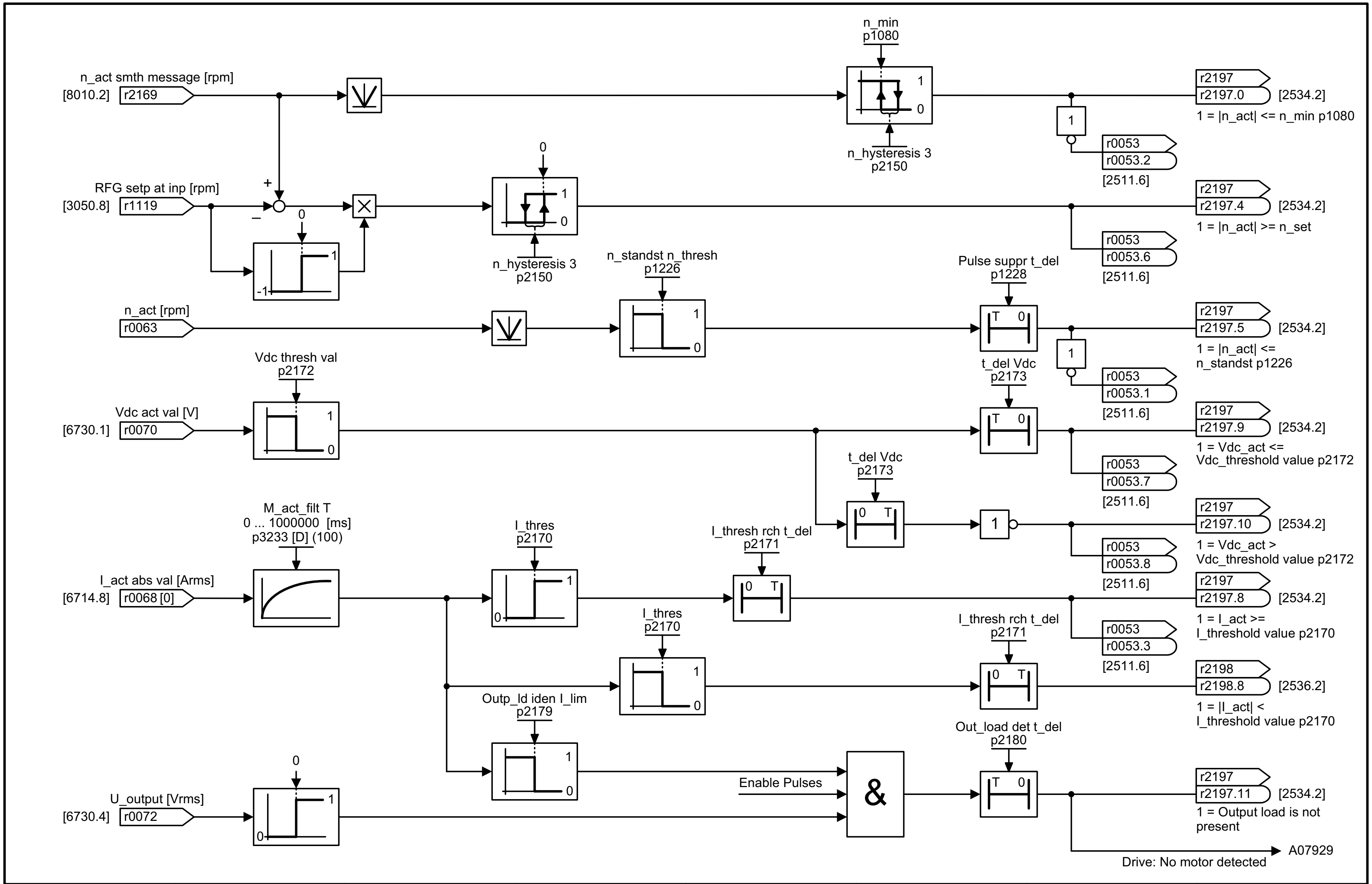
| | | | |
|---|---|---|---|
| Signals and monitoring functions | fp_8016_97_01.vsd | Function diagram | - 8016 - |
| Thermal monitoring, motor | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-131 8017 – Thermal motor models




<1> Only if there is a temperature sensor (p0601 > 0).
<2> Only if <1> are not met.
<3> The lower p0611 and the lower the reference current of the thermal motor model 1 (I2t), the faster A07012 is reached.
<4> p0605 also defines the target temperature for p0034 = 100 %. Therefore, p0605 has no influence on the time up to alarm A07012.
<5> If p0610 = 12.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Signals and monitoring functions | | | | | fp_8017_97_01.vsd | Function diagram | - 8017 - |
| Thermal motor models | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |




| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Signals and monitoring functions | | | | | fp_8020_97_01.vsd | Function diagram | - 8020 - |
| Monitoring functions 1 | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-132 8020 – Monitoring functions 1

## 3.15 Diagnostics

### Function diagrams

Fig. 3-133 8050 – Overview

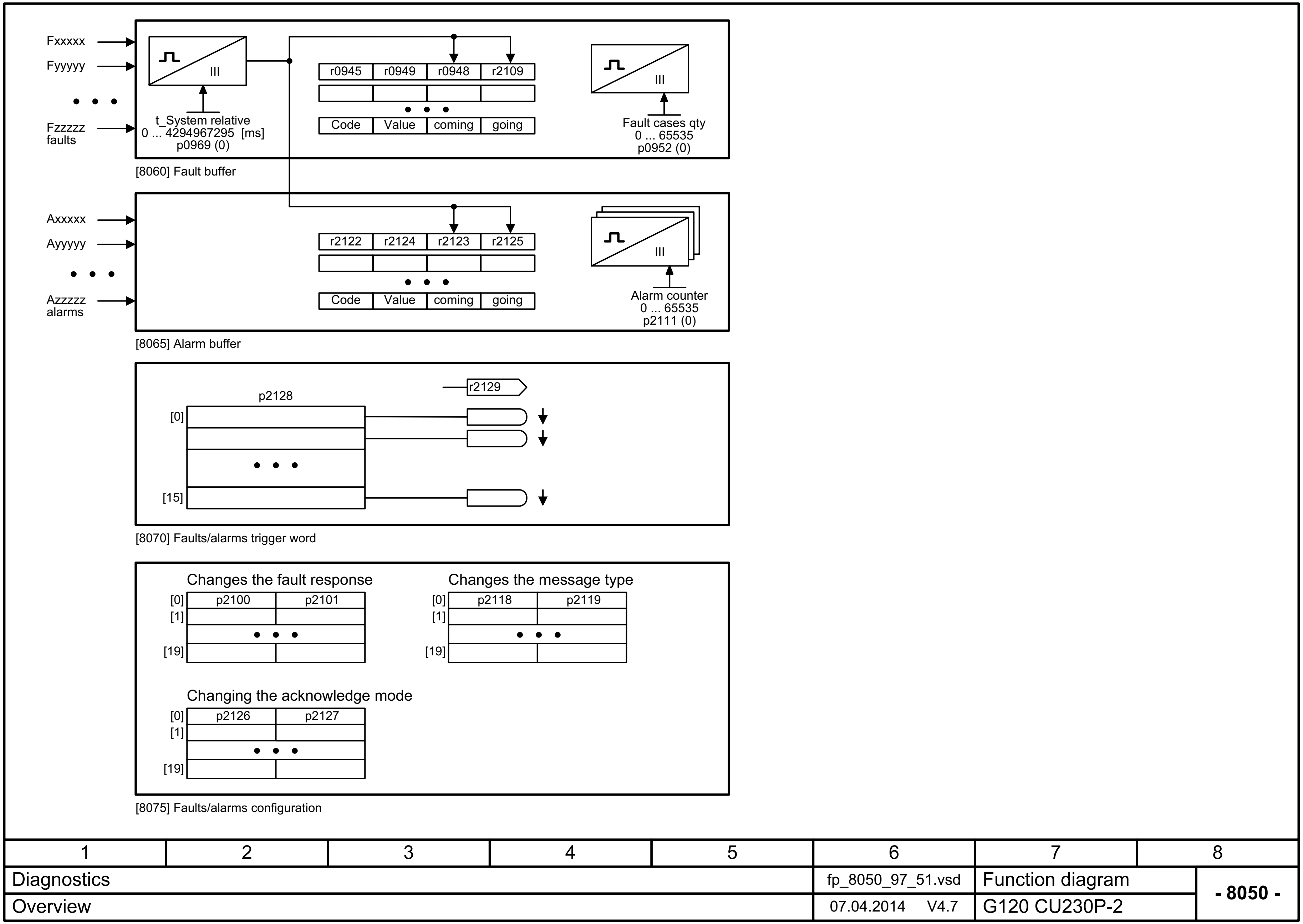
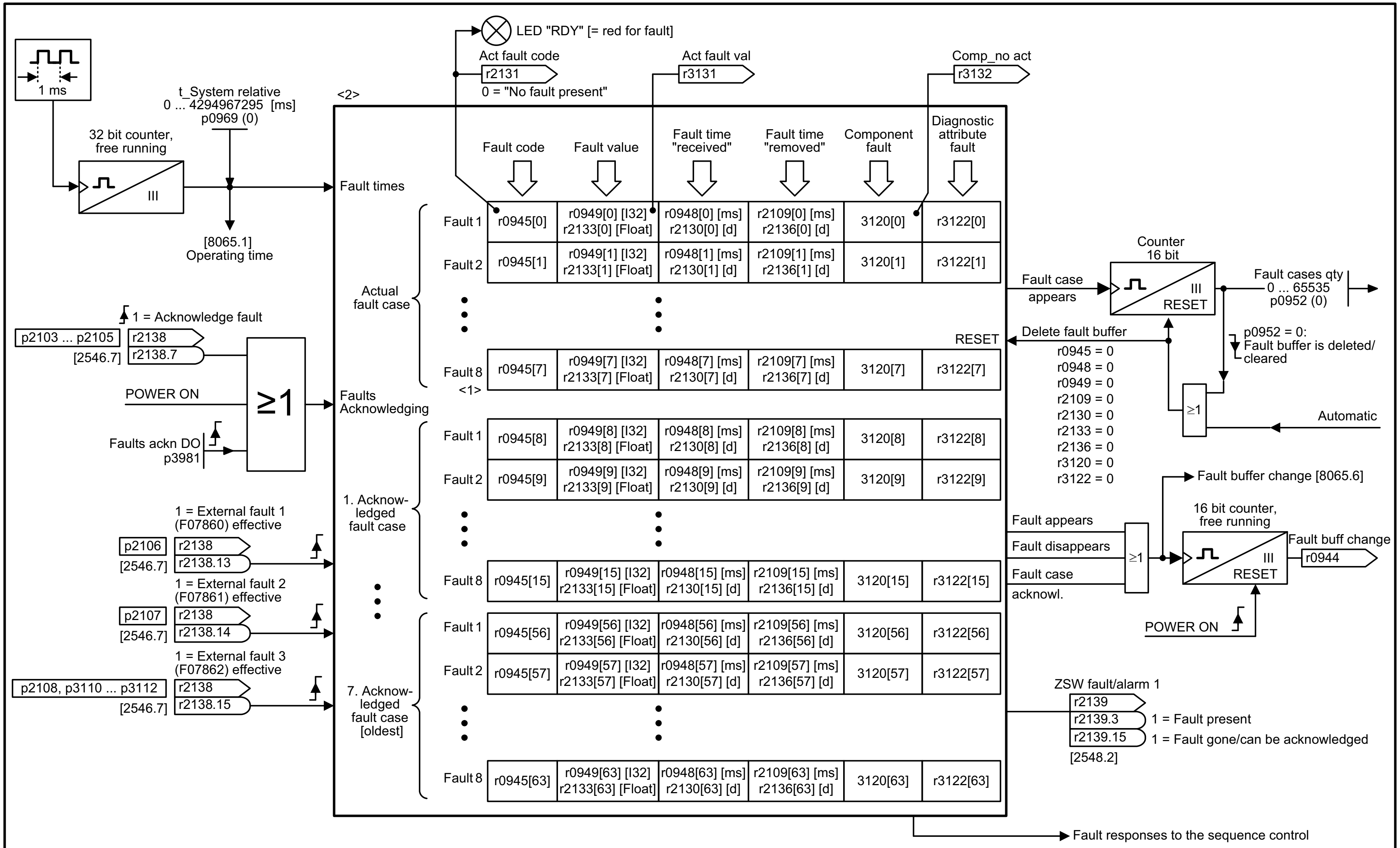


Fig. 3-134 8060 – Fault buffer

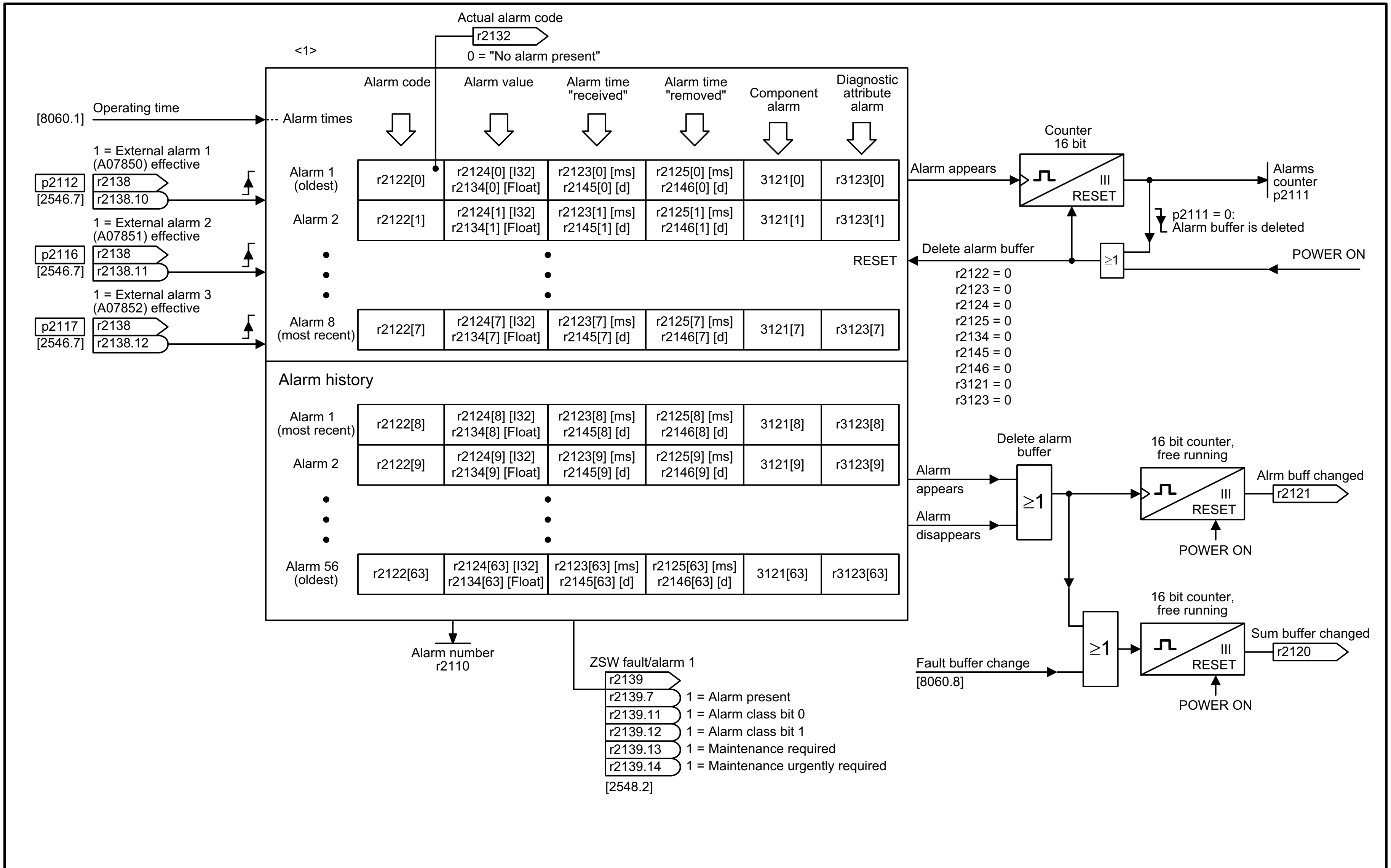



<1> This fault is overwritten when "more recent" faults occur.
<2> The buffer parameters are cyclically updated in the background (refer to the status signal in r2139).

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Diagnostics | | | | | fp_8060_97_51.vsd | Function diagram | - 8060 - |
| Fault buffer | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

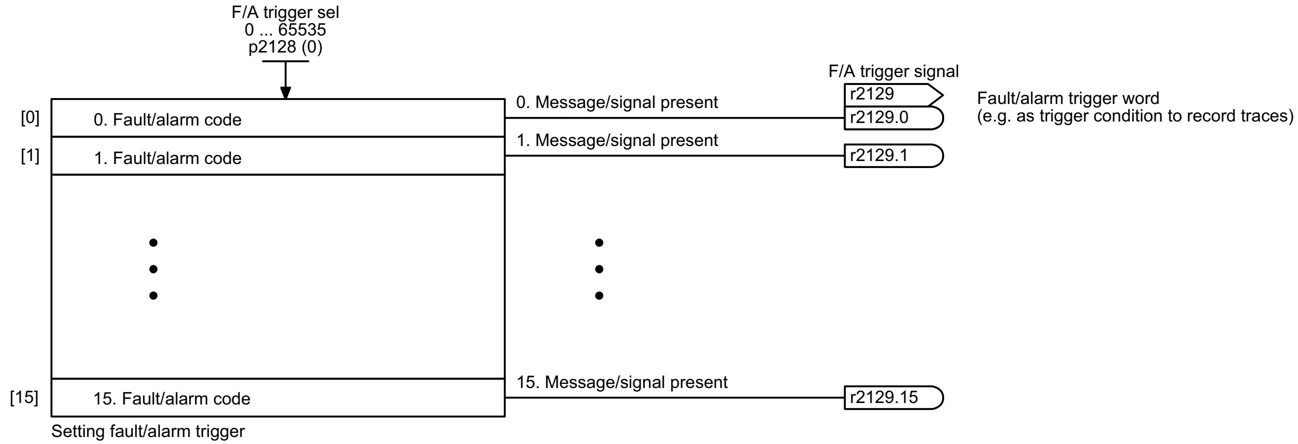
Fig. 3-135 8065 – Alarm buffer






<1> The buffer parameters are updated cyclically in the background (see status signal in r2139).

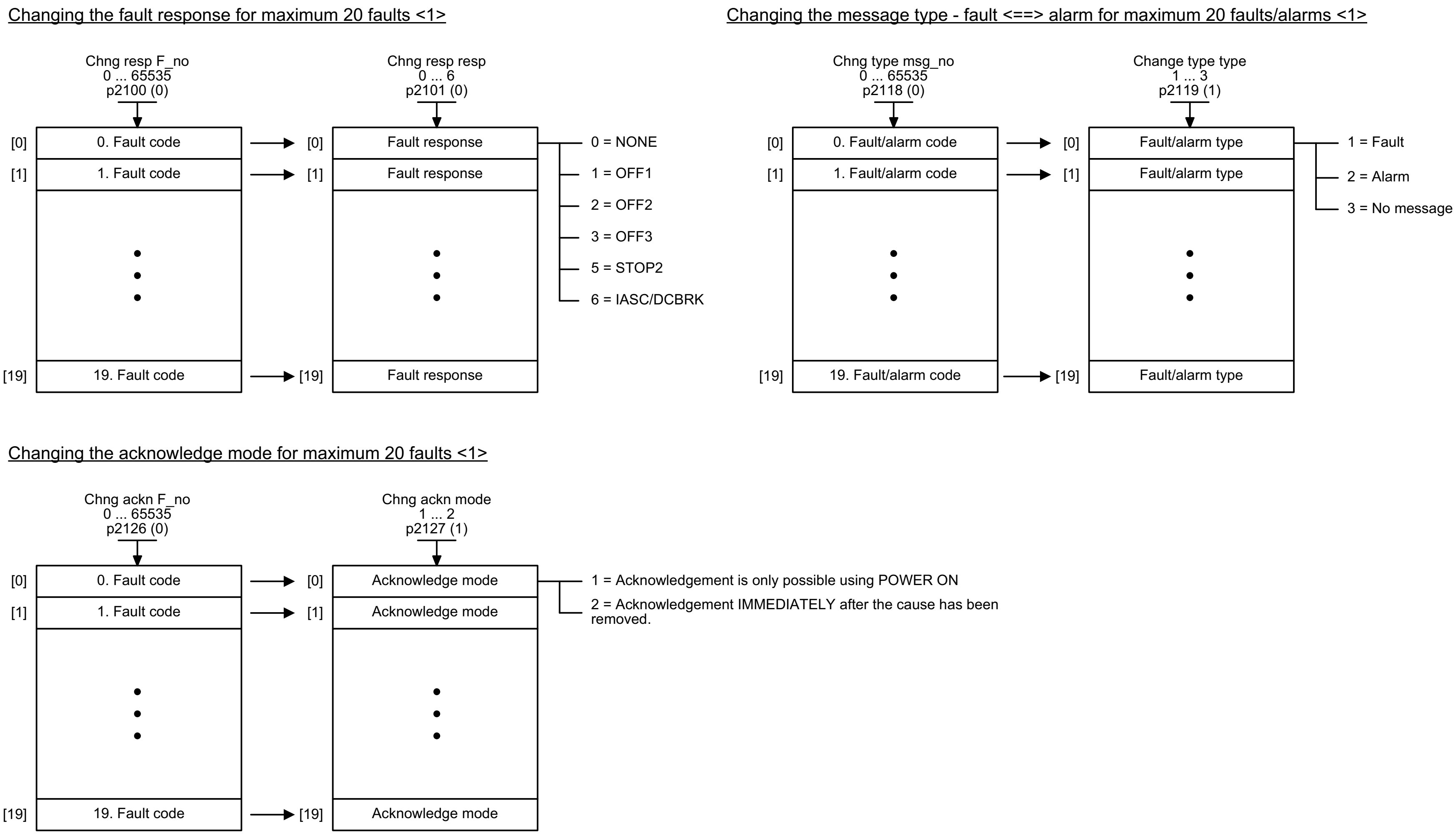
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Diagnostics | | | | | fp_8065_97_51.vsd | Function diagram | - 8065 - |
| Alarm buffer | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |




| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Diagnostics | | | | | fp_8070_97_61.vsd | Function diagram | - 8070 - |
| Faults/alarms trigger word (r2129) | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-136 8070 – Faults/alarms trigger word (r2129)

Fig. 3-137 8075 – Faults/alarms configuration




<1> The fault response, acknowledge mode and message type for all faults and alarms are set to meaningful default values in the factory setting.
Changes are only possible in specific value ranges specified by SIEMENS.
When the message type is changed, the supplementary information is tranferred from fault value r0949 to alarm value r2124 and vice versa.

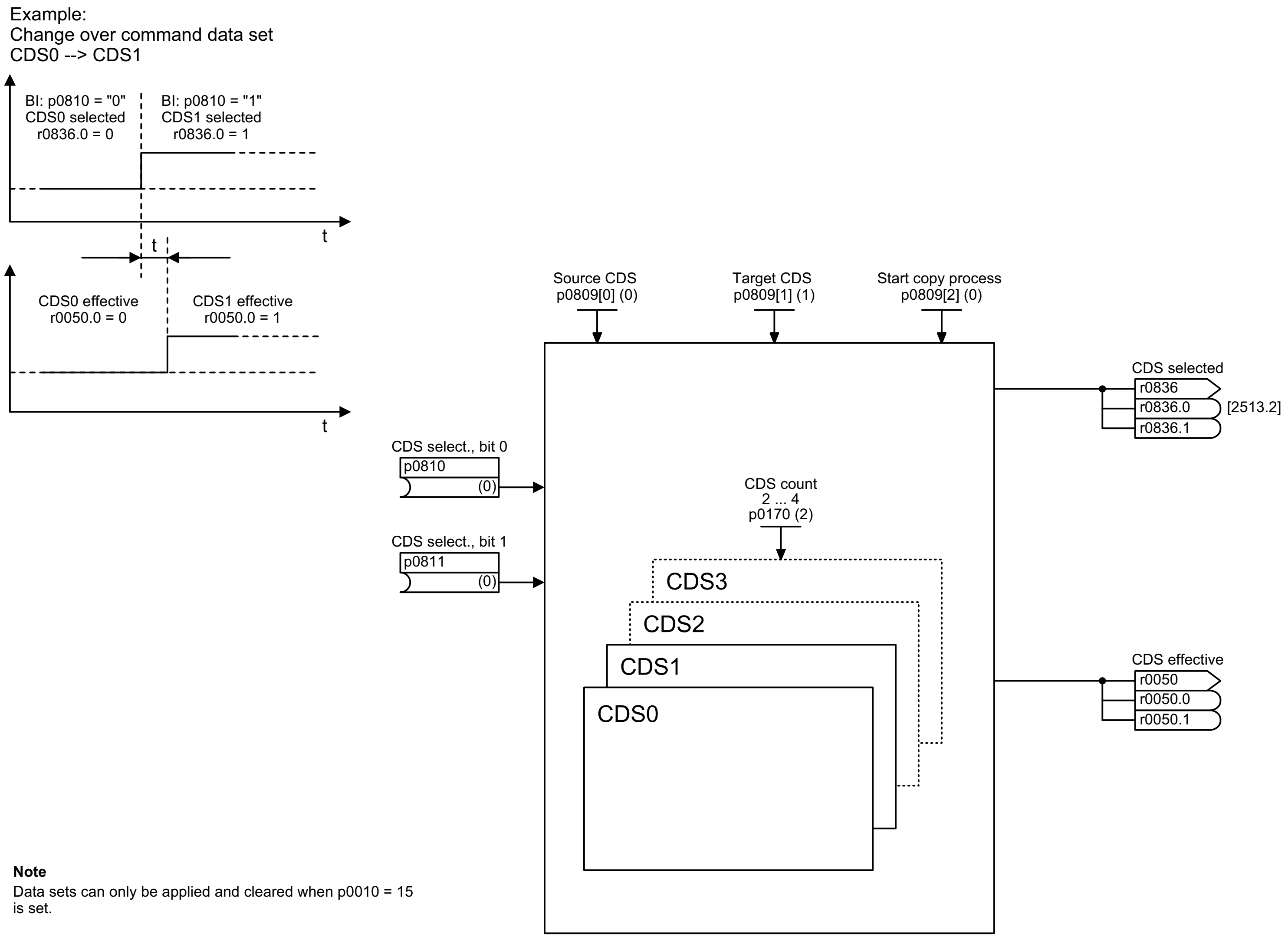
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| Diagnostics | fp_8075_97_51.vsd | Function diagram | - 8075 - |
| Faults/alarms configuration | 07.04.2014 V4.7 | G120 CU230P-2 | |

# 3.16 Data sets

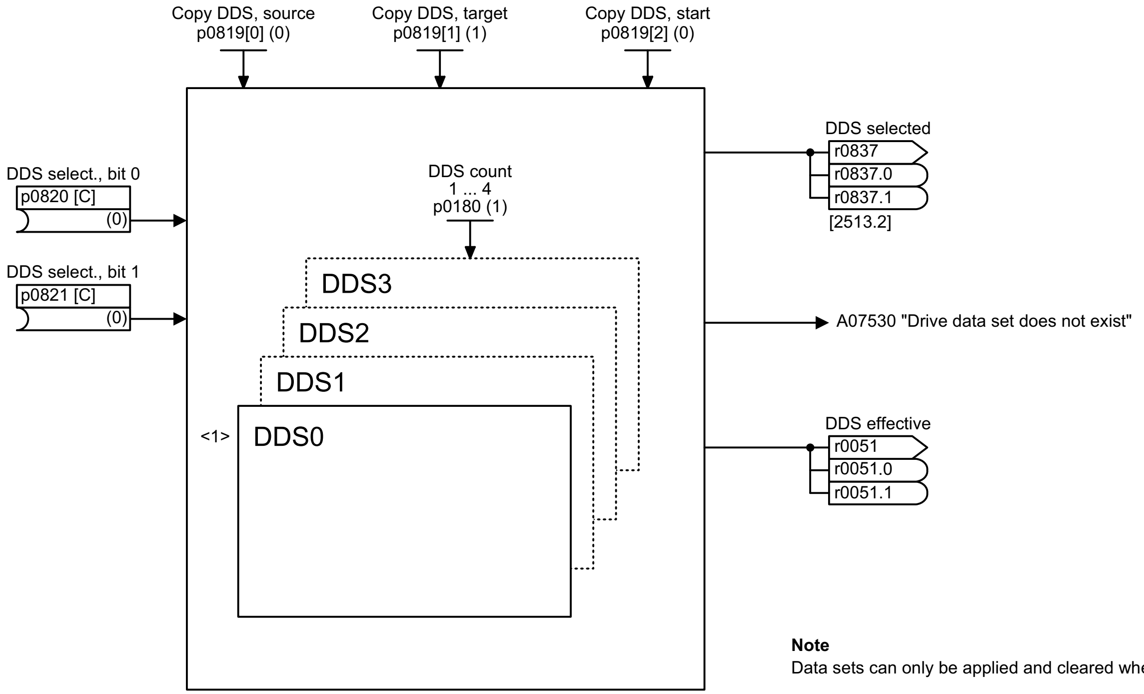
## Function diagrams

Fig. 3-138 8560 – Command Data Sets (CDS)




**Note**
Data sets can only be applied and cleared when p0010 = 15 is set.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Data sets | | | | | fp_8560_97_51.vsd | Function diagram | - 8560 - |
| Command Data Sets (CDS) | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |




**Note**
Data sets can only be applied and cleared when p0010 = 15 is set.

<1> A BICO interconnection to a parameter which is part of a drive data set always influences the currently effective data set.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| Data sets | | | | | fp_8565_97_54.vsd | Function diagram | - 8565 - |
| Drive Data Sets (DDS) | | | | | 07.04.2014 V4.7 | G120 CU230P-2 | |

Fig. 3-139 8565 – Drive Data Sets (DDS)

# Faults and alarms 4

## Content

# 4.1 Overview of faults and alarms

## 4.1.1 General information

### Fault and alarm displays (messages)

In the case of a fault, the drive signals the corresponding fault(s) and/or alarm(s).

For example, the following methods for displaying faults and alarms are available:

- Display via the fault and alarm buffer with PROFIBUS/PROFINET
- Display online via the commissioning software
- Display and operating unit (e.g. BOP, AOP)

### Differences between faults and alarms

The differences between faults and alarms are as follows:

Table 4-1 Differences between faults and alarms

| Type | Description |
|---|---|
| Faults | What happens when a fault occurs?<br>• The appropriate fault reaction is triggered.<br>• Status bit ZSW1.3 is set.<br>• The fault is entered in the fault buffer.<br><br>How are faults eliminated?<br>• Remove the original cause of the fault.<br>• Acknowledge the fault. |
| Alarms | What happens when an alarm occurs?<br>• Status signal ZSW1.7 is set.<br>• The alarm is entered in the alarm buffer.<br><br>How are alarms removed?<br>• Alarms acknowledge themselves.<br>If the cause of the alarm is no longer present, they automatically reset themselves. |

## Fault reactions

The following fault reactions are defined:

Table 4-2 Fault reactions

<table>
<tr><th>List</th><th>PROFIdrive</th><th>Reaction</th><th>Description</th></tr>
<tr><td>NONE</td><td>-</td><td>None</td><td>No reaction when a fault occurs.<br>Note<br>With "Basic positioner" (r0108.4 = 1), the following applies:<br>When a fault occurs with fault reaction "NONE", an active traversing task is interrupted and the system switches to tracking mode until the fault has been rectified and acknowledged.</td></tr>
<tr><td>OFF1</td><td>ON/<br>OFF</td><td>Brake along the ramp-function generator down ramp followed by pulse inhibit</td><td>Closed-loop speed control (p1300 = 20, 21)<br>• n_set = 0 is input immediately to brake the drive along the ramp-function generator ramp down (p1121).<br>• When zero speed is detected, the motor holding brake (if parameterized) is closed (p1215). The pulses are suppressed when the brake application time (p1217) expires.<br>Zero speed is detected if the actual speed drops below the threshold (p1226) or if the monitoring time (p1227) started when the speed setpoint <= speed threshold (p1226) has expired.<br>Torque control (p1300 = 22, 23)<br>• The following applies for torque control:<br>Reaction as for OFF2.<br>• When the system switches to torque control with p1501, the following applies:<br>No separate braking reaction.<br>If the actual speed value drops below the speed threshold (p1226) or the timer stage (p1227) has expired, the motor holding brake (if one is being used) is closed. The pulses are suppressed when the brake application time (p1217) expires.</td></tr>
<tr><td>OFF1_<br>DELAYED</td><td>-</td><td>As for OFF1, however delayed</td><td>Faults with this fault response only become effective after the delay time in p3136 has expired.<br>The remaining time up to OFF1 is displayed in r3137.</td></tr>
<tr><td>OFF2</td><td>COAST<br>STOP</td><td>Internal/external pulse inhibit</td><td>Speed and torque control<br>• Instantaneous pulse suppression, the drive “coasts” to a standstill.<br>• The motor holding brake (if one is being used) is closed immediately.<br>• Switching on inhibited is activated.</td></tr>
</table>

Table 4-2 Fault reactions, continued

| List | PROFIdrive | Reaction | Description |
|---|---|---|---|
| OFF3 | QUICK STOP | Braking along the OFF3 down ramp followed by pulse inhibit | **Closed-loop speed control (p1300 = 20, 21)**<br>• n_set = 0 is input immediately to brake the drive along the OFF3 ramp down (p1135).<br>• When zero speed is detected, the motor holding brake (if parameterized) is closed. The pulses are suppressed when the closing time of the holding brake (p1217) expires.<br>Zero speed is detected if the actual speed drops below the threshold (p1226) or if the monitoring time (p1227) started when the speed setpoint <= speed threshold (p1226) has expired.<br>• Switching on inhibited is activated.<br>**Torque control (p1300 = 22, 23)**<br>• Changeover to speed-controlled operation and other reactions as described for speed-controlled operation. |
| STOP2 | - | n_set = 0 | • n_set = 0 is input immediately to brake the drive along the OFF3 ramp down (p1135).<br>• The drive remains in closed-loop speed control. |
| IASC/DCBRK | - | - | • For synchronous motors, the following applies:<br>If a fault occurs with this fault reaction, an internal armature short-circuit is triggered.<br>The conditions for p1231 = 4 must be observed.<br>• For induction motors, the following applies:<br>If a fault occurs with this fault reaction, DC braking is triggered.<br>DC braking must have been commissioned (p1230 to p1239). |
| ENCODER | - | Internal/external pulse inhibit (p0491) | The fault reaction ENCODER is applied as a function of the setting in p0491.<br>Factory setting:<br>p0491 = 0 --> Encoder fault causes OFF2<br>**Notice**<br>When changing p0491, it is imperative that the information in the description of this parameter is carefully observed. |

## Acknowledging faults

The list of faults and alarms specifies how to acknowledge each fault after the cause has been removed.

Table 4-3 Acknowledging faults

| Acknowledgement | Description |
|---|---|
| POWER ON | The fault is acknowledged via a POWER ON (switch Control Unit off and on again).<br>**Note**<br>If this action has not removed the fault cause, the fault is displayed again immediately after power up. |
| IMMEDIATELY | Faults can be acknowledged as follows:<br>1 Acknowledge by setting parameter:<br>p3981 = 0 --> 1<br>2 Acknowledge via binector inputs:<br>p2103 BI: 1. Acknowledge faults<br>p2104 BI: 2. Acknowledge faults<br>p2105 BI: 3. Acknowledge faults<br>3 Acknowledge via PROFIBUS control signal:<br>STW1.7 = 0 --> 1 (edge)<br>**Note**<br>• These faults can also be acknowledged by a POWER ON.<br>• If the cause of the fault has not been removed, the fault will continue to be displayed after acknowledgement.<br>• Safety Integrated faults<br>The "Safe Torque Off" (STO) function must be deselected before these faults are acknowledged. |
| PULSE INHIBIT | The fault can only be acknowledged when the pulses are inhibited (r0899.11 = 0).<br>The same options are available for acknowledging as described under acknowledge IMMEDIATELY. |

### 4.1.2 Explanation of the list of faults and alarms

The data in the following example has been chosen at random. The information listed below is the maximum amount of information that a description can contain. Some of the information is optional.

The "List of faults and alarms" (Page 666) has the following layout:

**- - - - - - - - - - - - Start of example - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -**

| | |
|---|---|
| **Axxxxx (F, N)** | **Fault location (optional): Name** |
| **Message class:** | Text of the message class (number according to PROFIdrive) |
| **Reaction:** | NONE |
| **Acknowledgement:** | NONE |
| **Cause:** | Description of possible causes. |
| | Fault value (r0949, interpret format): or alarm value (r2124, interpret format): (optional) |
| | Information about fault or alarm values (optional). |
| **Remedy:** | Description of possible remedies. |

**- - - - - - - - - - - - End of example - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -**

| | |
|---|---|
| **Axxxxx** | **Alarm xxxxx** |
| **Axxxxx (F, N)** | **Alarm xxxxx (message type can be changed in F or N)** |
| **Fxxxxx** | **Fault xxxxx** |
| **Fxxxxx (A, N)** | **Fault xxxxx (message type can be changed in A or N)** |
| **Nxxxxx** | **No message** |
| **Nxxxxx (A)** | **No message (message type can be changed in A)** |

A message comprises a letter followed by the relevant number.

The meaning of the letters is as follows:

- A means "Alarm"
- F means "Fault"
- N means "No message" or "Internal message"

The optional brackets indicate whether the type specified for this message can be changed and which message types can be adjusted via parameters (p2118, p2119).

Information on reaction and acknowledgement is specified independently for a message with an adjustable message type (e.g. reaction to F, acknowledgement for F).

---

**Note**

You can change the default properties of a fault or alarm by setting parameters.

References: /BA5/ SINAMICS G120 Operating Instructions
Frequency Converter with CU230P-2 Control Units,
Section "Alarms, faults, and system messages"

The "List of faults and alarms" (Page 666) supplies information referred to the properties of a message set as default. If the properties of a specific message are changed, the corresponding information may have to be modified in this list.

---

## Fault location (optional): Name

The fault location (optional), the name of the fault or alarm and the message number are all used to identify the message (e.g. with the commissioning software).

## Message value:

The information provided under the message value informs you about the composition of the fault/alarm value.

**Example:**

Message value: Component number: %1, fault cause: %2

This message value contains information about the component number and cause of the fault. The entries %1 and %2 are placeholders, which are filled appropriately in online operation (e.g. with the commissioning software).

## Message class:

For each message, specifies the associated message class with the following structure:

Text of the message class (number according to PROFIdrive)

The message classes are transferred at different interfaces to higher-level control systems and their associated display and operating units.

The message classes that are available are shown in Table "Message classes and coding of various diagnostic interfaces" (Page 660). In addition to the text of the message class and their number according to PROFIdrive – as well as a brief help text regarding the cause and remedy – they also include information about the various diagnostic interfaces:

- PN (hex)

  Specifies the "Channel error type" of the PROFINET channel diagnostics.

  When activating the channel diagnostics, using the GSDML file, the texts listed in the table can be displayed.

- DS1 (dec)

  Specifies the bit number in date set DS1 of the diagnostic alarm for SIMATIC S7.

  When the diagnostic alarms are activated, the texts listed in the table can be displayed.

- DP (dec)

  Specifies the "Error type" of the channel-related diagnostics for PROFIBUS.

  When the channel diagnostics are activated, the texts listed in the standard and the GSD file can be displayed.

- ET 200 (dec)

  Specifies the "Error type" of the channel-related diagnostics for the SIMATIC ET 200pro FC-2 device.

  When the channel diagnostics are activated, the texts listed in the standard and the GSD file of the ET 200pro can be displayed.

- NAMUR (r3113.x)

  Specifies the bit number in parameter r3113.

For the interfaces DP, ET 200, NAMUR, in some instances, the message classes are combined.

Table 4-4 Message classes and coding of various diagnostic interfaces

| **Text of the message class (number according to PROFIdrive)**<br>Cause and remedy. | **Diagnostics interface** | | | | |
|---|---|---|---|---|---|
| | **PN (hex)** | **DS1 (dec)** | **DP (dec)** | **ET 200 (dec)** | **NAMUR (r3113.x)** |
| **Hardware/software errors (1)**<br>A hardware or software malfunction was detected. Carry out a POWER ON for the relevant component. If it occurs again, contact the hotline. | 9000 | 0 | 16 | 9 | 0 |
| **Line fault (2)**<br>A line supply fault has occurred (phase failure, voltage level ...). Check the line supply and fuses. Check the supply voltage. Check the wiring. | 9001 | 1 | 17 | 24 | 1 |
| **Supply voltage fault (3)**<br>An electronics supply voltage fault (48 V, 24 V, 5 V …) was detected. Check the wiring. Check the voltage level. | 9002 | 2 | 2 [1]<br>3 [2] | 2 [1]<br>3 [2] | 15 |
| **DC-link overvoltage (4)**<br>The DC-link voltage has assumed an inadmissibly high value. Check the dimensioning of the system (line supply, reactor, voltages). Check the infeed settings. | 9003 | 3 | 18 | 24 | 2 |
| **Power electronics fault (5)**<br>An impermissible operating state of the power electronics was detected (overcurrent, overtemperature, IGBT failure …). Check compliance with the permissible load cycles. Check the ambient temperatures (fan). | 9004 | 4 | 19 | 24 | 3 |
| **Overtemperature of the electronic component (6)**<br>The temperature in the component has exceeded the highest permissible limit. Check the ambient temperature / control cabinet ventilation. | 9005 | 5 | 20 | 5 | 4 |
| **Ground fault / inter-phase short-circuit detected (7)**<br>A ground fault / inter-phase short-circuit was detected in the power cables or in the motor windings. Check the power cables (connection). Check the motor. | 9006 | 6 | 21 | 20 | 5 |
| **Motor overload (8)**<br>The motor was operated outside the permissible limits (temperature, current, torque …). Check the load cycles and set limits. Check the ambient temperature / motor cooling. | 9007 | 7 | 22 | 24 | 6 |
| **Communication to the higher-level controller faulted (9)**<br>The communication to the higher-level controller (internal coupling, PROFIBUS, PROFINET …) is faulted or interrupted. Check the state of the higher-level controller. Check the communication connection/-wiring. Check the bus configuration/cycles. | 9008 | 8 | 23 | 19 | 7 |
| **Safety monitoring channel has detected an error (10)**<br>A safe operation monitoring function has detected an error. | 9009 | 9 | 24 | 25 | 8 |

Table 4-4 Message classes and coding of various diagnostic interfaces, continued

| Text of the message class (number according to PROFIdrive)<br>Cause and remedy. | Diagnostics interface | | | | |
|---|---|---|---|---|---|
| | **PN (hex)** | **DS1 (dec)** | **DP (dec)** | **ET 200 (dec)** | **NAMUR (r3113.x)** |
| **Actual position/speed value incorrect or not available (11)**<br>An illegal signal state was detected while evaluating the encoder signals (track signals, zero marks, absolute values …). Check the encoder / state of the encoder signals. Observe the maximum permissible frequencies. | 900A | 10 | 25 | 29 | 9 |
| **Internal (DRIVE-CLiQ) communication faulted (12)**<br>The internal communication between the SINAMICS components is faulted or interrupted. Check the DRIVE-CLiQ wiring. Ensure an EMC-compliant installation. Observe the maximum permissible quantity structures / cycles. | 900B | 11 | 26 | 31 | 10 |
| **Infeed fault (13)**<br>The infeed is faulty or has failed. Check the infeed and its environment (line supply, filters, reactors, fuses …). Check the infeed control. | 900C | 12 | 27 | 24 | 11 |
| **Braking controller / Braking Module faulted (14)**<br>The internal or external Braking Module is faulted or overloaded (temperature). Check the connection/state of the Braking Module. Comply with the permissible number of braking operations and their duration. | 900D | 13 | 28 | 24 | 15 |
| **Line filter fault (15)**<br>The line filter monitoring has detected an excessively high temperature or another impermissible state. Check the temperature / temperature monitoring. Check the configuration to ensure that it is permissible (filter type, infeed, thresholds). | 900E | 14 | 17 | 24 | 15 |
| **External measured value / signal state outside of the permissible range (16)**<br>A measured value / signal state read in via the input area (digital/analog/temperature) has assumed an impermissible value/state. Identify and check the relevant signal. Check the set thresholds. | 900F | 15 | 29 | 26 | 15 |
| **Application / technological function faulty (17)**<br>The application / technological function has exceeded a (set) limit (position, velocity, torque …). Identify and check the relevant limit. Check the setpoint specification of the higher-level controller. | 9010 | 16 | 30 | 9 | 15 |
| **Error in the parameterization/configuration/commissioning procedure (18)**<br>An error was identified in the parameterization or in a commissioning procedure, or the parameterization does not match the actual device configuration. Determine the precise cause of the fault using the commissioning tool. Adapt the parameterization or device configuration. | 9011 | 17 | 31 | 16 | 15 |

Table 4-4 Message classes and coding of various diagnostic interfaces, continued

| **Text of the message class (number according to PROFIdrive)**<br>Cause and remedy. | **Diagnostics interface** | | | | |
|---|---|---|---|---|---|
| | **PN (hex)** | **DS1 (dec)** | **DP (dec)** | **ET 200 (dec)** | **NAMUR (r3113.x)** |
| **General drive fault (19)**<br>Group fault. Determine the precise cause of the fault using the commissioning tool. | 9012 | 18 | 9 | 9 | 15 |
| **Auxiliary unit fault (20)**<br>The monitoring of an auxiliary unit (incoming transformer, cooling unit …) has detected an illegal state. Determine the exact cause of the fault and check the relevant device. | 9013 | 19 | 29 | 26 | 15 |

1. Undervoltage condition of the electronics power supply

2. Overvoltage condition of the electronics power supply

## Reaction: Default fault reaction (adjustable fault reaction)

Specifies the default reaction in the event of a fault.

The optional parentheses indicate whether the default fault reactions can be changed and which fault reactions can be adjusted via parameters (p2100, p2101).

**Note**

See Table "Fault reactions" (Page 655).

## Acknowledgement: Default acknowledgement (adjustable acknowledgement)

Specifies the default method of acknowledging faults after the cause has been eliminated.

The optional parentheses indicate whether the default acknowledgement can be changed and which acknowledgement can be adjusted via parameters (p2126, p2127).

**Note**

See Table "Acknowledging faults" (Page 657).

## Cause:

Describes the possible causes of the fault or alarm. A fault or alarm value can also be specified (optional).

Fault value (r0949, format):

The fault value is entered into the fault buffer in r0949[0...63] and specifies additional, more precise information about a fault.

Alarm value (r2124, format):

The alarm value specifies additional, more precise information about an alarm.

The alarm value is entered in the alarm buffer in r2124[0...63] and specifies additional, more precise information about an alarm.

**Remedy:**

Description of the methods available for eliminating the cause of the active fault/alarm

| ⚠ WARNING |
| --- |
| In certain cases, servicing and maintenance personnel are responsible for choosing a suitable method for eliminating the cause of faults. |

### 4.1.3 Number ranges of faults and alarms

**Note**

The following number ranges represent an overview of all faults and alarms used in the SINAMICS drive family.

The faults and alarms for the product described in this List Manual are described in detail in "List of faults and alarms" (Page 666).

Faults and alarms are organized into the following number ranges:

Table 4-5 Number ranges of faults and alarms

| of | To | Area |
|---|---|---|
| 1000 | 3999 | Control Unit |
| 4000 | 4999 | Reserved |
| 5000 | 5999 | Power section |
| 6000 | 6899 | Infeed |
| 6900 | 6999 | Braking Module |
| 7000 | 7999 | Drive |
| 8000 | 8999 | Option Board |
| 9000 | 12999 | Reserved |
| 13000 | 13020 | Licensing |
| 13021 | 13099 | Reserved |
| 13100 | 13102 | Know-how protection |
| 13103 | 19999 | Reserved |
| 20000 | 29999 | OEM |
| 30000 | 30999 | DRIVE-CLiQ component power unit |
| 31000 | 31999 | DRIVE-CLiQ component encoder 1 |
| 32000 | 32999 | DRIVE-CLiQ component encoder 2<br>**Note**<br>Faults that occur are automatically output as an alarm if the encoder is parameterized as a direct measuring system and does not intervene in the motor control. |
| 33000 | 33999 | DRIVE-CLiQ component encoder 3<br>**Note**<br>Faults that occur are automatically output as an alarm if the encoder is parameterized as a direct measuring system and does not intervene in the motor control. |
| 34000 | 34999 | Voltage Sensing Module (VSM) |
| 35000 | 35199 | Terminal Module 54F (TM54F) |
| 35200 | 35999 | Terminal Module 31 (TM31) |
| 36000 | 36999 | DRIVE-CLiQ Hub Module |
| 37000 | 37999 | HF Damping Module |

Table 4-5 Number ranges of faults and alarms, continued

| of | To | Area |
|---|---|---|
| 40000 | 40999 | Controller Extension 32 (CX32) |
| 41000 | 48999 | Reserved |
| 49000 | 49999 | SINAMICS GM/SM/GL |
| 50000 | 50499 | Communication Board (COMM BOARD) |
| 50500 | 59999 | OEM Siemens |
| 60000 | 65535 | SINAMICS DC MASTER (closed-loop DC current control) |

## 4.2 List of faults and alarms

Product: SINAMICS G120, Version: 4702900, Language: eng
Objects: CU230P-2_BT, CU230P-2_CAN, CU230P-2_DP, CU230P-2_HVAC, CU230P-2_PN

### F01000 Internal software error

**Message class:** Hardware / software error (1)
**Reaction:** OFF2
**Acknowledge:** POWER ON
**Cause:** An internal software error has occurred.
Fault value (r0949, interpret hexadecimal):
Only for internal Siemens troubleshooting.
**Remedy:** - evaluate fault buffer (r0945).
- carry out a POWER ON (power off/on) for all components.
- if required, check the data on the non-volatile memory (e.g. memory card).
- upgrade firmware to later version.
- contact the Hotline.
- replace the Control Unit.

### F01001 FloatingPoint exception

**Message class:** Hardware / software error (1)
**Reaction:** OFF2
**Acknowledge:** POWER ON
**Cause:** An exception occurred during an operation with the FloatingPoint data type.
The error may be caused by the basic system or an OA application (e.g., FBLOCKS, DCC).
Fault value (r0949, interpret hexadecimal):
Only for internal Siemens troubleshooting.
Note:
Refer to r9999 for further information about this fault.
r9999[0]: Fault number.
r9999[1]: Program counter at the time when the exception occurred.
r9999[2]: Cause of the FloatingPoint exception.
Bit 0 = 1: Operation invalid
Bit 1 = 1: Division by zero
Bit 2 = 1: Overflow
Bit 3 = 1: Underflow
Bit 4 = 1: Inaccurate result
**Remedy:** - carry out a POWER ON (power off/on) for all components.
- check configuration and signals of the blocks in FBLOCKS.
- check configuration and signals of DCC charts.
- upgrade firmware to later version.
- contact the Hotline.

### F01002 Internal software error

**Message class:** Hardware / software error (1)
**Reaction:** OFF2
**Acknowledge:** IMMEDIATELY
**Cause:** An internal software error has occurred.
Fault value (r0949, interpret hexadecimal):
Only for internal Siemens troubleshooting.
**Remedy:** - carry out a POWER ON (power off/on) for all components.
- upgrade firmware to later version.
- contact the Hotline.

## F01003 Acknowledgement delay when accessing the memory

**Message class:** Hardware / software error (1)
**Reaction:** OFF2
**Acknowledge:** IMMEDIATELY
**Cause:** A memory area was accessed that does not return a "READY".
Fault value (r0949, interpret hexadecimal):
Only for internal Siemens troubleshooting.
**Remedy:** - carry out a POWER ON (power off/on) for all components.
- contact the Hotline.

## N01004 (F, A) Internal software error

**Message class:** Hardware / software error (1)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** An internal software error has occurred.
Fault value (r0949, hexadecimal):
Only for internal Siemens troubleshooting.
**Remedy:** - read out diagnostics parameter (r9999).
- contact the Hotline.
See also: r9999 (Software error internal supplementary diagnostics)

## F01005 File upload/download error

**Message class:** Hardware / software error (1)
**Reaction:** NONE
**Acknowledge:** IMMEDIATELY
**Cause:** The upload or download of EEPROM data was unsuccessful.
Fault value (r0949, interpret hexadecimal):
yyxxxx hex: yy = component number, xxxx = fault cause
xxxx = 000B hex = 11 dec:
Power unit component has detected a checksum error.
xxxx = 000F hex = 15 dec:
The selected power unit will not accept the content of the EEPROM file.
xxxx = 0011 hex = 17 dec:
Power unit component has detected an internal access error.
xxxx = 0012 hex = 18 dec:
After several communication attempts, no response from the power unit component.
xxxx = 008B hex = 140 dec:
EEPROM file for the power unit component not available on the memory card.
xxxx = 008D hex = 141 dec:
An inconsistent length of the firmware file was signaled. It is possible that the download/upload has been interrupted.
xxxx = 0090 hex = 144 dec:
When checking the file that was loaded, the component detected a fault (checksum). It is possible that the file on the memory card is defective.
xxxx = 0092 hex = 146 dec:
This SW or HW does not support the selected function.
xxxx = 009C hex = 156 dec:
Component with the specified component number is not available (p7828).
xxxx = Additional values:
Only for internal Siemens troubleshooting.
**Remedy:** Save a suitable firmware file or EEPROM file for upload or download in folder "/ee_sac/" on the memory card.

## A01009 (N) CU: Control module overtemperature

**Message class:** Overtemperature of the electronic components (6)

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** The temperature (r0037[0]) of the control module (Control Unit) has exceeded the specified limit value.

**Remedy:** - check the air intake for the Control Unit.
- check the Control Unit fan.

Note:

The alarm automatically disappears after the limit value has been undershot.

## F01010 Drive type unknown

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)

**Reaction:** NONE

**Acknowledge:** IMMEDIATELY

**Cause:** An unknown drive type was found.

**Remedy:** - replace Power Module.
- carry out a POWER ON (power off/on).
- upgrade firmware to later version.
- contact the Hotline.

## F01015 Internal software error

**Message class:** Hardware / software error (1)

**Reaction:** OFF2

**Acknowledge:** POWER ON

**Cause:** An internal software error has occurred.

Fault value (r0949, interpret decimal):

Only for internal Siemens troubleshooting.

**Remedy:** - carry out a POWER ON (power off/on) for all components.
- upgrade firmware to later version.
- contact the Hotline.

## A01016 (F) Firmware changed

**Message class:** Hardware / software error (1)

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** At least one firmware file in the directory was illegally changed on the non-volatile memory (memory card/device memory) with respect to the version when shipped from the factory.

Alarm value (r2124, interpret decimal):

0: Checksum of one file is incorrect.

1: File missing.

2: Too many files.

3: Incorrect firmware version.

4: Incorrect checksum of the back-up file.

**Remedy:** For the non-volatile memory for the firmware (memory card/device memory), restore the delivery condition.

Note:

The file involved can be read out using parameter r9925.

The status of the firmware check is displayed using r9926.

See also: r9925 (Firmware file incorrect), r9926 (Firmware check status)

## A01017 Component lists changed

**Message class:** Hardware / software error (1)

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** On the memory card, one file in the directory /SIEMENS/SINAMICS/DATA or /ADDON/SINAMICS/DATA has been illegally changed with respect to that supplied from the factory. No changes are permitted in this directory.

Alarm value (r2124, interpret decimal):
zyx dec: x = Problem, y = Directory, z = File name
x = 1: File does not exist.
x = 2: Firmware version of the file does not match the software version.
x = 3: File checksum is incorrect.
y = 0: Directory /SIEMENS/SINAMICS/DATA/
y = 1: Directory /ADDON/SINAMICS/DATA/
z = 0: File MOTARM.ACX
z = 1: File MOTSRM.ACX
z = 2: File MOTSLM.ACX
z = 3: File ENCDATA.ACX
z = 4: File FILTDATA.ACX
z = 5: File BRKDATA.ACX
z = 6: File DAT_BEAR.ACX
z = 7: File CFG_BEAR.ACX

**Remedy:** For the file on the memory card involved, restore the status originally supplied from the factory.

## F01018 Booting has been interrupted several times

**Message class:** Hardware / software error (1)
**Reaction:** NONE
**Acknowledge:** POWER ON
**Cause:** Module booting was interrupted several times. As a consequence, the module boots with the factory setting.
Possible reasons for booting being interrupted:
- power supply interrupted.
- CPU crashed.
- parameterization invalid.

**Remedy:** - carry out a POWER ON (power off/on). After switching on, the module reboots from the valid parameterization (if available).
- restore the valid parameterization.
Examples:
a) Carry out a first commissioning, save, carry out a POWER ON (switch-off/switch-on).
b) Load another valid parameter backup (e.g. from the memory card), save, carry out a POWER ON (switch-off/switch-on).
Note:
If the fault situation is repeated, then this fault is again output after several interrupted boots.

## A01019 Writing to the removable data medium unsuccessful

**Message class:** Hardware / software error (1)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** The write access to the removable data medium was unsuccessful.
**Remedy:** Remove and check the removable data medium. Then run the data backup again.

## A01020 Writing to RAM disk unsuccessful

**Message class:** Hardware / software error (1)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** A write access to the internal RAM disk was unsuccessful.
**Remedy:** Adapt the file size for the system logbook to the internal RAM disk (p9930).
See also: p9930 (System logbook activation)

## A01021 Removable data medium as USB data storage medium from the PC used

**Message class:** General drive fault (19)

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** The removable data medium is used as USB data storage medium from a PC

As a consequence, the drive cannot access the removable data medium. When backing up, the configuration data cannot be saved on the removable data medium.

Fault value (r0949, interpret decimal):

1: The know-how protection as well as the copy protection for the removable data medium is active. Backup is inhibited.

2: The configuration data are only backed up in the Control Unit.

See also: r7760 (Write protection/know-how protection status), r9401 (Safely remove memory card status)

**Remedy:** Deactivate the USB connection to the PC and back up the configuration data.

Note:

The alarm is automatically canceled when disconnecting the USB connection or when removing the removable data medium.

See also: r9401 (Safely remove memory card status)

## F01023 Software timeout (internal)

**Message class:** Hardware / software error (1)

**Reaction:** NONE

**Acknowledge:** IMMEDIATELY

**Cause:** An internal software timeout has occurred.

Fault value (r0949, interpret decimal):

Only for internal Siemens troubleshooting.

**Remedy:** - carry out a POWER ON (power off/on) for all components.

- upgrade firmware to later version.

- contact the Hotline.

## A01028 (F) Configuration error

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** The parameterization that was downloaded was generated with a different module type (Order No., MLFB).

**Remedy:** Save parameters in a non-volatile fashion (p0971 = 1).

## F01030 Sign-of-life failure for master control

**Message class:** Communication error to the higher-level control system (9)

**Reaction:** OFF3 (IASC/DCBRK, NONE, OFF1, OFF2, STOP2)

**Acknowledge:** IMMEDIATELY

**Cause:** For active PC master control, no sign-of-life was received within the monitoring time.

The master control was returned to the active BICO interconnection.

**Remedy:** Set the monitoring time higher at the PC or, if required, completely disable the monitoring function.

For the commissioning software, the monitoring time is set as follows:

<Drive> -> Commissioning -> Control panel -> Button "Fetch master control" -> A window is displayed to set the monitoring time in milliseconds.

Notice:

The monitoring time should be set as short as possible. A long monitoring time means a late response when the communication fails!

## F01033 Units changeover: Reference parameter value invalid

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)

**Reaction:** NONE

**Acknowledge:** IMMEDIATELY

**Cause:** When changing over the units to the referred representation type, it is not permissible for any of the required reference parameters to be equal to 0.0

Fault value (r0949, parameter):
Reference parameter whose value is 0.0.
See also: p0505 (Selecting the system of units), p0595 (Technological unit selection)

**Remedy:** Set the value of the reference parameter to a number different than 0.0.
See also: p0304, p0305, p0310, p0596, p2000, p2001, p2002, p2003, r2004

## F01034 Units changeover: Calculation parameter values after reference value change unsuccessful

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** NONE
**Acknowledge:** IMMEDIATELY
**Cause:** The change of a reference parameter meant that for an involved parameter the selected value was not able to be re-calculated in the per unit representation. The change was rejected and the original parameter value restored.
Fault value (r0949, parameter):
Parameter whose value was not able to be re-calculated.
See also: p0304, p0305, p0310, p0596, p2000, p2001, p2002, p2003, r2004
**Remedy:** - Select the value of the reference parameter such that the parameter involved can be calculated in the per unit representation.
- Technology unit selection (p0595) before changing the reference parameter p0596, set p0595 = 1.
See also: p0304, p0305, p0310, p0596, p2000, p2001, p2002, p2003, r2004

## A01035 (F) ACX: Parameter back-up file corrupted

**Message class:** Hardware / software error (1)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** When the Control Unit is booted, no complete data set was found from the parameter back-up files. The last time that the parameterization was saved, it was not completely carried out.
It is possible that the backup was interrupted by switching off or withdrawing the memory card.
Alarm value (r2124, interpret hexadecimal):
ddccbbaa hex:
aa = 01 hex:
Power up was realized without data backup. The drive is in the factory setting.
aa = 02 hex:
The last available internal backup data record was loaded. The parameterization must be checked. It is recommended that the parameterization is downloaded again.
aa = 03 hex:
The last available data record from the memory card was loaded. The parameterization must be checked.
aa = 04 hex:
An invalid data backup was loaded from the memory card into the drive. The drive is in the factory setting.
dd, cc, bb:
Only for internal Siemens troubleshooting.
See also: p0971 (Save parameters)
**Remedy:** - Download the project again with the commissioning software.
- save all parameters (p0971 = 1 or "copy RAM to ROM").
See also: p0971 (Save parameters)

## F01036 (A) ACX: Parameter back-up file missing

**Message class:** Hardware / software error (1)
**Reaction:** NONE (OFF1, OFF2, OFF3)
**Acknowledge:** IMMEDIATELY
**Cause:** When downloading the device parameterization, a parameter back-up file PSxxxyyy.ACX associated with a drive object cannot be found.
Fault value (r0949, interpret hexadecimal):
Byte 1: yyy in the file name PSxxxyyy.ACX
yyy = 000 --> consistency back-up file

| | |
|---|---|
| | yyy = 001 ... 062 --> drive object number<br>yyy = 099 --> PROFIBUS parameter back-up file<br>Byte 2, 3, 4:<br>Only for internal Siemens troubleshooting. |
| **Remedy:** | If you have saved the project data using the commissioning software, carry out a new download for your project.<br>Save using the function "Copy RAM to ROM" or with p0971 = 1<br>This means that the parameter files are again completely written into the non-volatile memory.<br>Note:<br>If the project data have not been backed up, then a new first commissioning is required. |

## F01038 (A) ACX: Loading the parameter back-up file unsuccessful

| | |
|---|---|
| **Message class:** | Hardware / software error (1) |
| **Reaction:** | NONE (OFF1, OFF2, OFF3) |
| **Acknowledge:** | IMMEDIATELY |
| **Cause:** | An error has occurred when downloading PSxxxyyy.ACX or PTxxxyyy.ACX files from the non-volatile memory.<br>Fault value (r0949, interpret hexadecimal):<br>Byte 1: yyy in the file name PSxxxyyy.ACX<br>yyy = 000 --> consistency back-up file<br>yyy = 001 ... 062 --> drive object number<br>yyy = 099 --> PROFIBUS parameter back-up file<br>Byte 2:<br>255: Incorrect drive object type.<br>254: Topology comparison unsuccessful -> drive object type was not able to be identified.<br>Reasons could be:<br>- Incorrect component type in the actual topology<br>- Component does not exist in the actual topology.<br>- Component not active.<br>Additional values:<br>Only for internal Siemens troubleshooting.<br>Byte 4, 3:<br>Only for internal Siemens troubleshooting. |
| **Remedy:** | - If you have saved the project data using the commissioning software, download the project again. Save using the function "Copy RAM to ROM" or with p0971 = 1 so that all of the parameter files are again completely written to the non-volatile memory.<br>- replace the memory card or Control Unit. |

## F01039 (A) ACX: Writing to the parameter back-up file was unsuccessful

| | |
|---|---|
| **Message class:** | Hardware / software error (1) |
| **Reaction:** | NONE (OFF1, OFF2, OFF3) |
| **Acknowledge:** | IMMEDIATELY |
| **Cause:** | Writing to at least one parameter back-up file PSxxxyyy.*** in the non-volatile memory was unsuccessful.<br>- In the directory /USER/SINAMICS/DATA/ at least one parameter back-up file PSxxxyyy.*** has the "read only" file attribute and cannot be overwritten.<br>- There is not sufficient free memory space available.<br>- The non-volatile memory is defective and cannot be written to.<br>Fault value (r0949, interpret hexadecimal):<br>dcba hex<br>a = yyy in the file names PSxxxyyy.***<br>a = 000 --> consistency back-up file<br>a = 001 ... 062 --> drive object number<br>a = 099 --> PROFIBUS parameter back-up file<br>b = xxx in the file names PSxxxyyy.***<br>b = 000 --> data save started with p0971 = 1<br>b = 010 --> data save started with p0971 = 10<br>b = 011 --> data save started with p0971 = 11<br>b = 012 --> data save started with p0971 = 12 |

| | |
|---|---|
| | d, c: |
| | Only for internal Siemens troubleshooting. |
| **Remedy:** | - check the file attribute of the files (PSxxxyyy.***, CAxxxyyy.***, CCxxxyyy.***) and, if required, change from "read only" to "writeable". |
| | - check the free memory space in the non-volatile memory. Approx. 80 kbyte of free memory space is required for every drive object in the system. |
| | - replace the memory card or Control Unit. |

## F01040 Save parameter settings and carry out a POWER ON

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)

**Reaction:** OFF2

**Acknowledge:** POWER ON

**Cause:** A parameter has been changed that requires the parameters to be backed up and the Control Unit to be switched OFF and ON again.

**Remedy:** - Save parameters (p0971).

- carry out a POWER ON (power off/on) for the Control Unit.

## F01042 Parameter error during project download

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)

**Reaction:** OFF2 (NONE, OFF1, OFF3)

**Acknowledge:** IMMEDIATELY

**Cause:** An error was detected when downloading a project using the commissioning software (e.g. incorrect parameter value).

For the specified parameter, it was detected that dynamic limits were exceeded that may possibly depend on other parameters.

Fault value (r0949, interpret hexadecimal):

ccbbaaaa hex

aaaa = Parameter

bb = Index

cc = fault cause

0: Parameter number illegal.

1: Parameter value cannot be changed.

2: Lower or upper value limit exceeded.

3: Sub-index incorrect.

4: No array, no sub-index.

5: Data type incorrect.

6: Setting not permitted (only resetting).

7: Descriptive element cannot be changed.

9: Descriptive data not available.

11: No master control.

15: No text array available.

17: Task cannot be executed due to operating state.

20: Illegal value.

21: Response too long.

22: Parameter address illegal.

23: Format illegal.

24: Number of values not consistent.

108: Unit unknown.

Additional values:

Only for internal Siemens troubleshooting.

**Remedy:** - enter the correct value in the specified parameter.

- identify the parameter that restricts the limits of the specified parameter.

## F01043 Fatal error at project download

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)

**Reaction:** OFF2 (OFF1, OFF3)

**Acknowledge:** IMMEDIATELY

**Cause:** A fatal error was detected when downloading a project using the commissioning software.

Fault value (r0949, interpret decimal):

1: Device status cannot be changed to Device Download (drive object ON?).

2: Incorrect drive object number.

8: Maximum number of drive objects that can be generated exceeded.

11: Error while generating a drive object (global component).

12: Error while generating a drive object (drive component).

13: Unknown drive object type.

14: Drive status cannot be changed to "ready for operation" (r0947 and r0949).

15: Drive status cannot be changed to drive download.

16: Device status cannot be changed to "ready for operation".

18: A new download is only possible if the factory settings are restored for the drive unit.

20: The configuration is inconsistent.

21: Error when accepting the download parameters.

22: SW-internal download error.

100: The download was canceled, because no write requests were received from the commissioning client (e.g. for communication error).

Additional values:

Only for internal Siemens troubleshooting.

**Remedy:** - use the current version of the commissioning software.

- modify the offline project and download again (e.g. compare the motor and Power Module in the offline project and on the drive).

- change the drive state (is a drive rotating or is there a message/signal?).

- carefully note any other messages/signals and remove their cause.

- boot from previously saved files (switch-off/switch-on or p0970).

## F01044 CU: Descriptive data error

**Message class:** Hardware / software error (1)

**Reaction:** OFF2

**Acknowledge:** POWER ON

**Cause:** An error was detected when loading the descriptive data saved in the non-volatile memory.

**Remedy:** Replace the memory card or Control Unit.

## A01045 Configuring data invalid

**Message class:** Hardware / software error (1)

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** An error was detected when evaluating the parameter files PSxxxyyy.ACX, PTxxxyyy.ACX, CAxxxyyy.ACX, or CCxxxyyy.ACX saved in the non-volatile memory. Because of this, under certain circumstances, several of the saved parameter values were not able to be accepted. Also see r9406 up to r9408.

Alarm value (r2124, interpret hexadecimal):

Only for internal Siemens troubleshooting.

**Remedy:** - Check the parameters displayed in r9406 up to r9408, and correct these if required.

- Restore the factory setting using (p0970 = 1) and re-load the project into the drive unit.

Then save the parameterization in STARTER using the "Copy RAM to ROM" function or with p0971 = 1. This overwrites the incorrect parameter files in the non-volatile memory – and the alarm is withdrawn.

## A01049 It is not possible to write to file

**Message class:** Hardware / software error (1)

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** It is not possible to write into a write-protected file (PSxxxxxx.acx). The write request was interrupted.

Alarm value (r2124, interpret decimal):

Drive object number.

**Remedy:** Check whether the "write protected" attribute has been set for the files in the non-volatile memory under .../USER/SINAMICS/DATA/... When required, remove write protection and save again (e.g. set p0971 to 1).

## F01054 CU: System limit exceeded

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)

**Reaction:** OFF2

**Acknowledge:** IMMEDIATELY

**Cause:** At least one system overload has been identified.

Fault value (r0949, interpret decimal):

1: Computing time load too high (r9976[1]).

5: Peak load too high (r9976[5]).

Note:

As long as this fault is present, it is not possible to save the parameters (p0971).

**Remedy:** Re fault value = 1, 5:

- reduce the computing time load of the drive unit (r9976[1] and r9976[5]) to under 100 %.
- check the sampling times and adjust if necessary (p0115, p0799, p4099).
- de-activate function modules.
- de-activate drive objects.
- remove drive objects from the target topology.
- note the DRIVE-CLiQ topology rules and if required, change the DRIVE-CLiQ topology.

When using the Drive Control Chart (DCC) or free function blocks (FBLOCKS), the following applies

- the computing time load of the individual run-time groups on a drive object can be read out in r21005 (DCC) or r20005 (FBLOCKS).
- if necessary, the assignment of the run-time group (p21000, p20000) can be changed in order to increase the sampling time (r21001, r20001).
- if necessary, reduce the number of cyclically calculated blocks (DCC) and/or function blocks (FBLOCKS).

## A01066 Buffer memory: 70% fill level reached or exceeded

**Message class:** General drive fault (19)

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** The non-volatile buffer memory for parameter changes is filled to at least 70%.

This can also occur if the buffer memory is active (p0014 = 1) and parameters are continually changed via a fieldbus system.

**Remedy:** If required, de-activate and clear the buffer memory (p0014 = 0).

If required, clear the buffer memory (p0014 = 2).

In the following cases, the entries in the buffer memory are transferred into the ROM and then the buffer memory is cleared:

- p0971 = 1
- power down/power up the Control Unit

See also: p0014 (Buffer memory mode)

## A01067 Buffer memory: 100 % fill level reached

**Message class:** General drive fault (19)

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** The non-volatile buffer memory for parameter changes is filled to 100%.

All additional parameter changes will no longer be taken into account in the non-volatile buffer memory. However, parameter changes can still be made in the volatile memory (RAM).

This can also occur if the buffer memory is active (p0014 = 1) and parameters are continually changed via a fieldbus system.

**Remedy:** If required, de-activate and clear the buffer memory (p0014 = 0).

If required, clear the buffer memory (p0014 = 2).

In the following cases, the entries in the buffer memory are transferred into the ROM and then the buffer memory is cleared:

- p0971 = 1
- power down/power up the Control Unit

See also: p0014 (Buffer memory mode)

## F01068 CU: Data memory memory overflow

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)

**Reaction:** OFF2

**Acknowledge:** IMMEDIATELY

**Cause:** The utilization for a data memory area is too large.

Fault value (r0949, interpret binary):

Bit 0 = 1: High-speed data memory 1 overloaded

Bit 1 = 1: High-speed data memory 2 overloaded

Bit 2 = 1: High-speed data memory 3 overloaded

Bit 3 = 1: High-speed data memory 4 overloaded

**Remedy:**
- de-activate the function module.
- de-activate drive object.
- remove the drive object from the target topology.

## A01069 Parameter backup and device incompatible

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** The parameter backup on the memory card and the drive unit do not match.

The module boots with the factory settings.

Example:

Devices A and B. are not compatible and a memory card with the parameter backup for device A is inserted in device B.

**Remedy:**
- insert a memory card with compatible parameter backup and carry out a POWER ON.
- insert a memory card without parameter backup and carry out a POWER ON.
- If required, withdraw the memory card and carry out POWER ON.
- save the parameters (p0971 = 1).

## F01072 Memory card restored from the backup copy

**Message class:** General drive fault (19)

**Reaction:** NONE

**Acknowledge:** IMMEDIATELY

**Cause:** The Control Unit was switched-off while writing to the memory card. This is why the visible partition became defective.

After switching on, the data from the non-visible partition (backup copy) were written to the visible partition.

**Remedy:** Check that the firmware and parameterization is up-to-date.

## A01073 (N) POWER ON required for backup copy on memory card

**Message class:** General drive fault (19)

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** The parameter assignment on the visible partition of the memory card has changed.

In order that the backup copy on the memory card is updated on the non-visible partition, it is necessary to carry out a POWER ON or hardware reset (p0972) of the Control Unit.

Note:

It is possible that a new POWER ON is requested via this alarm (e.g. after saving with p0971 = 1).

**Remedy:** - carry out a POWER ON (power off/on) for the Control Unit.
- carry out a hardware reset (RESET button, p0972).

## A01098 RTC: Date and time setting required

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** The power supply for the Control Unit was interrupted for an extended period. The date and time displayed on the real-time clock are no longer accurate.
Note:
This alarm is only output when p8405 = 1 (factory setting).
See also: p8405 (Activate/de-activate RTC alarm A01098)
**Remedy:** Set the date and time on the real-time clock.
Note:
RTC: Real-time clock
See also: p8400 (RTC time), p8401 (RTC date)

## F01105 (A) CU: Insufficient memory

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** OFF1
**Acknowledge:** POWER ON
**Cause:** Too many data sets are configured on this Control Unit.
Fault value (r0949, interpret decimal):
Only for internal Siemens troubleshooting.
**Remedy:** - reduce the number of data sets.

## F01107 Save to memory card unsuccessful

**Message class:** Hardware / software error (1)
**Reaction:** NONE
**Acknowledge:** IMMEDIATELY
**Cause:** A data save to the memory card was not able to be successfully carried out.
- Memory card defective
- Insufficient space on memory card.
Fault value (r0949, interpret decimal):
1: The file on the RAM was not able to be opened.
2: The file on the RAM was not able to be read.
3: A new directory could not be created on the memory card.
4: A new file could not be created on the memory card.
5: A new file could not be written on the memory card.
**Remedy:** - try to save again.
- replace the memory card or Control Unit.

## F01112 CU: Power unit not permissible

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** NONE
**Acknowledge:** IMMEDIATELY
**Cause:** The connected power unit cannot be used together with this Control Unit.
Fault value (r0949, interpret decimal):
1: Power unit is not supported (e.g. PM340).
**Remedy:** Replace the power unit that is not permissible by a component that is permissible.

| F01120 (A) | **Terminal initialization has failed** |
|---|---|
| **Message class:** | Hardware / software error (1) |
| **Reaction:** | OFF1 (OFF2) |
| **Acknowledge:** | IMMEDIATELY (POWER ON) |
| **Cause:** | An internal software error occurred while the terminal functions were being initialized.<br>Fault value (r0949, interpret hexadecimal):<br>Only for internal Siemens troubleshooting. |
| **Remedy:** | - carry out a POWER ON (power off/on) for all components.<br>- upgrade firmware to later version.<br>- contact the Hotline.<br>- replace the Control Unit. |

| F01152 | **CU: Invalid constellation of drive object types** |
|---|---|
| **Message class:** | Error in the parameterization / configuration / commissioning procedure (18) |
| **Reaction:** | NONE |
| **Acknowledge:** | POWER ON |
| **Cause:** | It is not possible to simultaneously operate drive object types SERVO, VECTOR and HLA.<br>A maximum of 2 of these drive object types can be operated on a Control Unit. |
| **Remedy:** | - power down the unit.<br>- restrict the use of drive object types SERVO, VECTOR, HLA to a maximum of 2.<br>- re-commission the unit. |

| F01205 | **CU: Time slice overflow** |
|---|---|
| **Message class:** | Hardware / software error (1) |
| **Reaction:** | OFF2 |
| **Acknowledge:** | POWER ON |
| **Cause:** | Insufficient computation time.<br>Fault value (r0949, interpret hexadecimal):<br>Only for internal Siemens troubleshooting. |
| **Remedy:** | Contact the Hotline. |

| F01250 | **CU: CU-EEPROM incorrect read-only data** |
|---|---|
| **Message class:** | Hardware / software error (1) |
| **Reaction:** | NONE (OFF2) |
| **Acknowledge:** | POWER ON |
| **Cause:** | Error when reading the read-only data of the EEPROM in the Control Unit.<br>Fault value (r0949, interpret decimal):<br>Only for internal Siemens troubleshooting. |
| **Remedy:** | - carry out a POWER ON.<br>- replace the Control Unit. |

| A01251 | **CU: CU-EEPROM incorrect read-write data** |
|---|---|
| **Message class:** | Hardware / software error (1) |
| **Reaction:** | NONE |
| **Acknowledge:** | NONE |
| **Cause:** | Error when reading the read-write data of the EEPROM in the Control Unit.<br>Alarm value (r2124, interpret decimal):<br>Only for internal Siemens troubleshooting. |
| **Remedy:** | For alarm value r2124 < 256, the following applies:<br>- carry out a POWER ON.<br>- replace the Control Unit.<br>For alarm value r2124 >= 256, the following applies:<br>- clear the fault memory (p0952 = 0).<br>- replace the Control Unit. |

## F01257 CU: Firmware version out of date

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)

**Reaction:** OFF2

**Acknowledge:** POWER ON

**Cause:** The Control Unit firmware is too old.

Fault value (r0949, interpret hexadecimal):

bbbbbbaa hex: aa = unsupported component

aa = 01 hex = 1 dec:

The firmware being used does not support the Control Unit.

aa = 02 hex = 2 dec:

The firmware being used does not support the Control Unit.

aa = 03 hex = 3 dec:

The firmware being used does not support the Power Module.

aa = 04 hex = 4 dec:

The firmware being used does not support the Control Unit.

**Remedy:** Re fault value = 1, 2, 4:

- Upgrade the firmware of the Control Unit.

For fault value = 3:

- Upgrade the firmware of the Control Unit.
- Replace the Power Module by a component that is supported.

## F01340 Topology: Too many components on one line

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)

**Reaction:** NONE

**Acknowledge:** IMMEDIATELY

**Cause:** For the selected communications clock cycle, too many DRIVE-CLiQ components are connected to one line of the Control Unit.

Fault value (r0949, interpret hexadecimal):

xyy hex: x = fault cause, yy = component number or connection number.

1yy:

The communications clock cycle of the DRIVE-CLiQ connection on the Control Unit is not sufficient for all read transfers.

2yy:

The communications clock cycle of the DRIVE-CLiQ connection on the Control Unit is not sufficient for all write transfers.

3yy:

Cyclic communication is fully utilized.

4yy:

The DRIVE-CLiQ cycle starts before the earliest end of the application. An additional dead time must be added to the control. Sign-of-life errors can be expected.

The conditions of operation with a current controller sampling time of 31.25 µs have not been maintained.

5yy:

Internal buffer overflow for net data of a DRIVE-CLiQ connection.

6yy:

Internal buffer overflow for receive data of a DRIVE-CLiQ connection.

7yy:

Internal buffer overflow for send data of a DRIVE-CLiQ connection.

8yy:

The component clock cycles cannot be combined with one another

900:

The lowest common multiple of the clock cycles in the system is too high to be determined.

901:

The lowest common multiple of the clock cycles in the system cannot be generated with the hardware.

**Remedy:** - check the DRIVE-CLiQ wiring.

- Reduce the number of components on the DRIVE-CLiQ line involved and distribute these to other DRIVE-CLiQ sockets of the Control Unit. This means that communication is uniformly distributed over several lines.

Re fault value = 1yy - 4yy in addition:

- increase the sampling times (p0112, p0115, p4099). If necessary, for DCC or FBLOCKS, change the assignment of the run-time group (p21000, p20000) so that the sampling time (r21001, r20001) is increased.
- if necessary, reduce the number of cyclically calculated blocks (DCC) and/or function blocks (FBLOCKS).
- reduce the function modules (r0108).
- establish the conditions for operation with a current controller sampling time of 31.25 µs (at the DRIVE-CLiQ line, only operate Motor Modules and Sensor Modules with this sampling time and only use a permitted Sensor Module (e.g. SMC20, this means a 3 at the last position of the order number)).
- For an NX, the corresponding Sensor Module for a possibly existing second measuring system should be connected to a free DRIVE-CLiQ socket of the NX.

Re fault value = 8yy in addition:

- check the clock cycles settings (p0112, p0115, p4099). Clock cycles on a DRIVE-CLiQ line must be perfect integer multiples of one another. As clock cycle on a line, all clock cycles of all drive objects in the previously mentioned parameters apply, which have components on the line involved.

Re fault value = 9yy in addition:

- check the clock cycles settings (p0112, p0115, p4099). The lower the numerical value difference between two clock cycles, the higher the lowest common multiple. This behavior has a significantly stronger influence, the higher the numerical values of the clock cycles.

## F01505 (A) BICO: Interconnection cannot be established

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)

**Reaction:** NONE

**Acknowledge:** IMMEDIATELY

**Cause:** A PROFIdrive telegram has been set (p0922).

An interconnection contained in the telegram was not able to be established.

Fault value (r0949, interpret decimal):

Parameter receiver that should be changed.

**Remedy:** Establish another interconnection.

## F01510 BICO: Signal source is not float type

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)

**Reaction:** NONE

**Acknowledge:** IMMEDIATELY

**Cause:** The requested connector output does not have the correct data type. This interconnection is not established.

Fault value (r0949, interpret decimal):

Parameter number to which an interconnection should be made (connector output).

**Remedy:** Interconnect this connector input with a connector output having a float data type.

## F01511 (A) BICO: Interconnection with different scalings

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)

**Reaction:** NONE

**Acknowledge:** IMMEDIATELY

**Cause:** The requested BICO interconnection was established. However, a conversion is made between the BICO output and BICO input using the reference values.

- the BICO output has different normalized units than the BICO input.
- message only for interconnections within a drive object.

Example:

The BICO output has, as normalized unit, voltage and the BICO input has current.

This means that the factor p2002/p2001 is calculated between the BICO output and the BICO input.

p2002: contains the reference value for current

p2001: contains the reference value for voltage

Fault value (r0949, interpret decimal):

Parameter number of the BICO input (signal sink).

**Remedy:** Not necessary.

## F01512 BICO: No scaling available

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** OFF2
**Acknowledge:** POWER ON
**Cause:** An attempt was made to determine a conversion factor for a scaling that does not exist.
Fault value (r0949, interpret decimal):
Unit (e.g. corresponding to SPEED) for which an attempt was made to determine a factor.
**Remedy:** Apply scaling or check the transfer value.

## F01513 (N, A) BICO: Interconnection cross DO with different scalings

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** NONE
**Acknowledge:** IMMEDIATELY
**Cause:** The requested BICO interconnection was established. However, a conversion is made between the BICO output and BICO input using the reference values.
An interconnection is made between different drive objects and the BICO output has different normalized units than the BICO input or the normalized units are the same but the reference values are different.
Example 1:
BICO output with voltage normalized unit, BICO input with current normalized unit, BICO output and BICO input lie in different drive objects. This means that the factor p2002/p2001 is calculated between the BICO output and the BICO input.
p2002: contains the reference value for current
p2001: contains the reference value for voltage
Example 2:
BICO output with voltage normalized unit in drive object 1 (DO1), BICO input with voltage normalized unit in drive object 2 (DO2). The reference values for voltage (p2001) of the two drive objects have different values. This means that the factor p2001(DO1)/p2001(DO2) is calculated between the BICO output and the BICO input.
p2001: contains the reference value for voltage, drive objects 1, 2
Fault value (r0949, interpret decimal):
Parameter number of the BICO input (signal sink).
**Remedy:** Not necessary.

## A01514 (F) BICO: Error when writing during a reconnect

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** During a reconnect operation (e.g. while booting or downloading - but can also occur in normal operation) a parameter was not able to be written to.
Example:
When writing to BICO input with double word format (DWORD), in the second index, the memory areas overlap (e.g. p8861). The parameter is then reset to the factory setting.
Alarm value (r2124, interpret decimal):
Parameter number of the BICO input (signal sink).
**Remedy:** Not necessary.

## F01515 (A) BICO: Writing to parameter not permitted as the master control is active

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** NONE
**Acknowledge:** IMMEDIATELY
**Cause:** When changing the number of CDS or when copying from CDS, the master control is active.
**Remedy:** If required, return the master control and repeat the operation.

## A01590 (F) Drive: Motor maintenance interval expired

**Message class:** General drive fault (19)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** The selected service/maintenance interval for this motor was reached.
Alarm value (r2124, interpret decimal):
Motor data set number.
See also: p0650 (Actual motor operating hours), p0651 (Motor operating hours maintenance interval)
**Remedy:** carry out service/maintenance and reset the service/maintenance interval (p0651).

## F01662 Error internal communications

**Message class:** Hardware / software error (1)
**Reaction:** OFF2
**Acknowledge:** POWER ON
**Cause:** A module-internal communication error has occurred.
Fault value (r0949, interpret hexadecimal):
Only for internal Siemens troubleshooting.
**Remedy:** - carry out a POWER ON (power off/on).
- upgrade firmware to later version.
- contact the Hotline.

## A01900 (F) PROFIBUS: Configuration telegram error

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** A PROFIBUS master attempts to establish a connection using an incorrect configuring telegram.
Alarm value (r2124, interpret decimal):
2: Too many PZD data words for input or output. The number of possible PZD is specified by the number of indices in r2050/p2051.
3: Uneven number of bytes for input or output.
211: Unknown parameterizing block.
Additional values:
Only for internal Siemens troubleshooting.
**Remedy:** Check the bus configuration on the master and the slave sides.
Re alarm value = 2:
Check the number of data words for input and output.
Re alarm value = 211:
Ensure offline version <= online version.

## F01910 (N, A) Fieldbus interface setpoint timeout

**Message class:** Communication error to the higher-level control system (9)
**Reaction:** OFF3 (IASC/DCBRK, NONE, OFF1, OFF2, STOP2)
**Acknowledge:** IMMEDIATELY
**Cause:** The reception of setpoints from the fieldbus interface has been interrupted.
- bus connection interrupted.
- communication partner switched off.
CU230P-2 DP:
- PROFIBUS master set into the STOP state.
See also: p2040 (Fieldbus interface monitoring time), p2047 (PROFIBUS additional monitoring time)
**Remedy:** Ensure bus connection has been established and switch on communication peer.
CU230P-2 BT, CU230P-2 HVAC:
- if required, adapt p2040.

CU230P-2 DP:

- set the PROFIBUS master to the RUN state.

- slave redundancy: For operation on a Y link, it must be ensured that "DP alarm mode = DPV1" is set in the slave parameterization.

### A01920 (F) PROFIBUS: Interruption cyclic connection

**Message class:** Communication error to the higher-level control system (9)

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** The cyclic connection to the PROFIBUS master is interrupted.

**Remedy:** Establish the PROFIBUS connection and activate the PROFIBUS master in the cyclic mode.

Note:

If there is no communication to a higher-level control system, then p2030 should be set = 0 to suppress this message.

See also: p2030 (Field bus int protocol selection)

### A01945 PROFIBUS: Connection to the Publisher failed

**Message class:** Communication error to the higher-level control system (9)

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** For PROFIBUS peer-to-peer data transfer, the connection to at least one Publisher has failed.

Alarm value (r2124, interpret binary):

Bit 0 = 1: Publisher with address in r2077[0], connection failed.

...

Bit 15 = 1: Publisher with address in r2077[15], connection failed.

**Remedy:** Check the PROFIBUS cables.

See also: r2077 (PROFIBUS diagnostics peer-to-peer data transfer addresses)

### F01946 (A) PROFIBUS: Connection to the Publisher aborted

**Message class:** Communication error to the higher-level control system (9)

**Reaction:** OFF1 (NONE, OFF2, OFF3)

**Acknowledge:** IMMEDIATELY (POWER ON)

**Cause:** The connection to at least one Publisher for PROFIBUS peer-to-peer data transfer in cyclic operation has been aborted.

Fault value (r0949, interpret binary):

Bit 0 = 1: Publisher with address in r2077[0], connection aborted.

...

Bit 15 = 1: Publisher with address in r2077[15], connection aborted.

**Remedy:** - check the PROFIBUS cables.

- check the state of the Publisher that has the aborted connection.

See also: r2077 (PROFIBUS diagnostics peer-to-peer data transfer addresses)

### A02050 Trace: Start not possible

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** The trace has already been started.

**Remedy:** Stop the trace and, if necessary, start again.

## A02051 Trace: recording not possible as a result of know-how protection

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** TRACE recording is not possible as at least one signal or trigger signal being used is under know-how protection.

Alarm value (r2124, interpret decimal):

1: Recorder 0

2: Recorder 1

3: Recorders 0 and 1

**Remedy:** - Temporarily activate or deactivate know-how protection (p7766).

- Include the signal in the OEM exception list (p7763, p7764).

- Where relevant do not record of the signal.

See also: p7763 (KHP OEM exception list number of indices for p7764), p7764 (KHP OEM exception list)

## A02055 Trace: Recording time too short

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** The trace duration is too short.

The minimum is twice the value of the trace clock cycle.

**Remedy:** Check the selected recording time and, if necessary, adjust.

## A02056 Trace: Recording cycle too short

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** The selected recording clock cycle is lower than the basic clock cycle 500µs.

**Remedy:** Increase the value for the trace cycle.

## A02057 Trace: Time slice clock cycle invalid

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** The time slice clock cycle selected does not match any of the existing time slices.

**Remedy:** Enter an existing time slice clock cycle. The existing time slices can be read out via p7901.

See also: r7901 (Sampling times)

## A02058 Trace: Time slice clock cycle for endless trace not valid

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** The selected time slice clock cycle cannot be used for the endless trace

**Remedy:** Enter the clock cycle of an existing time slice with a cycle time >= 2 ms for up to 4 recording channels or >= 4 ms from 5 recording channels per trace.

The existing time slices can be read out via p7901.

See also: r7901 (Sampling times)

## A02059 Trace: Time slice clock cycle for 2 x 8 recording channels not valid

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** The selected time slice clock cycle cannot be used for more than 4 recording channels.

**Remedy:** Enter the clock cycle of an existing time slice with a cycle time >= 4 ms or reduce the number of recording channels to 4 per trace.

The existing time slices can be read out via p7901.

See also: r7901 (Sampling times)

## A02060 Trace: Signal to be traced missing

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** - a signal to be traced was not specified.
- the specified signals are not valid.
**Remedy:** - specify the signal to be traced.
- check whether the relevant signal can be traced.

## A02061 Trace: Invalid signal

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** - the specified signal does not exist.
- the specified signal can no longer be traced (recorded).
**Remedy:** - specify the signal to be traced.
- check whether the relevant signal can be traced.

## A02062 Trace: Invalid trigger signal

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** - a trigger signal was not specified.
- the specified signal does not exist.
- the specified signal is not a fixed-point signal.
- the specified signal cannot be used as a trigger signal for the trace.
**Remedy:** Specify a valid trigger signal.

## A02063 Trace: Invalid data type

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** The specified data type to select a signal using a physical address is invalid.
**Remedy:** Use a valid data type.

## A02070 Trace: Parameter cannot be changed

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** The trace parameter settings cannot be changed when the trace is active.
**Remedy:** - stop the trace before parameterization.
- if required, start the trace.

## A02075 Trace: Pretrigger time too long

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** The selected pretrigger time must be shorter than the trace time.
**Remedy:** Check the pretrigger time setting and change if necessary.

## F02080 Trace: Parameterization deleted due to unit changeover

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** NONE
**Acknowledge:** IMMEDIATELY
**Cause:** The trace parameterization in the drive unit was deleted due to a unit changeover or a change in the reference parameters.

**Remedy:** Restart trace.

### A02095 MTrace 0: multiple trace cannot be activated

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** The following functions or settings are not permissible in conjunction with a multiple trace (trace recorder 0):
- measuring function
- long-time trace
- trigger condition "immediate recording start" (IMMEDIATE)
- trigger condition "start with function generator" (FG_START)

**Remedy:**
- if required, deactivate the multiple trace (p4840[0] = 0).
- deactivate function or setting that is not permissible

### A02096 MTrace 0: cannot be saved

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** It is not possible to save the measurement results of a multiple trace on the memory card (trace recorder 0).
A multiple trace is not started or is canceled.
Alarm value (r2124, interpret decimal):
1: Memory card cannot be accessed.
- card is not inserted or is blocked by a mounted USB drive.
3: data save operation to slow.
- a second trace has been completed before the measurement results of the first trace were able to be saved.
- writing the measurement result files to the card is blocked by the parameter save.
4: Data save operation canceled.
- for instance, the file required for the data save operation was not able to be found.

**Remedy:**
- insert or remove the memory card.
- use a larger memory card.
- configure a longer trace time or use an endless trace.
- avoid saving parameters while a multiple trace is running.
- check whether other functions are presently accessing measurement result files.

### A02097 MTrace 1: multiple trace cannot be activated

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** The following functions or settings are not permissible in conjunction with a multiple trace (trace recorder 1):
- measuring function
- long-time trace
- trigger condition "immediate recording start" (IMMEDIATE)
- trigger condition "start with function generator" (FG_START)

**Remedy:**
- if required, deactivate the multiple trace (p4840[1] = 0).
- deactivate function or setting that is not permissible

### A02098 MTrace 1: cannot be saved

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** It is not possible to save the measurement results of a multiple trace on the memory card (trace recorder 1).
A multiple trace is not started or is canceled.
Alarm value (r2124, interpret decimal):
1: Memory card cannot be accessed.
- card is not inserted or is blocked by a mounted USB drive.

3: data save operation to slow.
- a second trace has been completed before the measurement results of the first trace were able to be saved.
- writing the measurement result files to the card is blocked by the parameter save.
4: Data save operation canceled.
- for instance, the file required for the data save operation was not able to be found.

**Remedy:**
- insert or remove the memory card.
- use a larger memory card.
- configure a longer trace time or use an endless trace.
- avoid saving parameters while a multiple trace is running.
- check whether other functions are presently accessing measurement result files.

## A02099 Trace: Insufficient Control Unit memory

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** The memory space still available on the Control Unit is no longer sufficient for the trace function.
**Remedy:** Reduce the memory required, e.g. as follows:
- reduce the trace time.
- increase the trace clock cycle.
- reduce the number of signals to be traced.

## A02150 OA: Application cannot be loaded

**Message class:** Hardware / software error (1)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** The system was not able to load an OA application.
Alarm value (r2124, interpret hexadecimal):
16:
The interface version in the DCB user library is not compatible to the DCC standard library that has been loaded.
Only for internal Siemens troubleshooting.

**Remedy:**
- carry out a POWER ON (power off/on) for all components.
- upgrade firmware to later version.
- contact the Hotline.

Re alarm value = 16:
Load a compatible DCB user library (compatible to the interface of the DCC standard library).
Note:
OA: Open Architecture

## F02151 (A) OA: Internal software error

**Message class:** Hardware / software error (1)
**Reaction:** OFF2 (NONE, OFF1, OFF3)
**Acknowledge:** IMMEDIATELY (POWER ON)
**Cause:** An internal software error has occurred within an OA application.
Fault value (r0949, interpret hexadecimal):
Only for internal Siemens troubleshooting.

**Remedy:**
- carry out a POWER ON (power off/on) for all components.
- upgrade firmware to later version.
- contact the Hotline.
- replace the Control Unit.

Note:
OA: Open Architecture

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| **F02152 (A)** | **OA: Insufficient memory** |
| **Message class:** | Hardware / software error (1) |
| **Reaction:** | OFF1 |
| **Acknowledge:** | IMMEDIATELY (POWER ON) |
| **Cause:** | Too many functions have been configured on this Control Unit (e.g. too many drives, function modules, data sets, OA applications, blocks, etc).<br>Fault value (r0949, interpret decimal):<br>Only for internal Siemens troubleshooting. |
| **Remedy:** | - change the configuration on this Control Unit (e.g. fewer drives, function modules, data sets, OA applications, blocks, etc).<br>- use an additional Control Unit.<br>Note:<br>OA: Open Architecture |

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| **F03000** | **NVRAM fault on action** |
| **Message class:** | Hardware / software error (1) |
| **Reaction:** | NONE |
| **Acknowledge:** | IMMEDIATELY |
| **Cause:** | A fault occurred during execution of action p7770 = 1 or 2 for the NVRAM data.<br>Fault value (r0949, interpret hexadecimal):<br>yyxx hex: yy = fault cause, xx = application ID<br>yy = 1:<br>The action p7770 = 1 is not supported by this version if Drive Control Chart (DCC) is activated for the drive object concerned.<br>yy = 2:<br>The data length of the specified application is not the same in the NVRAM and the backup.<br>yy = 3:<br>The data checksum in p7774 is not correct.<br>yy = 4:<br>No data available to load. |
| **Remedy:** | - Perform the remedy according to the results of the troubleshooting.<br>- If necessary, start the action again. |

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| **F03001** | **NVRAM checksum incorrect** |
| **Message class:** | Hardware / software error (1) |
| **Reaction:** | NONE |
| **Acknowledge:** | IMMEDIATELY |
| **Cause:** | A checksum error occurred when evaluating the non-volatile data (NVRAM) on the Control Unit.<br>The NVRAM data affected was deleted. |
| **Remedy:** | Carry out a POWER ON (power off/on) for all components. |

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| **F03505 (N, A)** | **Analog input wire breakage** |
| **Message class:** | External measured value / signal state outside the permissible range (16) |
| **Reaction:** | OFF1 (NONE, OFF2) |
| **Acknowledge:** | IMMEDIATELY (POWER ON) |
| **Cause:** | The wire-break monitoring for an analog input has responded.<br>The input current of the analog input has undershot the threshold value parameterized in p0761[0...3].<br>p0756[0]: Analog input 0<br>p0756[1]: Analog input 1<br>p0756[2]: Analog input 2<br>Fault value (r0949, interpret decimal):<br>yxxx dec<br>y = analog input (0 = analog input 0 (AI 0), 1 = analog input 1 (AI 1), 2 = analog input 2 (AI 2))<br>xxx = component number (p0151) |

Note:
For the following analog input type, the wire breakage monitoring is active:
p0756[0...1] = 1 (2 ... 10 V with monitoring)
p0756[0...2] = 3 (4 ... 20 mA with monitoring)

**Remedy:** Check the connection to the signal source for interruptions.
Check the magnitude of the injected current - it is possible that the infed signal is too low.
The input current measured by the analog input can be read in r0752[x].

## A03510 (F, N) Calibration data not plausible

**Message class:** Hardware / software error (1)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** During booting, the calibration data for the analog inputs is read and checked with respect to plausibility.
At least one calibration data point was determined to be invalid.
**Remedy:** - power down/power up the power supply for the Control Unit.
Note:
If it reoccurs, then replace the module.
In principle, operation could continue.
The analog channel involved possibly does not achieve the specified accuracy.

## A03520 (F, N) Temperature sensor fault

**Message class:** External measured value / signal state outside the permissible range (16)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** When evaluating the temperature sensor, an error occurred.
It is expected that an LG-Ni1000 temperature sensor (p0756[2...3] = 6) or PT1000 p0756[2...3] = 7 is connected via the analog input.
Alarm value (r2124, interpret decimal):
33: Analog input 2 (AI2) wire breakage or sensor not connected.
34: Analog input 2 (AI2) measured resistance too low (short circuit).
49: Analog input 3 (AI3) wire breakage or sensor not connected.
50: Analog input 3 (AI3) measured resistance too low (short circuit).
See also: p0756 (CU analog inputs type)
**Remedy:** - make sure that the sensor is connected correctly.
- check the sensor for correct function and if required, replace.
- change over the analog input to type "no sensor connected" (p0756 = 8).

## A05000 (N) Power unit: Overtemperature heat sink AC inverter

**Message class:** Power electronics faulted (5)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** The alarm threshold for overtemperature at the inverter heat sink has been reached. The response is set using p0290.
If the temperature of the heat sink increases by an additional 5 K, then fault F30004 is initiated.
**Remedy:** Check the following:
- is the ambient temperature within the defined limit values?
- have the load conditions and the load duty cycle been appropriately dimensioned?
- has the cooling failed?

## A05001 (N) Power unit: Overtemperature depletion layer chip

**Message class:** Power electronics faulted (5)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** Alarm threshold for overtemperature of the power semiconductor in the AC converter has been reached.
Note:
- The response is set using p0290.
- If the depletion layer temperature increases by an additional 15 K, then fault F30025 is triggered.

**Remedy:** Check the following:
- is the ambient temperature within the defined limit values?
- have the load conditions and the load duty cycle been appropriately dimensioned?
- has the cooling failed?
- pulse frequency too high?

See also: r0037 (Power unit temperatures), p0290 (Power unit overload response)

## A05002 (N) Power unit: Air intake overtemperature

**Message class:** Power electronics faulted (5)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** For chassis power units, the following applies:
The alarm threshold for the air intake overtemperature has been reached. For air-cooled power units, the threshold is 42 °C (hysteresis 2 K). The response is set using p0290.
If the air intake temperature increases by an additional 13 K, then fault F30035 is output.
**Remedy:** Check the following:
- is the ambient temperature within the defined limit values?
- has the fan failed? Check the direction of rotation.

## A05003 (N) Power unit: Internal overtemperature

**Message class:** Power electronics faulted (5)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** For chassis power units, the following applies:
The alarm threshold for internal overtemperature has been reached.
If the temperature inside the power unit increases by an additional 5 K, then fault F30036 is triggered.
**Remedy:** Check the following:
- is the ambient temperature within the defined limit values?
- has the fan failed? Check the direction of rotation.

## A05004 (N) Power unit: Rectifier overtemperature

**Message class:** Power electronics faulted (5)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** The alarm threshold for the overtemperature of the rectifier has been reached. The response is set using p0290.
If the temperature of the rectifier increases by an additional 5 K, then fault F30037 is triggered.
**Remedy:** Check the following:
- is the ambient temperature within the defined limit values?
- have the load conditions and the load duty cycle been appropriately dimensioned?
- has the fan failed? Check the direction of rotation.
- has a phase of the line supply failed?
- is an arm of the supply (incoming) rectifier defective?

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| **A05006 (N)** | **Power unit: Overtemperature thermal model** |
| **Message class:** | Power electronics faulted (5) |
| **Reaction:** | NONE |
| **Acknowledge:** | NONE |
| **Cause:** | The temperature difference between the chip and heat sink has exceeded the permissible limit value (blocksize power units only).<br>Depending on p0290, an appropriate overload response is initiated.<br>See also: r0037 (Power unit temperatures) |
| **Remedy:** | Not necessary.<br>The alarm disappears automatically once the limit value is undershot.<br>Note:<br>If the alarm does not disappear automatically and the temperature continues to rise, this can result in fault F30024.<br>See also: p0290 (Power unit overload response) |

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| **A05065 (F, N)** | **Voltage measured values not plausible** |
| **Message class:** | Power electronics faulted (5) |
| **Reaction:** | NONE |
| **Acknowledge:** | NONE |
| **Cause:** | The voltage measurement does not supply any plausible values and is not used.<br>Alarm value (r2124, interpret bitwise binary):<br>Bit 1: Phase U<br>Bit 2: Phase V<br>Bit 3: Phase W |
| **Remedy:** | The following parameterization must be made in order to deactivate the alarm:<br>- Deactivate voltage measurement (p0247.0 = 0).<br>- Deactivate flying restart with voltage measurement (p0247.5 = 0) and deactivate fast flying restart (p1780.11 = 0). |

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| **F06310 (A)** | **Supply voltage (p0210) incorrectly parameterized** |
| **Message class:** | Network fault (2) |
| **Reaction:** | NONE (OFF1, OFF2) |
| **Acknowledge:** | IMMEDIATELY (POWER ON) |
| **Cause:** | The measured DC voltage lies outside the tolerance range after pre-charging has been completed.<br>Permissible range: 1.16 * p0210 < r0070 < 1.6 * p0210<br>Note:<br>The fault can only be acknowledged when the drive is powered down.<br>See also: p0210 (Drive unit line supply voltage) |
| **Remedy:** | - check the parameterized supply voltage and if required change (p0210).<br>- check the line supply voltage.<br>See also: p0210 (Drive unit line supply voltage) |

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| **A06921 (N)** | **Braking resistor phase unsymmetry** |
| **Message class:** | Braking Module faulted (14) |
| **Reaction:** | NONE |
| **Acknowledge:** | NONE |
| **Cause:** | - the three resistors of the braking chopper are not symmetrical.<br>- DC link voltage oscillations caused by fluctuating loads of the connected drives. |
| **Remedy:** | - check the feeder cables to the braking resistors.<br>- If required, increase the value for detecting dissymmetry (p1364). |

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| **F06922** | **Braking resistor phase failure** |
| **Message class:** | Braking Module faulted (14) |
| **Reaction:** | NONE |
| **Acknowledge:** | IMMEDIATELY |
| **Cause:** | A phase failure for the brake resistor was detected.<br>Fault value (r0949, interpret decimal):<br>11: Phase U<br>12: Phase V<br>13: Phase W<br>See also: p3235 (Phase failure signal motor monitoring time) |
| **Remedy:** | Check the feeder cables to the braking resistors. |

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| **F07011** | **Drive: Motor overtemperature** |
| **Message class:** | Motor overload (8) |
| **Reaction:** | OFF2 (NONE, OFF1, OFF3, STOP2) |
| **Acknowledge:** | IMMEDIATELY |
| **Cause:** | KTY:<br>The motor temperature has exceeded the fault threshold (p0605) or a timer after the alarm threshold was exceeded (p0604) has expired. The response parameterized in p0610 becomes active. The alarm is withdrawn if the response threshold for wire breakage or sensor not connected is exceeded (R > 2120 Ohm).<br>PTC or bimetallic NC contact:<br>The response threshold of 1650 Ohm was exceeded or the NC contact opened and a timer has expired. The response parameterized in p0610 becomes active.<br>Possible causes:<br>- Motor is overloaded<br>- motor ambient temperature too high.<br>- Wire break or sensor not connected<br>Fault value (r0949, interpret decimal):<br>200:<br>The motor temperature model 1 (I2t) signals an overtemperature (p0612.0 = 1, p0611 > 0, p0615 reached).<br>See also: p0604, p0605, p0612, p0625, p0626, p0627, p0628 |
| **Remedy:** | - Reduce the motor load.<br>- check the ambient temperature and the motor ventilation.<br>- check the wiring and the connection of the PTC or bimetallic NC contact.<br>See also: p0604, p0605, p0612, p0625, p0626, p0627, p0628 |

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| **A07012 (N)** | **Drive: Motor temperature model 1 overtemperature** |
| **Message class:** | Motor overload (8) |
| **Reaction:** | NONE |
| **Acknowledge:** | NONE |
| **Cause:** | The thermal I2t motor model for synchronous motors identified that the alarm threshold was exceeded.<br>See also: r0034 (Motor utilization thermal), p0605 (Mot_temp_mod 1/2 threshold), p0611 (I2t motor model thermal time constant), p0612 (Mot_temp_mod activation) |
| **Remedy:** | - check the motor load and if required, reduce.<br>- check the motor ambient temperature.<br>- check the thermal time constant (p0611).<br>- check the alarm threshold for motor temperature model 1 (I2t) (p0605).<br>See also: r0034 (Motor utilization thermal), p0605 (Mot_temp_mod 1/2 threshold), p0611 (I2t motor model thermal time constant), p0612 (Mot_temp_mod activation) |

## A07014 (N) Drive: Motor temperature model configuration alarm

**Message class:** Motor overload (8)

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** A fault has occurred in the configuration of the motor temperature model.

Alarm value (r2124, interpret decimal):

1:

All motor temperature models: It is not possible to save the model temperature

See also: p0610 (Motor overtemperature response)

**Remedy:** - set the response for motor overtemperature to "Alarm and fault, no reduction of I_max" (p0610 = 2).

See also: p0610 (Motor overtemperature response)

## A07015 Drive: Motor temperature sensor alarm

**Message class:** External measured value / signal state outside the permissible range (16)

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** An error was detected when evaluating the temperature sensor set in p0601.

With the fault, the time in p0607 is started. If the fault is still present after this time has expired, then fault F07016 is output; however, at the earliest, 50 ms after alarm A07015.

Possible causes:

- wire breakage or sensor not connected (KTY: R > 2120 Ohm).
- measured resistance too low (PTC: R < 20 Ohm, KTY: R < 50 Ohm).

**Remedy:**

- make sure that the sensor is connected correctly.
- check the parameterization (p0601).

See also: r0035 (Motor temperature), p0601 (Motor temperature sensor type)

## F07016 Drive: Motor temperature sensor fault

**Message class:** External measured value / signal state outside the permissible range (16)

**Reaction:** OFF1 (NONE, OFF2, OFF3, STOP2)

**Acknowledge:** IMMEDIATELY

**Cause:** An error was detected when evaluating the temperature sensor set in p0601.

Possible causes:

- wire breakage or sensor not connected (KTY: R > 2120 Ohm).
- measured resistance too low (PTC: R < 20 Ohm, KTY: R < 50 Ohm).

Note:

If alarm A07015 is present, the time in p0607 is started. If the fault is still present after this time has expired, then fault F07016 is output; however, at the earliest, 50 ms after alarm A07015.

**Remedy:**

- make sure that the sensor is connected correctly.
- check the parameterization (p0601).
- induction motors: De-activate temperature sensor fault (p0607 = 0).

See also: r0035 (Motor temperature), p0601 (Motor temperature sensor type)

## F07080 Drive: Incorrect control parameter

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)

**Reaction:** NONE

**Acknowledge:** IMMEDIATELY (POWER ON)

**Cause:** The closed-loop control parameters have been parameterized incorrectly (e.g. p0356 = L_spread = 0).

Fault value (r0949, interpret decimal):

The fault value includes the parameter number involved.

The following parameter numbers only occur as fault values for vector drives:

p0310, for synchronous motors: p0341, p0344, p0350, p0357

The following parameter numbers do not occur as fault values for synchronous motors:

p0354, p0358, p0360

See also: p0310, p0311, p0341, p0344, p0350, p0354, p0356, p0357, p0358, p0360, p0640, p1082, p1300

**Remedy:** Modify the parameter indicated in the fault value (r0949) (e.g. p0640 = current limit > 0).

See also: p0311, p0341, p0344, p0350, p0354, p0356, p0358, p0360, p0640, p1082

## F07082 Macro: Execution not possible

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)

**Reaction:** NONE

**Acknowledge:** IMMEDIATELY

**Cause:** The macro cannot be executed.

Fault value (r0949, interpret hexadecimal):

ccccbbaa hex:

cccc = preliminary parameter number, bb = supplementary information, aa = fault cause

Fault causes for the trigger parameter itself:

19: Called file is not valid for the trigger parameter.

20: Called file is not valid for parameter 15.

21: Called file is not valid for parameter 700.

22: Called file is not valid for parameter 1000.

23: Called file is not valid for parameter 1500.

24: Data type of a TAG is incorrect (e.g. Index, number or bit is not U16).

Fault causes for the parameters to be set:

25: Error level has an undefined value.

26: Mode has an undefined value.

27: A value was entered as string in the tag value that is not "DEFAULT".

31: Entered drive object type unknown.

32: A device was not able to be found for the determined drive object number.

34: A trigger parameter was recursively called.

35: It is not permissible to write to the parameter via macro.

36: Check, writing to a parameter unsuccessful, parameter can only be read, not available, incorrect data type, value range or assignment incorrect.

37: Source parameter for a BICO interconnection was not able to be determined.

38: An index was set for a non-indexed (or CDS-dependent) parameter.

39: No index was set for an indexed parameter.

41: A bit operation is only permissible for parameters with the parameter format DISPLAY_BIN.

42: A value not equal to 0 or 1 was set for a BitOperation.

43: Reading the parameter to be changed by the BitOperation was unsuccessful.

51: Factory setting for DEVICE may only be executed on the DEVICE.

61: The setting of a value was unsuccessful.

**Remedy:** - check the parameter involved.

- check the macro file and BICO interconnection.

See also: p0015, p1000

## F07083 Macro: ACX file not found

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)

**Reaction:** NONE

**Acknowledge:** IMMEDIATELY

**Cause:** The ACX file (macro) to be executed was not able to be found in the appropriate directory.

Fault value (r0949, interpret decimal):

Parameter number with which the execution was started.

See also: p0015, p1000

**Remedy:** - check whether the file is saved in the appropriate directory on the memory card.

## F07084 Macro: Condition for WaitUntil not fulfilled

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** NONE
**Acknowledge:** IMMEDIATELY
**Cause:** The WaitUntil condition set in the macro was not fulfilled in a certain number of attempts.
Fault value (r0949, interpret decimal):
Parameter number for which the condition was set.
**Remedy:** Check and correct the conditions for the WaitUntil loop.

## F07086 Units changeover: Parameter limit violation due to reference value change

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** NONE
**Acknowledge:** IMMEDIATELY
**Cause:** A reference parameter was changed in the system. This resulted in the fact that for the parameters involved, the selected value was not able to be written in the per unit notation.
The values of the parameters were set to the corresponding violated minimum limit/maximum limit or to the factory setting.
Possible causes:
- the steady-state minimum limit/maximum limit or that defined in the application was violated.
Fault value (r0949, parameter):
Diagnostics parameter to display the parameters that were not able to be re-calculated.
See also: p0304, p0305, p0310, p0596, p2000, p2001, p2002, p2003, r2004
**Remedy:** Check the adapted parameter value and if required correct.

## F07088 Units changeover: Parameter limit violation due to units changeover

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** NONE
**Acknowledge:** IMMEDIATELY
**Cause:** A changeover of units was initiated. This resulted in a violation of a parameter limit
Possible causes for the violation of a parameter limit:
- When rounding off a parameter corresponding to its decimal places, the steady-state minimum limit or maximum limit was violated.
- inaccuracies for the data type "FloatingPoint".
In these cases, when the minimum limit is violated then the parameter value is rounded up and when the maximum limited is violated the parameter value is rounded down.
Fault value (r0949, interpret decimal):
Diagnostics parameter r9451 to display all parameters whose value had to be adapted.
See also: p0100 (IEC/NEMA mot stds), p0505 (Selecting the system of units), p0595 (Technological unit selection)
**Remedy:** Check the adapted parameter values and if required correct.
See also: r9451 (Units changeover adapted parameters)

## A07089 Changing over units: Function module activation is blocked because the units have been changed over

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** An attempt was made to activate a function module. This is not permissible if the units have already been changed over.
See also: p0100 (IEC/NEMA mot stds), p0505 (Selecting the system of units)
**Remedy:** Restore units that have been changed over to the factory setting.

## A07200 Drive: Master control ON command present

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** The ON/OFF1 command is present (no 0 signal).
The command is either influenced via binector input p0840 (current CDS) or control word bit 0 via the master control.
**Remedy:** Switch the signal via binector input p0840 (current CDS) or control word bit 0 via the master control to 0.

## F07220 (N, A) Drive: Master control by PLC missing

**Message class:** Communication error to the higher-level control system (9)
**Reaction:** OFF1 (NONE, OFF2, OFF3, STOP2)
**Acknowledge:** IMMEDIATELY
**Cause:** The "master control by PLC" signal was missing in operation.
- interconnection of the binector input for "master control by PLC" is incorrect (p0854).
- the higher-level control has withdrawn the "master control by PLC" signal.
- data transfer via the fieldbus (master/drive) was interrupted.

**Remedy:** - check the interconnection of the binector input for "master control by PLC" (p0854).
- check the "master control by PLC" signal and, if required, switch in.
- check the data transfer via the fieldbus (master/drive).

Note:
If the drive should continue to operate after withdrawing "master control by PLC" then fault response must be parameterized to NONE or the message type should be parameterized as alarm.

## F07300 (A) Drive: Line contactor feedback signal missing

**Message class:** Auxiliary unit faulted (20)
**Reaction:** OFF2 (NONE)
**Acknowledge:** IMMEDIATELY
**Cause:** - the line contactor was not able to be closed within the time in p0861.
- the line contactor was not able to be opened within the time in p0861.
- the line contactor dropped out during operation
- the line contactor has closed although the drive converter is powered down.

**Remedy:** - check the setting of p0860.
- check the feedback circuit from the line contactor.
- increase the monitoring time in p0861.

See also: p0860 (Line contactor feedback signal), p0861 (Line contactor monitoring time)

## F07311 Bypass motor switch

**Message class:** Application / technological function faulted (17)
**Reaction:** OFF2
**Acknowledge:** IMMEDIATELY
**Cause:** Fault value (r0949, interpret bitwise binary):
Bit 1: Switch "Closed" feedback signal missing.
Bit 2: Switch "Open" feedback signal missing.
Bit 3: Switch feedback signal too slow.
After switching, the system waits for the positive feedback signal. If the feedback signal is received later than the specified time, then a fault trip (shutdown) is issued.
Bit 6: Drive switch feedback signal not consistent with the bypass state.
The drive switch is closed when switching-on or when switching-in the motor.
See also: p1260 (Bypass configuration), r1261 (Bypass control/status word), p1266 (Bypass control command), p1267 (Bypass changeover source configuration), p1269 (Bypass switch feedback signal), p1274 (Bypass switch monitoring time)
**Remedy:** - check the transfer of the feedback signals.
- check the switch.

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| **F07312** | **Bypass LSS:** |
| **Message class:** | Application / technological function faulted (17) |
| **Reaction:** | OFF2 |
| **Acknowledge:** | IMMEDIATELY |
| **Cause:** | Fault value (r0949, interpret bitwise binary):<br>Bit 1: Switch "Closed" feedback signal missing.<br>Bit 2: Switch "Open" feedback signal missing.<br>Bit 3: Switch feedback signal too slow.<br>After switching, the system waits for the positive feedback signal. If the feedback signal is received later than the specified time, then a fault trip (shutdown) is issued.<br>Bit 6: Line Side Switch feedback signal not consistent with the bypass state.<br>When switching-on or when switching-in the motor, the line side switch is closed without this having been requested from the bypass.<br>See also: p1260 (Bypass configuration), r1261 (Bypass control/status word), p1266 (Bypass control command), p1267 (Bypass changeover source configuration), p1269 (Bypass switch feedback signal), p1274 (Bypass switch monitoring time) |
| **Remedy:** | - check the transfer of the feedback signals.<br>- check the switch. |

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| **F07320** | **Drive: Automatic restart interrupted** |
| **Message class:** | Application / technological function faulted (17) |
| **Reaction:** | OFF2 |
| **Acknowledge:** | IMMEDIATELY |
| **Cause:** | - The specified number of restart attempts (p1211) has been completely used up because within the monitoring time (p1213) the faults were not able to be acknowledged. The number of restart attempts (p1211) is decremented at each new start attempt.<br>- there is no active ON command.<br>- the monitoring time for the power unit has expired (p0857).<br>- when exiting commissioning or at the end of the motor identification routine or the speed controller optimization, the drive unit is not automatically powered up again.<br>Fault value (r0949, interpret hexadecimal):<br>Only for internal Siemens troubleshooting. |
| **Remedy:** | - increase the number of restart attempts (p1211). The actual number of starting attempts is displayed in r1214.<br>- increase the delay time in p1212 and/or the monitoring time in p1213.<br>- issue an ON command (p0840).<br>- either increase or disable the monitoring time of the power unit (p0857).<br>- Reduce the delay time for resetting the start counter (p1213[1]) so that fewer faults are registered in the time interval. |

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| **A07321** | **Drive: Automatic restart active** |
| **Message class:** | Application / technological function faulted (17) |
| **Reaction:** | NONE |
| **Acknowledge:** | NONE |
| **Cause:** | The automatic restart (AR) is active. When the line supply returns and/or the causes of the existing faults are removed the drive is automatically restarted. The pulses are enabled and the motor starts to rotate.<br>For p1210 = 26, restarting is realized with the delayed setting of the ON command. |
| **Remedy:** | - the automatic restart (AR) should, if required, be inhibited (p1210 = 0).<br>- an automatic restart can be directly interrupted by withdrawing the power-on command (BI: p0840).<br>- for p1210 = 26: by withdrawing the OFF2- / OFF3 control commands. |

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| **A07325** | **Drive: Energy-saving mode active - drive automatically switched-on again** |
| **Message class:** | Application / technological function faulted (17) |
| **Reaction:** | NONE |
| **Acknowledge:** | NONE |
| **Cause:** | The "energy-saving mode" function is active (p2398). The drive automatically powers itself up again as soon as the restart conditions are present.<br>See also: p2398 (Energy-saving mode), r2399 (Energy-saving mode status would) |

**Remedy:** Not necessary.
The alarm disappears when the motor is restarted automatically or when the motor is manually switched off.

## F07330 Flying restart: Measured search current too low

**Message class:** Application / technological function faulted (17)
**Reaction:** OFF2 (NONE, OFF1)
**Acknowledge:** IMMEDIATELY
**Cause:** During a flying restart, it was identified that the search current reached is too low.
It is possible that the motor is not connected.
**Remedy:** Check the motor feeder cables.

## F07331 Flying restart: Function not supported

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** OFF2 (NONE, OFF1)
**Acknowledge:** IMMEDIATELY
**Cause:** It is not possible to power up with the motor rotating (no flying restart). In the following cases, the "flying restart" function is not supported:
Perm.-magnet synch. motors (PEM): operation with U/f char. and sensorless vector control.
**Remedy:** De-activate the "flying restart" function (p1200 = 0).

## A07353 Drive: DC quantity control deactivated

**Message class:** Motor overload (8)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** The DC quantity control has deactivated itself.
The manipulated variable of the DC quantity control was at its limit.
**Remedy:** Optimize the DC quantity controller (Kp, Tn, bandwidth, PT2 filter).
Note:
After changing the corresponding parameters, the DC quantity control is re-enabled and the alarm is automatically withdrawn.
See also: p3857 (DC quantity controller P gain), p3858 (DC quantity controller integral time)

## A07400 (N) Drive: DC link voltage maximum controller active

**Message class:** Application / technological function faulted (17)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** The DC link voltage controller has been activated because the upper switch-in threshold has been exceeded (r1242, r1282).
The ramp-down times are automatically increased in order to maintain the DC link voltage (r0070) within the permissible limits. There is a system deviation between the setpoint and actual speeds.
When the DC link voltage controller is switched out (disabled), this is the reason that the ramp-function generator output is set to the speed actual value.
See also: r0056 (Status word, closed-loop control), p1240 (Vdc controller configuration (vector control)), p1280 (Vdc controller configuration (U/f))
**Remedy:** If the controller is not to intervene:
- increase the ramp-down times.
- switch-off the Vdc_max controller (p1240 = 0 for vector control, p1280 = 0 for U/f control).
If the ramp-down times are not to be changed:
- use a chopper or regenerative feedback unit.

## A07401 (N) Drive: DC link voltage maximum controller de-activated

**Message class:** Application / technological function faulted (17)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** The Vdc_max controller can no longer maintain the DC link voltage (r0070) below the limit value (r1242, r1282) and was therefore switched out (disabled).

- the line supply voltage is permanently higher than specified for the power unit.
- the motor is permanently in the regenerative mode as a result of a load that is driving the motor.

**Remedy:** - check whether the input voltage is within the permissible range (if required, increase the value in p0210).

- check whether the load duty cycle and load limits are within the permissible limits.

## A07402 (N) Drive: DC link voltage minimum controller active

**Message class:** Application / technological function faulted (17)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** The DC link voltage controller has been activated as the lower switch-in threshold has been undershot (r1246, r1286).

The kinetic energy of the motor is used to buffer the DC link. The drive is therefore braked.

See also: r0056 (Status word, closed-loop control), p1240 (Vdc controller configuration (vector control)), p1280 (Vdc controller configuration (U/f))

**Remedy:** The alarm disappears when power supply returns.

## F07405 (N, A) Drive: Kinetic buffering minimum speed not reached

**Message class:** Application / technological function faulted (17)
**Reaction:** OFF2 (IASC/DCBRK, NONE, OFF1, OFF3, STOP2)
**Acknowledge:** IMMEDIATELY
**Cause:** During kinetic buffering the speed fell below minimum speed (p1257 or p1297 for vector drives with U/f control) and the line supply did not return.
**Remedy:** Check the speed threshold for the Vdc_min controller (kinetic buffering) (p1257, p1297).

See also: p1257 (Vdc_min controller speed threshold), p1297 (Vdc_min controller speed threshold (U/f))

## F07406 (N, A) Drive: Kinetic buffering maximum time exceeded

**Message class:** Application / technological function faulted (17)
**Reaction:** OFF3 (IASC/DCBRK, NONE, OFF1, OFF2, STOP2)
**Acknowledge:** IMMEDIATELY
**Cause:** The maximum buffer time (p1255 and p1295 for vector drives with U/f control) has been exceeded without the line supply having returned.
**Remedy:** Check the time threshold for Vdc-min controller (kinetic buffering) (p1255, p1295).

See also: p1255 (Vdc_min controller time threshold), p1295 (Vdc_min controller time threshold (U/f))

## A07409 Drive: U/f control, current limiting controller active

**Message class:** Application / technological function faulted (17)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** The current limiting controller of the U/f control was activated because the current limit was exceeded.
**Remedy:** The alarm automatically disappears after one of the following measures:

- increase current limit (p0640).
- reduce the load.
- slow down the ramp up to the setpoint speed.

## F07410 Drive: Current controller output limited

**Message class:** Application / technological function faulted (17)
**Reaction:** OFF2 (NONE, OFF1)
**Acknowledge:** IMMEDIATELY
**Cause:** The condition "I_act = 0 and Uq_set_1 longer than 16 ms at its limit" is present and can be caused by the following:
- motor not connected or motor contactor open.
- motor data and motor configuration (star-delta) do not match.
- no DC link voltage present.
- power unit defective.
- the "flying restart" function is not activated.

**Remedy:**
- connect the motor or check the motor contactor.
- check the motor parameterization and the connection type (star-delta).
- check the DC link voltage (r0070).
- check the power unit.
- activate the "flying restart" function (p1200).

## F07411 Drive: Flux setpoint not reached when building up excitation

**Message class:** Application / technological function faulted (17)
**Reaction:** OFF2
**Acknowledge:** IMMEDIATELY
**Cause:** When quick magnetizing is configured (p1401.6 = 1) the specified flux setpoint is not reached although 90% of the maximum current is specified.
- incorrect motor data.
- motor data and motor configuration (star-delta) do not match.
- the current limit has been set too low for the motor.
- induction motor (encoderless, open-loop controlled) in I2t limiting.
- power unit is too small.
- the magnetizing time is too short.

**Remedy:**
- correct the motor data. Perform motor data identification and rotating measurement.
- check the motor configuration.
- correct the current limits (p0640).
- reduce the induction motor load.
- if necessary, use a larger power unit.
- check motor supply cable.
- check power unit.
- increase p0346.

## A07416 Drive: Flux controller configuration

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** The configuration of the flux control (p1401) is contradictory.
Alarm value (r2124, interpret hexadecimal):
ccbbaaaa hex
aaaa = Parameter
bb = Index
cc = fault cause
1: Quick magnetizing (p1401.6) for soft starting (p1401.0).
2: Quick magnetizing for flux build-up control (p1401.2).
3: Quick magnetizing (p1401.6) for Rs identification after restart (p0621 = 2).

**Remedy:** Re fault cause = 1:
- Shut down soft start (p1401.0 = 0).
- Shut down quick magnetizing (p1401.6 = 0).

Re fault cause = 2:
- De-energize flux build-up control (p1401.2 = 0).
- Shut down quick magnetizing (p1401.6 = 0).
Re fault cause = 3:
- Re-parameterize Rs identification (p0621 = 0, 1)
- Shut down quick magnetizing (p1401.6 = 0).

## F07426 (A) Technology controller actual value limited

**Message class:** Application / technological function faulted (17)
**Reaction:** OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
**Acknowledge:** IMMEDIATELY
**Cause:** The actual value for the technology controller, interconnected via connector input p2264, has reached a limit.
Fault value (r0949, interpret decimal):
1: upper limit reached.
2: lower limit reached.
**Remedy:** - adapt the limits to the signal level (p2267, p2268).
- Check the actual value normalization (p0595, p0596).
- Deactivate evaluation of the limits (p2252 bit 3)
See also: p0595 (Technological unit selection), p0596 (Technological unit reference quantity), p2264 (Technology controller actual value), p2267 (Technology controller upper limit actual value), p2268 (Technology controller lower limit actual value)

## A07427 Motor switch-in alarm

**Message class:** Application / technological function faulted (17)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** Alarm value (r2124, interpret decimal):
1:
The technology controller is not active or is not being used to control the main setpoint (see p2251).
2:
The operating time limits have been exceeded in at least one external motor.
**Remedy:** Re alarm value = 1:
- enable technology controller (p2200).
- set technology controller mode p2251 = 0 (main setpoint).
Re alarm value = 2:
- increase p2381, p2382 or set p2380 = 0.

## A07428 (N) Technology controller parameterizing error

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** The technology controller has a parameterizing error.
Alarm value (r2124, interpret decimal):
1:
The upper output limit in p2291 is set lower than the lower output limit in p2292.
**Remedy:** Re alarm value = 1:
Set the output limit in p2291 higher than in p2292.
See also: p2291 (Technology controller maximum limiting), p2292 (Technology controller minimum limiting)

## F07435 (N) Drive: Setting the ramp-function generator for sensorless vector control

**Message class:** Application / technological function faulted (17)
**Reaction:** OFF2 (IASC/DCBRK, NONE, OFF1, OFF3)
**Acknowledge:** IMMEDIATELY
**Cause:** During operation with sensorless vector control (r1407.1) the ramp-function generator was stopped (p1141). An internal setting command of the ramp-function generator output caused the set setpoint speed to be frozen.

**Remedy:** - de-activate the holding command for the ramp-function generator (p1141).
- suppress the fault (p2101, p2119). This is necessary if the ramp-function generator is held using jogging and the speed setpoint is simultaneously inhibited (r0898.6).

## F07436 (A) Free tec_ctrl 0 actual value limited

**Message class:** Application / technological function faulted (17)
**Reaction:** OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
**Acknowledge:** IMMEDIATELY
**Cause:** The actual value for the free technology controller 0 has reached the limit.
The signal source for the actual value is set via connector input p11064.
Fault value (r0949, interpret decimal):
1: The actual value has reached the upper limit.
2: The actual value has reached the lower limit.
**Remedy:** - adapt the limit settings to the actual value signal (p11067, p11068).
- check the scaling of the actual value signal.
- check the signal source setting for the actual value (p11064).
See also: p11064 (Free tec_ctrl 0 actual value signal source), p11067 (Free tec_ctrl 0 actual value upper limit), p11068 (Free tec_ctrl 0 actual value lower limit)

## F07437 (A) Free tec_ctrl 1 actual value limited

**Message class:** Application / technological function faulted (17)
**Reaction:** OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
**Acknowledge:** IMMEDIATELY
**Cause:** The actual value for the free technology controller 1 has reached the limit.
The signal source for the actual value is set via connector input p11164.
Fault value (r0949, interpret decimal):
1: The actual value has reached the upper limit.
2: The actual value has reached the lower limit.
**Remedy:** - adapt the limit settings to the actual value signal (p11167, p11168).
- check the scaling of the actual value signal.
- check the signal source setting for the actual value (p11164).
See also: p11164 (Free tec_ctrl 1 actual value signal source), p11167 (Free tec_ctrl 1 actual value upper limit), p11168 (Free tec_ctrl 1 actual value lower limit)

## F07438 (A) Free tec_ctrl 2 actual value limited

**Message class:** Application / technological function faulted (17)
**Reaction:** OFF1 (IASC/DCBRK, NONE, OFF2, OFF3)
**Acknowledge:** IMMEDIATELY
**Cause:** The actual value for the free technology controller 2 has reached the limit.
The signal source for the actual value is set via connector input p11264.
Fault value (r0949, interpret decimal):
1: The actual value has reached the upper limit.
2: The actual value has reached the lower limit.
**Remedy:** - adapt the limit settings to the actual value signal (p11267, p11268).
- check the scaling of the actual value signal.
- check the signal source setting for the actual value (p11264).
See also: p11264 (Free tec_ctrl 2 actual value signal source), p11267 (Free tec_ctrl 2 actual value upper limit), p11268 (Free tec_ctrl 2 actual value lower limit)

## A07530 Drive: Drive Data Set DDS not present

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** The selected drive data set is not available (p0837 > p0180). The drive data set was not changed over.
See also: p0180 (Number of Drive Data Sets (DDS)), p0820 (Drive Data Set selection DDS bit 0), p0821 (Drive Data Set selection DDS bit 1), r0837 (Drive Data Set DDS selected)

**Remedy:** - select the existing drive data set.
- set up additional drive data sets.

## A07531 Drive: Command Data Set CDS not present

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** The selected command data set is not available (p0836 > p0170). The command data set was not changed over.
See also: p0810 (Command data set selection CDS bit 0), p0811 (Command data set selection CDS bit 1), r0836 (Command Data Set CDS selected)
**Remedy:** - select the existing command data set.
- set up additional command data sets.

## F07800 Drive: No power unit present

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** NONE
**Acknowledge:** IMMEDIATELY
**Cause:** The power unit parameters cannot be read or no parameters are stored in the power unit.
Note:
This fault also occurs if an incorrect topology was selected in the commissioning software and this parameterization is then downloaded to the Control Unit.
See also: r0200 (Power unit code number actual)
**Remedy:** - carry out a POWER ON (power off/on) for all components.
- Check the power unit and replace if necessary.
- check the Control Unit, and if required replace it.
- after correcting the topology, the parameters must be again downloaded using the commissioning software.

## F07801 Drive: Motor overcurrent

**Message class:** Motor overload (8)
**Reaction:** OFF2 (NONE, OFF1, OFF3)
**Acknowledge:** IMMEDIATELY
**Cause:** The permissible motor limit current was exceeded.
- effective current limit set too low.
- current controller not correctly set.
- U/f operation: Up ramp was set too short or the load is too high.
- U/f operation: Short-circuit in the motor cable or ground fault.
- U/f operation: Motor current does not match current of power unit.
- Switch to rotating motor without flying restart function (p1200).
Note:
Limit current = 2 x minimum (p0640, 4 x p0305 x p0306) >= 2 x p0305 x p0306
**Remedy:** - check the current limits (p0640).
- vector control: Check the current controller (p1715, p1717).
- U/f control: Check the current limiting controller (p1340 ... p1346).
- increase the up ramp (p1120) or reduce the load.
- check the motor and motor cables for short-circuit and ground fault.
- check the motor for the star-delta configuration and rating plate parameterization.
- check the power unit and motor combination.
- Choose "flying restart" function (p1200) if switched to rotating motor.

## F07802 Drive: Infeed or power unit not ready

**Message class:** Infeed faulted (13)
**Reaction:** OFF2 (NONE)
**Acknowledge:** IMMEDIATELY
**Cause:** After an internal power-on command, the infeed or drive does not signal ready.
- monitoring time is too short.
- DC link voltage is not present.

- associated infeed or drive of the signaling component is defective.
- supply voltage incorrectly set.

**Remedy:**
- increase the monitoring time (p0857).
- ensure that there is a DC link voltage. Check the DC link busbar. Enable the infeed.
- replace the associated infeed or drive of the signaling component.
- check the line supply voltage setting (p0210).

See also: p0857 (Power unit monitoring time)

## A07805 (N) Drive: Power unit overload I2t

**Message class:** Power electronics faulted (5)

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** Alarm threshold for I2t overload (p0294) of the power unit exceeded.
The response parameterized in p0290 becomes active.
See also: p0290 (Power unit overload response)

**Remedy:**
- reduce the continuous load.
- adapt the load duty cycle.
- check the assignment of the motor and power unit rated currents.

## F07806 Drive: Regenerative power limit exceeded (F3E)

**Message class:** Power electronics faulted (5)

**Reaction:** OFF2 (IASC/DCBRK)

**Acknowledge:** IMMEDIATELY

**Cause:** For blocksize power units, types PM250 and PM260, the regenerative rated power r0206[2] was exceeded for more than 10 s.
See also: r0206 (Rated power unit power), p1531 (Power limit regenerative)

**Remedy:**
- increase the down ramp.
- reduce the driving load.
- use a power unit with a higher regenerative feedback capability.
- for vector control, the regenerative power limit in p1531 can be reduced so that the fault is no longer triggered.

## F07807 Drive: Short-circuit/ground fault detected

**Message class:** Ground fault / inter-phase short-circuit detected (7)

**Reaction:** OFF2 (NONE)

**Acknowledge:** IMMEDIATELY

**Cause:** A phase-phase short-circuit or ground fault was detected at the motor-side output terminals of the converter.
Fault value (r0949, interpret decimal):
1: Short-circuit, phases U-V
2: Short-circuit, phases U-W
3: Short-circuit, phases V-W
4: Ground fault with overcurrent
1xxxx: Ground fault with current in phase U detected (xxxx = component of the current in phase V in per mille)
2xxxx: Ground fault with current in phase V detected (xxxx = component of the current in phase U in per mille)
Note:
Also when interchanging the line and motor cables is identified as a motor-side short circuit.
Connecting to a motor that is either not de-energized or partially de-energized is possibly detected as ground fault.

**Remedy:**
- check the motor-side converter connection for a phase-phase short-circuit.
- rule-out interchanged line and motor cables.
- check for a ground fault.

For a ground fault:
- do not enable the pulses when connecting to a rotating motor without the "Flying restart" function activated (p1200).
- increase the de-energization time (p0347).
- If required, deactivate the monitoring (p1901).

## F07810 Drive: Power unit EEPROM without rated data

**Message class:** Hardware / software error (1)
**Reaction:** NONE
**Acknowledge:** IMMEDIATELY
**Cause:** No rated data are stored in the power unit EEPROM.
See also: p0205 (Power unit application), r0206 (Rated power unit power), r0207 (Rated power unit current), r0208 (Rated power unit line supply voltage), r0209 (Power unit maximum current)
**Remedy:** Replace the power unit or inform Siemens Customer Service.

## A07850 (F) External alarm 1

**Message class:** External measured value / signal state outside the permissible range (16)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** The condition for "External alarm 1" is satisfied.
Note:
The "External alarm 1" is initiated by a 1/0 edge via binector input p2112.
See also: p2112 (External alarm 1)
**Remedy:** Eliminate the causes of this alarm.

## A07851 (F) External alarm 2

**Message class:** External measured value / signal state outside the permissible range (16)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** The condition for "External alarm 2" is satisfied.
Note:
The "External alarm 2" is initiated by a 1/0 edge via binector input p2116.
See also: p2116 (External alarm 2)
**Remedy:** Eliminate the causes of this alarm.

## A07852 (F) External alarm 3

**Message class:** External measured value / signal state outside the permissible range (16)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** The condition for "External alarm 3" is satisfied.
Note:
The "External alarm 3" is initiated by a 1/0 edge via binector input p2117.
See also: p2117 (External alarm 3)
**Remedy:** Eliminate the causes of this alarm.

## F07860 (A) External fault 1

**Message class:** External measured value / signal state outside the permissible range (16)
**Reaction:** OFF2 (IASC/DCBRK, NONE, OFF1, OFF3, STOP2)
**Acknowledge:** IMMEDIATELY (POWER ON)
**Cause:** The condition for "External fault 1" is satisfied.
Note:
The "External fault 1" is initiated by a 1/0 edge via binector input p2106.
See also: p2106 (External fault 1)
**Remedy:** - eliminate the causes of this fault.
- acknowledge fault.

## F07861 (A) External fault 2

**Message class:** External measured value / signal state outside the permissible range (16)

**Reaction:** OFF2 (IASC/DCBRK, NONE, OFF1, OFF3, STOP2)

**Acknowledge:** IMMEDIATELY (POWER ON)

**Cause:** The condition for "External fault 2" is satisfied.

Note:

The "External fault 2" is initiated by a 1/0 edge via binector input p2107.

See also: p2107 (External fault 2)

**Remedy:** - eliminate the causes of this fault.

- acknowledge fault.

## F07862 (A) External fault 3

**Message class:** External measured value / signal state outside the permissible range (16)

**Reaction:** OFF2 (IASC/DCBRK, NONE, OFF1, OFF3, STOP2)

**Acknowledge:** IMMEDIATELY (POWER ON)

**Cause:** The condition for "External fault 3" is satisfied.

Note:

The "External fault 3" is initiated by a 1/0 edge via the following parameters.

- AND logic operation, binector input p2108, p3111, p3112.
- switch-on delay p3110.

See also: p2108 (External fault 3), p3110 (External fault 3 power-up delay), p3111 (External fault 3 enable), p3112 (External fault 3 enable negated)

**Remedy:** - eliminate the causes of this fault.

- acknowledge fault.

## F07900 (N, A) Drive: Motor blocked

**Message class:** Application / technological function faulted (17)

**Reaction:** OFF2 (NONE, OFF1, OFF3, STOP2)

**Acknowledge:** IMMEDIATELY

**Cause:** Motor has been operating at the torque limit longer than the time specified in p2177 and below the speed threshold in p2175.

This signal can also be triggered if the speed is oscillating and the speed controller output repeatedly goes to its limit.

It may also be the case that thermal monitoring of the power unit reduces the current limit (see p0290), thereby causing the motor to decelerate.

See also: p2175 (Motor blocked speed threshold), p2177 (Motor blocked delay time)

**Remedy:** - check that the motor can freely move.

- check the effective torque limit (r1538, r1539).
- check the parameter, message "Motor blocked" and if required, correct (p2175, p2177).
- check the direction of rotation enable signals for a flying restart of the motor (p1110, p1111).
- for U/f control: check the current limits and acceleration times (p0640, p1120).

## F07901 Drive: Motor overspeed

**Message class:** Application / technological function faulted (17)

**Reaction:** OFF2 (IASC/DCBRK)

**Acknowledge:** IMMEDIATELY

**Cause:** The maximum permissible speed was either positively or negatively exceeded.

The maximum permissible positive speed is formed as follows: Minimum (p1082, CI: p1085) + p2162

The maximum permissible negative speed is formed as follows: Maximum (-p1082, CI: 1088) - p2162

**Remedy:** The following applies for a positive direction of rotation:

- check r1084 and if required, correct p1082, CI:p1085 and p2162.

The following applies for a negative direction of rotation:

- check r1087 and if required, correct p1082, CI:p1088 and p2162.

Activate pre-control of the speed limiting controller (p1401.7 = 1).

Increase the hysteresis for the overspeed signal p2162. This upper limit is dependent upon the maximum motor speed p0322 and the maximum speed p1082 of the setpoint channel.

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| **F07902 (N, A)** | **Drive: Motor stalled** |
| **Message class:** | Application / technological function faulted (17) |
| **Reaction:** | OFF2 (IASC/DCBRK, NONE, OFF1, OFF3, STOP2) |
| **Acknowledge:** | IMMEDIATELY |
| **Cause:** | The system has identified that the motor has stalled for a time longer than is set in p2178.<br>Fault value (r0949, interpret decimal):<br>1: Reserved.<br>2: Stall detection using r1408.12 (p1745) or via (r0084 ... r0083).<br>See also: p2178 (Motor stalled delay time) |
| **Remedy:** | Steps should always be taken to ensure that both motor data identification and the rotating measurement were carried out (see p1900, r3925).<br>- check whether the drive stalls solely due to the load in controlled mode or when the speed setpoint is still zero. If yes, then increase the current setpoint using p1610.<br>- if the motor excitation time (p0346) was significantly reduced and the drive stalls when it is switched on and run immediately, p0346 should be increased again.<br>- check whether a line phase failure is affecting power unit PM230, PM250, PM260.<br>- check whether the motor cables are disconnected (see A07929).<br>If there is no fault, then the fault tolerance (p1745) or the delay time (p2178) can be increased.<br>- check the current limits (p0640, r0067, r0289). If the current limits are too low, then the drive cannot be magnetized.<br>- If the fault occurs with fault value 2 when the motor accelerates very quickly to the field weakening range, the deviation between the flux setpoint and flux actual value can be reduced and, in turn, the message prevented, by reducing p1596 or p1553. |

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| **A07903** | **Drive: Motor speed deviation** |
| **Message class:** | Application / technological function faulted (17) |
| **Reaction:** | NONE |
| **Acknowledge:** | NONE |
| **Cause:** | The absolute value of the speed difference from the setpoint (p2151) and the speed actual value (r2169) exceeds the tolerance threshold (p2163) longer than tolerated (p2164, p2166).<br>The alarm is only enabled for p2149.0 = 1.<br>Possible causes:<br>- the load torque is greater than the torque setpoint.<br>- when accelerating, the torque/current/power limit is reached. If the limits are not sufficient, then it is possible that the drive has been dimensioned too small.<br>- for closed-loop torque control, the speed setpoint does not track the speed actual value.<br>- for active Vdc controller.<br>For U/f control, the overload condition is detected as the I_max controller is active.<br>See also: p2149 (Monitoring configuration) |
| **Remedy:** | - increase p2163 and/or p2166.<br>- increase the torque/current/power limits.<br>- for closed-loop torque control: The speed setpoint should track the speed actual value.<br>- de-activate alarm with p2149.0 = 0. |

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| **A07910 (N)** | **Drive: Motor overtemperature** |
| **Message class:** | Motor overload (8) |
| **Reaction:** | NONE |
| **Acknowledge:** | NONE |
| **Cause:** | KTY or no sensor:<br>The measured motor temperature or the temperature of the motor temperature model 2 has exceeded the alarm threshold (p0604). The response parameterized in p0610 becomes active.<br>PTC or bimetallic NC contact:<br>The response threshold of 1650 Ohm was exceeded or the NC contact opened.<br>Alarm value (r2124, interpret decimal):<br>11: No output current reduction.<br>12: Output current reduction active.<br>See also: p0604 (Mot_temp_mod 2/KTY alarm threshold), p0610 (Motor overtemperature response) |

**Remedy:** - check the motor load.
- check the motor ambient temperature.
- check KTY84.
- check overtemperatures of the motor temperature model 2 (p0626 ... p0628).
See also: p0612 (Mot_temp_mod activation), p0625 (Motor ambient temperature during commissioning), p0626 (Motor overtemperature, stator core), p0627 (Motor overtemperature, stator winding), p0628 (Motor overtemperature rotor winding)

## A07920 Drive: Torque/speed too low

**Message class:** Application / technological function faulted (17)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** For p2193 = 1:
The torque deviates from the torque/speed envelope characteristic (too low).
For p2193 = 2:
The speed signal from the external encoder (refer to p3230) deviates from the speed (r2169) (too low).
See also: p2181 (Load monitoring response)
**Remedy:** - check the connection between the motor and load.
- adapt the parameterization corresponding to the load.

## A07921 Drive: Torque/speed too high

**Message class:** Application / technological function faulted (17)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** For p2193 = 1:
The torque deviates from the torque/speed envelope characteristic (too high).
For p2193 = 2:
The speed signal from the external encoder (refer to p3230) deviates from the speed (r2169) (too high).
**Remedy:** - check the connection between the motor and load.
- adapt the parameterization corresponding to the load.

## A07922 Drive: Torque/speed out of tolerance

**Message class:** Application / technological function faulted (17)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** For p2193 = 1:
The torque deviates from the torque/speed envelope characteristic.
For p2193 = 2:
The speed signal from the external encoder (refer to p3230) deviates from the speed (r2169).
**Remedy:** - check the connection between the motor and load.
- adapt the parameterization corresponding to the load.

## F07923 Drive: Torque/speed too low

**Message class:** Application / technological function faulted (17)
**Reaction:** OFF1 (NONE, OFF2, OFF3)
**Acknowledge:** IMMEDIATELY
**Cause:** For p2193 = 1:
The torque deviates from the torque/speed envelope characteristic (too low).
For p2193 = 2:
The speed signal from the external encoder (refer to p3230) deviates from the speed (r2169) (too low).
**Remedy:** - check the connection between the motor and load.
- adapt the parameterization corresponding to the load.

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| **F07924** | **Drive: Torque/speed too high** |
| **Message class:** | Application / technological function faulted (17) |
| **Reaction:** | OFF1 (NONE, OFF2, OFF3) |
| **Acknowledge:** | IMMEDIATELY |
| **Cause:** | For p2193 = 1:<br>The torque deviates from the torque/speed envelope characteristic (too high).<br>For p2193 = 2:<br>The speed signal from the external encoder (refer to p3230) deviates from the speed (r2169) (too high). |
| **Remedy:** | - check the connection between the motor and load.<br>- adapt the parameterization corresponding to the load. |

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| **F07925** | **Drive: Torque/speed out of tolerance** |
| **Message class:** | Application / technological function faulted (17) |
| **Reaction:** | OFF1 (NONE, OFF2, OFF3) |
| **Acknowledge:** | IMMEDIATELY |
| **Cause:** | For p2193 = 1:<br>The torque deviates from the torque/speed envelope characteristic.<br>For p2193 = 2:<br>The speed signal from the external encoder (refer to p3230) deviates from the speed (r2169). |
| **Remedy:** | - check the connection between the motor and load.<br>- adapt the parameterization corresponding to the load. |

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| **A07927** | **DC braking active** |
| **Message class:** | Application / technological function faulted (17) |
| **Reaction:** | NONE |
| **Acknowledge:** | NONE |
| **Cause:** | The motor is braked with DC current. DC braking is active.<br>1)<br>A message with response DCBRK is active. The motor is braked with the braking current set in p1232 for the duration set in in p1233. If the standstill threshold p1226 is undershot, then braking is prematurely canceled.<br>2)<br>DC braking has been activated at binector input p1230 with the DC braking set (p1230 = 4). Braking current p1232 is injected until this binector input becomes inactive. |
| **Remedy:** | Not necessary.<br>The alarm automatically disappears once DC braking has been executed. |

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| **A07929 (F)** | **Drive: No motor detected** |
| **Message class:** | Application / technological function faulted (17) |
| **Reaction:** | NONE |
| **Acknowledge:** | NONE |
| **Cause:** | The absolute current value is so small after enabling the inverter pulses that no motor is detected.<br>Note:<br>In the case of vector control and an induction motor, this alarm is followed by the fault F07902.<br>See also: p2179 (Output load identification current limit) |
| **Remedy:** | - check the motor feeder cables.<br>- reduce the threshold value (p2179), e.g. for synchronous motors.<br>- check the voltage boost of the U/f control (p1310).<br>- carry out a standstill measurement to set the stator resistance (p0350). |

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| **F07936** | **Drive: load failure** |
| **Message class:** | Application / technological function faulted (17) |
| **Reaction:** | OFF1 (NONE, OFF2, OFF3) |
| **Acknowledge:** | IMMEDIATELY |
| **Cause:** | The load monitoring has detected a load failure. |

**Remedy:** - check the sensor.
- if necessary, de-activate the load monitoring (p2193).
See also: p2193 (Load monitoring configuration), p3232 (Load monitoring failure detection)

## F07950 (A) Motor parameter incorrect

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** NONE
**Acknowledge:** IMMEDIATELY
**Cause:** The motor parameters were incorrectly entered while commissioning (e.g. p0300 = 0, no motor)
Fault value (r0949, interpret decimal):
Parameter number involved.
See also: p0300, p0301, p0304, p0305, p0307, p0310, p0311, p0314, p0316, p0320, p0322, p0323
**Remedy:** Compare the motor data with the rating plate data and if required, correct.

## F07967 Drive: Incorrect pole position identification

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** OFF2 (NONE, OFF1)
**Acknowledge:** IMMEDIATELY
**Cause:** A fault has occurred during the pole position identification routine.
Only for internal Siemens troubleshooting.
**Remedy:** Carry out a POWER ON.

## F07968 Drive: Lq-Ld measurement incorrect

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** OFF2
**Acknowledge:** IMMEDIATELY
**Cause:** A fault has occurred during the Lq-Ld measurement.
Fault value (r0949, interpret decimal):
10: Stage 1: The ratio between the measured current and zero current is too low.
12: Stage 1: The maximum current was exceeded.
15: Second harmonic too low.
16: Drive converter too small for the measuring technique.
17: Abort due to pulse inhibit.
**Remedy:** For fault value = 10:
Check whether the motor is correctly connected.
Replace the power unit involved.
De-activate technique (p1909).
For fault value = 12:
Check whether motor data have been correctly entered.
De-activate technique (p1909).
For fault value = 16:
De-activate technique (p1909).
For fault value = 17:
Repeat technique.

## F07969 Drive: Incorrect pole position identification

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** OFF2
**Acknowledge:** IMMEDIATELY
**Cause:** A fault has occurred during the pole position identification routine.
Fault value (r0949, interpret decimal):
1: Current controller limited
2: Motor shaft locked.
10: Stage 1: The ratio between the measured current and zero current is too low.
11: Stage 2: The ratio between the measured current and zero current is too low.
12: Stage 1: The maximum current was exceeded.

13: Stage 2: The maximum current was exceeded.
14: Current difference to determine the +d axis too low.
15: Second harmonic too low.
16: Drive converter too small for the measuring technique.
17: Abort due to pulse inhibit.
18: First harmonic too low.
20: Pole position identification requested with the motor shaft rotating and activated "flying restart" function.

**Remedy:**
For fault value = 1:
Check whether the motor is correctly connected.
Check whether motor data have been correctly entered.
Replace the power unit involved.
For fault value = 2:
Bring the motor into a no-load condition.
For fault value = 10:
When selecting p1980 = 4: Increase the value for p0325.
When selecting p1980 = 1: Increase the value for p0329.
Check whether the motor is correctly connected.
Replace the power unit involved.
For fault value = 11:
Increase the value for p0329.
Check whether the motor is correctly connected.
Replace the power unit involved.
For fault value = 12:
When selecting p1980 = 4: Reduce the value for p0325.
When selecting p1980 = 1: Reduce the value for p0329.
Check whether motor data have been correctly entered.
For fault value = 13:
Reduce the value for p0329.
Check whether motor data have been correctly entered.
For fault value = 14:
Increase the value for p0329.
For fault value = 15:
Increase the value for p0325.
Motor not sufficiently anisotropic, change the technique (p1980 = 1 or 10).
For fault value = 16:
Change the technique (p1980).
For fault value = 17:
Repeat technique.
For fault value = 18:
Increase the value for p0329.
Saturation not sufficient, change the technique (p1980 = 10).
For fault value = 20:
Before carrying out a pole position identification routine ensure that the motor shaft is absolutely stationary (zero speed).

## A07976 Drive: Fine encoder calibration activated

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** The alarm indicates the phases of the fine encoder calibration using the alarm value.
Alarm value (interpret decimal):
1: Fine encoder calibration active.
2: Rotating measurement started (set the setpoint speed > 40 % rated motor speed).
3: Rotating measurement lies within the speed and torque range.
4: Rotating measurement successful: pulse inhibit can be initiated to accept the values.

5: Fine encoder calibration is calculated.
10: Speed too low, rotating measurement interrupted.
12: Torque too high, rotating measurement interrupted.

**Remedy:** Re alarm value = 10:
Increase the speed.
Re alarm value = 12:
Bring the drive into a no-load condition.

## A07980 Drive: Rotating measurement activated

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** The rotating measurement (automatic speed controller optimization) is activated.
The rotating measurement is carried out at the next power-on command.
Note:
During the rotating measurement it is not possible to save the parameters (p0971).
See also: p1960 (Rotating measurement selection)
**Remedy:** Not necessary.
The alarm disappears automatically after the speed controller optimization has been successfully completed or for the setting p1900 = 0.

## A07981 Drive: Enable signals for the rotating measurement missing

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** The rotating measurement cannot be started due to missing enable signals.
For p1959.13 = 1, the following applies:
- enable signals for the ramp-function generator missing (see p1140 ... p1142).
- enable signals for the speed controller integrator missing (see p1476, p1477).
**Remedy:** - acknowledge faults that are present.
- establish missing enable signals.
See also: r0002 (Drive operating display), r0046 (Missing enable sig)

## F07983 Drive: Rotating measurement saturation characteristic

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** OFF1 (NONE, OFF2)
**Acknowledge:** IMMEDIATELY
**Cause:** A fault has occurred while determining the saturation characteristic.
Fault value (r0949, interpret decimal):
1: The speed did not reach a steady-state condition.
2: The rotor flux did not reach a steady-state condition.
3: The adaptation circuit did not reach a steady-state condition.
4: The adaptation circuit was not enabled.
5: Field weakening active.
6: The speed setpoint was not able to be approached as the minimum limiting is active.
7: The speed setpoint was not able to be approached as the suppression (skip) bandwidth is active.
8: The speed setpoint was not able to be approached as the maximum limiting is active.
9: Several values of the determined saturation characteristic are not plausible.
10: Saturation characteristic could not be sensibly determined because load torque too high.
**Remedy:** For fault value = 1:
- the total drive moment of inertia is far higher than that of the motor (p0341, p0342).
De-select rotating measurement (p1960), enter the moment of inertia p0342, re-calculate the speed controller p0340 = 4 and repeat the measurement.
Re fault value = 1 ... 2:
- increase the measuring speed (p1961) and repeat the measurement.

Re fault value = 1 ... 4:

- check the motor parameters (rating plate data). After the change: Calculate p0340 = 3.
- check the moment of inertia (p0341, p0342). After the change: Calculate p0340 = 3.
- carry out a motor data identification routine (p1910).
- if required, reduce the dynamic factor (p1967 < 25 %).

For fault value = 5:

- the speed setpoint (p1961) is too high. Reduce the speed.

For fault value = 6:

- adapt the speed setpoint (p1961) or minimum limiting (p1080).

For fault value = 7:

- adapt the speed setpoint (p1961) or suppression (skip) bandwidths (p1091 ... p1094, p1101).

For fault value = 8:

- adapt the speed setpoint (p1961) or maximum limit (p1082, p1083 and p1086).

Re fault value = 9, 10:

- the measurement was carried out at an operating point where the load torque is too high. Select a more suitable operating point, either by changing the speed setpoint (p1961) or by reducing the load torque. The load torque may not be varied while making measurements.

Note:

The saturation characteristic identification routine can be disabled using p1959.1.

See also: p1959 (Rotating measurement configuration)

## F07984 Drive: Speed controller optimization, moment of inertia

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)

**Reaction:** OFF1 (NONE, OFF2)

**Acknowledge:** IMMEDIATELY

**Cause:** A fault has occurred while identifying the moment of inertia.

Fault value (r0949, interpret decimal):

1: The speed did not reach a steady-state condition.

2: The speed setpoint was not able to be approached as the minimum limiting is active.

3. The speed setpoint was not able to be approached as the suppression (skip) bandwidth is active.

4. The speed setpoint was not able to be approached as the maximum limiting is active.

5: It is not possible to increase the speed by 10% as the minimum limiting is active.

6: It is not possible to increase the speed by 10% as the suppression (skip) bandwidth is active.

7: It is not possible to increase the speed by 10% as the maximum limiting is active.

8: The torque difference after the speed setpoint step is too low in order to be able to still reliably identify the moment of inertia.

9: Too few data to be able to reliably identify the moment of inertia.

10: After the setpoint step, the speed either changed too little or in the incorrect direction.

11: The identified moment of inertia is not plausible.

**Remedy:** For fault value = 1:

- check the motor parameters (rating plate data). After the change: Calculate p0340 = 3.
- check the moment of inertia (p0341, p0342). After the change: Calculate p0340 = 3.
- carry out a motor data identification routine (p1910).
- if required, reduce the dynamic factor (p1967 < 25 %).

Re fault value = 2, 5:

- adapt the speed setpoint (p1965) or adapt the minimum limit (p1080).

Re fault value = 3, 6:

- adapt the speed setpoint (p1965) or suppression (skip) bandwidths (p1091 ... p1094, p1101).

Re fault value = 4, 7:

- adapt the speed setpoint (p1965) or maximum limit (p1082, p1083 and p1086).

For fault value = 8:

- the total drive moment of inertia is far higher than that of the motor (refer to p0341, p0342). De-select rotating measurement (p1960), enter the moment of inertia p0342, re-calculate the speed controller p0340 = 4 and repeat the measurement.

For fault value = 9:

- check the moment of inertia (p0341, p0342). After the change, re-calculate (p0340 = 3 or 4).

For fault value = 10:
- check the moment of inertia (p0341, p0342). After the change: Calculate p0340 = 3.
Note:
The moment of inertia identification routine can be disabled using p1959.2.
See also: p1959 (Rotating measurement configuration)

## F07985 Drive: Speed controller optimization (oscillation test)

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** OFF1 (NONE, OFF2)
**Acknowledge:** IMMEDIATELY
**Cause:** A fault has occurred during the vibration test.
Fault value (r0949, interpret decimal):
1: The speed did not reach a steady-state condition.
2: The speed setpoint was not able to be approached as the minimum limiting is active.
3: The speed setpoint was not able to be approached as the suppression (skip) bandwidth is active.
4: The speed setpoint was not able to be approached as the maximum limiting is active.
5: Torque limits too low for a torque step.
6: No suitable speed controller setting was found.
**Remedy:** For fault value = 1:
- check the motor parameters (rating plate data). After the change: Calculate p0340 = 3.
- check the moment of inertia (p0341, p0342). After the change: Calculate p0340 = 3.
- carry out a motor data identification routine (p1910).
- if required, reduce the dynamic factor (p1967 < 25 %).
For fault value = 2:
- adapt the speed setpoint (p1965) or adapt the minimum limit (p1080).
For fault value = 3:
- adapt the speed setpoint (p1965) or suppression (skip) bandwidths (p1091 ... p1094, p1101).
For fault value = 4:
- adapt the speed setpoint (p1965) or maximum limit (p1082, p1083 and p1086).
For fault value = 5:
- increase the torque limits (e.g. p1520, p1521).
For fault value = 6:
- reduce the dynamic factor (p1967).
- disable the vibration test (p1959.4 = 0) and repeat the rotating measurement.
See also: p1959 (Rotating measurement configuration)

## F07986 Drive: Rotating measurement ramp-function generator

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** OFF1 (NONE, OFF2)
**Acknowledge:** IMMEDIATELY
**Cause:** During the rotating measurements, problems with the ramp-function generator occurred.
Fault value (r0949, interpret decimal):
1: The positive and negative directions are inhibited.
**Remedy:** For fault value = 1:
Enable the direction (p1110 or p1111).

## F07988 Drive: Rotating measurement, no configuration selected

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** OFF2 (NONE, OFF1)
**Acknowledge:** IMMEDIATELY
**Cause:** When configuring the rotating measurement (p1959), no function was selected.
**Remedy:** Select at least one function for automatic optimization of the speed controller (p1959).
See also: p1959 (Rotating measurement configuration)

| | |
|---|---|
| **F07990** | **Drive: Incorrect motor data identification** |
| **Message class:** | Error in the parameterization / configuration / commissioning procedure (18) |
| **Reaction:** | OFF2 (NONE, OFF1) |
| **Acknowledge:** | IMMEDIATELY |
| **Cause:** | A fault has occurred during the identification routine.<br>Fault value (r0949, interpret decimal):<br>1: Current limit value reached.<br>2: Identified stator resistance lies outside the expected range 0.1 ... 100% of Zn.<br>3: Identified rotor resistance lies outside the expected range 0.1 ... 100% of Zn.<br>4: Identified stator reactance lies outside the expected range 50 ... 500 % of Zn.<br>5: Identified magnetizing reactance lies outside the expected range 50 ... 500 % of Zn.<br>6: Identified rotor time constant lies outside the expected range 10 ms ... 5 s.<br>7: Identified total leakage reactance lies outside the expected range 4 ... 50 % of Zn.<br>8: Identified stator leakage reactance lies outside the expected range 2 ... 50% of Zn.<br>9: Identified rotor leakage reactance lies outside the expected range 2 ... 50% of Zn.<br>10: Motor has been incorrectly connected.<br>11: Motor shaft rotates.<br>12: Ground fault detected.<br>15: Pulse inhibit occurred during motor data identification<br>20: Identified threshold voltage of the semiconductor devices lies outside the expected range 0 ... 10 V.<br>30: Current controller in voltage limiting.<br>40: At least one identification contains errors. The identified parameters are not saved to prevent inconsistencies.<br>60: Incorrect power stack data for the converter output voltage calibration<br>61: Incorrect measured values for the converter output voltage calibration<br>Note:<br>Percentage values are referred to the rated motor impedance:<br>Zn = Vmot.nom / sqrt(3) / Imot,nom |
| **Remedy:** | Re fault value = 1 ... 40:<br>- check whether motor data have been correctly entered in p0300, p0304 ... p0311.<br>- is there an appropriate relationship between the motor power rating and that of the power unit? The ratio of the power unit to the rated motor current should not be less than 0.5 and not be greater than 4.<br>- check connection type (star-delta).<br>Re fault value = 4, 7:<br>- check whether the inductance in p0233 is correctly set.<br>- check whether motor has been correctly connected (star-delta).<br>Re fault value = 11 in addition:<br>- Deactivate oscillation monitoring (p1909.7 = 1).<br>For fault value = 12:<br>- check the power cable connections.<br>- check the motor.<br>- check the CT. |

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| **A07991 (N)** | **Drive: Motor data identification activated** |
| **Message class:** | Error in the parameterization / configuration / commissioning procedure (18) |
| **Reaction:** | NONE |
| **Acknowledge:** | NONE |
| **Cause:** | The motor data identification routine is activated.<br>The motor data identification routine is carried out at the next power-on command.<br>If rotating measurement is selected (see p1900, p1960), it will not be possible to save the parameter assignment. Once motor data identification has been completed or de-activated, the option to save the parameter assignment will be made available again.<br>See also: p1910 (Motor data identification selection) |
| **Remedy:** | Not necessary.<br>The alarm automatically disappears after the motor data identification routine has been successfully completed or for the setting p1900 = 0. |

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|---|---|
| **A07994 (F, N)** | **Drive: motor data identification not performed** |
| **Message class:** | Error in the parameterization / configuration / commissioning procedure (18) |
| **Reaction:** | NONE |
| **Acknowledge:** | NONE |
| **Cause:** | The "vector control" mode has been selected and a motor data identification has still not been performed.<br>The alarm is initiated when changing the drive data set (see r0051) in the following cases:<br>- vector control is parameterized in the actual drive data set (p1300 >= 20).<br>and<br>- motor data identification has still not been performed in the actual drive data set (see r3925).<br>Note:<br>For SINAMICS G120, a check is made and an alarm is output also when exiting commissioning and when the system powers up. |
| **Remedy:** | - Perform motor data identification (see p1900).<br>- If required, parameterize "U/f control" (p1300 < 20).<br>- switch over to a drive data set, in which the conditions do not apply. |

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|---|---|
| **F08010 (N, A)** | **CU: Analog-to-digital converter** |
| **Message class:** | Hardware / software error (1) |
| **Reaction:** | OFF1 (IASC/DCBRK, NONE, OFF2, OFF3, STOP2) |
| **Acknowledge:** | IMMEDIATELY (POWER ON) |
| **Cause:** | The analog-to-digital converter on the Control Unit has not supplied any converted data. |
| **Remedy:** | - check the power supply.<br>- replace Control Unit. |

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| **F08501 (N, A)** | **PROFINET: Setpoint timeout** |
| **Message class:** | Communication error to the higher-level control system (9) |
| **Reaction:** | OFF3 (IASC/DCBRK, NONE, OFF1, OFF2, STOP2) |
| **Acknowledge:** | IMMEDIATELY |
| **Cause:** | The reception of setpoints from PROFINET has been interrupted.<br>- bus connection interrupted.<br>- controller switched off.<br>- controller set into the STOP state. |
| **Remedy:** | - Restore the bus connection and set the controller to RUN.<br>- check the set monitoring time if the error persists (p2040). |

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| **F08502 (A)** | **PROFINET: Monitoring time sign-of-life expired** |
| **Message class:** | Communication error to the higher-level control system (9) |
| **Reaction:** | OFF1 (OFF2, OFF3) |
| **Acknowledge:** | IMMEDIATELY |
| **Cause:** | The monitoring time for the sign-of-life counter has expired.<br>The connection to the PROFINET interface was interrupted. |
| **Remedy:** | - carry out a POWER ON (power off/on).<br>- contact the Hotline. |

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| **A08511 (F)** | **PROFINET: Receive configuration data invalid** |
| **Message class:** | Error in the parameterization / configuration / commissioning procedure (18) |
| **Reaction:** | NONE |
| **Acknowledge:** | NONE |
| **Cause:** | The drive unit did not accept the receive configuration data.<br>Alarm value (r2124, interpret decimal):<br>Return value of the receive configuration data check.<br>2: Too many PZD data words for output or input. Maximum of 12 words are possible.<br>3: Uneven number of bytes for input or output. |

**Remedy:** Check the receive configuration data.

Re alarm value = 2:

- Check the number of data words for output and input.

## A08526 (F) PROFINET: No cyclic connection

**Message class:** Communication error to the higher-level control system (9)

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** There is no connection to a PROFINET controller.

**Remedy:** Establish the cyclic connection and activate the controller with cyclic operation.

Check the parameters "Name of Station" and "IP of Station" (r61000, r61001).

## A08565 PROFINET: Consistency error affecting adjustable parameters

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)

**Reaction:** NONE

**Acknowledge:** NONE

**Cause:** A consistency error was detected when activating the configuration (p8925) for the PROFINET interface. The currently set configuration has not been activated.

Alarm value (r2124, interpret decimal):

0: general consistency error

1: error in the IP configuration (IP address, subnet mask or standard gateway)

2: Error in the station names.

3: DHCP was not able to be activated, as a cyclic PROFINET connection already exists.

4: a cyclic PROFINET connection is not possible as DHCP is activated.

See also: p8920 (PN Name of Station), p8921 (PN IP address of station), p8922 (PN Default Gateway of Station), p8923 (PN Subnet Mask of Station)

**Remedy:** - Check the required interface configuration (p8920 and following), correct if necessary, and activate (p8925).

or

- Reconfigure the station via the "Edit Ethernet node" screen form (e.g. with STARTER commissioning software).

See also: p8925 (PN interface configuration)

## F08700 (A) CAN: Communications error

**Message class:** Communication error to the higher-level control system (9)

**Reaction:** OFF3 (NONE, OFF1, OFF2)

**Acknowledge:** IMMEDIATELY

**Cause:** A CAN communications error has occurred.

Fault value (r0949, interpret decimal):

1: The error counter for the send telegrams has exceeded the BUS OFF value 255. The bus disables the CAN controller.

- bus cable short circuit.
- incorrect baud rate.
- incorrect bit timing.

2: The master no longer interrogated the CAN node status longer than for its "life time". The "life time" is obtained from the "guard time" (p8604[0]) multiplied by the "life time factor" (p8604[1]).

- bus cable interrupted.
- bus cable not connected.
- incorrect baud rate.
- incorrect bit timing.
- master fault.

Note:

The fault response can be set as required using p8641.

See also: p8604 (CAN life guarding), p8641 (CAN Abort Connection Option Code)

**Remedy:**
- check the bus cable
- check the baud rate (p8622).
- check the bit timing (p8623).
- check the master.

The CAN controller must be manually restarted with p8608 = 1 after the cause of the fault has been resolved!
See also: p8608 (CAN Clear Bus Off Error), p8622 (CAN bit rate), p8623 (CAN Bit Timing selection)

## F08701 CAN: NMT state change

**Message class:** Communication error to the higher-level control system (9)
**Reaction:** OFF3
**Acknowledge:** IMMEDIATELY
**Cause:** A CANopen NMT state transition from "operational" to "pre-operational" or after "stopped".
Fault value (r0949, interpret decimal):
1: CANopen NMT state transition from "operational" to "pre-operational".
2: CANopen NMT state transition from "operational" to "stopped".
Note:
In the NMT state "pre-operational", process data cannot be transferred and in the NMT state "stopped", no process data and no service data can be transferred.
**Remedy:** Not necessary.
Acknowledge the fault and continue operation.

## F08702 (A) CAN: RPDO Timeout

**Message class:** Communication error to the higher-level control system (9)
**Reaction:** OFF3 (NONE, OFF1, OFF2)
**Acknowledge:** IMMEDIATELY
**Cause:** The monitoring time of the CANopen RPDO telegram has expired because the bus connection was either interrupted or the CANopen Master was switched-off.
See also: p8699 (CAN: RPDO monitoring time)
**Remedy:** - check the bus cable
- check the master.
- If required, increase the monitoring time (p8699).

## A08751 (N) CAN: Telegram loss

**Message class:** Communication error to the higher-level control system (9)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** The CAN controller has lost a receive message (telegram).
**Remedy:** Reduce the cycle times of the receive messages.

## A08752 CAN: Error counter for error passive exceeded

**Message class:** Communication error to the higher-level control system (9)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** The error counter for the send or receive telegrams has exceeded the value 127.
**Remedy:** - check the bus cable
- set a higher baud rate (p8622).
- check the bit timing and if required optimize (p8623).
See also: p8622 (CAN bit rate), p8623 (CAN Bit Timing selection)

## A08753 CAN: Message buffer overflow

**Message class:** Communication error to the higher-level control system (9)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** A message buffer overflow.
Alarm value (r2124, interpret decimal):
1: Non-cyclic send buffer (SDO response buffer) overflow.
2: Non-cyclic receive buffer (SDO receive buffer) overflow.
3: Cyclic send buffer (PDO send buffer) overflow.

**Remedy:** - check the bus cable.
- set a higher baud rate (p8622).
- check the bit timing and if required optimize (p8623).
Re alarm value = 2:
- reduce the cycle times of the SDO receive messages.
- SDO request from master only after SDO feedback for previous SDO request.
See also: p8622 (CAN bit rate), p8623 (CAN Bit Timing selection)

## A08754 CAN: Incorrect communications mode

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** In the "operational" mode, an attempt was made to change parameters p8700 ... p8737.
**Remedy:** Change to the "pre-operational" or "stopped" mode.

## A08755 CAN: Obj cannot be mapped

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** The CANopen object is not provided for the Process Data Object (PDO) Mapping.
**Remedy:** Use a CANopen object intended for the PDO mapping or enter 0.
The following objects can be mapped in the Receive Process Data Object (RPDO) or Transmit Process Data Object (TPDO):
- RPDO: 6040 hex, 6060 hex, 60FF hex, 6071 hex; 5800 hex - 580F hex; 5820 hex - 5827 hex
- TPDO: 6041 hex, 6061 hex, 6063 hex, 6069 hex, 606B hex, 606C hex, 6074 hex; 5810 hex - 581F hex; 5830 hex - 5837 hex
Only sub-index 0 of the specified objects can be mapped.
Note:
As long as A08755 is present, the COB-ID cannot be set to valid.

## A08756 CAN: Number of mapped bytes exceeded

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** The number of bytes of the mapped objects exceeds the telegram size for net data. A max. of 8 bytes is permissible.
**Remedy:** Map fewer objects or objects with a smaller data type.
See also: p8710, p8711, p8712, p8713, p8714, p8715, p8716, p8717, p8730, p8731, p8732, p8733, p8734, p8735, p8736, p8737

## A08757 CAN: Set COB-ID invalid

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** For online operation, the appropriate COB-ID must be set invalid before mapping.
Example:
Mapping for RPDO 1 should be changed (p8710[0]).
--> set p8700[0] = C00006E0 hex (invalid COB-ID)
--> set p8710[0] as required.
--> p8700[0] enter a valid COB-ID
**Remedy:** Set the COB-ID to invalid.

## A08759 CAN: PDO COB-ID already available

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** An existing PDO COB-ID was allocated.

**Remedy:** Select another PDO COB-ID.

## A08760 CAN: maximum size of the IF PZD exceeded

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** The maximum size of the IF PZD was exceeded.
Alarm value (r2124, interpret decimal):
1: error for IF PZD receive.
2: error for IF PZD send.
Note:
IF: interface
**Remedy:** Map fewer process data in PDO.
Apply one of the following options to delete the alarm:
- POWER ON (off/on).
- carry out a warm restart (p0009 = 30, p0976 = 2).
- execute CANopen NMT command reset node.
- change CANopen NMT state.
- delete alarm buffer [0...7] (p2111 = 0).

## A08800 PROFIenergy energy-saving mode active

**Message class:** Communication error to the higher-level control system (9)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** The PROFIenergy energy-saving mode is active
Alarm value (r2124, interpret decimal):
Mode ID of the active PROFIenergy energy-saving mode.
See also: r5600 (Pe energy saving mode ID)
**Remedy:** The alarm automatically disappears when the energy-saving mode is exited.
Note:
After receiving the PROFIenergy command "End_Pause" via PROFINET, the energy-saving mode is exited.

## A08802 PROFIenergy not possible to switch off incremental encoder supply

**Message class:** Communication error to the higher-level control system (9)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** The incremental encoder is used for the closed-loop position control. This means that its power supply cannot be switched off during the PROFIenergy energy-saving mode, otherwise it would lose its position actual value.
Alarm value (r2124, interpret decimal):
Encoder number
**Remedy:** The alarm automatically disappears when the energy-saving mode is exited.
Note:
After receiving the PROFIenergy command "End_Pause" via PROFINET, the energy-saving mode is exited.

## F13009 Licensing OA application not licensed

**Message class:** Error in the parameterization / configuration / commissioning procedure (18)
**Reaction:** OFF1
**Acknowledge:** IMMEDIATELY
**Cause:** At least one OA application which is under license does not have a license.
Note:
Refer to r4955 and p4955 for information about the installed OA applications.
**Remedy:** - enter and activate the license key for OA applications under license (p9920, p9921).
- if necessary, de-activate unlicensed OA applications (p4956).

| | |
|---|---|
| **F13100** | **Know-how protection: Copy protection error** |
| **Message class:** | Error in the parameterization / configuration / commissioning procedure (18) |
| **Reaction:** | OFF1 |
| **Acknowledge:** | IMMEDIATELY |
| **Cause:** | The know-how protection with copy protection for the memory card is active.<br>An error has occurred when checking the memory card.<br>Fault value (r0949, interpret decimal):<br>0: A memory card is not inserted.<br>1: An invalid memory card is inserted (not SIEMENS).<br>2: An invalid memory card is inserted.<br>3: The memory card is being used in another Control Unit.<br>12: An invalid memory card is inserted (OEM input incorrect, p7769).<br>13: The memory card is being used in another Control Unit (OEM input incorrect, p7759).<br>See also: p7765 (KHP configuration) |
| **Remedy:** | Re fault value = 0, 1:<br>- Insert the correct memory card and carry out POWER ON.<br>Re fault value = 2, 3, 12, 13:<br>- contact the responsible OEM.<br>- Deactivate copy protection (p7765) and acknowledge the fault (p3981).<br>- Deactivate know-how protection (p7766 ... p7768) and acknowledge the fault (p3981).<br>Note:<br>In general, the copy protection can only be changed when know-how protection is deactivated.<br>KHP: Know-How Protection<br>See also: p3981 (Faults acknowledge drive object), p7765 (KHP configuration) |

| | |
|---|---|
| **F13101** | **Know-how protection: Copy protection cannot be activated** |
| **Message class:** | Error in the parameterization / configuration / commissioning procedure (18) |
| **Reaction:** | NONE |
| **Acknowledge:** | IMMEDIATELY |
| **Cause:** | An error occurred when attempting to activate the copy protection for the memory card.<br>Fault value (r0949, interpret decimal):<br>0: A memory card is not inserted.<br>1: An invalid memory card is inserted (not SIEMENS).<br>Note:<br>KHP: Know-How Protection |
| **Remedy:** | - Insert a valid memory card.<br>- Try to activate copy protection again (p7765).<br>See also: p7765 (KHP configuration) |

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|---|---|
| **F13102** | **Know-how protection: Consistency error of the protected data** |
| **Message class:** | Error in the parameterization / configuration / commissioning procedure (18) |
| **Reaction:** | OFF1 |
| **Acknowledge:** | IMMEDIATELY |
| **Cause:** | An error was identified when checking the consistency of the protected files. As a consequence, the project on the memory card cannot be run.<br>Fault value (r0949, interpret hexadecimal):<br>yyyyxxxx hex: yyyy = object number, xxxx = fault cause<br>xxxx = 1:<br>A file has a checksum error.<br>xxxx = 2:<br>The files are not consistent with one another.<br>xxxx = 3:<br>The project files, which were loaded into the file system via load (download from the memory card), are inconsistent.<br>Note:<br>KHP: Know-How Protection |

| | |
|---|---|
| **Remedy:** | - Replace the project on the memory card or replace project files for download from the memory card.<br>- Restore the factory setting and download again. |

| **F30001** | **Power unit: Overcurrent** |
|---|---|
| **Message class:** | Power electronics faulted (5) |
| **Reaction:** | OFF2 |
| **Acknowledge:** | IMMEDIATELY |
| **Cause:** | The power unit has detected an overcurrent condition.<br>- closed-loop control is incorrectly parameterized.<br>- motor has a short-circuit or fault to ground (frame).<br>- U/f operation: Up ramp set too low.<br>- U/f operation: rated current of motor much greater than that of power unit.<br>- High discharge and post-charging current for line supply voltage interruptions.<br>- High post-charging currents for overload when motoring and DC link voltage dip.<br>- Short-circuit currents at power-on due to the missing line reactor.<br>- power cables are not correctly connected.<br>- power cables exceed the maximum permissible length.<br>- power unit defective.<br>- line phase interrupted.<br>Fault value (r0949, interpret bitwise binary):<br>Bit 0: Phase U.<br>Bit 1: Phase V.<br>Bit 2: Phase W.<br>Bit 3: Overcurrent in the DC link.<br>Note:<br>Fault value = 0 means that the phase with overcurrent is not recognized. |
| **Remedy:** | - check the motor data - if required, carry out commissioning.<br>- check the motor circuit configuration (star/delta).<br>- U/f operation: Increase up ramp.<br>- U/f operation: Check assignment of rated currents of motor and power unit.<br>- check the line supply quality.<br>- Reduce motor load.<br>- Correct connection of line reactor.<br>- check the power cable connections.<br>- check the power cables for short-circuit or ground fault.<br>- check the length of the power cables.<br>- replace power unit.<br>- check the line supply phases. |

| **F30002** | **Power unit: DC link voltage overvoltage** |
|---|---|
| **Message class:** | DC link overvoltage (4) |
| **Reaction:** | OFF2 |
| **Acknowledge:** | IMMEDIATELY |
| **Cause:** | The power unit has detected an overvoltage condition in the DC link.<br>- motor regenerates too much energy.<br>- line supply voltage too high.<br>- line phase interrupted.<br>- DC-link voltage control switched off.<br>- dynamic response of DC-link voltage controller excessive or insufficient.<br>Fault value (r0949, interpret decimal):<br>DC link voltage at the time of trip [0.1 V]. |
| **Remedy:** | -increase the ramp-down time (p1121).<br>- set the rounding times (p1130, p1136). This is particularly recommended in U/f operation to relieve the DC link voltage controller with rapid ramp-down times of the ramp-function generator.<br>- Activate the DC link voltage controller (p1240, p1280). |

- adapt the dynamic response of the DC-link voltage controller (p1243, p1247, p1283, p1287).
- check the line supply voltage and setting in p0210.
- check and correct the phase assignment at the power unit.
- check the line supply phases.

See also: p0210 (Drive unit line supply voltage), p1240 (Vdc controller configuration (vector control))

## F30003 Power unit: DC link voltage undervoltage

**Message class:** Infeed faulted (13)

**Reaction:** OFF2

**Acknowledge:** IMMEDIATELY

**Cause:** The power unit has detected an undervoltage condition in the DC link.
- line supply failure
- line supply voltage below the permissible value.
- line phase interrupted.

Note:
The monitoring threshold for the DC link undervoltage is the minimum of the following values:
- for a calculation, refer to p0210.

**Remedy:**
- check the line supply voltage
- check the line supply phases.

See also: p0210 (Drive unit line supply voltage)

## F30004 Power unit: Overtemperature heat sink AC inverter

**Message class:** Power electronics faulted (5)

**Reaction:** OFF2

**Acknowledge:** IMMEDIATELY

**Cause:** The temperature of the power unit heat sink has exceeded the permissible limit value.
- insufficient cooling, fan failure.
- overload.
- ambient temperature too high.
- pulse frequency too high.

Fault value (r0949):
Temperature [1 bit = 0.01 °C].

**Remedy:**
- check whether the fan is running.
- check the fan elements.
- check whether the ambient temperature is in the permissible range.
- check the motor load.
- reduce the pulse frequency if this is higher than the rated pulse frequency.

Notice:
This fault can only be acknowledged after this alarm threshold for alarm A05000 has been undershot.
See also: p1800 (Pulse frequency setpoint)

## F30005 Power unit: Overload I2t

**Message class:** Power electronics faulted (5)

**Reaction:** OFF2

**Acknowledge:** IMMEDIATELY

**Cause:** The power unit was overloaded (r0036 = 100 %).
- the permissible rated power unit current was exceeded for an inadmissibly long time.
- the permissible load duty cycle was not maintained.

Fault value (r0949, interpret decimal):
I2t [100 % = 16384].

**Remedy:**
- reduce the continuous load.
- adapt the load duty cycle.
- check the motor and power unit rated currents.
- reduce the current limit (p0640).
- during operation with U/f characteristic: reduce the integral time of the current limiting controller (p1341).

See also: r0036 (Power unit overload I2t), r0206 (Rated power unit power), p0307 (Rated motor power)

| | |
|---|---|
| **F30011** | **Power unit: Line phase failure in main circuit** |
| **Message class:** | Network fault (2) |
| **Reaction:** | OFF2 (OFF1) |
| **Acknowledge:** | IMMEDIATELY |
| **Cause:** | At the power unit, the DC link voltage ripple has exceeded the permissible limit value.<br>Possible causes:<br>- A line phase has failed.<br>- The 3 line phases are inadmissibly unsymmetrical.<br>- The capacitance of the DC link capacitor forms a resonance frequency with the line inductance and the reactor integrated in the power unit.<br>- the fuse of a phase of a main circuit has ruptured.<br>- A motor phase has failed.<br>Fault value (r0949, interpret decimal):<br>Only for internal Siemens troubleshooting. |
| **Remedy:** | - check the main circuit fuses.<br>- Check whether a single-phase load is distorting the line voltages.<br>- Detune the resonant frequency with the line inductance by using an upstream line reactor.<br>- Dampen the resonant frequency with the line inductance by switching over the DC link voltage compensation in the software (see p1810) – or increase the smoothing (see p1806). However, this can have a negative impact on the torque ripple at the motor output.<br>- check the motor feeder cables. |

| | |
|---|---|
| **F30012** | **Power unit: Temperature sensor heat sink wire breakage** |
| **Message class:** | Power electronics faulted (5) |
| **Reaction:** | OFF1 (OFF2) |
| **Acknowledge:** | IMMEDIATELY |
| **Cause:** | The connection to a heat sink temperature sensor in the power unit is interrupted.<br>Fault value (r0949, interpret hexadecimal):<br>Bit 0: Module slot (electronics slot)<br>Bit 1: Air intake<br>Bit 2: Inverter 1<br>Bit 3: Inverter 2<br>Bit 4: Inverter 3<br>Bit 5: Inverter 4<br>Bit 6: Inverter 5<br>Bit 7: Inverter 6<br>Bit 8: Rectifier 1<br>Bit 9: Rectifier 2 |
| **Remedy:** | Contact the manufacturer. |

| | |
|---|---|
| **F30013** | **Power unit: Temperature sensor heat sink short-circuit** |
| **Message class:** | Power electronics faulted (5) |
| **Reaction:** | OFF1 (OFF2) |
| **Acknowledge:** | IMMEDIATELY |
| **Cause:** | The heat sink temperature sensor in the power unit is short-circuited.<br>Fault value (r0949, interpret hexadecimal):<br>Bit 0: Module slot (electronics slot)<br>Bit 1: Air intake<br>Bit 2: Inverter 1<br>Bit 3: Inverter 2<br>Bit 4: Inverter 3<br>Bit 5: Inverter 4<br>Bit 6: Inverter 5<br>Bit 7: Inverter 6 |

| | |
|---|---|
| | Bit 8: Rectifier 1 |
| | Bit 9: Rectifier 2 |
| **Remedy:** | Contact the manufacturer. |

## F30015 (N, A) Power unit: Phase failure motor cable

| | |
|---|---|
| **Message class:** | Application / technological function faulted (17) |
| **Reaction:** | OFF2 (NONE, OFF1, OFF3) |
| **Acknowledge:** | IMMEDIATELY |
| **Cause:** | A phase failure in the motor feeder cable was detected.<br>The signal can also be output in the following cases:<br>- The motor is correctly connected, but the drive has stalled in U/f control. In this case, a current of 0 A is possibly measured in one phase due to asymmetry of the currents.<br>- the motor is correctly connected, however the closed-speed control is instable and therefore an oscillating torque is generated.<br>Note:<br>Chassis power units do not feature phase failure monitoring. |
| **Remedy:** | - check the motor feeder cables.<br>- increase the ramp-up or ramp-down time (p1120) if the drive has stalled in U/f control.<br>- check the speed controller settings. |

## A30016 (N) Power unit: Load supply switched out

| | |
|---|---|
| **Message class:** | Network fault (2) |
| **Reaction:** | NONE |
| **Acknowledge:** | NONE |
| **Cause:** | The DC link voltage is too low.<br>Alarm value (r2124, interpret decimal):<br>DC link voltage at the time of trip [0.1 V]. |
| **Remedy:** | Under certain circumstances, the AC line supply is not switched on. |

## F30017 Power unit: Hardware current limit has responded too often

| | |
|---|---|
| **Message class:** | Power electronics faulted (5) |
| **Reaction:** | OFF2 |
| **Acknowledge:** | IMMEDIATELY |
| **Cause:** | The hardware current limitation in the relevant phase (see A30031, A30032, A30033) has responded too often. The number of times the limit has been exceeded depends on the design and type of power unit.<br>- closed-loop control is incorrectly parameterized.<br>- fault in the motor or in the power cables.<br>- the power cables exceed the maximum permissible length.<br>- motor load too high<br>- power unit defective.<br>Fault value (r0949, interpret binary):<br>Bit 0: Phase U<br>Bit 1: Phase V<br>Bit 2: Phase W |
| **Remedy:** | - check the motor data.<br>- check the motor circuit configuration (star-delta).<br>- check the motor load.<br>- check the power cable connections.<br>- check the power cables for short-circuit or ground fault.<br>- check the length of the power cables.<br>- replace power unit. |

## F30021 Power unit: Ground fault

**Message class:** Ground fault / inter-phase short-circuit detected (7)
**Reaction:** OFF2
**Acknowledge:** IMMEDIATELY
**Cause:** The Power unit has detected a ground fault.
Possible causes:
- ground fault in the power cables.
- Ground fault at the motor.
- CT defective.
- when the brake closes, this causes the hardware DC current monitoring to respond.
- short-circuit at the braking resistor.
Fault value (r0949, interpret decimal):
0:
- the hardware DC current monitoring has responded.
- short-circuit at the braking resistor.
> 0:
Absolute value, summation current [32767 = 271 % rated current].
**Remedy:** - check the power cable connections.
- check the motor.
- check the CT.
- check the cables and contacts of the brake connection (a wire is possibly broken).
- check the braking resistor.
See also: p0287 (Ground fault monitoring thresholds)

## F30022 Power unit: Monitoring U_ce

**Message class:** Ground fault / inter-phase short-circuit detected (7)
**Reaction:** OFF2
**Acknowledge:** POWER ON
**Cause:** In the power unit, the monitoring of the collector-emitter voltage (U_ce) of the semiconductor has responded.
Possible causes:
- fiber-optic cable interrupted.
- power supply of the IGBT gating module missing.
- short-circuit at the power unit output.
- defective semiconductor in the power unit.
Fault value (r0949, interpret binary):
Bit 0: Short-circuit in phase U
Bit 1: Short circuit in phase V
Bit 2: Short-circuit in phase W
Bit 3: Light transmitter enable defective
Bit 4: U_ce group fault signal interrupted
See also: r0949 (Fault value)
**Remedy:** - check the fiber-optic cable and if required, replace.
- check the power supply of the IGBT gating module (24 V).
- check the power cable connections.
- select the defective semiconductor and replace.

## F30024 Power unit: Overtemperature thermal model

**Message class:** Power electronics faulted (5)
**Reaction:** OFF2
**Acknowledge:** IMMEDIATELY
**Cause:** The temperature difference between the heat sink and chip has exceeded the permissible limit value.
- the permissible load duty cycle was not maintained.
- insufficient cooling, fan failure.
- overload.

- ambient temperature too high.
- pulse frequency too high.

See also: r0037 (Power unit temperatures)

**Remedy:**
- adapt the load duty cycle.
- check whether the fan is running.
- check the fan elements.
- check whether the ambient temperature is in the permissible range.
- check the motor load.
- reduce the pulse frequency if this is higher than the rated pulse frequency.
- if DC braking is active: reduce braking current (p1232).

## F30025 Power unit: Chip overtemperature

**Message class:** Power electronics faulted (5)

**Reaction:** OFF2

**Acknowledge:** IMMEDIATELY

**Cause:** The chip temperature of the semiconductor has exceeded the permissible limit value.
- the permissible load duty cycle was not maintained.
- insufficient cooling, fan failure.
- overload.
- ambient temperature too high.
- pulse frequency too high.

Fault value (r0949, interpret decimal):

Temperature difference between the heat sink and chip [0.01 °C].

**Remedy:**
- adapt the load duty cycle.
- check whether the fan is running.
- check the fan elements.
- check whether the ambient temperature is in the permissible range.
- check the motor load.
- reduce the pulse frequency if this is higher than the rated pulse frequency.

Notice:

This fault can only be acknowledged after this alarm threshold for alarm A05001 has been undershot.

See also: r0037 (Power unit temperatures)

## F30027 Power unit: Precharging DC link time monitoring

**Message class:** Infeed faulted (13)

**Reaction:** OFF2

**Acknowledge:** IMMEDIATELY

**Cause:** The power unit DC link was not able to be pre-charged within the expected time.

1) There is no line supply voltage connected.
2) The line contactor/line side switch has not been closed.
3) The line supply voltage is too low.
4) Line supply voltage incorrectly set (p0210).
5) The pre-charging resistors are overheated as there were too many pre-charging operations per time unit.
6) The pre-charging resistors are overheated as the DC link capacitance is too high.
7) The DC link has either a ground fault or a short-circuit.
8) Pre-charging circuit may be defective.

Fault value (r0949, interpret binary):

yyyyxxxx hex:

yyyy = power unit state

0: Fault status (wait for OFF and fault acknowledgement).
1: Restart inhibit (wait for OFF).
2: Overvoltage condition detected -> change into the fault state.
3: Undervoltage condition detected -> change into the fault state.
4: Wait for bridging contactor to open -> change into the fault state.
5: Wait for bridging contactor to open -> change into restart inhibit.

6: Commissioning.
7: Ready for pre-charging.
8: Pre-charging started, DC link voltage less than the minimum switch-on voltage.
9: Pre-charging, DC link voltage end of pre-charging still not detected.
10: Wait for the end of the de-bounce time of the main contactor after pre-charging has been completed.
11: Pre-charging completed, ready for pulse enable.
12: Reserved.
xxxx = Missing internal enable signals, power unit (inverted bit-coded, FFFF hex -> all internal enable signals available)
Bit 0: Power supply of the IGBT gating shut down.
Bit 1: Ground fault detected.
Bit 2: Peak current intervention.
Bit 3: I2t exceeded.
Bit 4. Thermal model overtemperature calculated.
Bit 5: (heat sink, gating module, power unit) overtemperature measured.
Bit 6: Reserved.
Bit 7: Overvoltage detected.
Bit 8: Power unit has completed pre-charging, ready for pulse enable.
Bit 9: Reserved.
Bit 10: Overcurrent detected.
Bit 11: Reserved.
Bit 12: Reserved.
Bit 13: Vce fault detected, transistor de-saturated due to overcurrent/short-circuit.
Bit 14: Undervoltage detected.
See also: p0210 (Drive unit line supply voltage)

**Remedy:** In general:
- check the line supply voltage at the input terminals.
- check the line supply voltage setting (p0210).
- wait until the pre-charging resistors have cooled down. For this purpose, preferably disconnect the infeed unit from the line supply.

Re 5):
- carefully observe the permissible pre-charging frequency (refer to the appropriate Equipment Manual).

Re 6):
- check the capacitance of the DC link and, if necessary, reduce it in accordance with the maximum permissible DC link capacitance (see relevant Equipment Manual).

Re 7):
- check the DC link for a ground fault or short circuit.

See also: p0210 (Drive unit line supply voltage)

## A30030 Power unit: Internal overtemperature alarm

**Message class:** Power electronics faulted (5)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** The temperature inside the drive converter has exceeded the permissible temperature limit.
- insufficient cooling, fan failure.
- overload.
- ambient temperature too high.

Alarm value (r2124, interpret decimal):
Only for internal Siemens troubleshooting.

**Remedy:**
- possibly use an additional fan.
- check whether the ambient temperature is in the permissible range.

Notice:
This fault can only be acknowledged once the permissible temperature limit minus 5 K has been fallen below.

## A30031 Power unit: Hardware current limiting in phase U

**Message class:** Power electronics faulted (5)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** Hardware current limit for phase U responded. The pulsing in this phase is inhibited for one pulse period.
- closed-loop control is incorrectly parameterized.
- fault in the motor or in the power cables.
- the power cables exceed the maximum permissible length.
- motor load too high
- power unit defective.

Note:
Alarm A30031 is always output if, for a Power Module, the hardware current limiting of phase U, V or W responds.

**Remedy:** - check the motor data and if required, recalculate the control parameters (p0340 = 3). As an alternative, run a motor data identification (p1910 = 1, p1960 = 1).
- check the motor circuit configuration (star/delta).
- check the motor load.
- check the power cable connections.
- check the power cables for short-circuit or ground fault.
- check the length of the power cables.

## A30032 Power unit: Hardware current limiting in phase V

**Message class:** Power electronics faulted (5)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** Hardware current limit for phase V responded. The pulsing in this phase is inhibited for one pulse period.
- closed-loop control is incorrectly parameterized.
- fault in the motor or in the power cables.
- the power cables exceed the maximum permissible length.
- motor load too high
- power unit defective.

Note:
Alarm A30031 is always output if, for a Power Module, the hardware current limiting of phase U, V or W responds.

**Remedy:** Check the motor data and if required, recalculate the control parameters (p0340 = 3). As an alternative, run a motor data identification (p1910 = 1, p1960 = 1).
- check the motor circuit configuration (star/delta).
- check the motor load.
- check the power cable connections.
- check the power cables for short-circuit or ground fault.
- check the length of the power cables.

## A30033 Power unit: Hardware current limiting in phase W

**Message class:** Power electronics faulted (5)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** Hardware current limit for phase W responded. The pulsing in this phase is inhibited for one pulse period.
- closed-loop control is incorrectly parameterized.
- fault in the motor or in the power cables.
- the power cables exceed the maximum permissible length.
- motor load too high
- power unit defective.

Note:
Alarm A30031 is always output if, for a Power Module, the hardware current limiting of phase U, V or W responds.

**Remedy:** - check the motor data and if required, recalculate the control parameters (p0340 = 3). As an alternative, run a motor data identification (p1910 = 1, p1960 = 1).
- check the motor circuit configuration (star/delta).
- check the motor load.
- check the power cable connections.
- check the power cables for short-circuit or ground fault.
- check the length of the power cables.

### A30034 Power unit: Internal overtemperature

**Message class:** Power electronics faulted (5)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** The alarm threshold for internal overtemperature has been reached.
If the temperature inside the unit continues to increase, fault F30036 may be triggered.
- ambient temperature might be too high.
- insufficient cooling, fan failure.
Fault value (r0949, interpret decimal):
Only for internal Siemens troubleshooting.
**Remedy:** - check the ambient temperature.
- check the fan for the inside of the unit.

### F30035 Power unit: Air intake overtemperature

**Message class:** Power electronics faulted (5)
**Reaction:** OFF1 (OFF2)
**Acknowledge:** IMMEDIATELY
**Cause:** The air intake in the power unit has exceeded the permissible temperature limit.
For air-cooled power units, the temperature limit is at 55 °C.
- ambient temperature too high.
- insufficient cooling, fan failure.
Fault value (r0949, interpret decimal):
Temperature [0.01 °C].
**Remedy:** - check whether the fan is running.
- check the fan elements.
- check whether the ambient temperature is in the permissible range.
Notice:
This fault can only be acknowledged after this alarm threshold for alarm A05002 has been undershot.

### F30036 Power unit: Internal overtemperature

**Message class:** Power electronics faulted (5)
**Reaction:** OFF2
**Acknowledge:** IMMEDIATELY
**Cause:** The temperature inside the drive converter has exceeded the permissible temperature limit.
- insufficient cooling, fan failure.
- overload.
- ambient temperature too high.
Fault value (r0949, interpret decimal):
Only for internal Siemens troubleshooting.
**Remedy:** - check whether the fan is running.
- check the fan elements.
- check whether the ambient temperature is in the permissible range.
Notice:
This fault can only be acknowledged once the permissible temperature limit minus 5 K has been fallen below.

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|---|---|
| **F30037** | **Power unit: Rectifier overtemperature** |
| **Message class:** | Power electronics faulted (5) |
| **Reaction:** | OFF2 |
| **Acknowledge:** | IMMEDIATELY |
| **Cause:** | The temperature in the rectifier of the power unit has exceeded the permissible temperature limit.<br>- insufficient cooling, fan failure.<br>- overload.<br>- ambient temperature too high.<br>- line supply phase failure.<br>Fault value (r0949, interpret decimal):<br>Temperature [0.01 °C]. |
| **Remedy:** | - check whether the fan is running.<br>- check the fan elements.<br>- check whether the ambient temperature is in the permissible range.<br>- check the motor load.<br>- check the line supply phases.<br>Notice:<br>This fault can only be acknowledged after this alarm threshold for alarm A05004 has been undershot. |

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|---|---|
| **A30042** | **Power unit: Fan has reached the maximum operating hours** |
| **Message class:** | Power electronics faulted (5) |
| **Reaction:** | NONE |
| **Acknowledge:** | NONE |
| **Cause:** | The maximum operating time of at least one fan will soon be reached, or has already been exceeded.<br>Fault value (r0949, interpret binary):<br>Bit 0: heat sink fan will reach the maximum operating time in 500 hours.<br>Bit 1: heat sink fan has exceeded the maximum operating time.<br>Bit 8: internal device fan will reach the maximum operating time in 500 hours.<br>Bit 9: internal device fan has exceeded the maximum operating time.<br>Note:<br>The maximum operating time of the heat sink fan in the power unit is displayed in p0252.<br>The maximum operating time of the internal device fan in the power unit is internally specified and is fixed. |
| **Remedy:** | For the fan involved, carry out the following:<br>- replace the fan.<br>- reset the operating hours counter (p0251, p0254). |

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|---|---|
| **A30049** | **Power unit: Internal fan faulty** |
| **Message class:** | Auxiliary unit faulted (20) |
| **Reaction:** | NONE |
| **Acknowledge:** | NONE |
| **Cause:** | The internal fan has failed. |
| **Remedy:** | Check the internal fan and replace if necessary. |

| | |
|---|---|
| **F30051** | **Power unit: Motor holding brake short circuit detected** |
| **Message class:** | External measured value / signal state outside the permissible range (16) |
| **Reaction:** | OFF2 |
| **Acknowledge:** | IMMEDIATELY |
| **Cause:** | A short-circuit at the motor holding brake terminals has been detected.<br>Fault value (r0949, interpret decimal):<br>Only for internal Siemens troubleshooting. |
| **Remedy:** | - check the motor holding brake for a short-circuit.<br>- check the connection and cable for the motor holding brake. |

## F30052 EEPROM data error

**Message class:** Hardware / software error (1)
**Reaction:** OFF2
**Acknowledge:** POWER ON
**Cause:** EEPROM data error of the power unit module.
Fault value (r0949, interpret decimal):
0, 2, 3, 4:
The EEPROM data read in from the power unit module is inconsistent.
1:
EEPROM data is not compatible to the firmware of the Control Unit.
**Remedy:** Replace power unit module.

## F30055 Power unit: Braking chopper overcurrent

**Message class:** Braking Module faulted (14)
**Reaction:** OFF2
**Acknowledge:** IMMEDIATELY
**Cause:** An overcurrent condition has occurred in the braking chopper.
**Remedy:** - check whether the braking resistor has a short circuit.
- for an external braking resistor, check whether the resistor may have been dimensioned too small.
Note:
The braking chopper is only enabled again at pulse enable after the fault has been acknowledged.

## A30057 Power unit: Line asymmetry

**Message class:** Network fault (2)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** Frequencies have been detected on the DC link voltage that would suggest line asymmetry or failure of a line phase.
It is also possible that a motor phase has failed.
Fault F30011 is output if the alarm is present and at the latest after 5 minutes.
The precise duration depends on the power unit type and the particular frequencies. For booksize and chassis power units, the duration also depends on how long the alarm has been active.
Alarm value (r2124, interpret decimal):
Only for internal Siemens troubleshooting.
**Remedy:** - check the line phase connection.
- check the motor feeder cable connections.
If there is no phase failure of the line or motor, then line asymmetry is involved.
- reduce the power in order to avoid fault F30011.

## F30059 Power unit: Internal fan faulty

**Message class:** Auxiliary unit faulted (20)
**Reaction:** OFF2
**Acknowledge:** IMMEDIATELY
**Cause:** The internal power unit fan has failed and is possibly defective.
**Remedy:** Check the internal fan and replace if necessary.

## A30065 (F, N) Voltage measured values not plausible

**Message class:** Power electronics faulted (5)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** The voltage measurement supplies values that are not plausible
Bit01: Phase U.
Bit02: Phase V.
Bit03: Phase W.
**Remedy:** - Deactivate voltage measurement (p247.0 = 0).
- Deactivate flying restart with voltage measurement (p247.5 = 0) and deactivate fast flying restart (p1780.11 = 0).

| | |
|---|---|
| **F30071** | **No new actual values received from the Power Module** |
| **Message class:** | Internal (DRIVE-CLiQ) communication error (12) |
| **Reaction:** | OFF2 |
| **Acknowledge:** | IMMEDIATELY |
| **Cause:** | More than one actual value telegram from the power unit module has failed. |
| **Remedy:** | Check the interface (adjustment and locking) to the power unit module. |

| | |
|---|---|
| **F30072** | **Setpoints can no longer be transferred to the Power Module** |
| **Message class:** | Internal (DRIVE-CLiQ) communication error (12) |
| **Reaction:** | OFF2 |
| **Acknowledge:** | IMMEDIATELY |
| **Cause:** | More than one setpoint telegram was not able to be transferred to the power unit module. |
| **Remedy:** | Check the interface (adjustment and locking) to the power unit module. |

| | |
|---|---|
| **F30074 (A)** | **Communication error between the Control Unit and Power Module** |
| **Message class:** | Internal (DRIVE-CLiQ) communication error (12) |
| **Reaction:** | NONE |
| **Acknowledge:** | IMMEDIATELY |
| **Cause:** | Communications between the Control Unit (CU) and Power Module (PM) via the interface no longer possible. The CU may have been withdrawn or is incorrectly inserted.<br>Fault value (r0949, interpret hexadecimal):<br>0 hex:<br>- a Control Unit with external 24 V supply was withdrawn from the Power Module during operation.<br>- with the Power Module switched off, the external 24 V supply for the Control unit was interrupted for some time.<br>1 hex:<br>The Control Unit was withdrawn from the Power Module during operation, although the encoderless safe motion monitoring functions are enabled. This is not supported. After re-inserting the Control Unit in operation, communications to the Power Module no longer possible.<br>20A hex:<br>The Control Unit was inserted on a Power Module, which has another code number.<br>20B hex:<br>The Control Unit was inserted on a Power Module, which although it has the same code number, has a different serial number. The Control Unit executes an automatic warm restart to accept the new calibration data. |
| **Remedy:** | For fault value = 0 and 20A hex:<br>Insert the Control Unit on an appropriate Power Module and continue operation. If required, carry out a POWER ON of the Control Unit.<br>For fault value = 1 hex:<br>Carry out a POWER ON of the Control Unit. |

| | |
|---|---|
| **F30075** | **Configuration of the power unit unsuccessful** |
| **Message class:** | Internal (DRIVE-CLiQ) communication error (12) |
| **Reaction:** | OFF2 |
| **Acknowledge:** | IMMEDIATELY |
| **Cause:** | A communication error has occurred while configuring the power unit using the Control Unit. The cause is not clear.<br>Fault value (r0949, interpret decimal):<br>0:<br>The output filter initialization was unsuccessful.<br>1:<br>Activation/deactivation of the regenerative feedback functionality was unsuccessful. |
| **Remedy:** | - acknowledge the fault and continue operation.<br>- if the fault reoccurs, carry out a POWER ON (switch off/on).<br>- if required, replace the power unit. |

## F30080 Power unit: Current increasing too quickly

**Message class:** Power electronics faulted (5)
**Reaction:** OFF2
**Acknowledge:** IMMEDIATELY
**Cause:** The power unit has detected an excessive rate of rise in the overvoltage range.
- closed-loop control is incorrectly parameterized.
- motor has a short-circuit or fault to ground (frame).
- U/f operation: Up ramp set too low.
- U/f operation: rated current of motor much greater than that of power unit.
- power cables are not correctly connected.
- power cables exceed the maximum permissible length.
- power unit defective.

Fault value (r0949, interpret bitwise binary):
Bit 0: Phase U.
Bit 1: Phase V.
Bit 2: Phase W.

**Remedy:**
- check the motor data - if required, carry out commissioning.
- check the motor circuit configuration (star-delta)
- U/f operation: Increase up ramp.
- U/f operation: Check assignment of rated currents of motor and power unit.
- check the power cable connections.
- check the power cables for short-circuit or ground fault.
- check the length of the power cables.
- replace power unit.

## F30081 Power unit: Switching operations too frequent

**Message class:** Power electronics faulted (5)
**Reaction:** OFF2
**Acknowledge:** IMMEDIATELY
**Cause:** The power unit has executed too many switching operations for current limitation.
- closed-loop control is incorrectly parameterized.
- motor has a short-circuit or fault to ground (frame).
- U/f operation: Up ramp set too low.
- U/f operation: rated current of motor much greater than that of power unit.
- power cables are not correctly connected.
- power cables exceed the maximum permissible length.
- power unit defective.

Fault value (r0949, interpret bitwise binary):
Bit 0: Phase U.
Bit 1: Phase V.
Bit 2: Phase W.

**Remedy:**
- check the motor data - if required, carry out commissioning.
- check the motor circuit configuration (star-delta)
- U/f operation: Increase up ramp.
- U/f operation: Check assignment of rated currents of motor and power unit.
- check the power cable connections.
- check the power cables for short-circuit or ground fault.
- check the length of the power cables.
- replace power unit.

## F30105 PU: Actual value sensing fault

**Message class:** Power electronics faulted (5)
**Reaction:** OFF2
**Acknowledge:** IMMEDIATELY
**Cause:** At least one incorrect actual value channel was detected on the Power Stack Adapter (PSA).
The incorrect actual value channels are displayed in the following diagnostic parameters.
**Remedy:** Evaluate the diagnostic parameters.
If the actual value channel is incorrect, check the components and if required, replace.

## A30502 Power unit: DC link overvoltage

**Message class:** DC link overvoltage (4)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** The power unit has detected overvoltage in the DC link on a pulse inhibit.
- device connection voltage too high.
- line reactor incorrectly dimensioned.
Alarm value (r0949, interpret decimal):
DC link voltage [1 bit = 100 mV].
See also: r0070 (Actual DC link voltage)
**Remedy:** - check the device supply voltage (p0210).
- check the dimensioning of the line reactor.
See also: p0210 (Drive unit line supply voltage)

## F30662 Error in internal communications

**Message class:** Hardware / software error (1)
**Reaction:** OFF2
**Acknowledge:** POWER ON
**Cause:** A module-internal communication error has occurred.
Fault value (r0949, interpret hexadecimal):
Only for internal Siemens troubleshooting.
**Remedy:** - carry out a POWER ON (power off/on).
- upgrade firmware to later version.
- contact the Hotline.

## F30664 Error while booting

**Message class:** Hardware / software error (1)
**Reaction:** OFF2
**Acknowledge:** POWER ON
**Cause:** An error has occurred during booting.
Fault value (r0949, interpret hexadecimal):
Only for internal Siemens troubleshooting.
**Remedy:** - carry out a POWER ON (power off/on).
- upgrade firmware to later version.
- contact the Hotline.

## N30800 (F) Power unit: Group signal

**Message class:** Power electronics faulted (5)
**Reaction:** OFF2
**Acknowledge:** NONE
**Cause:** The power unit has detected at least one fault.
**Remedy:** Evaluate the other messages that are presently available.

## F30802 Power unit: Time slice overflow

**Message class:** Hardware / software error (1)
**Reaction:** OFF2
**Acknowledge:** IMMEDIATELY
**Cause:** A time slice overflow has occurred.
Fault value (r0949, interpret decimal):
xx: Time slice number xx
**Remedy:** - carry out a POWER ON (power off/on) for all components.
- upgrade firmware to later version.
- contact the Hotline.

## F30804 (N, A) Power unit: CRC

**Message class:** Hardware / software error (1)
**Reaction:** OFF2 (OFF1, OFF3)
**Acknowledge:** IMMEDIATELY
**Cause:** A CRC error has occurred for the power unit.
**Remedy:** - carry out a POWER ON (power off/on) for all components.
- upgrade firmware to later version.
- contact the Hotline.

## F30805 Power unit: EEPROM checksum error

**Message class:** Hardware / software error (1)
**Reaction:** OFF2
**Acknowledge:** IMMEDIATELY
**Cause:** Internal parameter data is corrupted.
Fault value (r0949, interpret hexadecimal):
01: EEPROM access error.
02: Too many blocks in the EEPROM.
**Remedy:** Replace the module.

## F30809 Power unit: Switching information not valid

**Message class:** Hardware / software error (1)
**Reaction:** OFF2
**Acknowledge:** IMMEDIATELY
**Cause:** For 3P gating unit, the following applies:
The last switching status word in the setpoint telegram is identified by the end ID. Such an end ID was not found.
**Remedy:** - carry out a POWER ON (power off/on) for all components.
- upgrade firmware to later version.
- contact the Hotline.

## A30810 (F) Power unit: Watchdog timer

**Message class:** Hardware / software error (1)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** When booting it was detected that the cause of the previous reset was an SAC watchdog timer overflow.
**Remedy:** - carry out a POWER ON (power off/on) for all components.
- upgrade firmware to later version.
- contact the Hotline.

## F30850 Power unit: Internal software error

**Message class:** Hardware / software error (1)
**Reaction:** OFF1 (NONE, OFF2, OFF3)
**Acknowledge:** POWER ON
**Cause:** An internal software error has occurred in the power unit.
Fault value (r0949, interpret decimal):
Only for internal Siemens troubleshooting.
**Remedy:** - replace power unit.
- if required, upgrade the firmware in the power unit.
- contact the Hotline.

## F30903 Power unit: I2C bus error occurred

**Message class:** Hardware / software error (1)
**Reaction:** OFF2 (IASC/DCBRK, NONE, OFF1, OFF3, STOP2)
**Acknowledge:** IMMEDIATELY
**Cause:** Communications error with an EEPROM or A/D converter.
Fault value (r0949, interpret hexadecimal):
80000000 hex:
- internal software error.
00000001 hex ... 0000FFFF hex:
- module fault.
**Remedy:** Re fault value = 80000000 hex:
- upgrade firmware to later version.
Re fault value = 00000001 hex ... 0000FFFF hex:
- replace the module.

## A30920 (F) Temperature sensor fault

**Message class:** Power electronics faulted (5)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** When evaluating the temperature sensor, an error occurred.
Alarm value (r2124, interpret decimal):
1: Wire breakage or sensor not connected (KTY: R > 2120 Ohm).
2: Measured resistance too low (PTC: R < 20 Ohm, KTY: R < 50 Ohm).
**Remedy:** - make sure that the sensor is connected correctly.
- replace the sensor.

## F30950 Power unit: Internal software error

**Message class:** Hardware / software error (1)
**Reaction:** OFF2
**Acknowledge:** POWER ON
**Cause:** An internal software error has occurred.
Fault value (r0949, interpret decimal):
Information about the fault source.
Only for internal Siemens troubleshooting.
**Remedy:** - If necessary, upgrade the firmware in the power unit to a later version.
- contact the Hotline.

## A30999 (F, N) Power unit: Unknown alarm

**Message class:** Power electronics faulted (5)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** An alarm occurred on the power unit that cannot be interpreted by the Control Unit firmware.
This can occur if the firmware on this component is more recent than the firmware on the Control Unit.

Alarm value (r2124, interpret decimal):
Alarm number.
Note:
If required, the significance of this new alarm can be read about in a more recent description of the Control Unit.

**Remedy:** - replace the firmware on the power unit by an older firmware version (r0128).
- upgrade the firmware on the Control Unit (r0018).

### F35950 TM: Internal software error

**Message class:** Hardware / software error (1)
**Reaction:** OFF2 (NONE)
**Acknowledge:** POWER ON
**Cause:** An internal software error has occurred.
Fault value (r0949, interpret decimal):
Information about the fault source.
Only for internal Siemens troubleshooting.
**Remedy:** - If necessary, upgrade the firmware in the Terminal Module to a later version.
- contact the Hotline.

### A50010 (F) PROFINET Name of Station invalid

**Message class:** Communication error to the higher-level control system (9)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** PROFINET Name of Station is invalid.
**Remedy:** Correct the name of the station (p8920) and activate (p8925 = 2).
See also: p8920 (PN Name of Station)

### F50510 FBLOCKS: Logon of the run-time group rejected

**Message class:** General drive fault (19)
**Reaction:** OFF2
**Acknowledge:** IMMEDIATELY
**Cause:** When the run-time groups of the free function blocks attempted to log on with the sampling time management, the logon of at least one run-time group was rejected.
Too many different hardware sampling times may have been assigned to the free function blocks.
**Remedy:** - Check number of available hardware sampling times (T_sample < 8 ms) (r7903).

### F50511 FBLOCKS: Memory no longer available for free function blocks

**Message class:** General drive fault (19)
**Reaction:** OFF2
**Acknowledge:** IMMEDIATELY
**Cause:** When the free function blocks were activated, more memory was requested than was available on the Control Unit.
**Remedy:** Not necessary.

### A50513 (F) FBLOCKS: Run sequence value already assigned

**Message class:** General drive fault (19)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** An attempt was made to assign a run sequence value already assigned to a function block on this drive object to another additional function block on the same drive object. A run sequence value can only be precisely assigned to one function block on one drive object.
**Remedy:** Set another value that is still available on this drive object for the run sequence.

### A50517 FBLOCKS: Int. meas. active

**Message class:** General drive fault (19)
**Reaction:** NONE
**Acknowledge:** NONE
**Cause:** A Siemens internal measurement has been activated.

**Remedy:** Carry out a POWER ON (power off/on) for the Control Unit involved.

## F50518 FBLOCKS: Sampling time of free run-time group differs at download

**Message class:** General drive fault (19)

**Reaction:** NONE

**Acknowledge:** IMMEDIATELY

**Cause:** In the STARTER/SCOUT project that was downloaded, the hardware sampling time of a free run-time group (1 <= p20000[i] <= 256) was set to a value that was either too low or too high.

The sampling time must be between 1 ms and the value r20003 - r20002.

If the sampling time of the selected free run-time group is < 1 ms, the equivalent value of 1 ms is used.

If the value >= r20003, then the sampling time is set to the next higher or the same software sampling time >= r21003.

Fault value (r0949, interpret decimal):

Number of the p20000 index of the run-time group where the sampling time is incorrectly set.

Number of the run-time group = fault value + 1

**Remedy:** - correctly set the sampling time of the run-time group.

- if required, take all of the blocks from the run-time group.

Note:

Fault F50518 only detects an incorrectly parameterized run-time group. If, after correcting p20000[i] in the project, this error occurs again at download, then the run-time group involved should be identified using the fault value (r0949) and the sampling time correctly set.

# Appendix

# A

## Content

## A.1 ASCII table (characters that can be displayed)

The following table includes the decimal and hexadecimal notation of ASCII characters that can be displayed (printable).

Table A-1 ASCII table (characters that can be displayed)

| Character | Decimal | Hexadecimal | Meaning |
|---|---|---|---|
| | 32 | 20 | Space |
| ! | 33 | 21 | Exclamation mark |
| " | 34 | 22 | Quotation mark |
| # | 35 | 23 | Number sign |
| $ | 36 | 24 | Dollar |
| % | 37 | 25 | Percent |
| & | 38 | 26 | Ampersand |
| ’ | 39 | 27 | Apostrophe, closing single quotation mark |
| ( | 40 | 28 | Opening parenthesis |
| ) | 41 | 29 | Closing parenthesis |
| * | 42 | 2A | Asterisk |
| + | 43 | 2B | Plus |
| , | 44 | 2C | Comma |
| - | 45 | 2D | Hyphen, minus |
| . | 46 | 2E | Period, decimal point |
| / | 47 | 2F | Slash, slant |
| 0 | 48 | 30 | Digit 0 |
| 1 | 49 | 31 | Digit 1 |
| 2 | 50 | 32 | Digit 2 |
| 3 | 51 | 33 | Digit 3 |
| 4 | 52 | 34 | Digit 4 |
| 5 | 53 | 35 | Digit 5 |
| 6 | 54 | 36 | Digit 6 |
| 7 | 55 | 37 | Digit 7 |
| 8 | 56 | 38 | Digit 8 |
| 9 | 57 | 39 | Digit 9 |
| : | 58 | 3A | Colon |
| ; | 59 | 3B | Semicolon |
| < | 60 | 3C | Less than |
| = | 61 | 3D | Equals |
| > | 62 | 3E | Greater than |
| ? | 63 | 3F | Question mark |
| @ | 64 | 40 | Commercial At |

Table A-1 ASCII table (characters that can be displayed), continued

| Character | Decimal | Hexadecimal | Meaning |
|---|---|---|---|
| A | 65 | 41 | Capital letter A |
| B | 66 | 42 | Capital letter B |
| C | 67 | 43 | Capital letter C |
| D | 68 | 44 | Capital letter D |
| E | 69 | 45 | Capital letter E |
| F | 70 | 46 | Capital letter F |
| G | 71 | 47 | Capital letter G |
| H | 72 | 48 | Capital letter H |
| I | 73 | 49 | Capital letter I |
| J | 74 | 4A | Capital letter J |
| K | 75 | 4B | Capital letter K |
| L | 76 | 4C | Capital letter L |
| M | 77 | 4D | Capital letter M |
| N | 78 | 4E | Capital letter N |
| O | 79 | 4F | Capital letter O |
| P | 80 | 50 | Capital letter P |
| Q | 81 | 51 | Capital letter Q |
| R | 82 | 52 | Capital letter R |
| S | 83 | 53 | Capital letter S |
| T | 84 | 54 | Capital letter T |
| U | 85 | 55 | Capital letter U |
| V | 86 | 56 | Capital letter V |
| W | 87 | 57 | Capital letter W |
| X | 88 | 58 | Capital letter X |
| Y | 89 | 59 | Capital letter Y |
| Z | 90 | 5A | Capital letter Z |
| [ | 91 | 5B | Opening bracket |
| \ | 92 | 5C | Backslash |
| ] | 93 | 5D | Closing bracket |
| ^ | 94 | 5E | Circumflex |
| _ | 95 | 5F | Underline |
| ‘ | 96 | 60 | Opening single quotation mark |
| a | 97 | 61 | Small letter a |
| b | 98 | 62 | Small letter b |
| c | 99 | 63 | Small letter c |
| d | 100 | 64 | Small letter d |

Table A-1 ASCII table (characters that can be displayed), continued

| Character | Decimal | Hexadecimal | Meaning |
|---|---|---|---|
| e | 101 | 65 | Small letter e |
| f | 102 | 66 | Small letter f |
| g | 103 | 67 | Small letter g |
| h | 104 | 68 | Small letter h |
| i | 105 | 69 | Small letter i |
| j | 106 | 6A | Small letter j |
| k | 107 | 6B | Small letter k |
| l | 108 | 6C | Small letter l |
| m | 109 | 6D | Small letter m |
| n | 110 | 6E | Small letter n |
| o | 111 | 6F | Small letter o |
| p | 112 | 70 | Small letter p |
| q | 113 | 71 | Small letter q |
| r | 114 | 72 | Small letter r |
| s | 115 | 73 | Small letter s |
| t | 116 | 74 | Small letter t |
| u | 117 | 75 | Small letter u |
| v | 118 | 76 | Small letter v |
| w | 119 | 77 | Small letter w |
| x | 120 | 78 | Small letter x |
| y | 121 | 79 | Small letter y |
| z | 122 | 7A | Small letter z |
| { | 123 | 7B | Opening brace |
| \| | 124 | 7C | Vertical line |
| } | 125 | 7D | Closing brace |
| ~ | 126 | 7E | Tilde |

## A.2 Motor code list

Table A-2 Motor code for synchronous motors

| Order number | Motor type (p0300) | Motor code (p0301) |
|---|---|---|
| 1LE400x-1ABxx-xxxx | 204 | 20401 |
| 1LE400x-1BBxx-xxxx | 204 | 20402 |

## A.3 List of abbreviations

**Note**

The following list of abbreviations includes all abbreviations and their meanings used in the entire SINAMICS family of drives.

| Abbreviation | Source of abbreviation | Meaning |
|---|---|---|
| **A** | | |
| A… | Alarm | Alarm |
| AC | Alternating Current | Alternating current |
| ADC | Analog Digital Converter | Analog-digital converter |
| AI | Analog Input | Analog input |
| AIM | Active Interface Module | Active Interface Module |
| ALM | Active Line Module | Active Line Module |
| AO | Analog Output | Analog output |
| AOP | Advanced Operator Panel | Advanced Operator Panel |
| APC | Advanced Positioning Control | Advanced Positioning Control |
| AR | Automatic Restart | Automatic restart |
| ASC | Armature Short-Circuit | Armature short-circuit |
| ASCII | American Standard Code for Information Interchange | American standard code for information interchange |
| AS-i | AS-Interface (Actuator Sensor Interface) | AS-interface (open bus system in automation technology) |
| ASM | Asynchronmotor | Induction motor |
| **B** | | |
| BB | Betriebsbedingung | Operating condition |
| BERO | - | Proximity switch |
| BI | Binector Input | Binector input |
| BIA | Berufsgenossenschaftliches Institut für Arbeitssicherheit | BG-Institute for Occupational Safety and Health |
| BICO | Binector Connector Technology | Binector connector technology |
| BLM | Basic Line Module | Basic Line Module |
| BO | Binector Output | Binector output |
| BOP | Basic Operator Panel | Basic Operator Panel |
| **C** | | |
| C | Capacitance | Capacitance |
| C… | - | Safety message |
| CAN | Controller Area Network | Serial bus system |
| CBC | Communication Board CAN | Communication Board CAN |
| CBE | Communication Board Ethernet | Communication Board PROFINET (Ethernet) |
| CD | Compact Disk | Compact disk |
| CDS | Command Data Set | Command data set |
| CF card | CompactFlash card | CompactFlash card |
| CI | Connector Input | Connector input |

| Abbreviation | Source of abbreviation | Meaning |
|---|---|---|
| CLC | Clearance Control | Clearance control |
| CNC | Computer Numerical Control | Computer-supported numerical control |
| CO | Connector Output | Connector output |
| CO/BO | Connector Output / Binector Output | Connector/binector output |
| COB ID | CAN Object Identification | CAN object identification |
| CoL | Certificate of License | Certificate of License |
| COM | Common contact of a changeover relay | Center contact on a changeover contact |
| COMM | Commissioning | Commissioning |
| CP | Communications Processor | Communications processor |
| CPU | Central Processing Unit | Central processing unit |
| CRC | Cyclic Redundancy Check | Cyclic redundancy check |
| CSM | Control Supply Module | Control Supply Module |
| CU | Control Unit | Control Unit |
| CUA | Control Unit Adapter | Control Unit Adapter |
| CUD | Control Unit DC MASTER | Control Unit DC MASTER |
| **D** | | |
| DAC | Digital Analog Converter | Digital-analog converter |
| DC | Direct Current | Direct current |
| DCB | Drive Control Block | Drive Control Block |
| DCBRK | DC Brake | DC braking |
| DCC | Drive Control Chart | Drive Control Chart |
| DCN | Direct Current Negative | Direct current negative |
| DCP | Direct Current Positive | Direct current positive |
| DDS | Drive Data Set | Drive data set |
| DI | Digital Input | Digital input |
| DI/DO | Digital Input / Digital Output | Bidirectional digital input/output |
| DMC | DRIVE-CLiQ Hub Module Cabinet | DRIVE-CLiQ Hub Module Cabinet |
| DME | DRIVE-CLiQ Hub Module External | DRIVE-CLiQ Hub Module External |
| DMM | Double Motor Module | Double Motor Module |
| DO | Digital Output | Digital output |
| DO | Drive Object | Drive object |
| DP | Decentralized Peripherals | Distributed peripherals |
| DPRAM | Dual Ported Random Access Memory | Dual-port random access memory |
| DQ | DRIVE-CLiQ | DRIVE-CLiQ |
| DRAM | Dynamic Random Access Memory | Dynamic random access memory |
| DRIVE-CLiQ | Drive Component Link with IQ | Drive Component Link with IQ |
| DSC | Dynamic Servo Control | Dynamic Servo Control |
| DTC | Digital Time Clock | Timer |
| **E** | | |
| EASC | External Armature Short-Circuit | External armature short-circuit |
| EDS | Encoder data set | Encoder data set |
| EEPROM | Electrically Erasable Programmable Read-Only Memory | Electrically Erasable Programmable Read-Only-Memory |

| Abbreviation | Source of abbreviation | Meaning |
|---|---|---|
| EGB | Elektrostatisch gefährdete Baugruppen | Electrostatic sensitive devices |
| ELCB | Earth Leakage Circuit-Breaker | Residual current operated circuit breaker |
| ELP | Earth Leakage Protection | Ground-fault monitoring |
| EMC | Electromagnetic Compatibility | Electromagnetic compatibility |
| EMF | Electromotive Force | Electromotive force |
| EMK | Elektromotorische Kraft | Electromotive force |
| EMV | Elektromagnetische Verträglichkeit | Electromagnetic compatibility |
| EN | Europäische Norm | European standard |
| EnDat | Encoder-Data-Interface | Encoder interface |
| EP | Enable Pulses | Enable pulses |
| EPOS | Einfachpositionierer | Basic positioner |
| ES | Engineering System | Engineering system |
| ESB | Ersatzschaltbild | Equivalent circuit diagram |
| ESD | Electrostatic Sensitive Devices | Electrostatic sensitive devices |
| ESM | Essential Service Mode | Essential service mode |
| ESR | Extended Stop and Retract | Extended stop and retract |
| **F** | | |
| F… | Fault | Fault |
| FAQ | Frequently Asked Questions | Frequently asked questions |
| FBLOCKS | Free Blocks | Free function blocks |
| FCC | Function Control Chart | Function control chart |
| FCC | Flux Current Control | Flux current control |
| FD | Function Diagram | Function diagram |
| F-DI | Fail-safe Digital Input | Fail-safe digital input |
| F-DO | Fail-safe Digital Output | Fail-safe digital output |
| FEM | Fremderregter Synchronmotor | Separately excited synchronous motor |
| FEPROM | Flash EPROM | Non-volatile write and read memory |
| FG | Function Generator | Function generator |
| FI | - | Residual current |
| FOC | Fiber-Optic Cable | Fiber-optic cable |
| FP | Funktionsplan | Function diagram |
| FPGA | Field Programmable Gate Array | Field programmable gate array |
| FW | Firmware | Firmware |
| **G** | | |
| GB | Gigabyte | Gigabyte |
| GC | Global Control | Global control telegram (broadcast telegram) |
| GND | Ground | Reference potential for all signal and operating voltages, usually defined as 0 V (also referred to as M) |
| GSD | Generic Station Description | Generic Station Description: Describes the features of a PROFIBUS slave |
| GSV | Gate Supply Voltage | Gate supply voltage |
| GUID | Globally Unique Identifier | Globally unique identifier |

| Abbreviation | Source of abbreviation | Meaning |
|---|---|---|
| **H** | | |
| HF | High Frequency | High frequency |
| HFD | Hochfrequenzdrossel | High-frequency reactor |
| HLA | Hydraulic Linear Actuator | Hydraulic linear drive |
| HLG | Hochlaufgeber | Ramp-function generator |
| HM | Hydraulic Module | Hydraulic Module |
| HMI | Human Machine Interface | Human machine interface |
| HTL | High-Threshold Logic | Logic with high fault threshold |
| HW | Hardware | Hardware |
| **I** | | |
| i. V. | In Vorbereitung | Under development: This property is currently not available |
| I/O | Input/Output | Input/output |
| I2C | Inter-Integrated Circuit | Internal serial data bus |
| IASC | Internal Armature Short-Circuit | Internal armature short-circuit |
| IBN | Inbetriebnahme | Commissioning |
| ID | Identifier | Identification |
| IE | Industrial Ethernet | Industrial Ethernet |
| IEC | International Electrotechnical Commission | International Electrotechnical Commission |
| IF | Interface | Interface |
| IGBT | Insulated Gate Bipolar Transistor | Bipolar transistor with insulated control electrode |
| IGCT | Integrated Gate-Controlled Thyristor | Semiconductor power switch with integrated control electrode |
| IL | Impulslöschung | Pulse suppression |
| IP | Internet Protocol | Internet protocol |
| IPO | Interpolator | Interpolator |
| IT | Isolé Terre | Non-grounded three-phase line supply |
| IVP | Internal Voltage Protection | Internal voltage protection |
| **J** | | |
| JOG | Jogging | Jogging |
| **K** | | |
| KDV | Kreuzweiser Datenvergleich | Data cross-check |
| KHP | Know-How Protection | Know-how protection |
| KIP | Kinetische Pufferung | Kinetic buffering |
| Kp | - | Proportional gain |
| KTY | - | Special temperature sensor |
| **L** | | |
| L | - | Symbol for inductance |
| LED | Light Emitting Diode | Light-emitting diode |
| LIN | Linear motor | Linear motor |
| LR | Lageregler | Position controller |
| LSB | Least Significant Bit | Least significant bit |
| LSC | Line-Side Converter | Line-side converter |

| Abbreviation | Source of abbreviation | Meaning |
|---|---|---|
| LSS | Line-Side Switch | Line-side switch |
| LU | Length Unit | Length unit |
| LWL | Lichtwellenleiter | Fiber-optic cables |
| **M** | | |
| M | - | Symbol for torque |
| M | Mass | Reference potential for all signal and operating voltages, usually defined as 0 V (also referred to as GND) |
| MB | Megabyte | Megabyte |
| MCC | Motion Control Chart | Motion Control Chart |
| MDI | Manual Data Input | Manual data input |
| MDS | Motor Data Set | Motor data set |
| MLFB | Maschinenlesbare Fabrikatebezeichnung | Machine-readable product code |
| MM | Motor Module | Motor Module |
| MMC | Man-Machine Communication | Man-machine communication |
| MMC | Micro Memory Card | Micro memory card |
| MSB | Most Significant Bit | Most significant bit |
| MSC | Motor-Side Converter | Motor-side converter |
| MSCY_C1 | Master Slave Cycle Class 1 | Cyclic communication between master (class 1) and slave |
| MSR | Motorstromrichter | Motor-side converter |
| MT | Messtaster | Probe |
| **N** | | |
| N. C. | Not Connected | Not connected |
| N… | No Report | No report or internal message |
| NAMUR | Normenarbeitsgemeinschaft für Mess- und Regeltechnik in der chemischen Industrie | Standardization association for measurement and control in chemical industries |
| NC | Normally Closed (contact) | NC contact |
| NC | Numerical Control | Numerical control |
| NEMA | National Electrical Manufacturers Association | Standardization body in the US |
| NM | Nullmarke | Zero mark |
| NO | Normally Open (contact) | NO contact |
| NSR | Netzstromrichter | Line-side converter |
| NVRAM | Non-Volatile Random Access Memory | Non-volatile read/write memory |
| **O** | | |
| OA | Open Architecture | Software component (technology package) which provides additional functions for the SINAMICS drive system |
| OAIF | Open Architecture Interface | Version of the SINAMICS firmware from which the OA-application can be used |
| OASP | Open Architecture Support Package | Expands the STARTER commissioning tool by the corresponding OA-application |
| OC | Operating Condition | Operating condition |
| OEM | Original Equipment Manufacturer | Original equipment manufacturer |

| Abbreviation | Source of abbreviation | Meaning |
|---|---|---|
| OLP | Optical Link Plug | Bus connector for fiber-optic cable |
| OMI | Option Module Interface | Option Module Interface |
| **P** | | |
| p… | - | Setting parameters |
| P1 | Processor 1 | CPU 1 |
| P2 | Processor 2 | CPU 2 |
| PB | PROFIBUS | PROFIBUS |
| PcCtrl | PC Control | Master control |
| PD | PROFIdrive | PROFIdrive |
| PDS | Power unit Data Set | Power unit data set |
| PE | Protective Earth | Protective ground |
| PELV | Protective Extra-Low Voltage | Safety extra-low voltage |
| PEM | Permanenterregter Synchronmotor | Permanent-magnet synchronous motor |
| PG | Programmiergerät | Programming device |
| PI | Proportional Integral | Proportional integral |
| PID | Proportional Integral Differential | Proportional integral differential |
| PLC | Programmable Logic Controller | Programmable logic controller |
| PLL | Phase-Locked Loop | Phase-locked loop |
| PM | Power Module | Power Module |
| PN | PROFINET | PROFINET |
| PNO | PROFIBUS Nutzerorganisation | PROFIBUS user organization |
| PPI | Point-to-Point Interface | Point-to-point interface |
| PRBS | Pseudo Random Binary Signal | White noise |
| PROFIBUS | Process Field Bus | Serial data bus |
| PS | Power Supply | Power supply |
| PSA | Power Stack Adapter | Power Stack Adapter |
| PTC | Positive Temperature Coefficient | Positive temperature coefficient |
| PTP | Point-To-Point | Point-to-point |
| PWM | Pulse Width Modulation | Pulse width modulation |
| PZD | Prozessdaten | Process data |
| **Q** | | |
| **R** | | |
| r … | - | Display parameters (read only) |
| RAM | Random Access Memory | Read/write memory |
| RCCB | Residual Current Circuit Breaker | Residual current operated circuit breaker |
| RCD | Residual Current Device | Residual current operated circuit breaker |
| RCM | Residual Current Monitor | Residual current monitor |
| RFG | Ramp-Function Generator | Ramp-function generator |
| RJ45 | Registered Jack 45 | Term for an 8-pin socket system for data transmission with shielded or non-shielded multi-wire copper cables |
| RKA | Rückkühlanlage | Cooling unit |
| RLM | Renewable Line Module | Renewable Line Module |

| Abbreviation | Source of abbreviation | Meaning |
|---|---|---|
| RO | Read Only | Read only |
| ROM | Read-Only Memory | Read-only memory |
| RPDO | Receive Process Data Object | Receive process data object |
| RS 232 | Recommended Standard 232 | Interface standard for cable-connected serial data transmission between a sender and receiver (also known as EIA232) |
| RS485 | Recommended Standard 485 | Interface standard for a cable-connected differential, parallel, and/or serial bus system (data transmission between a number of senders and receivers, also known as EIA485) |
| RTC | Real-Time Clock | Real-time clock |
| RZA | Raumzeigerapproximation | Space vector approximation |
| **S** | | |
| S1 | - | Continuous duty |
| S3 | - | Intermittent duty |
| SAM | Safe Acceleration Monitor | Safe acceleration monitoring |
| SBC | Safe Brake Control | Safe brake control |
| SBH | Sicherer Betriebshalt | Safe operating stop |
| SBR | Safe Brake Ramp | Safe brake ramp monitoring |
| SBT | Safe Brake Test | Safe brake test |
| SCA | Safe Cam | Safe cam |
| SD Card | SecureDigital Card | Secure digital memory card |
| SDI | Safe Direction | Safe motion direction |
| SE | Sicherer Software-Endschalter | Safe software limit switches |
| SG | Sicher reduzierte Geschwindigkeit | Safely-limited speed |
| SGA | Sicherheitsgerichteter Ausgang | Safety-related output |
| SGE | Sicherheitsgerichteter Eingang | Safety-related input |
| SH | Sicherer Halt | Safe standstill |
| SI | Safety Integrated | Safety Integrated |
| SIL | Safety Integrity Level | Safety integrity level |
| SLM | Smart Line Module | Smart Line Module |
| SLP | Safely-Limited Position | Safely limited position |
| SLS | Safely-Limited Speed | Safely-limited speed |
| SLVC | Sensorless Vector Control | Vector control without encoder |
| SM | Sensor Module | Sensor Module |
| SMC | Sensor Module Cabinet | Sensor Module Cabinet |
| SME | Sensor Module External | Sensor Module External |
| SMI | Sensor Module Integrated | SINAMICS Sensor Module Integrated |
| SMM | Single Motor Module | Single Motor Module |
| SN | Sicherer Software-Nocken | Safe software cam |
| SOS | Safe Operating Stop | Safe operating stop |
| SP | Service Pack | Service pack |
| SP | Safe Position | Safe position |
| SPC | Setpoint Channel | Setpoint channel |

| Abbreviation | Source of abbreviation | Meaning |
|---|---|---|
| SPI | Serial Peripheral Interface | Serial peripheral interface |
| SPS | Speicherprogrammierbare Steuerung | Programmable Logic Controller |
| SS1 | Safe Stop 1 | Safe stop 1 (monitored for time and ramp) |
| SS2 | Safe Stop 2 | Safe stop 2 |
| SSI | Synchronous Serial Interface | Synchronous serial interface |
| SSM | Safe Speed Monitor | Safe feedback from speed monitor |
| SSP | SINAMICS Support Package | SINAMICS support package |
| STO | Safe Torque Off | Safe torque off |
| STW | Steuerwort | Control word |
| **T** | | |
| TB | Terminal Board | Terminal Board |
| TIA | Totally Integrated Automation | Totally Integrated Automation |
| TM | Terminal Module | Terminal Module |
| TN | Terre Neutre | Grounded three-phase line supply |
| Tn | - | Integral-action time |
| TPDO | Transmit Process Data Object | Transmit process data object |
| TT | Terre Terre | Grounded three-phase line supply |
| TTL | Transistor-Transistor Logic | Transistor-transistor logic |
| Tv | - | Derivative action time |
| **U** | | |
| UL | Underwriters Laboratories Inc. | Underwriters Laboratories Inc. |
| UPS | Uninterruptible Power Supply | Uninterruptible power supply |
| USV | Unterbrechungsfreie Stromversorgung | Uninterruptible power supply |
| UTC | Universal Time Coordinated | Universal time coordinated |
| **V** | | |
| VC | Vector Control | Vector control |
| Vdc | - | DC-link voltage |
| VdcN | - | Partial DC-link voltage, negative |
| VdcP | - | Partial DC-link voltage, positive |
| VDE | Verband Deutscher Elektrotechniker | Association of German Electrical Engineers |
| VDI | Verein Deutscher Ingenieure | Association of German Engineers |
| VPM | Voltage Protection Module | Voltage Protection Module |
| Vpp | Volt peak to peak | Volt peak-to-peak |
| VSM | Voltage Sensing Module | Voltage Sensing Module |
| **W** | | |
| WEA | Wiedereinschaltautomatik | Automatic restart |
| WZM | Werkzeugmaschine | Machine tool |
| **X** | | |
| XML | Extensible Markup Language | Extensible Markup Language (standard language for Web publishing and document management) |

| Abbreviation | Source of abbreviation | Meaning |
|---|---|---|
| **Y** | | |
| **Z** | | |
| ZK | Zwischenkreis | DC link |
| ZM | Zero Mark | Zero mark |
| SW | Zustandswort | Status word |

# Index

## Numbers

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