

Quick Start Guide—TECDrive TDI20-EU

1 Safety precautions

	<ul style="list-style-type: none"> Do not refit the inverter unauthorizedly; otherwise fire, electric shock or other injury may occur. Please install the inverter on fire-retardant material and keep the inverter away from combustible materials. Connect the braking optional parts according to the wiring diagram. Do not operate on the inverter if there is any damage or components loss to the inverter. Do not touch the inverter with wet items or body, otherwise electric shock may occur. 								
	<ul style="list-style-type: none"> Only qualified electricians are allowed to operate on the inverter. Do not carry out any wiring and inspection or changing components when the power supply is applied. Ensure all input power supply is disconnected before wiring and checking and always wait for at least the time designated on the inverter or until the DC bus voltage is less than 36V. Below is the table of the waiting time: <table border="1"> <thead> <tr> <th>Inverter model</th> <th>Minimum waiting time</th> </tr> </thead> <tbody> <tr> <td>1PH 220V 0.4kW-2.2kW</td> <td>5 minutes</td> </tr> <tr> <td>3PH 220V 0.4kW-7.5kW</td> <td>5 minutes</td> </tr> <tr> <td>3PH 380V 0.75kW-110kW</td> <td>5 minutes</td> </tr> </tbody> </table>	Inverter model	Minimum waiting time	1PH 220V 0.4kW-2.2kW	5 minutes	3PH 220V 0.4kW-7.5kW	5 minutes	3PH 380V 0.75kW-110kW	5 minutes
Inverter model	Minimum waiting time								
1PH 220V 0.4kW-2.2kW	5 minutes								
3PH 220V 0.4kW-7.5kW	5 minutes								
3PH 380V 0.75kW-110kW	5 minutes								

2 Type designation key

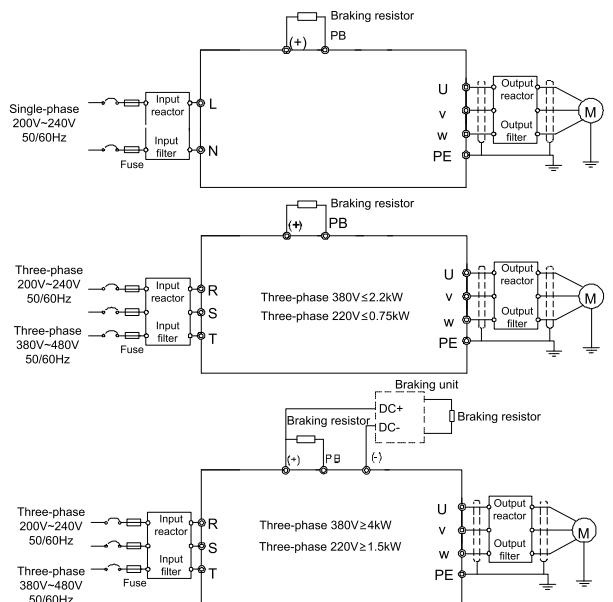
TDI20 - 2R2G - 4 - B - EU

① ② ③ ④ ⑤

Key	No.	Instruction	Content
Product abbreviation	①	Abbreviation for product series	TDI20: TDI20 is short for TECDrive Industrial TDI20-EU
Rated power	②	Power range + load type	055: 55kW; G: Constant torque load
Voltage degree	③	Voltage degree	S2: 1PH 220V (-15%)V – 240V (+10%) 2: 3PH 220V (-15%)V – 240V (+10%) 4: 3PH 380V (-15%)V – 440V (+10%)
Additional remark 1	④	Built-in braking unit	Null: Built-in braking unit is standard configuration for models ≤ 37kW -B: Built-in braking unit is optional for models ≥ 45kW, -B is its built-in braking unit model
Additional remark 2	⑤		EU: Built-in safe torque off function

3 Standard wiring

3.1 Main circuit

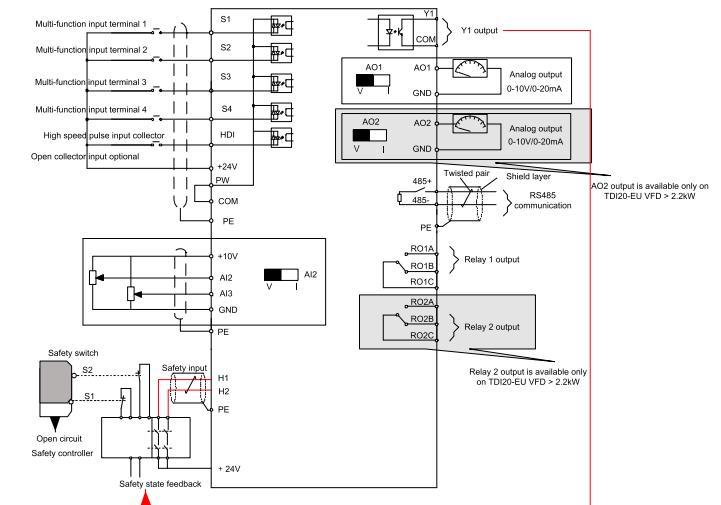


Terminal	Function
L, N	Single phase AC input terminals which are generally connected with the power supply.
R, S, T	Three phase AC input terminals which are generally connected with the power supply.
PB, (+)	External dynamic braking resistor terminal
(+), (-)	Input terminal of the DBU or DC bus
U, V, W	Three phase AC input terminals which are generally connected with the motor.
PE	Protective grounding terminal

Note:

- Do not use asymmetrically motor cables. If there is a symmetrically grounding conductor in the motor cable in addition to the conductive shield, connect the grounding conductor to the grounding terminal at the inverter and motor ends.
- Route the motor cable, input power cable and control cables separately.

3.2 Control circuit



3.3 Terminals of control circuit

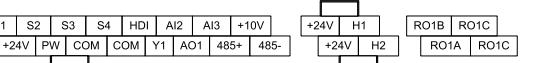


Figure 3-1 Connection terminal diagram for inverters ≤ 2.2kW

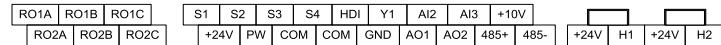
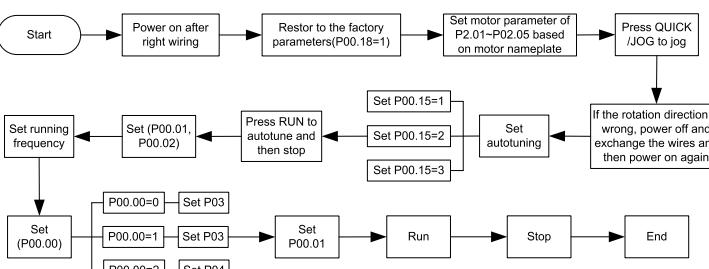


Figure 3-2 Connection terminal diagram for inverters ≥ 4kW

Type	Terminal name	Function description	Technical specifications
Communication			
	485+	485 communication	485 communication interface
	485-		
Digital input/output	S1	Digital input	1. Internal impedance: 3.3kΩ 2. 12 – 30V voltage input is available 3. The terminal is the dual-direction input terminal 4. Max. input frequency: 1kHz
	S2		
	S3		
	S4		
Digital input/output	HDI	High frequency input channel	Except for S1 – S4, this terminal can be used as high frequency input channel. Max input frequency: 50kHz Duty cycle: 30% – 70%
	PW	Digital power supply	To provide the external digital power supply Voltage range: 12 – 30V
	Y1	Digital output	1. Contact capacity: 50mA/30V; 2. Output frequency range: 0 – 1kHz; 3. Default is STO state output indicator.
	24V-H1	STO input 1	1. Safe torque stop (STO) redundant input, externally connected to NC contact, STO acts when the contact is open, and the drive stops output; 2. The safe input signal cable should be shield cable within 25m. 3. When employing STO function, please disassemble the short circuit plate on the terminals shown in Figure 3-1 and Figure 3-2.
STO function input	24V-H2	STO input 2	1. Safe torque stop (STO) redundant input, externally connected to NC contact, STO acts when the contact is open, and the drive stops output; 2. The safe input signal cable should be shield cable within 25m. 3. When employing STO function, please disassemble the short circuit plate on the terminals shown in Figure 3-1 and Figure 3-2.
	+24V	24V power supply	External 24V±10% power supply and the maximum output current is 200mA. Generally used as the operation power supply of digital input and output or external sensor power supply
	COM		
	+10V	External 10V reference power supply	10V reference power supply Max output current: 50mA As the adjusting power supply of the external potentiometer Potentiometer resistance: 5kΩ above
Analog input/output	AI2		1. Input range: AI2 voltage and current can be chose: 0 – 10V/0 – 20mA; AI3: -10V – +10V. 2. Input impedance: voltage input: 20kΩ; current input: 5000Ω. 3. Voltage or current input can be set by DIP switch. 4. Resolution: the minimum AI2/AI3 is 10mV/20mV when 10V corresponds to 50Hz.
	AI3	Analog input	

Type	Terminal name	Function description	Technical specifications
	GND	Analog reference ground	Analog reference ground
	AO1		
	AO2	Analog output	1. Output range: 0 – 10V voltage or 0 – 20mA current; 2. Voltage or current output is set by jumpers or toggle switch; 3. Error ±1%, 25°C; 4. There is only one AO1 for inverters ≤ 2.2kW.
Relay output	RO1A	Relay 1 NO contact	1. Contact capacity: 3A/AC250V, 1A/DC30V;
	RO1B	Relay 1 NC contact	2. Please note that it should not be used as high frequency switch output;
	RO1C	Relay 1 common contact	3. There is only one relay output for inverters ≤ 2.2kW.
	RO2A	Relay 2 NO contact	
	RO2B	Relay 2 NC contact	
	RO2C	Relay 2 common contact	

4 Diagram of quick start-up



5 Parameters setting

○: The parameter setting can be modified in both stopped and running states.

○: The parameter setting cannot be modified in running state.

●: The parameter setting is the actually detected value and cannot be modified.

The inverter automatically checks and constrains the modification of parameters, helping prevent incorrect modifications.

Function code	Name	Detailed instruction of parameters	Default value	Modify
P00 Group Basic function group				
P00.00	Speed control mode	0: SVC 0 1: SVC 1 2:SVPWM control	1	○
P00.01	Run command channel	0:Keypad running command channel 1:Terminal running command channel 2:Communication running command channel	0	○
P00.03	Max. output frequency	P00.04~400.00Hz	50.00 Hz	○
P00.04	Upper limit of the running frequency	P00.05~P00.03 (Max. output frequency)	50.00 Hz	○
P00.05	Lower limit of the running frequency	0.00Hz~P00.04 (Upper limit of the running frequency)	0.00Hz	○
P00.06	A frequency command selection	0:Keypad data setting 1:Analog AI1 setting(corresponding keypad potentiometer) 2:Analog AI2 setting(corresponding terminal AI2) 3:Analog AI3 setting(corresponding terminal AI3) 4:High-speed pulse HDI setting 5:Simple PLC program setting 6:Multi-step speed running setting 7:PID control setting 8:MODBUS communication setting	0	○
P00.07	B frequency command selection		2	○
P00.08	B frequency command reference selection	0:Maximum output frequency, 1: A frequency command,	0	○
P00.09	Combination of the setting source	0: A 1: B 2: A+B 3: A-B 4: Max (A, B) 5: Min (A, B)	0	○
P00.10	Keypad set frequency	0.00 Hz~P00.03 (the Max. frequency)	50.00Hz	○
P00.11	ACC time 1	Setting range of P00.11 and P00.12:0.0~3600.0s	Depend on model	○
P00.12	DEC time 1			
P00.13	Running direction selection	0: Runs at the default direction 1: Runs at the opposite direction 2: Forbid to run in reverse direction	0	○
P00.14	Carrier frequency setting	1.0~15.0kHz	Depend on model	○
P00.15	Motor parameter autotuning	0: No operation 1: Rotation autotuning 2: Static autotuning 1(autotune totally) 3: Static autotuning 2(autotune part parameters)	0	○

Function code	Name	Detailed instruction of parameters	Default value	Modify
P00.16	AVR function selection	0:Invalid 1:Valid during the whole procedure	1	○
P00.18	Function restore parameter	0:No operation 1:Restore the default value 2:Clear fault records 3: Lock all function codes	0	○
P01 Group Start-up and stop control				
P01.00	Start mode	0:Start-up directly 1:Start-up after DC braking 2: Start after speed tracking 1 3: Start after speed tracking 2	0	○
P01.08	Stop selection	0: Decelerate to stop 1: Coast to stop	0	○
P01.09	Starting frequency of DC braking	Setting range of P01.09: 0.00Hz~P00.03 (the Max. frequency)	0.00Hz	○
P01.10	Waiting time before DC braking	Setting range of P01.10: 0.00~50.00s	0.00s	○
P01.11	DC braking current	Setting range of P01.11: 0.0~100.0%	0.0%	○
P01.12	DC braking time	Setting range of P01.12: 0.00~50.00s	0.00s	○
P01.18				

Function code	Name	Detailed instruction of parameters	Default value	Modify
P04.01	Torque boost	The setting range of P04.01: 0.0%:(automatic), 0.1%~10.0%	0.0%	<input type="radio"/>
P04.02	Torque boost close	The setting range of P04.02: 0.0%~50.0%	20.0%	<input type="radio"/>
P04.03	V/F frequency point 1	Setting range of P04.03: 0.00Hz~P04.05	0.00Hz	<input type="radio"/>
P04.04	V/F voltage point 1	Setting range of P04.04, P04.06 and P04.08: 0.0%~110.0% (rated motor voltage)	0.0%	<input type="radio"/>
P04.05	V/F frequency point 2	Setting range of P04.05:P04.03~P04.07	0.00Hz	<input type="radio"/>
P04.06	V/F voltage point 2	Setting range of P04.07: P04.05~P02.02 (rated motor voltage frequency)	0.0%	<input type="radio"/>
P04.07	V/F frequency point 3	Setting range of P04.08: 0.0~200.0%	0.00Hz	<input type="radio"/>
P04.09	V/F slip compensation gain	$\Delta f = f_0 \cdot n^p / 60$ Setting range: 0.0~200.0%	100.0%	<input type="radio"/>
P04.10	Low frequency vibration control factor	Setting range of P04.10: 0~100	10	<input type="radio"/>
P04.11	High frequency vibration control factor	Setting range of P04.11: 0~100	10	<input type="radio"/>
P04.12	Vibration control threshold	Setting range of P04.12: 0.00Hz~P00.03 (the Max. frequency)	30.00 Hz	<input type="radio"/>
P04.26	Energy-saving operation selection	0:No operation 1:Automatic energy-saving operation	0	<input type="radio"/>
P05 Group Input terminals				
P05.00	HDI input selection	0: HDI is high pulse input. 1: HDI is switch input	0	<input type="radio"/>
P05.01	S1 terminals function selection	0: No function 1: Forward rotation operation 2: Reverse rotation operation 3: 3-wire control operation	1	<input type="radio"/>
P05.02	S2 terminals function selection	4: Forward jogging 5: Reverse jogging	4	<input type="radio"/>
P05.03	S3 terminals function selection	6: Coast to stop 7: Fault reset 8: Operation pause 9: External fault input 10: Increasing frequency setting(UP) 11: Decreasing frequency setting(DOWN)	7	<input type="radio"/>
P05.04	S4 terminals function selection	12: Cancel the frequency change setting 13: Shift between A setting and B setting 14: Shift between combination setting and A setting 15: Shift between combination setting and B setting	0	<input type="radio"/>
P05.05	S5 terminals function selection	16: Multi-step speed terminal 1 17: Multi-step speed terminal 2 18: Multi-step speed terminal 3 19: Multi-step speed terminal 4 20: Multi-step speed pause 21: ACC/DEC time 1 22: ACC/DEC time 2 23: Simple PLC stop reset 24: Simple PLC pause 25: PID control pause 26: Traverse Pause(stop at the current frequency)	0	<input type="radio"/>
P05.06	S6 terminals function selection	27: Traverse reset(return to the center frequency) 28: Counter reset 29: Torque control prohibition 30: ACC/DEC prohibition 31: Counter trigger 33: Cancel the frequency change setting temporarily 34: DC brake 36: Shift the command to the keypad 37: Shift the command to the terminals 38: Shift the command to the communication 39: Pre-magnetized command 40: Clear the power 41: Keep the power 42: PID pole switching	0	<input type="radio"/>
P05.09	HDI terminals function selection	43: Motor overheat(OH1) 44: Motor overheat(OH2) 45: External fault(EF) 46: 485 communication fault(CE) 47: Current detection fault(IIE) 48: Motor autotune fault(IIE) 49: EEPROM operation fault(EEP) 50: PID response offline fault(PIDE) 51: Running time arrival(END) 52: Electrical overload(OL3) 53: PCE 54: UPE 55: DNE 56: Speed deviation fault(dEu) 57: Maladjustment(STo) 58: Underload fault(LL) 59: Safe torque off (STO) 60: Channel 1 is abnormal (STL1) 61: Channel 2 is abnormal (STL2) 62: Channel 1 and channel 2 become abnormal simultaneously (STL3) 63: Safety code FLASH CRC check fault (CrCE)	0	<input type="radio"/>
P05.32	Lower limit of AI1	0.00V~P05.34	0.00V	<input type="radio"/>
P05.33	Corresponding setting of the lower limit of AI1	-100.0%~100.0%	0.0%	<input type="radio"/>
P05.34	Upper limit of AI1	P05.32~10.00V	10.00V	<input type="radio"/>
P05.35	Corresponding setting of the upper limit of AI1	-100.0%~100.0%	100.0%	<input type="radio"/>
P05.36	AI1 input filter time	0.000s~10.000s	0.100s	<input type="radio"/>
P05.37	Lower limit of AI2	0.00V~P05.39	0.00V	<input type="radio"/>
P05.38	Corresponding setting of the lower limit of AI2	-100.0%~100.0%	0.0%	<input type="radio"/>
P05.39	Upper limit of AI2	P05.37~10.00V	10.00V	<input type="radio"/>
P05.40	Corresponding setting of the upper limit of AI2	-100.0%~100.0%	100.0%	<input type="radio"/>

Function code	Name	Detailed instruction of parameters	Default value	Modify
P05.41	AI2 input filter time	0.000s~10.000s	0.100s	<input type="radio"/>
P06 Group Output terminals				
P06.01	Y1 output selection	0:Invalid 1:In operation	27	<input type="radio"/>
P06.03	Relay RO1 output selection	2:Forward rotation operation 3:Reverse rotation operation 4:Jogging operation 5:The inverter fault 6:Frequency degree test FDT1 7:Frequency degree test FDT2 8:Frequency arrival 9:Zero speed running 10:Upper limit frequency arrival 11:Lower limit frequency arrival 12:Ready for operation 13:Pre-magnetizing 14:Overload pre-alarm 15:Underload pre-alarm 16:Completion of simple PLC stage 17:Completion of simple PLC cycle 18:Setting count value arrival 19:Defined count value arrival 20:External fault valid 22:Running time arrival 23:MODBUS communication virtual terminals output 24~25:Reserved 26:Establishment of DC bus voltage 27:STO action 28~30:Reserved	1	<input type="radio"/>
P06.04	Relay RO2 output selection	5	<input type="radio"/>	
P06.14	AO1 output selection	0:Running frequency 1:Setting frequency 2:Ramp reference frequency 3:Running rotation speed 4:Output current (relative to 2 times rated current of the inverter) 5:Output current (relative to 2 times rated current of the motor) 6:Output voltage 7:Output power 8:Set torque value 9:Output torque 10:Analog AI1 input value 11:Analog AI2 input value 12:Analog AI3 input value 13:High speed pulse HDI input value 14:MODBUS communication set value 1 15:MODBUS communication set value 2 22:Torque current (corresponds to 3 times rated current of the motor) 23:Ramp reference frequency (with sign)	0	<input type="radio"/>
P06.15	AO2 output selection	0	<input type="radio"/>	
P07.27	Current fault type	0:No fault 1:OC1 2:OC2 3:OC3 4:OV1 5:OV2 6:OV3 7:UV 8:Motor overload(OL1) 9:The inverter overload(OL2) 10:Input side phase loss(SPI) 11:Output side phase loss(SPO) 12:Overheat of the rectifier module(OH1) 13:Overheat fault of the inverter module(OH2) 14:External fault(EF) 15:485 communication fault(CE) 16:Current detection fault(IIE) 17:Motor autotune fault(IIE) 18:EEPROM operation fault(EEP) 19:PID response offline fault(PIDE) 20:Running time arrival(END) 21:Electrical overload(OL3) 22:PCE 23:UPE 24:DNE 25:Speed deviation fault(dEu) 26:Maladjustment(STo) 27:Underload fault(LL) 28:Safe torque off (STO) 29:Channel 1 is abnormal (STL1) 30:Channel 2 is abnormal (STL2) 31:Channel 1 and channel 2 become abnormal simultaneously (STL3) 32:Safety code FLASH CRC check fault (CrCE)	●	
P07.28	Previous fault type	●		
P07.29	Previous 2 fault type	●		
P07.30	Previous 3 fault type	●		
P07.31	Previous 4 fault type	●		
P07.32	Previous 5 fault type	●		
P07.33	Current fault running frequency	0.00Hz	●	

Function code	Name	Detailed instruction of parameters	Default value	Modify
P07.34	Ramp reference frequency at current fault		0.00Hz	
P07.35	Output voltage at the current fault		0V	
P07.36	Output current at the current fault		0.0A	
P07.37	Current bus voltage at the current fault		0.0V	
P07.38	The Max. temperature at the current fault		0.0°C	
P07.39	Input terminals state at the current fault		0	●
P07.40	Output terminals state at the current fault		0	●
P08 Group Enhanced functions				
P08.27	Setting running time	0~65535min	0min	<input type="radio"/>
P08.28	Time of fault reset	0~10	0	<input type="radio"/>
P08.29	Interval time of automatic fault reset	0.1~100.0s	1.0s	<input type="radio"/>
P08.37	Energy Braking enable	0:Disabled 1:Enabled	0	<input type="radio"/>
P08.38	Energy braking threshold voltage	200.0~2000.0V	220V voltage: 380.0V 460V voltage: 740.0V	<input type="radio"/>
P08.39	Cooling fan running mode	0:Rated running mode 1:The fan keeps on running after power on	0	<input type="radio"/>
P08.50	Magnetic flux braking	0: Invalid. 100~150: the bigger the coefficient, the bigger the braking strength.	0	<input type="radio"/>
P08.51	Input power factor of the inverter	0.00~1.00	0.56	<input type="radio"/>
P09 Group PID control				
P09.00	PID reference source	0:Keypad digital given(P09.01) 1:Analog channel AI1 given 2:Analog channel AI2 given 3:Analog channel AI3 set 4:High speed pulse HDI set 5:Multi-step speed set 6:MODBUS communication set	0	<input type="radio"/>
P09.01	Keypad PID preset	-100.0%~100.0%	0.0%	<input type="radio"/>
P09.02	PID feedback source	0:Analog channel AI1 feedback 1:Analog channel AI2 feedback 2:Analog channel AI3 feedback 3:High speed HDI feedback 4:MODBUS communication feedback	0	<input type="radio"/>
P09.03	PID output feature	0: PID output is positive 1: PID output is negative	0	<input type="radio"/>
P09.04	Proportional gain (Kp)	0.00~100.00	1.00	<input type="radio"/>
P09.05	Interval time(Ti)	0.00~10.00s	0.10s	<input type="radio"/>
P09.06	Differential time(Td)	0.00~10.00s	0.00s	<input type="radio"/>
P09.07	Sampling cycle(T)	0.001~10.000s	0.100s	<input type="radio"/>
P09.08	PID control deviation limit	0.0~100.0%	0.0%	<input type="radio"/>
P09.09	Output upper limit of PID	P09.10~100.0%	100.0%	<input type="radio"/>
P09.10	Output lower limit of PID	-100.0%~P09.09	0.0%	<input type="radio"/>
P11 Group Protective parameters				
P11.00	Phase loss protection	0x00~0x11 LED ones: 0: Input phase loss protection disable 1: Input phase loss protection enable LED tens: 0: Output phase loss protection disable 1: Output phase loss protection enable	0x10	<input type="radio"/>
P11.01	Frequency-decreasing ratio at sudden power loss	0: Enabled 1: Disabled	0	<input type="radio"/>
P11.02	Frequency-decreasing ratio at sudden power loss	0.00Hz/s~P00.03 (the Max. frequency)	10.00Hz/s	<input type="radio"/>
P11.03	Overvoltage stall protection	0:Disabled 1:Enabled	1	<input type="radio"/>
P11.04	Overvoltage stall voltage protection	120~150%(standard bus voltage)(460V) 120~150%(standard bus voltage)(220V)	136% 115%	<input type="radio"/>

Function code	Name	Detailed instruction of parameters	Default value	Modify
P11.05	Current limit action	Setting range of P11.05: 0:current limit invalid 1:current limit valid	0x01	<input type="radio"/>
P11.06	Automatic current limit level	160.0%	<input type="radio"/>	
P11.07	The decreasing ratio during current limit	Setting range of P11.05: 0x00~0x12 Setting range of P11.06: 50.0~200.0% Setting range of P11.07: 0.00~50.0Hz/s	10.00Hz/s	<input type="radio"/>
P11.08	Overload pre-alarm of the motor/ inverter	Setting range of P11.08: 0x000~0x131 LED ones: 0:Overload pre-alarm of the motor 1:Overload pre-alarm of the inverter	0x000	<input type="radio"/>
P11.09	Overload pre-alarm test level	150%	<input type="radio"/>	
P11.10	Overload pre-alarm detection time	Setting range of P11.09: P11.11~200.0s LED hundreds : 0:Detection all the time 1:Detection in constant running Setting range of P11.10: 0.1~3600.0s	1.0s	<input type="radio"/>
P11.11	Detection level of the underload pre-alarm	0~P11.09	50%	<input type="radio"/>
P11.12	Detection time of the underload pre-alarm	0.1~3600.0s	1.0s	<input type="radio"/>
P11.13	Output terminal action selection during fault	0x00~0x11 LED ones: 0:Action under fault undervoltage 1:No action under fault undervoltage LED tens: 0:Action during the automatic reset 1:No action during the automatic reset	0x00	<input type="radio"/>
P11.14	Speed deviation detection</			