SIEMENS

SINAMICS drives

SINAMICS DCM

Commutation reactors

Operating Instructions

Edition 11/2013

Answers for industry.

SIEMENS

SINAMICS

SINAMICS DCM commutating reactors

Operating Instructions

Safety notes 1

Description 2

Mechanical installation 3

Electrical installation 4

Configuring 5

Technical data 6

Dimension drawings 7

Appendix A

11/2013

A5E32621741B

Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

⚠ DANGER

indicates that death or severe personal injury **will** result if proper precautions are not taken.

⚠ WARNING

indicates that death or severe personal injury **may** 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 degree of danger is present, the warning notice representing the highest degree of danger will be 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 be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, 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 may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

Trademarks

All names identified by ® are registered trademarks of Siemens AG. The remaining trademarks in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owner.

Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

Siemens AG
Industry Sector
Postfach 48 48
90026 NÜRNBERG
GERMANY

Order number: A5E32621741B
℗ 11/2013 Technical data subject to change

Copyright © Siemens AG 2013.
All rights reserved

Table of contents

1 Safety notes 7

1.1 Warning notices 7

1.2 Safety and application instructions 8

2 Description 11

3 Mechanical installation 13

4 Electrical installation 17

5 Configuring 23

5.1 Commutating reactor rectifier assignment 23

6 Technical data 25

7 Dimension drawings 33

A Appendix 67

A.1 Customer Service 67

A.2 Environment 68

A.3 Standards, certifications 69

Safety notes

1

1.1 Warning notices



⚠ WARNING

Dangerous electrical voltage

Hazardous voltages are present when electrical equipment is in operation.
Severe personal injury or substantial material damage may result if these warnings are not observed.
Only qualified personnel are permitted to work on or around the equipment.
These personnel must be thoroughly familiar with all the warnings and maintenance procedures described in these operating instructions.
The successful and safe operation of this device is dependent on correct transport, proper storage and installation, as well as careful operation and maintenance.
National safety guidelines must be observed.



⚠ DANGER

Five safety rules

When carrying out any kind of work on electrical devices, the "five safety rules" according to EN 50110-1 must always be observed:

1. Disconnect the system.
2. Protect against reconnection.
3. Make sure that the equipment is de-energized.
4. Ground and short-circuit.
5. Cover or enclose adjacent components that are still live.

Note

Use of copper cables for a UL-approved system

For a UL-approved system use 60/75°C copper conductors only.

1.2 Safety and application instructions



⚠ DANGER

Dangerous electrical voltage

This equipment is used in industrial high-voltage installations. During operation, this equipment contains live, bare parts. For this reason, they could cause severe injury or significant material damage if the required covers are removed, if they are used or operated incorrectly, or have not been properly maintained.
When the machines are used in non-industrial areas, the installation location must be protected against unauthorized access (protective fencing, appropriate signs).

⚠ CAUTION

Hot surfaces

The surface of the commutating reactors can reach high temperatures.

NOTICE

Component cooling

Provisions for component cooling must be made at the installation site. Power loss data is given in the technical specifications.

Note

The core of the commutating reactors should not be considered as being a metal part that can be touched.

Preconditions

The persons responsible for the safety of the plant must ensure that the following conditions are met:

- Basic planning work for the system and all work relating to transportation, assembly, installation, commissioning, maintenance and repairs is carried out by qualified personnel and checked by responsible, suitably skilled personnel.
- The Operating Instructions and machine documentation are always available.
- The technical specifications regarding the applicable installation, connection, environmental, and operating conditions are always observed.
- The plant-specific assembly and safety guidelines are observed and personal protection equipment is used.
- Unqualified personnel are forbidden from using these machines and working near them.

These Operating Instructions are intended for qualified personnel and only contain information and notes relating to the intended purpose of the machines.

Note

Support by Siemens service centers

We recommend engaging the support and services of your local Siemens service center for all planning, installation, commissioning and maintenance work.

Description 2

Field of application

Disturbances in the feeding supply system occur during the operation of rectifier-feed drives. Such disturbances are caused by commutation voltage dips that produce a distortion of the supply system voltage. Commutating reactors are deployed to limit the voltage dips required for public supply systems. Commutating reactors also limit the current and dampen the oscillations caused rectifiers.

The commutating reactors in this document are specially adapted to the SINAMICS DCM rectifier series and ensure optimum conditions for operation of this rectifier.

Structure

The commutating reactors have an open construction (IP00 degree of protection) and designed for installation in a switch cabinet.

The reactors provide a foot bracket and, depending on the power, connected using screw terminals or copper busbars.

Available types

3-phase commutating reactors

The spectrum of available 3-phase commutating reactors is oriented on the requirements of the offered SINAMICS DC MASTER rectifier units.

The rated current of the 3-phase commutating reactors ranges from AC 13 A to AC 2490 A; the rated voltages range from 400 V to 950 V.

As standard, the commutating reactors are defined with uk = 4% and designed for a line frequency of 50 to 60 Hz.

1-phase commutating reactors

The 1-phase commutating reactors are designed as 4% commutating reactors in accordance with the field power sections of the SINAMICS DCM from AC 3 A to AC 85 A. The rated voltage is 400 V at 50 Hz or 480 V at 60 Hz.

Thre 1-phase commutating reactors can also be used as line reactors in the supply system feed cable.

Note

2% commutating reactors

2% commutating reactors are also available on request.

Mechanical installation

3

⚠ CAUTION

Use protective equipment

Failure to lift the unit properly can lead to physical injury or material damage.

The reactor should be lifted only with suitable equipment (work gloves should be used) and by appropriately qualified personnel.

⚠ CAUTION

Comply with all safety regulations

The user assumes responsibility for installing the reactor in accordance with safety regulations (e.g. EN, DIN, VDE) and all other relevant national or local regulations affecting conductor and grounding dimensioning, overcurrent protection, etc.

The reactor must be installed in accordance with safety regulations (e.g. EN, DIN, VDE) as well as all other applicable national or local regulations. Grounding, conductor dimensioning, and the appropriate short-circuit protection measures must be carried out correctly in order to ensure operational safety.

Lifting

NOTICE
Observe when lifting the reactor • In order to prevent the reactor from becoming deformed, no horizontal forces may be exerted on the lifting eyes. • Do not lift the reactor at the connecting lugs.

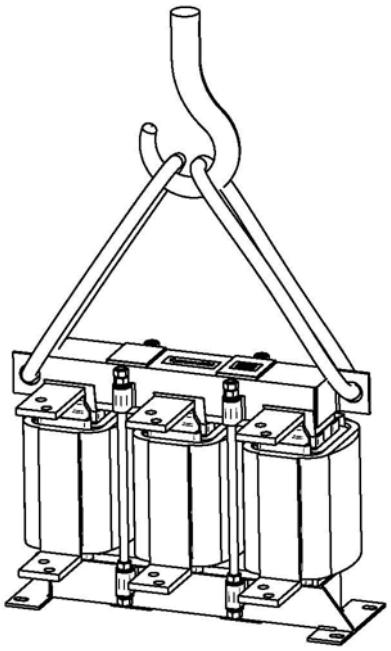
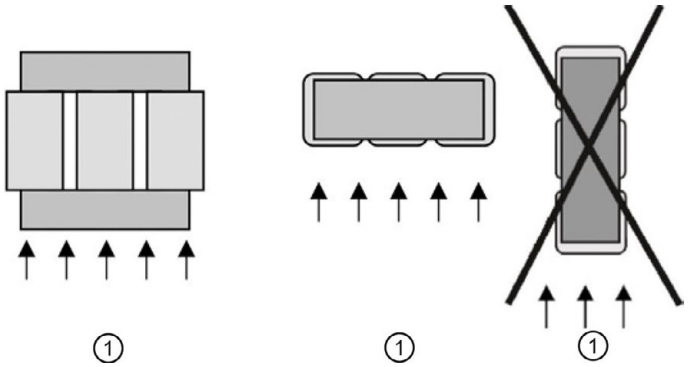


Figure 3-1 Lifting the reactor

Mounting position

Alignment

The commutating reactor must be installed in the appropriate orientation in the cooling-air flow, see following figure.



① Cooling air flow

Figure 3-2 Mounting position

Distance from neighboring components

When the reactor is installed in the switch cabinet, a clearance of approximately 100 mm to neighboring components is recommended. This clearance guarantees the heat dissipation of the reactors. If the reactor is installed in a cabinet, it must be ventilated adequately.

Mounting holes, fastening screws

The commutating reactor is provided with 4 elongated holes. Layout and dimensions, see dimension drawing (Section Dimension drawings (Page 33))

The commutating reactor must be fastened with 4 screws.

Table 3- 1 Retaining screws

Commutating reactor Order number = 6RX1800-...	Screws (4x)
4DK00; 4FK00; 4DE00; 4DE01; 4DE02; 4DE03	M4
4DE04; 4DE05; 4DE06	M5
4DK01; 4FK01; 4DK02; 4FK02; 4GK00; 4DK03; 4FK03; 4DE07	M6
4DK04; 4FK04; 4GK01;	M8
4DK05; 4FK05; 4DK06; 4GK02; 4FK06; 4DK07; 4DK08; 4FK07; 4FK08; 4GK03; 4DK10; 4FK10; 4GK04; 4FK13; 4DK12; 4KK02; 4GK10; 4KK03; 4GK11; 4FK14; 4LK00; 4DK11; 4GK05; 4GK06; 4FK11; 4FK12; 4KK00; 4KK01; 4GK07; 4GK08; 4DK13; 4DK14; 4GK12; 4FK15; 4KK04; 4GK13; 4FK16; 4FK17; 4LK01; 4KK05; 4GK14; 4KK06; 4GK15; 4FK18; 4DK15; 4LK02; 4GK16; 4GK17; 4LK03; 4MK00; 4KK07	M10

Electrical installation

4

Important safety precautions



⚠ WARNING

Dangerous electrical voltage

The devices are operated with high voltages.
All connection work must be performed with power off.
All work on the device must be performed by trained personnel only.
Non-observance of these warnings can result in death, serious personal injury, or substantial property damage.

Work on an open device must be carried out with extreme caution because external supply voltages may be present. The power and control terminals may be live even when the motor is not running.
Even after safety disconnection, the TSE capacitors still carry a dangerous voltage. Consequently, the unit may be opened only after an appropriate wait time.

The operator is responsible for ensuring that the commutating reactor and other components are installed and connected in accordance with the recognized technical rules in the country of installation and applicable regional guidelines. Special attention should be paid to cable dimensioning, fuses, grounding, shutdown, disconnection, and overcurrent protection.

Connection

Note

EMC-compliant installation

When the commutating reactors are connected, observe the installation notes for the EMC-conform assembly of drives in the SINAMICS DCM DC Converter Operating Instructions.

Note

Strain relief

Connection cables or busbars must be fixed near the commutating reactor so that no forces act on the terminals and connection lugs.

Connection overview

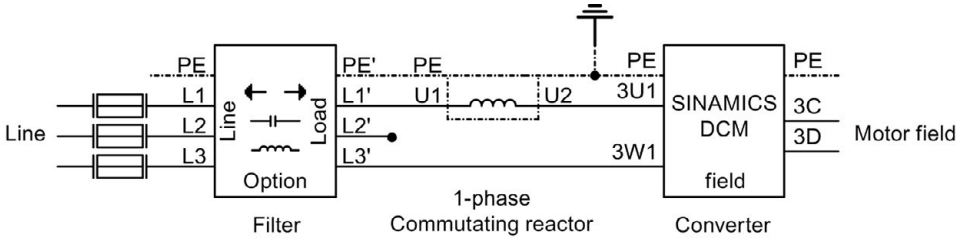


Figure 4-1 1-phase connection overview

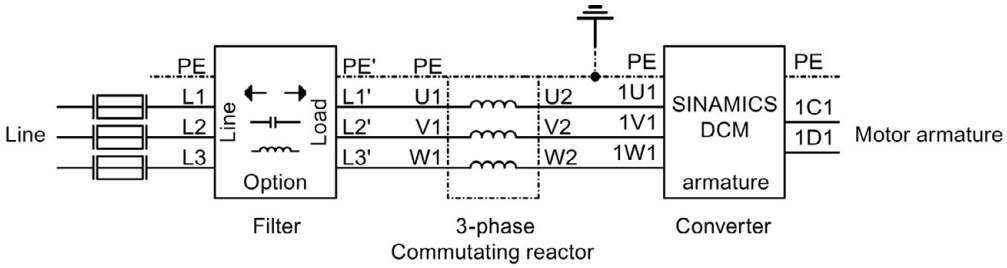


Figure 4-2 3-phase connection overview

Note

Installation sequence

When commutating reactors with SCCR of 20 ms and 100 ms are deployed, semiconductor fuses must be installed in the rectifier system upstream of the reactor. These interrupting times are then achieved by the semiconductor fuses that are normally used.

Winding connections

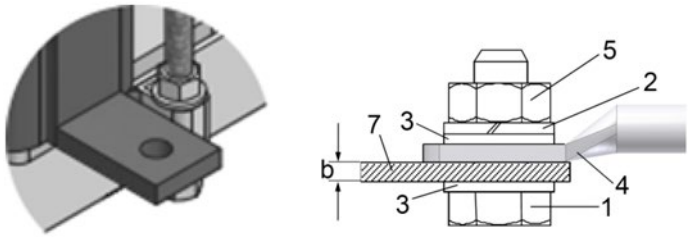
Depending on the rated current, the connections are provided as terminal block or as connection lugs.

Table 4- 1 Connection with terminal block

Commutating reactor **Order number = 6RX1800-...**	**Stripped length**	**Tightening torque**
4DE00; 4DE01; 4DE02	10 - 11 mm	0.8 Nm
4DE03; 4DE04	13 - 14 mm	2.5 Nm
4DK00; 4FK00	10 mm	1 Nm
4DK01; 4FK01	12 mm	2.4 Nm
4DK02; 4FK02; 4GK00	16 mm	4 Nm
4DK03; 4FK03	18 mm	5 Nm

Table 4- 2 Connection with connection lugs

Commutating reactor **Order number = 6RX1800-...**	**Screw, nut**	**Connection lug thickness (b)**	**Tightening torque**
4DE06; 4DE05	M6	5 mm	6.8 Nm
4DK04; 4FK04; 4GK01; 4DK05; 4FK05; 4DK06; 4GK02; 4FK06; 4DE07	M8	5 mm	17 Nm
4DK07; 4DK08; 4FK07; 4FK08; 4GK03	M12	5 mm	35 Nm
4DK10; 4FK10; 4GK04; 4DK11; 4GK05; 4GK06; 4FK11; 4FK12; 4KK00; 4KK01; 4GK07; 4GK08; 4FK13; 4DK12; 4KK02; 4GK10; 4KK03; 4GK11; 4FK14; 4LK00; 4GK12; 4KK04; 4LK01	M12	10 mm	35 Nm
4DK13; 4DK14; 4FK15; 4GK13; 4FK16; 4FK17; 4KK05; 4GK14; 4KK06; 4GK15; 4FK18; 4DK15; 4LK02; 4GK16; 4GK17; 4LK03; 4MK00; 4KK07	M12	20 mm	35 Nm



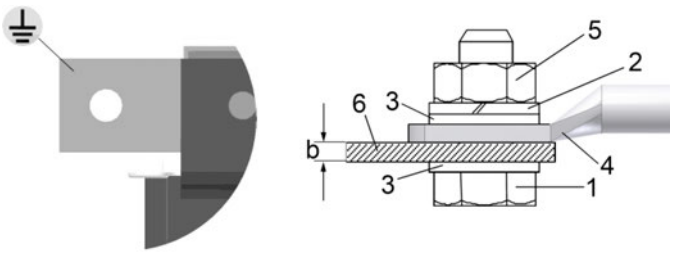
1	Screw	4	Cable lug or busbar
2	Spring lock washer / conical spring washer	5	Nut
3	Disk	7	Flat connection (connection lug)

Figure 4-3 Connecting lug

3-phase commutating reactors protective conductor connection

Table 4- 3 Protective conductor connection (1)

Commutating reactor Order number = 6RX1800-...	Screw, nut	Connection lug thickness (b)	Tightening torque
4DK04; 4FK04; 4GK01; 4DK05; 4FK05; 4DK06; 4GK02; 4FK06	M8	2 mm	17 Nm
4DK07; 4DK08; 4FK07; 4FK08; 4GK03	M12	2 mm	35 Nm

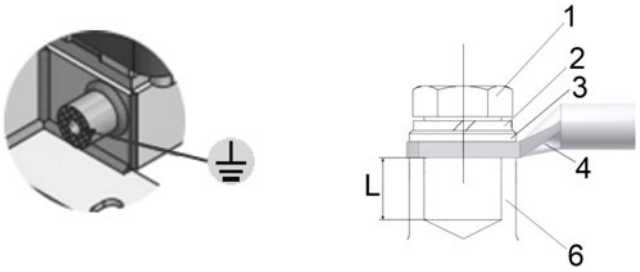


1	Screw	4	Cable lug or busbar
2	Spring lock washer / conical spring washer	5	Nut
3	Disk	6	PE terminal

Figure 4-4 Protective conductor connection (1)

Table 4- 4 Protective conductor connection (2)

Commutating reactor Order number = 6RX1800-...	Screw, protective conductor connection	Thread length protective conductor connection (L)	Tightening torque
4DK10; 4FK10; 4GK04; 4DK11; 4GK05; 4GK06; 4FK11; 4FK12; 4KK00; 4KK01; 4GK07; 4GK08; 4FK13; 4DK12; 4KK02; 4GK10; 4KK03; 4GK11; 4FK14; 4LK00; 4GK12; 4KK04; 4LK01; 4DK13; 4DK14; 4FK15; 4GK13; 4FK16; 4FK17; 4KK05; 4GK14; 4KK06; 4GK15; 4FK18; 4DK15; 4LK02; 4GK16; 4GK17; 4LK03; 4MK00; 4KK07	M12	18 mm	35 Nm



1	Screw	4	Cable lug or busbar
2	Spring lock washer / conical spring washer	6	PE terminal
3	Disk		

Figure 4-5 Protective conductor connection (2)

1-phase commutating reactors protective conductor connection

For 1-phase commutating reactors, the protective conductor connection is provided as screwed connection for pin or ring cable lug. See also Chapter Dimension drawings (Page 33).

Configuring

5

5.1 Commutating reactor rectifier assignment

Assignment of 3-phase commutating reactors

Table 5- 1 Assignment of 3-phase commutating reactors

SINAMICS DCM	I_{AC}	4% reactor 50 Hz	4% reactor 60 Hz
3-ph. 400 V AC			
6RA8013-6D...	12.45 A	6RX1800-4DK00	-
6RA8018-6D...	24.9 A	6RX1800-4DK01	-
6RA8025-6D...	49.8 A	6RX1800-4DK02	-
6RA8028-6D...	74.7 A	6RX1800-4DK03	-
6RA8031-6D...	103.75 A	6RX1800-4DK04	-
6RA8075-6D...	174.3 A	6RX1800-4DK05	-
6RA8078-6D...	232.4 A	6RX1800-4DK06	-
6RA8081-6D...	332 A	6RX1800-4DK07	-
6RA8085-6D...	498 A	6RX1800-4DK10	-
6RA8087-6D...	705.5 A	6RX1800-4DK11	-
6RA8091-6D...	996 A	6RX1800-4DK12	-
6RA8093-4D...	1328 A	6RX1800-4DK13	-
6RA8095-4D...	1660 A	6RX1800-4DK14	-
6RA8098-4D...	2490 A	6RX1800-4DK15	-
3-ph. 480 V AC			
6RA8013-6F...	12.45 A	6RX1800-4FK00	6RX1800-4DK00
6RA8018-6F...	24.9 A	6RX1800-4FK01	6RX1800-4DK01
6RA8025-6F...	49.8 A	6RX1800-4FK02	6RX1800-4DK02
6RA8028-6F...	74.7 A	6RX1800-4FK03	6RX1800-4DK03
6RA8031-6F...	103.75 A	6RX1800-4FK04	6RX1800-4DK04
6RA8075-6F...	174.3 A	6RX1800-4FK05	6RX1800-4DK05
6RA8078-6F...	232.4 A	6RX1800-4FK06	6RX1800-4DK06
6RA8082-6F..	373.5 A	6RX1800-4FK08	6RX1800-4DK08
6RA8085-6F..	498 A	6RX1800-4FK10	6RX1800-4DK10
6RA8087-6F...	705.5 A	6RX1800-4FK12	6RX1800-4DK11
6RA8091-6F..	996 A	6RX1800-4FK14	6RX1800-4DK12
3-ph. 575 V AC			
6RA8025-6G...	49.8 A	6RX1800-4GK00	6RX1800-4FK02
6RA8031-6G...	103.75 A	6RX1800-4GK01	6RX1800-4FK04
6RA8075-6G...	174.3 A	6RX1800-4GK02	6RX1800-4FK05

SINAMICS DCM	I_{AC}	4% reactor 50 Hz	4% reactor 60 Hz
6RA8081-6G...	332 A	6RX1800-4GK03	6RX1800-4FK07
6RA8085-6G...	498 A	6RX1800-4GK04	6RX1800-4FK10
6RA8087-6GS…	664 A	6RX1800-4GK07	6RX1800-4FK11
6RA8087-6GV...	705.5 A	6RX1800-4GK08	6RX1800-4FK12
6RA8090-6G...	913 A	6RX1800-4GK11	6RX1800-4FK13
6RA8093-4G...	1328 A	6RX1800-4GK13	6RX1800-4FK15
6RA8095-4G...	1660 A	6RX1800-4GK14	6RX1800-4FK16
6RA8096-4G...	1826 A	6RX1800-4GK15	6RX1800-4FK17
6RA8097-4G...	2324 A	6RX1800-4GK17	6RX1800-4FK18
3-ph. 690 V AC			
6RA8086-6KS…	597.6 A	6RX1800-4KK00	6RX1800-4GK05
6RA8086-6KV...	630.8 A	6RX1800-4KK01	6RX1800-4GK06
6RA8090-6K...	830 A	6RX1800-4KK03	6RX1800-4GK10
6RA8093-4K...	1245 A	6RX1800-4KK04	6RX1800-4GK12
6RA8095-4K...	1660 A	6RX1800-4KK06	6RX1800-4GK14
6RA8097-4K...	2158 A	6RX1800-4KK07	6RX1800-4GK16
3-ph. 830 V AC			
6RA8088-6L...	788.5 A	6RX1800-4LK00	6RX1800-4KK02
6RA8093-4L...	1245 A	6RX1800-4LK01	6RX1800-4KK04
6RA8095-4L...	1577 A	6RX1800-4LK02	6RX1800-4KK05
3-ph. 950 V AC			
6RA8096-4M...	1826 A	6RX1800-4MK00	6RX1800-4LK03

1-phase commutating reactors assignment

The 1-phase commutating reactors are selected based on the field rated current of the SINAMICS DCM.

Technical data

6

General technical specifications

Degree of protection	IP00
Safety class	Class 1 (see also note below)
Cooling	AN, self-ventilated
Inductance tolerance	±10 %
Environmental classes according to DIN IEC 60721-3 Parts 1 to 3	Climatic:
	Storage 1K3
	Transport 2K2
	Operation 3K3
	Mechanical: 3M3
Ambient Temperature during Operation	
• 1-phase reactors	0 to +45° C, above with derating
• 3-phase reactors	0 to +40° C, above with derating
Ambient temperature storage and transport	-40° to +70° C
Installation altitude (at rated current)	≤ 1000 m above sea level, above with derating

Operation at 50 Hz and 60 Hz with rated current is permissible

Note

Declaration for protection class 1

Despite protective conductor connection, no 'touchable conductive parts' with regard to the standard (e.g. EN 61800-5-1) are defined.

In this case, the protective conductor ensures that no dangerous voltages/currents can act at the mounting surfaces.

The complete reactor must be considered as being an active part.

Derating

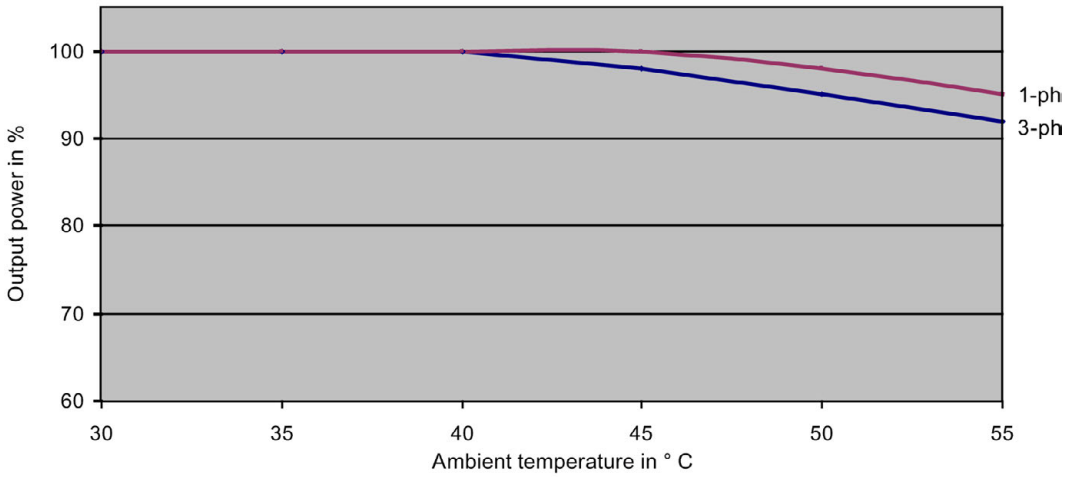


Figure 6-1 Derating as a function of the ambient temperature

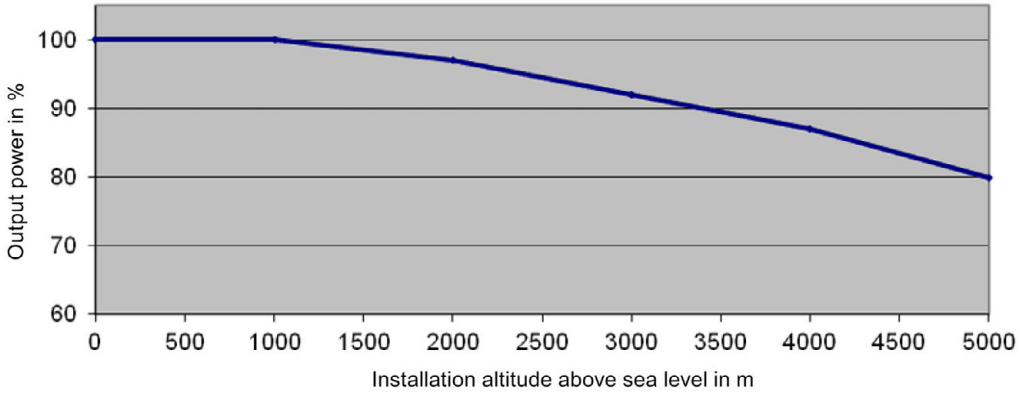
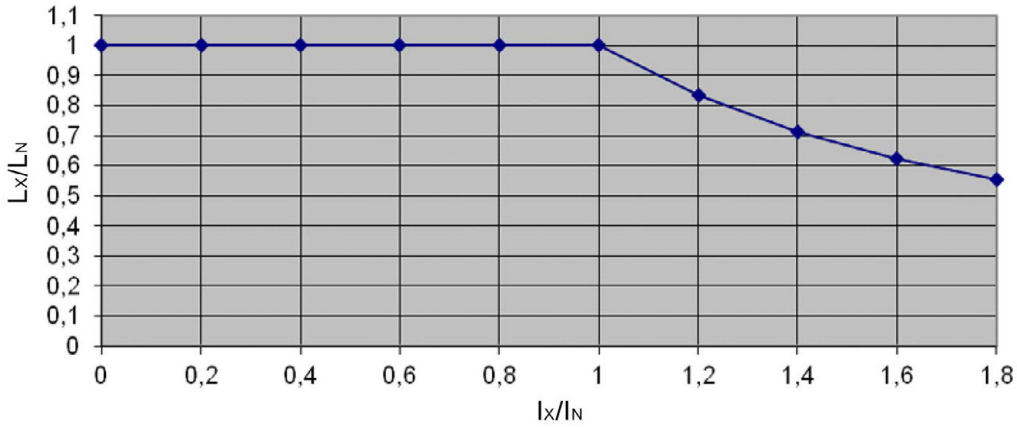


Figure 6-2 Derating as a function of the installation altitude

Inductance curve



L_N	Rated inductance	I_{rated}	Rated current of the commutating reactor
L_X	Inductance at I_X	I_X	Current in the commutating reactor

Figure 6-3 Typical inductance curve

Specific technical data

Dimensions, see Section Dimension drawings (Page 33).

3-phase commutating reactors

Table 6- 1 Commutating reactors 3ph
uk=4 % for rated current and 3AC 400 V/50 Hz or 3AC 480 V/60 Hz

Order number 6RX1800-..	AC rated current	DC rated current	Inductance	Copper losses	Total losses	SCCR	Weight	Rated insulating voltage	Insulating material class according to DIN EN 60085
4DK00	13 A	15 A	2.315 mH	22.8 W	33.1 W	2.0 kA (20 ms)	2.9 kg	600 V	B
4DK01	25 A	30 A	1.158 mH	30.8 W	53.2 W	5.0 kA (20 ms)	4.4 kg	600 V	B
4DK02	51 A	60 A	0.579 mH	43.5 W	73.2 W	6.5 kA (100 ms)	10.9 kg	600 V	B
4DK03	76 A	90 A	0.386 mH	64.4 W	118.5 W	9.0 kA (100 ms)	13.8 kg	600 V	B
4DK04	106 A	125 A	0.278 mH	51.3 W	119.3 W	15 kA (100 ms)	23.9 kg	600 V	B
4DK05	174 A	210 A	0.169 mH	164.8 W	206.4 W	15 kA (100 ms)	24.0 kg	600 V	F
4DK06	232 A	280 A	0.127 mH	197.4 W	256.2 W	20 kA (100 ms)	26.8 kg	600 V	F
4DK07	332 A	400 A	0.089 mH	190.7 W	251.1 W	24 kA (200 ms)	45.8 kg	600 V	F
4DK08	374 A	450 A	0.079 mH	186.7 W	251.7 W	24 kA (200 ms)	56.8 kg	600 V	F
4DK10	498 A	600 A	0.059 mH	277.0 W	357.4 W	35 kA (200 ms)	60.0 kg	600 V	F
4DK11	706 A	850 A	0.042 mH	329.4 W	424.8 W	55 kA (200 ms)	81.6 kg	1000 V	F
4DK12	996 A	1200 A	0.030 mH	390.3 W	562.8 W	75 kA (200 ms)	100.1 kg	1000 V	F
4DK13	1328 A	1600 A	0.022 mH	339.3 W	554.5 W	75 kA (200 ms)	138.8 kg	1000 V	F
4DK14	1660 A	2000 A	0.018 mH	369.3 W	591.9 W	75 kA (200 ms)	210.7 kg	1000 V	F
4DK15	2490 A	3000 A	0.012 mH	587.3 W	1038.3 W	75 kA (200 ms)	205.6 kg	1000 V	F

Table 6- 2 Commutating reactors 3ph
uk=4 % for rated current and 3AC 480 V/50 Hz or 3AC 575 V/60 Hz

Order number 6RX1800-..	AC rated current	DC rated current	Inductance	Copper losses	Total losses	SCCR	Weight	Rated insulating voltage	Insulating material class according to DIN EN 60085
4FK00	13 A	15 A	2.779 mH	27.4 W	39.2 W	2.0 kA (20 ms)	2.9 kg	600 V	B
4FK01	25 A	30 A	1.389 mH	34.8 W	57.8 W	5.0 kA (20 ms)	6.0 kg	600 V	B
4FK02	51 A	60 A	0.695 mH	42.3 W	77.2 W	6.5 kA (100 ms)	11.8 kg	600 V	B
4FK03	76 A	90 A	0.463 mH	56.3 W	118.0 W	9.0 kA (100 ms)	16.3 kg	600 V	B
4FK04	106 A	125 A	0.333 mH	68.8 W	152.9 W	15 kA (100 ms)	22.3 kg	600 V	B
4FK05	174 A	210 A	0.202 mH	204.6 W	255.6 W	15 kA (100 ms)	26.0 kg	600 V	F
4FK06	232 A	280 A	0.152 mH	178.3 W	231.4 W	20 kA (100 ms)	37.8 kg	600 V	F
4FK07	332 A	400 A	0.106 mH	193.7 W	261.5 W	24 kA (100 ms)	56.1 kg	600 V	F
4FK08	374 A	450 A	0.094 mH	189.1 W	279.2 W	24 kA (100 ms)	56.8 kg	600 V	F
4FK10	498 A	600 A	0.071 mH	313.8 W	396.9 W	35 kA (200 ms)	78.1 kg	1000 V	F
4FK11	664 A	800 A	0.053 mH	255.6 W	360.8 W	75 kA (200 ms)	96.6 kg	1000 V	F
4FK12	706 A	850 A	0.050 mH	293.9 W	404.1 W	75 kA (200 ms)	96.6 kg	1000 V	F
4FK13	913 A	1100 A	0.039 mH	375.6 W	558.6 W	75 kA (200 ms)	114.5 kg	1000 V	F
4FK14	996 A	1200 A	0.035 mH	332.7 W	532.8 W	75 kA (200 ms)	127.8 kg	1000 V	F
4FK15	1328 A	1600 A	0.027 mH	320.4 W	573.7 W	75 kA (200 ms)	177.6 kg	1000 V	F
4FK16	1660 A	2000 A	0.021 mH	436.5 W	819.0 W	75 kA (200 ms)	161.0 kg	1000 V	F
4FK17	1326 A	2200 A	0.019 mH	464.7 W	819.9 W	75 kA (200 ms)	164.2 kg	1000 V	F
4FK18	2324 A	2800 A	0.015 mH	671.8 W	1056.7 W	75 kA (200 ms)	258.2 kg	1000 V	F

Table 6- 3 Commutating reactors 3ph
uk=4 % for rated current and 3AC 575 V/50 Hz or 3AC 690 V/60 Hz

Order number 6RX1800-..	AC rated current	DC rated current	Inductance	Copper losses	Total losses	SCCR	Weight	Rated insulating voltage	Insulating material class according to DIN EN 60085
4GK00	51 A	60 A	0.832 mH	56.8 W	109.7 W	6.5 kA (100 ms)	13.6 kg	600 V	B
4GK01	106 A	125 A	0.399 mH	65.6 W	156.7 W	15 kA (100 ms)	26.4 kg	600 V	B
4GK02	174 A	210 A	0.243 mH	150.0 W	200.5 W	15 kA (100 ms)	34.5 kg	600 V	F
4GK03	332 A	400 A	0.127 mH	252.1 W	327.3 W	24 kA (200 ms)	63.1 kg	600 V	F
4GK04	498 A	600 A	0.085 mH	330.3 W	427.5 W	35 kA (200 ms)	86.0 kg	1000 V	F
4GK05	598 A	720 A	0.071 mH	339.6 W	455.5 W	55 kA (200 ms)	89.8 kg	1000 V	F
4GK06	631 A	760 A	0.067 mH	322.8 W	441.1 W	55 kA (200 ms)	95.7 kg	1000 V	F
4GK07	664 A	800 A	0.064 mH	380.7 W	547.2 W	75 kA (200 ms)	108.4 kg	1000 V	F
4GK08	706 A	850 A	0.060 mH	392.7 W	564.5 W	75 kA (200 ms)	120.6 kg	1000 V	F
4GK10	830 A	1000 A	0.051 mH	308.1 W	498.3 W	75 kA (200 ms)	134.8 kg	1000 V	F
4GK11	913 A	1100 A	0.046 mH	320.7 W	515.9 W	75 kA (200 ms)	143.9 kg	1000 V	F
4GK12	1245 A	1500 A	0.034 mH	371.4 W	605.4 W	75 kA (200 ms)	206.1 kg	1000 V	F
4GK13	1328 A	1600 A	0.032 mH	503.1 W	812.4 W	75 kA (200 ms)	160.9 kg	1000 V	F
4GK14	1660 A	2000 A	0.025 mH	631.3 W	993.1 W	75 kA (200 ms)	202.0 kg	1000 V	F
4GK15	1826 A	2200 A	0.023 mH	614.7 W	1006.9 W	75 kA (200 ms)	212.1 kg	1000 V	H
4GK16	2158 A	2600 A	0.020 mH	534.6 W	1073.7 W	75 kA (200 ms)	303.0 kg	1000 V	F
4GK17	2324 A	2800 A	0.018 mH	556.2 W	1110.0 W	75 kA (200 ms)	321.6 kg	1000 V	F

Table 6- 4 Commutating reactors 3ph
uk=4 % for rated current and 3AC 690 V/50 Hz or 3AC 830 V/60 Hz

Order number 6RX1800-..	AC rated current	DC rated current	Inductance	Copper losses	Total losses	SCCR	Weight	Rated insulating voltage	Insulating material class according to DIN EN 60085
4KK00	598 A	720 A	0.085 mH	388.2 W	562.1 W	55 kA (200 ms)	108.9 kg	1000 V	F
4KK01	631 A	760 A	0.080 mH	402.0 W	586.4 W	75 kA (200 ms)	113.3 kg	1000 V	F
4KK02	789 A	950 A	0.064 mH	362.7 W	564.6 W	75 kA (200 ms)	141.9 kg	1000 V	F
4KK03	830 A	1000 A	0.061 mH	350.7 W	561.4 W	75 kA (200 ms)	153.4 kg	1000 V	F
4KK04	1245 A	1500 A	0.041 mH	505.2 W	845.7 W	75 kA (200 ms)	169.7 kg	1000 V	F
4KK05	1577 A	1900 A	0.032 mH	716.8 W	1093.8 W	75 kA (200 ms)	226.1 kg	1000 V	F
4KK06	1660 A	2000 A	0.031 mH	596.0 W	1011.8 W	75 kA (200 ms)	257.2 kg	1000 V	F
4KK07	2158 A	2600 A	0.024 mH	484.8 W	1185.6 W	75 kA (200 ms)	360.2 kg	1000 V	F

Table 6- 5 Commutating reactors 3ph
uk=4 % for rated current and 3AC 830 V/50 Hz or 3AC 950 V/60 Hz

Order number 6RX1800-..	AC rated current	DC rated current	Inductance	Copper losses	Total losses	SCCR	Weight	Rated insulating voltage	Insulating material class according to DIN EN 60085
4LK00	789 A	950 A	0.077 mH	312.0 W	532.1 W	75 kA (200 ms)	205.2 kg	1000 V	F
4LK01	1245 A	1500 A	0.049 mH	692.4 W	1061.9 W	75 kA (200 ms)	222.4 kg	1000 V	F
4LK02	1577 A	1900 A	0.039 mH	479.4 W	1059.6 W	75 kA (200 ms)	308.5 kg	1000 V	F
4LK03	1826 A	2200 A	0.033 mH	585.6 W	1269.0 W	75 kA (200 ms)	372.5 kg	1000 V	F

Table 6- 6 Commutating reactor 3ph
uk=4 % for rated current and 3AC 950 V/50 Hz, operation at 60 Hz and rated current permissible

Order number 6RX1800-..	AC rated current	DC rated current	Inductance	Copper losses	Total losses	SCCR	Weight	Rated insulating voltage	Insulating material class according to DIN EN 60085
4MK00	1826 A	2200 A	0.038 mH	534.9 W	1303.5 W	75 kA (200 ms)	399.7 kg	1000 V	F

1-phase commutating reactors

Table 6- 7 Commutating reactors 1ph
uk=4 % for rated current and 1AC 400 V/50 Hz or 1AC 480 V/60 Hz

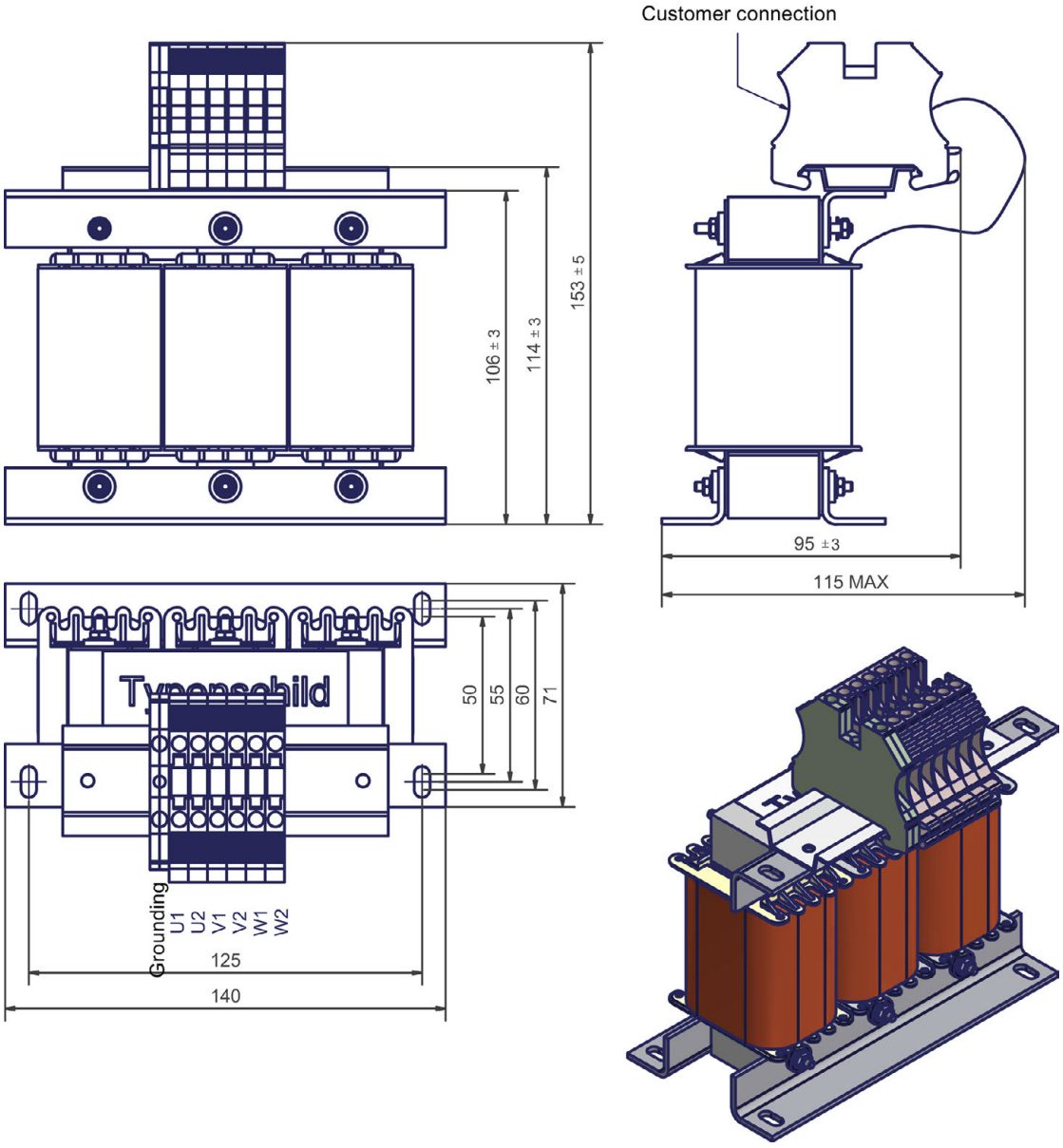
Order number 6RX1800-..	AC rated current	DC rated current	Inductance	Copper losses	Total losses	SCCR	Weight	Rated insulating voltage	Insulating material class according to DIN EN 60085
4DE00	3 A	3 A	16.98 mH	3 W	5 W	0.8 kA (20 ms)	0.7 kg	600 V	B
4DE01	5 A	5 A	10.19 mH	5 W	7 W	0.8 kA (20 ms)	1.5 kg	600 V	B
4DE02	10 A	10 A	5.090 mH	7 W	12 W	2 kA (20 ms)	2.0 kg	600 V	B
4DE03	15 A	15 A	3.400 mH	8 W	17 W	2 kA (20 ms)	2.3 kg	600 V	B
4DE04	25 A	25 A	2.040 mH	8 W	29 W	6 kA (20 ms)	3.0 kg	600 V	B
4DE05	30 A	30 A	1.700 mH	10 W	30 W	6 kA (20 ms)	3.8 kg	600 V	B
4DE06	40 A	40 A	1.270 mH	9 W	49 W	10 kA (20 ms)	5.2 kg	600 V	B
4DE07	85 A	85 A	0.600 mH	13 W	67 W	15 kA (20 ms)	9.6 kg	600 V	B

Dimension drawings

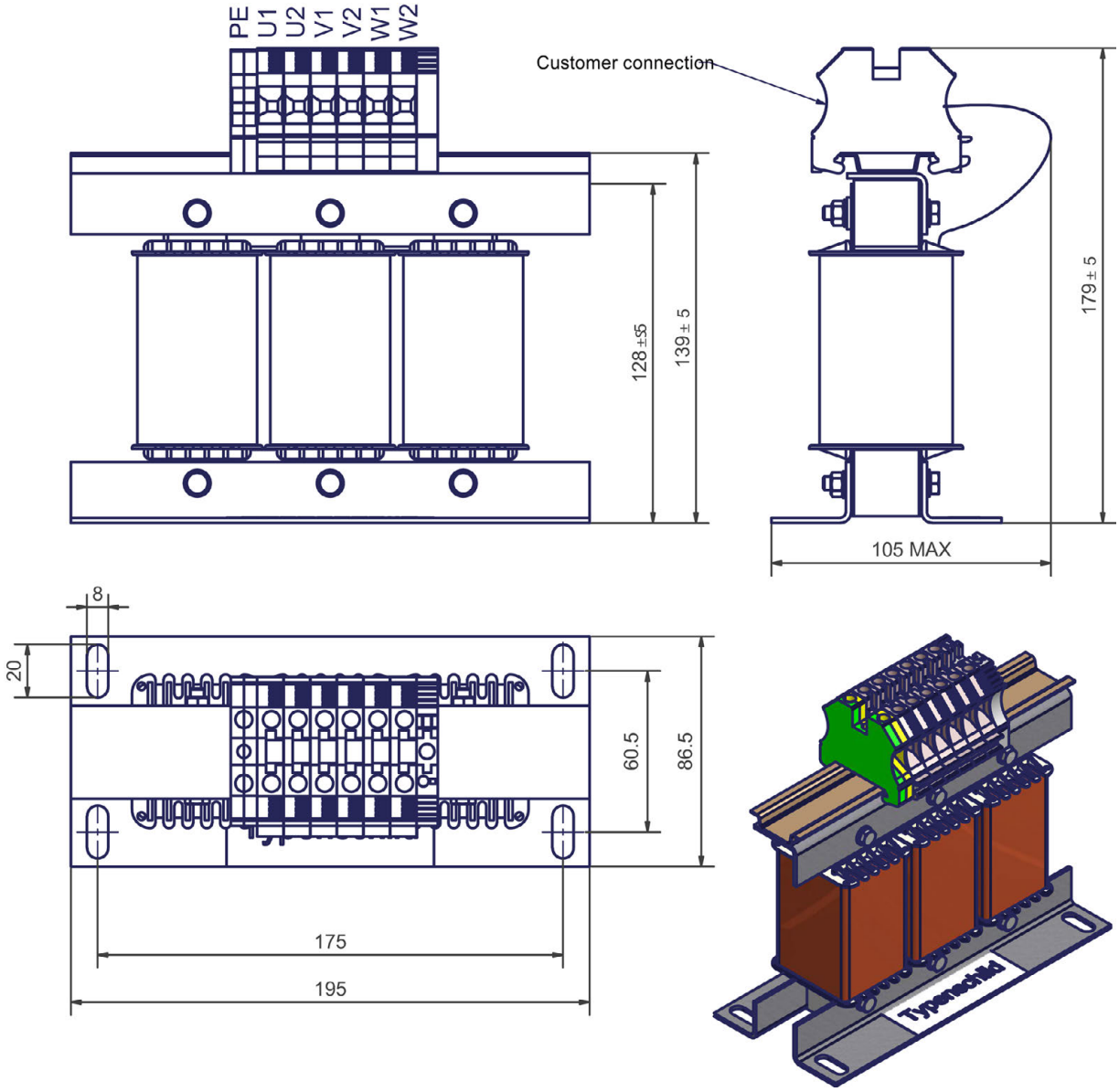
7

Dimensions in mm

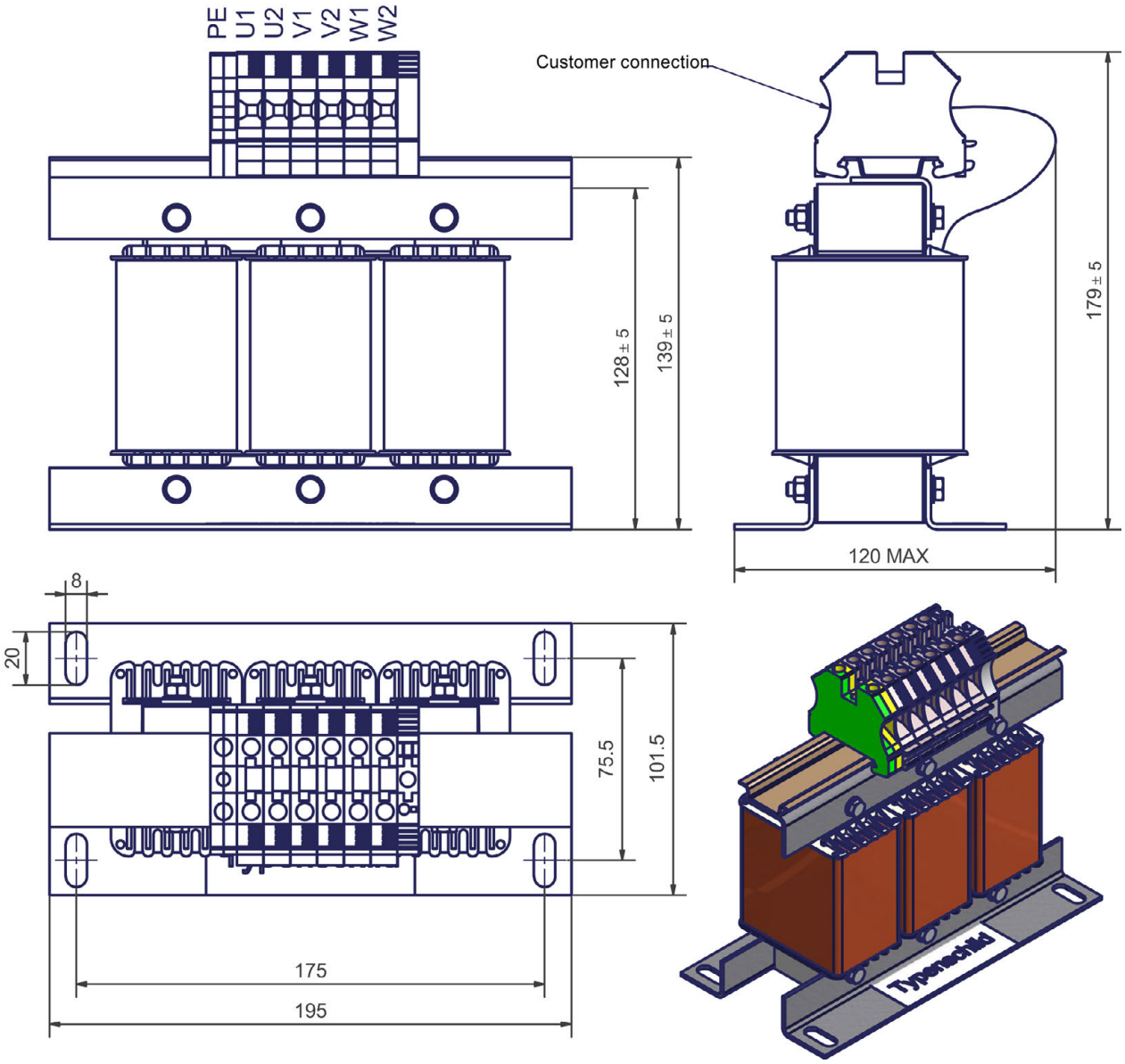
Type: 6RX1800-4DK00, 6RX1800-4FK00



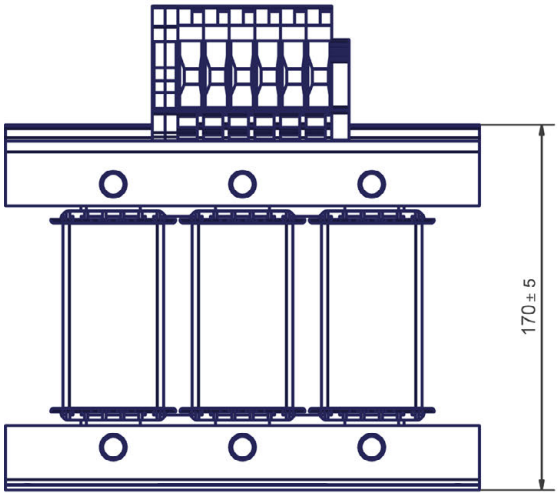
Type: 6RX1800-4DK01

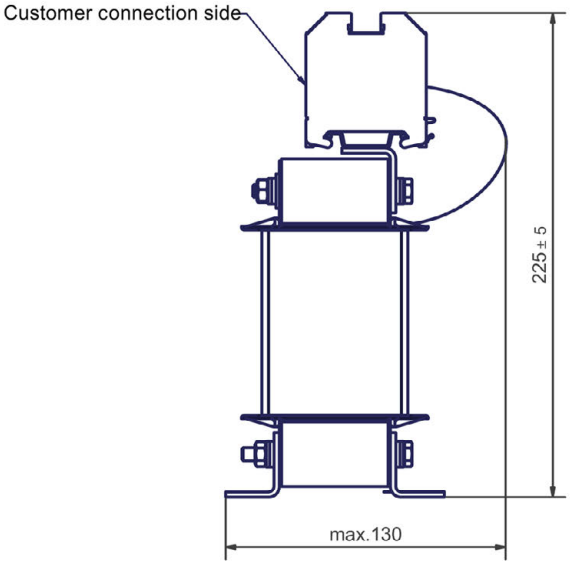


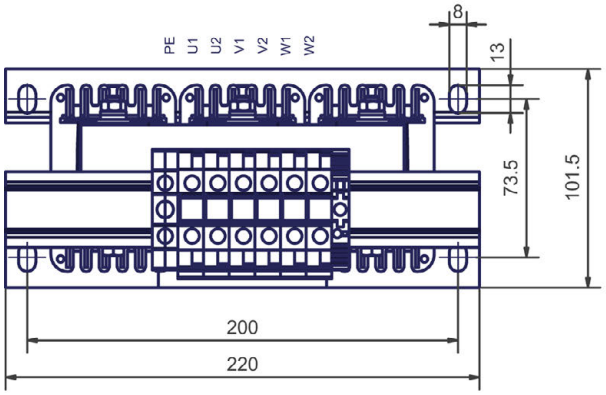
Type: 6RX1800-4FK01

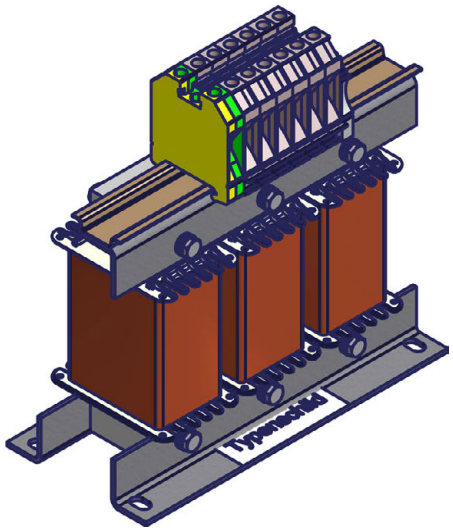


Type: 6RX1800-4DK02, 6RX1800-4FK02

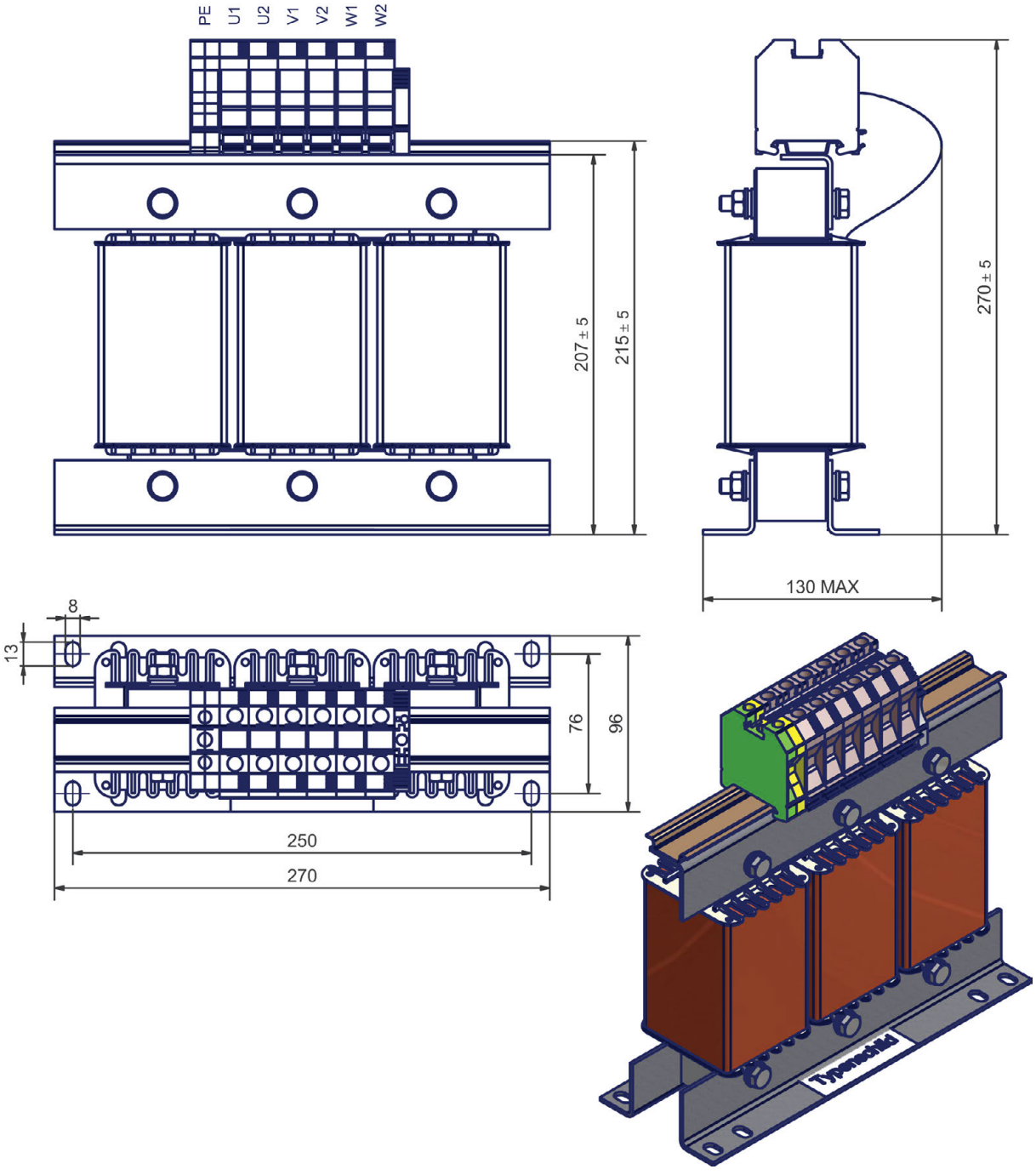




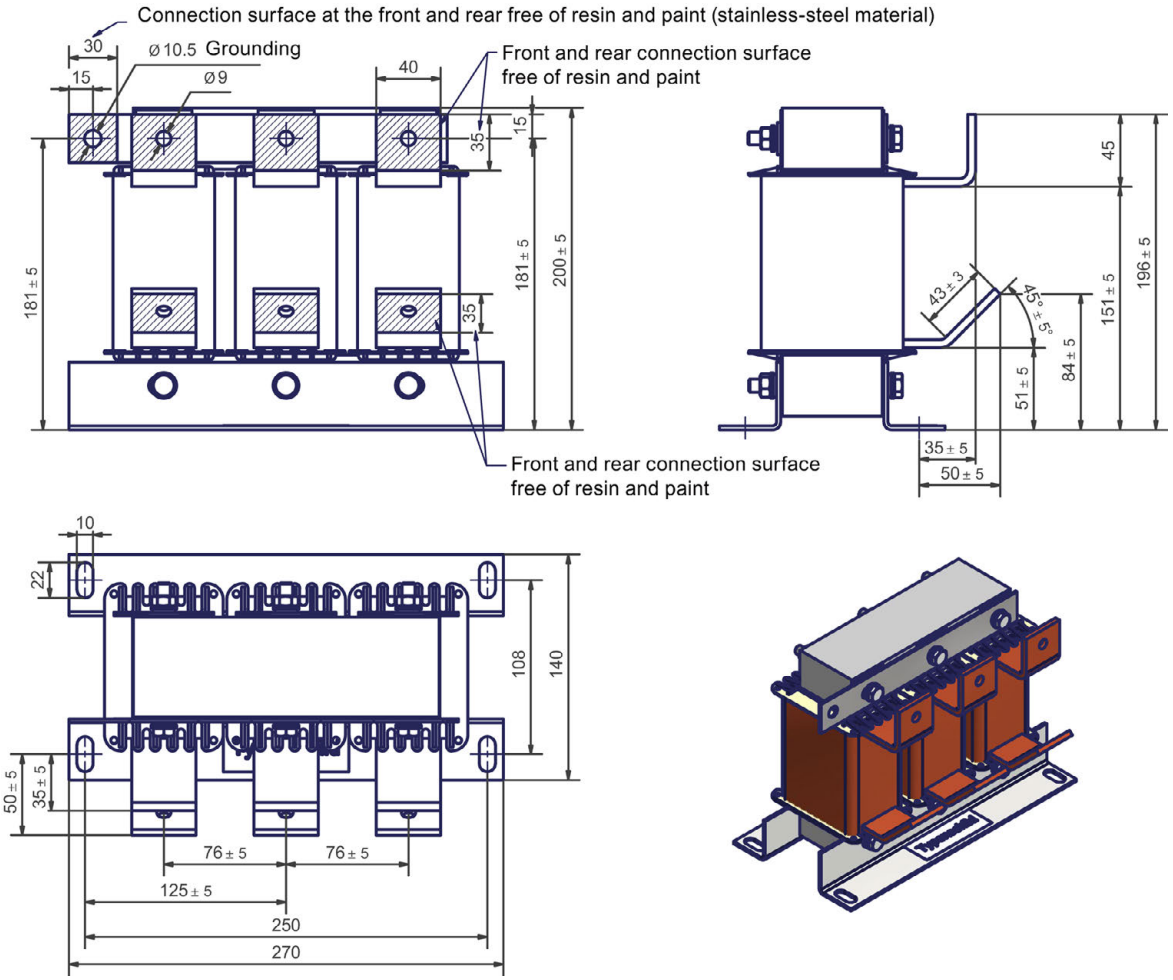




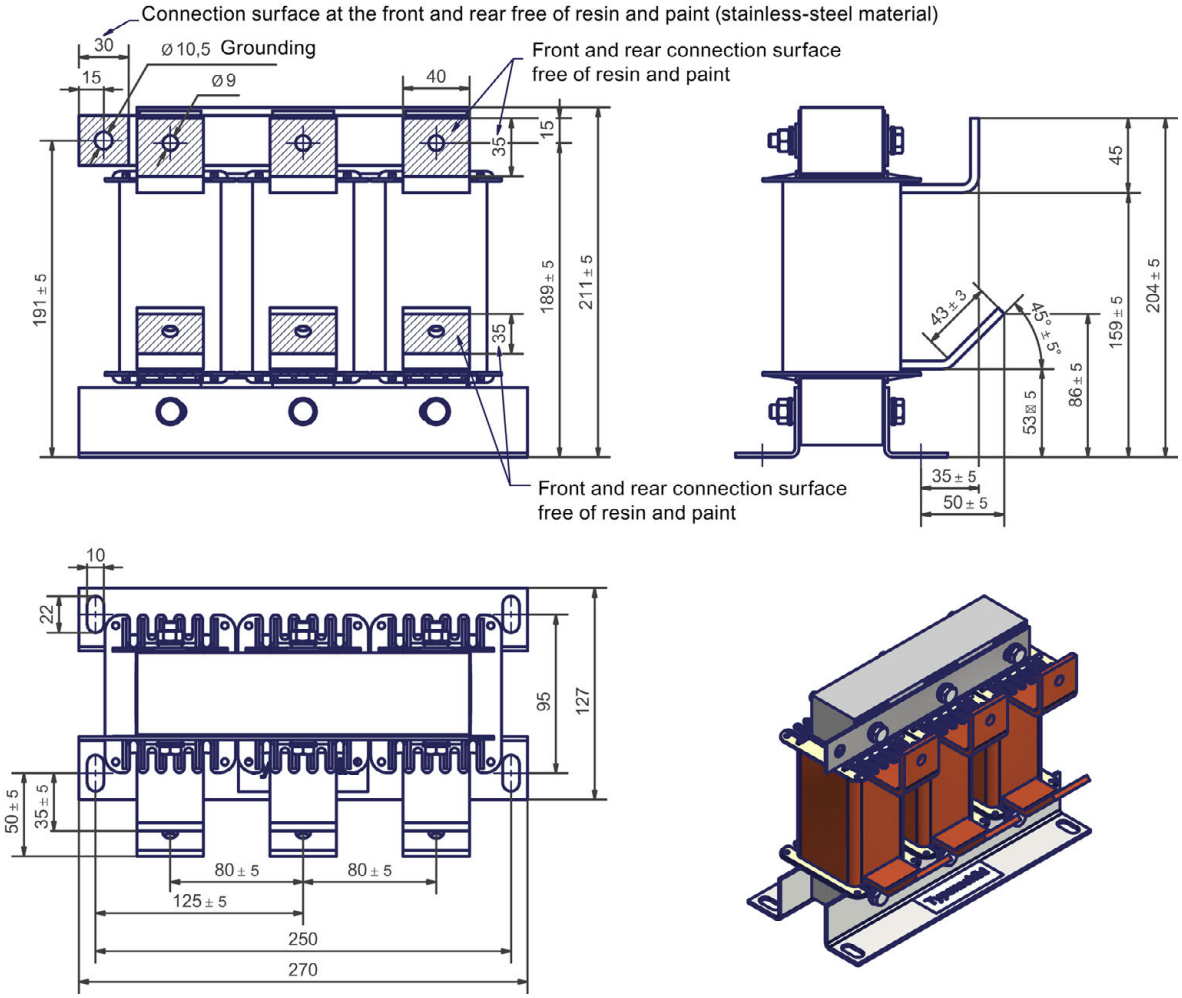
Type: 6RX1800-4GK00, 6RX1800-4DK03, 6RX1800-4FK03



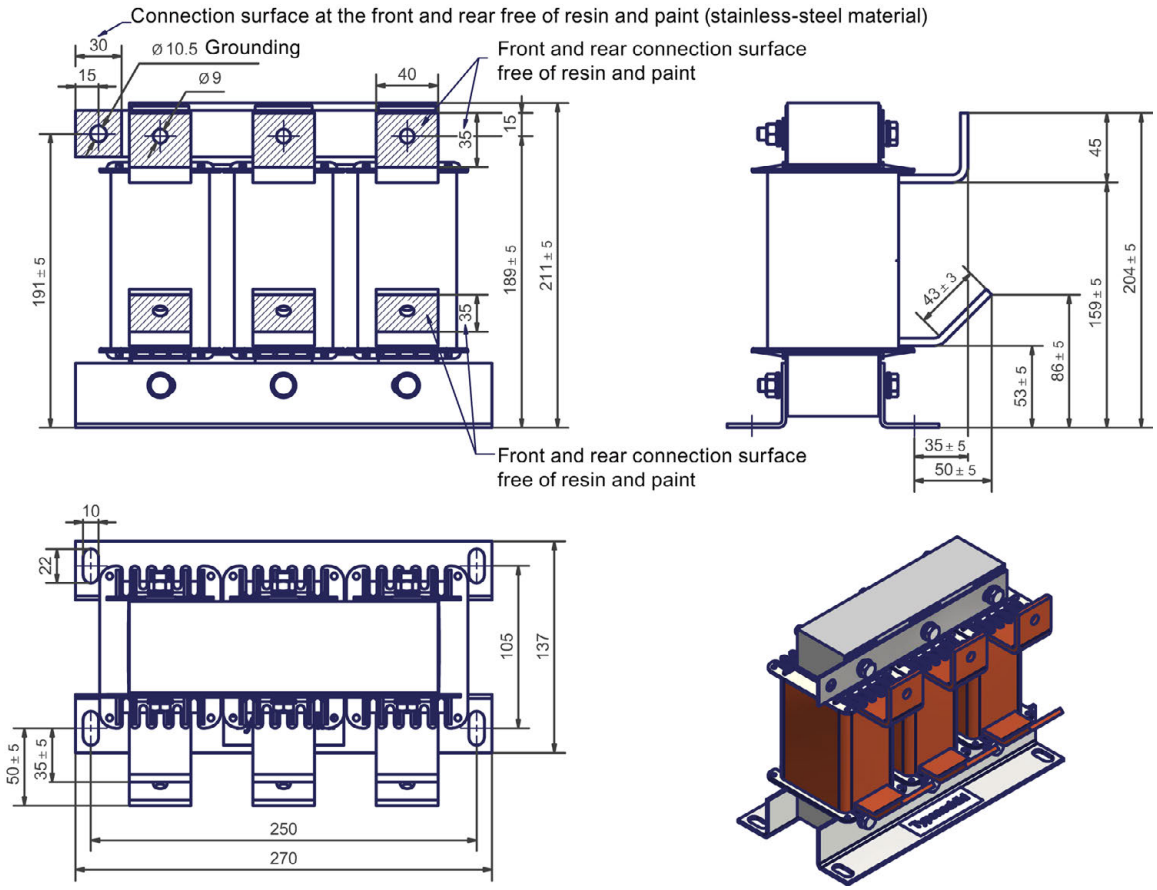
Type: 6RX1800-4DK04



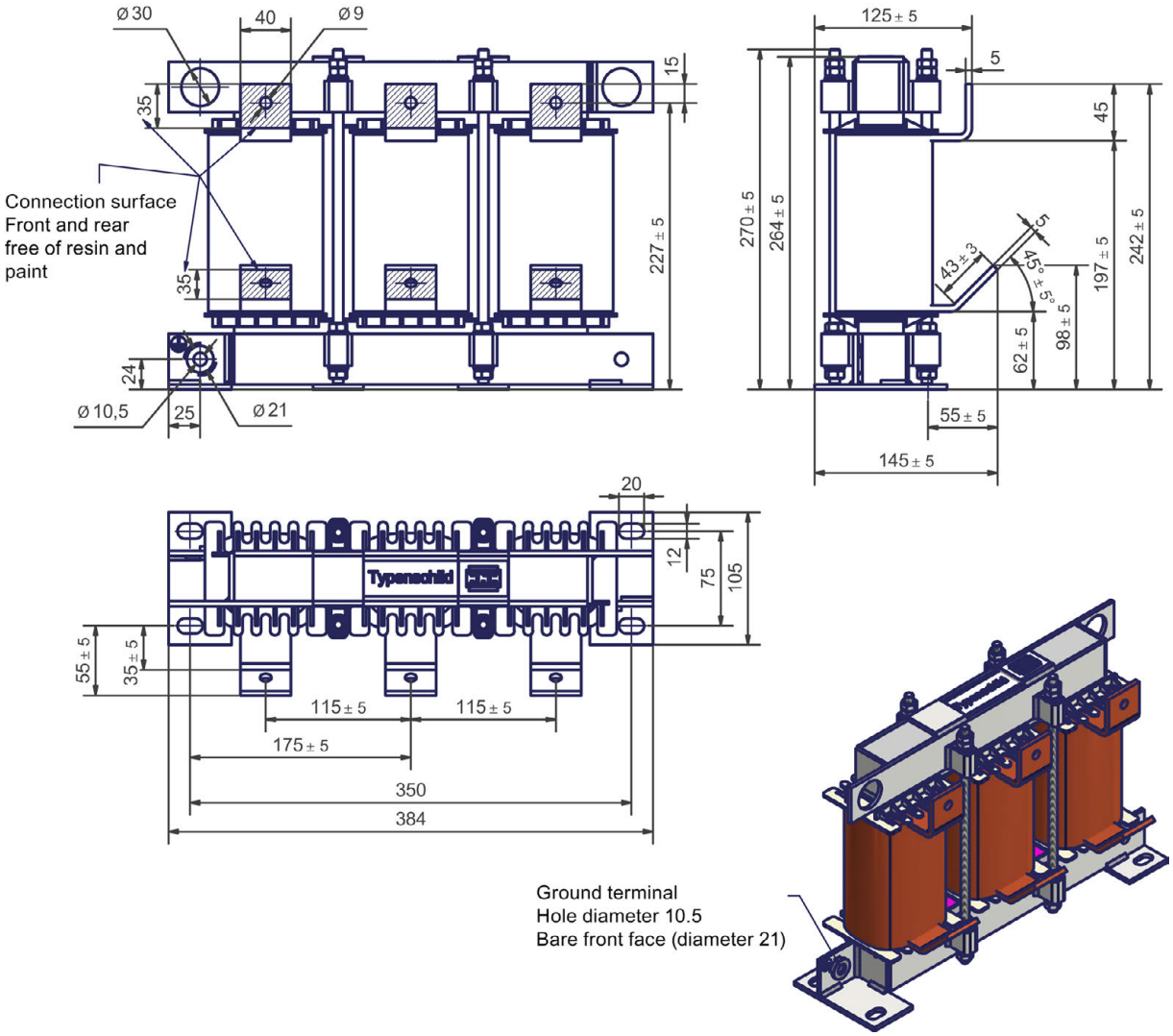
Type: 6RX1800-4FK04



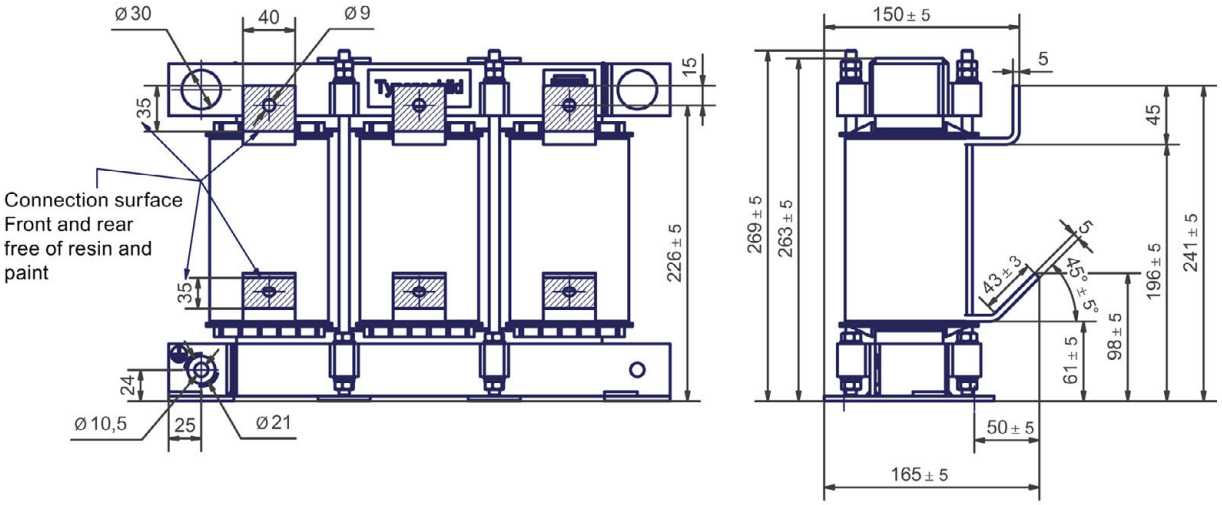
Type: 6RX1800-4GK01



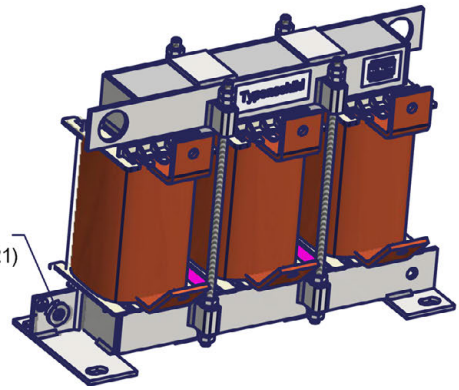
Type: 6RX1800-4DK05, 6RX1800-4FK05, 6RX1800-4DK06



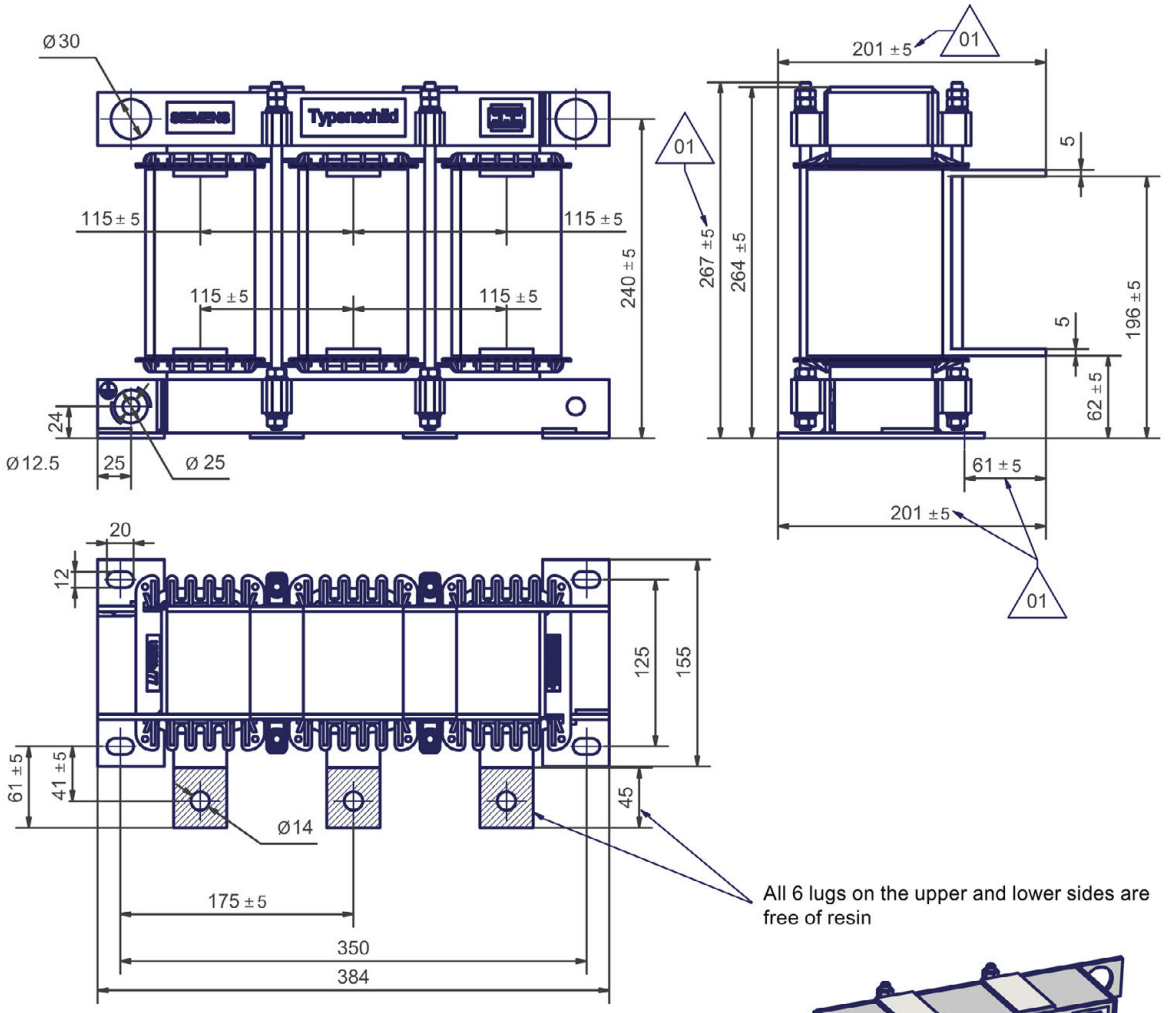
Type: 6RX1800-4GK02, 6RX1800-4FK06



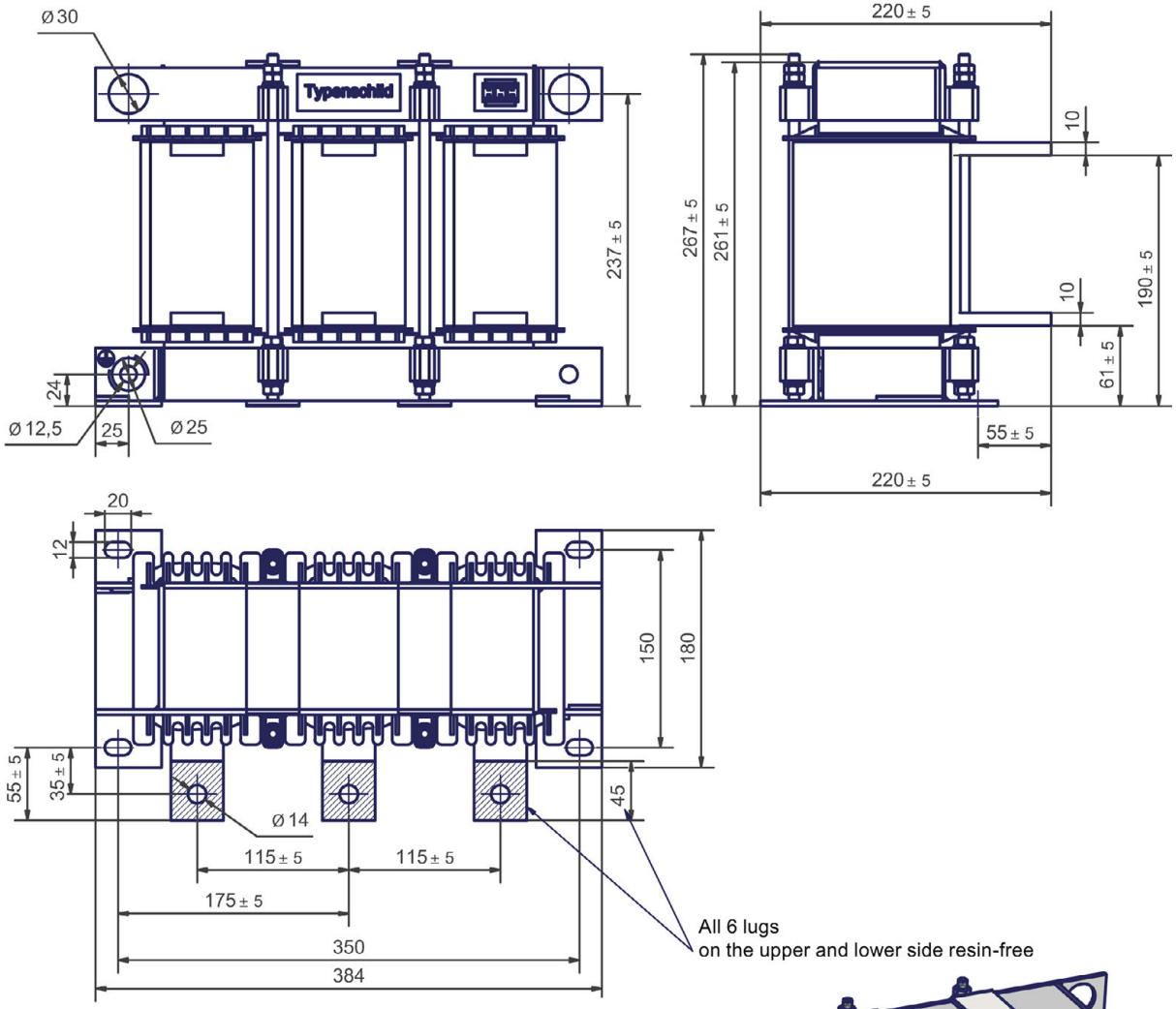
Ground terminal
Hole diameter 10.5
Bare front face (diameter 21)



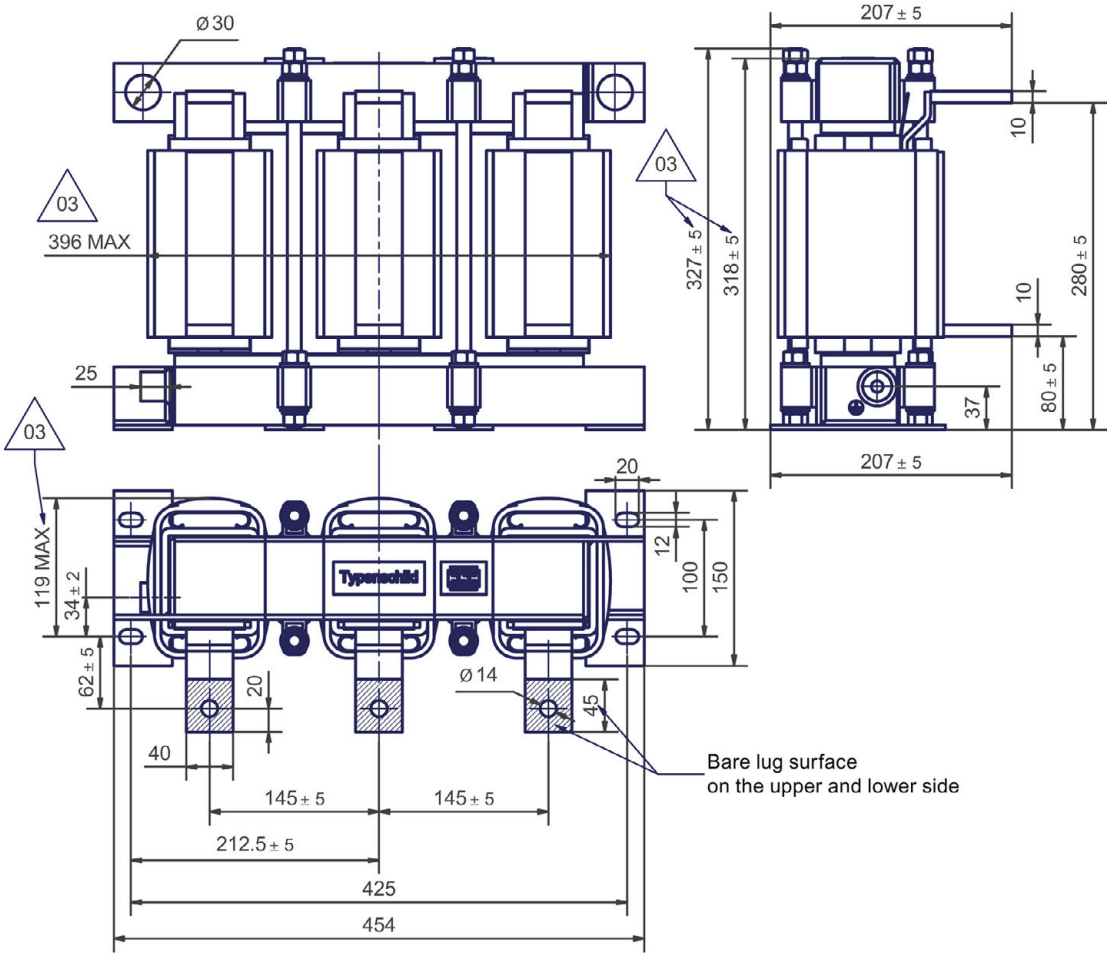
Type: 6RX1800-4DK07

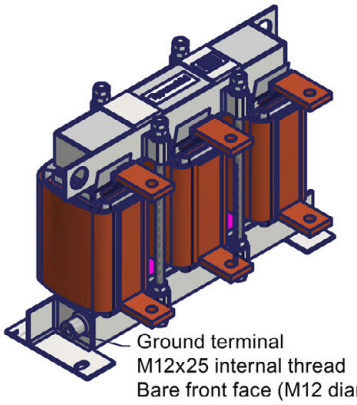


Type: 6RX1800-4DK08, 6RX1800-4FK07, 6RX1800-4FK08

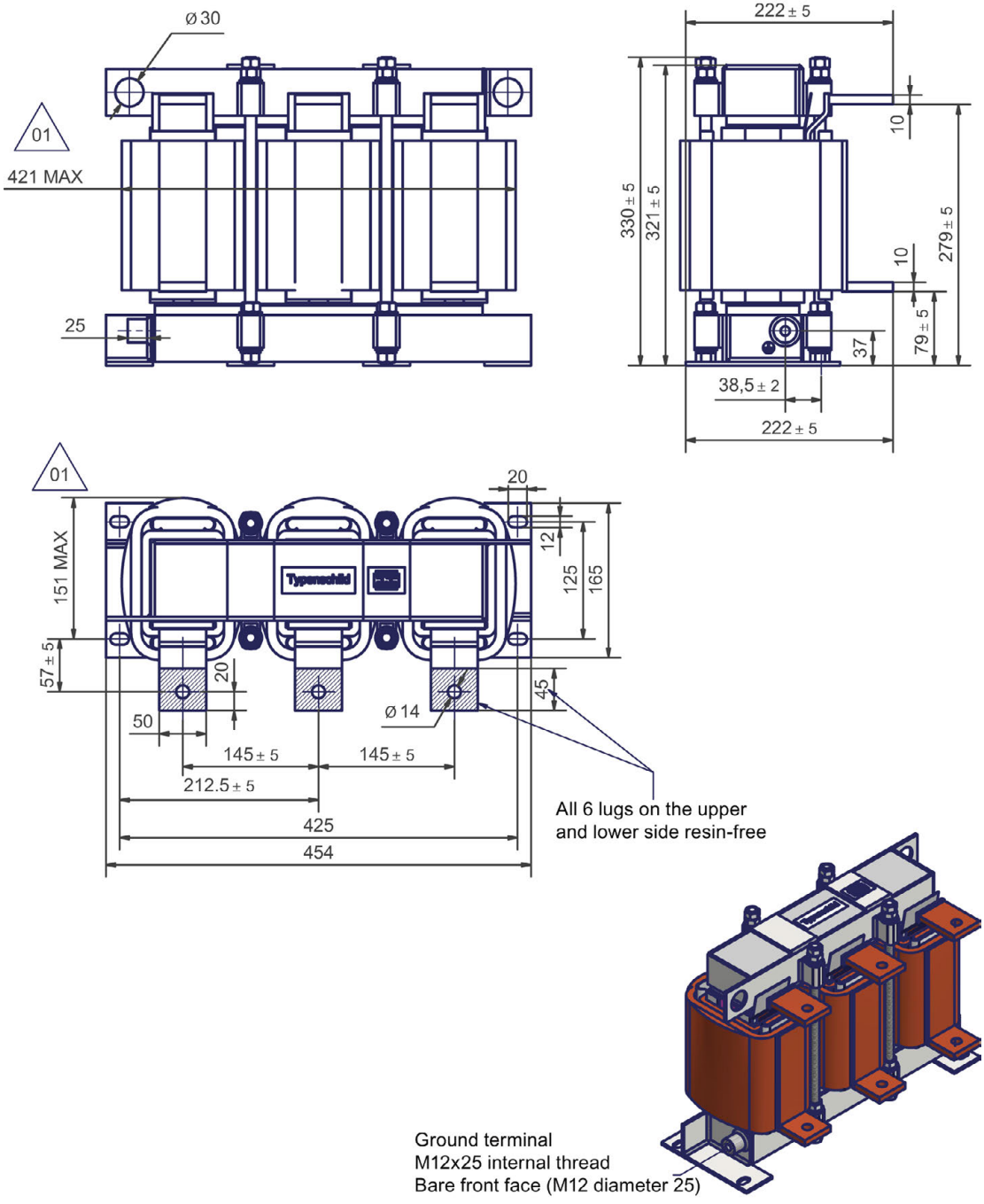


Type: 6RX1800-4GK03, 6RX1800-4DK10

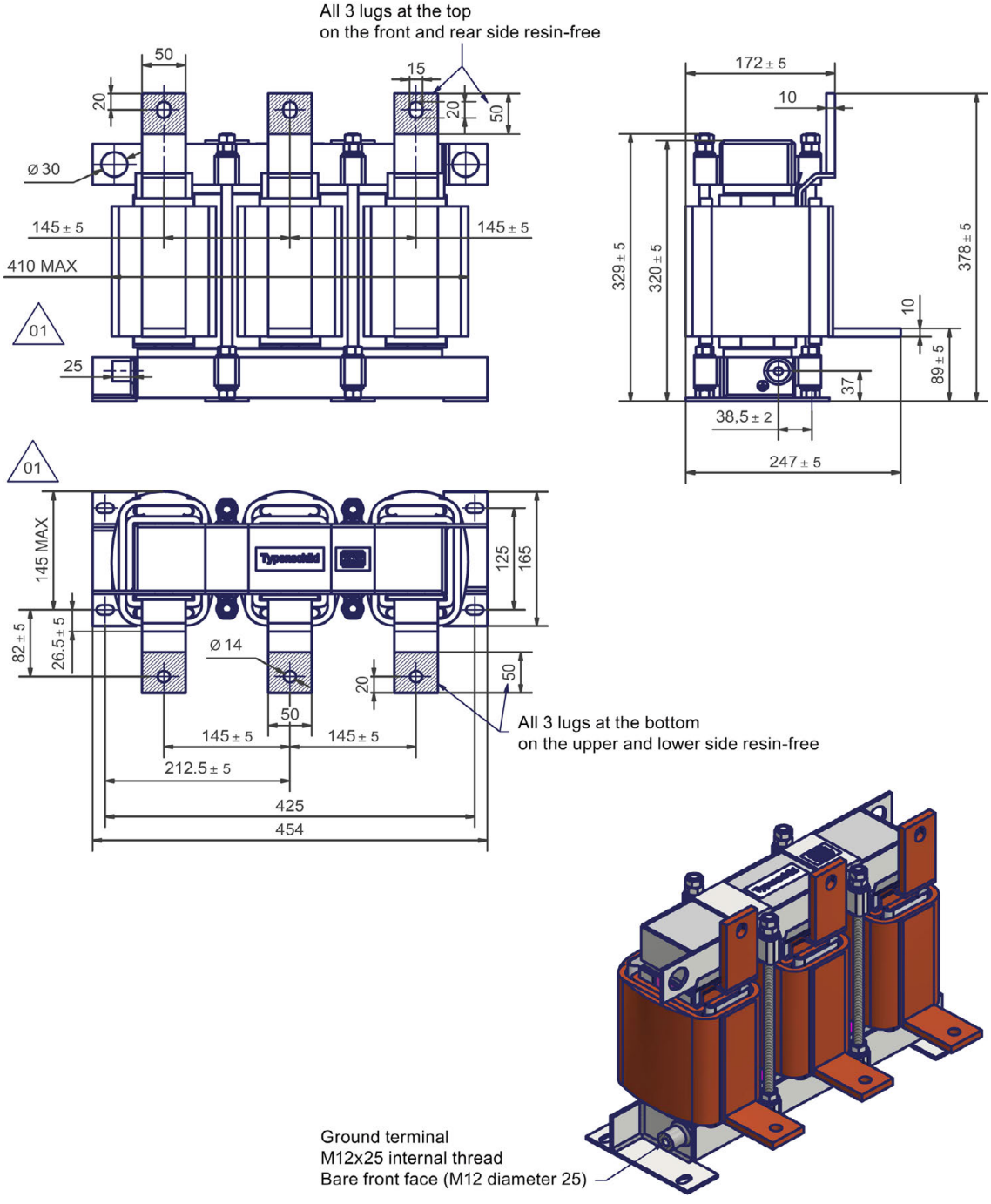




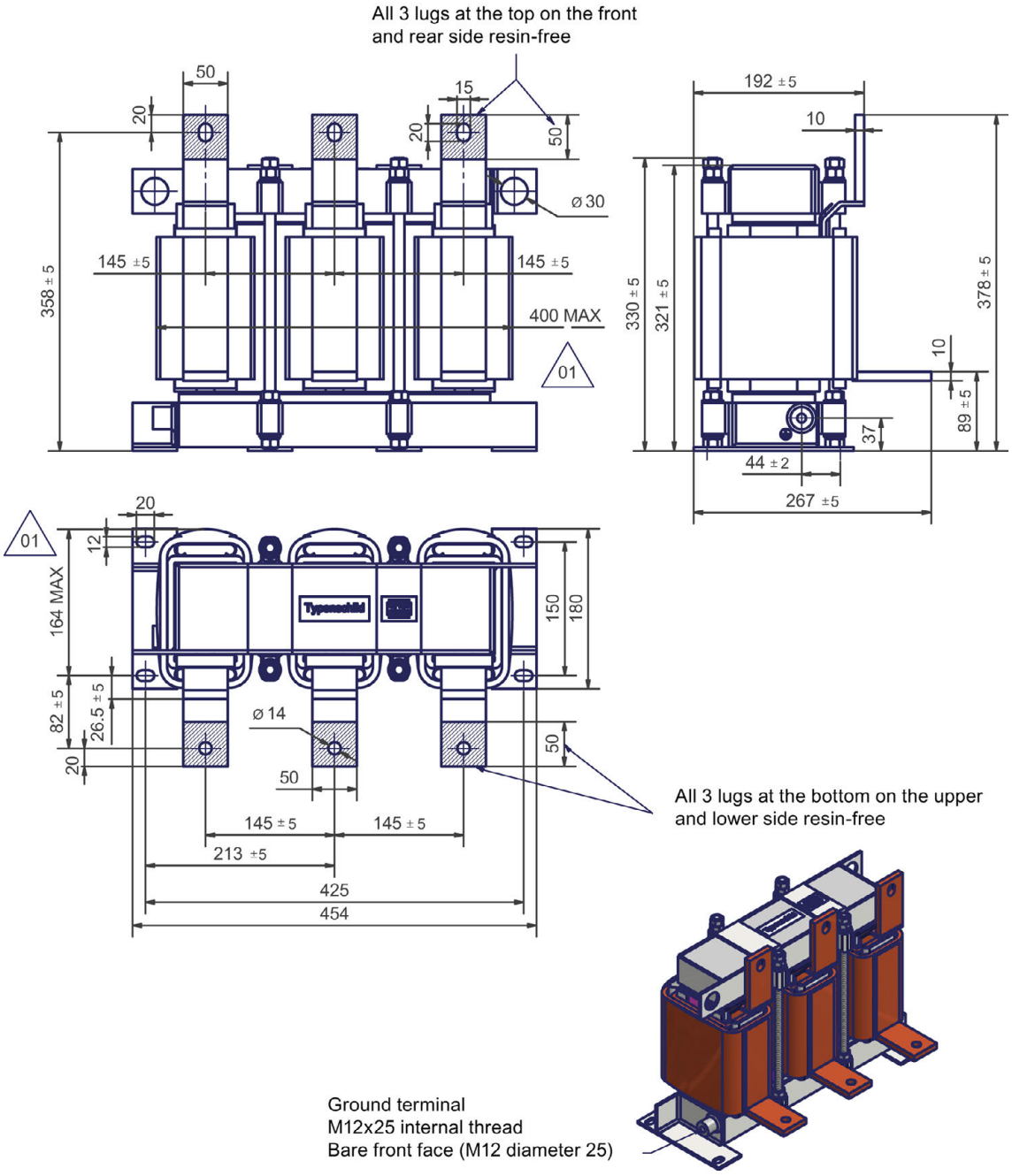
Type: 6RX1800-4FK10, 6RX1800-4GK04



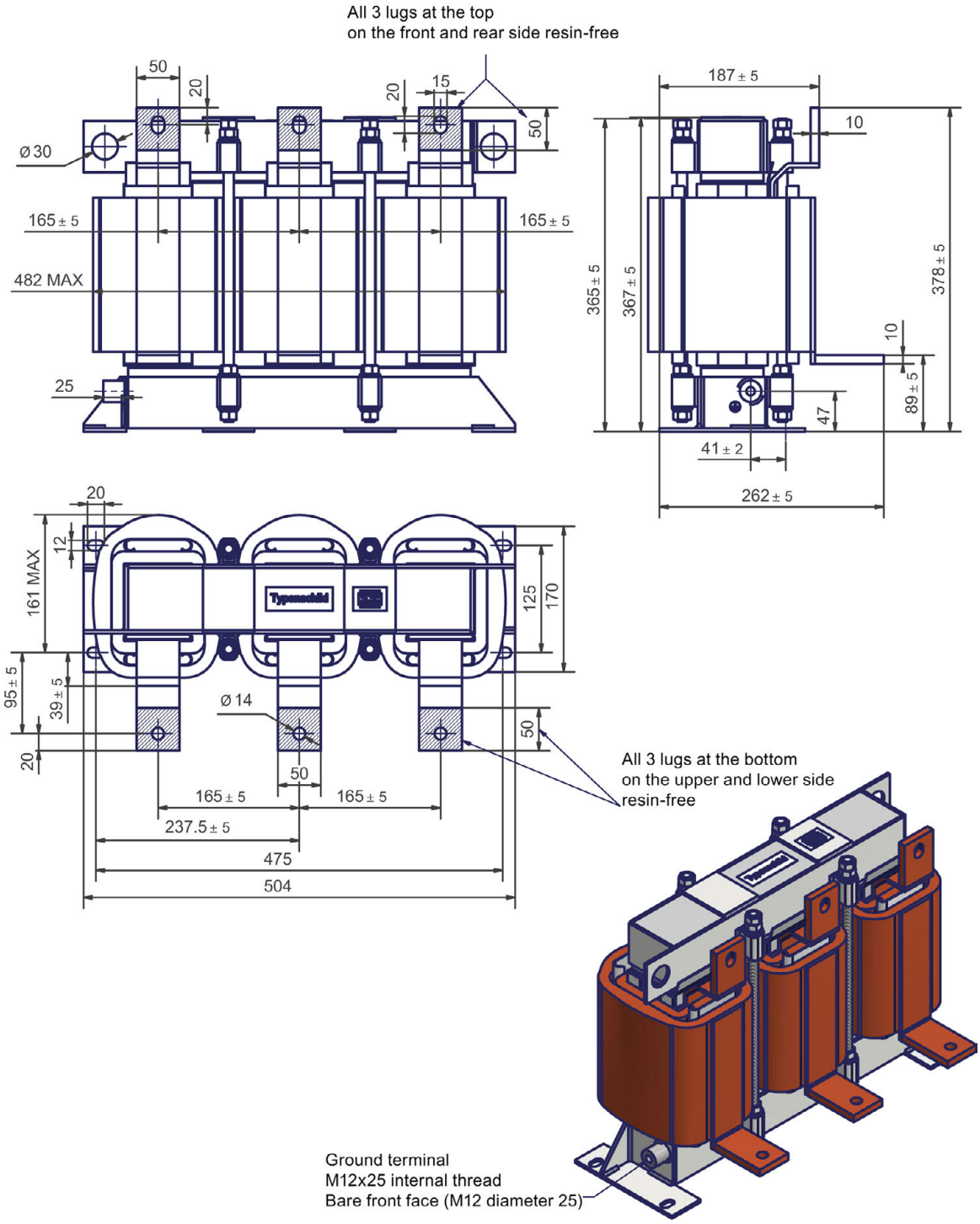
Type: 6RX1800-4DK11



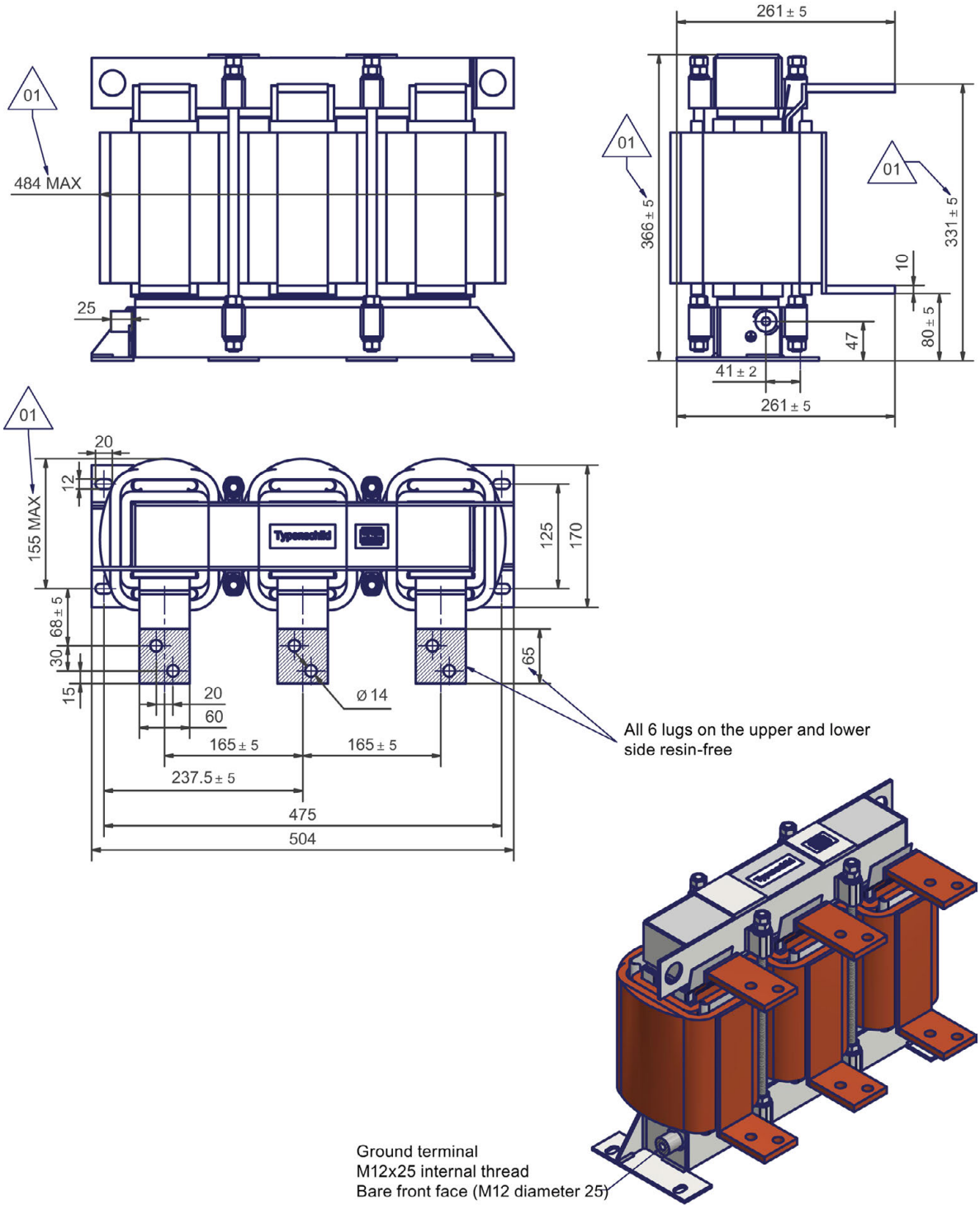
Type: 6RX1800-4GK05, 6RX1800-4GK06, 6RX1800-4FK11, 6RX1800-4FK12



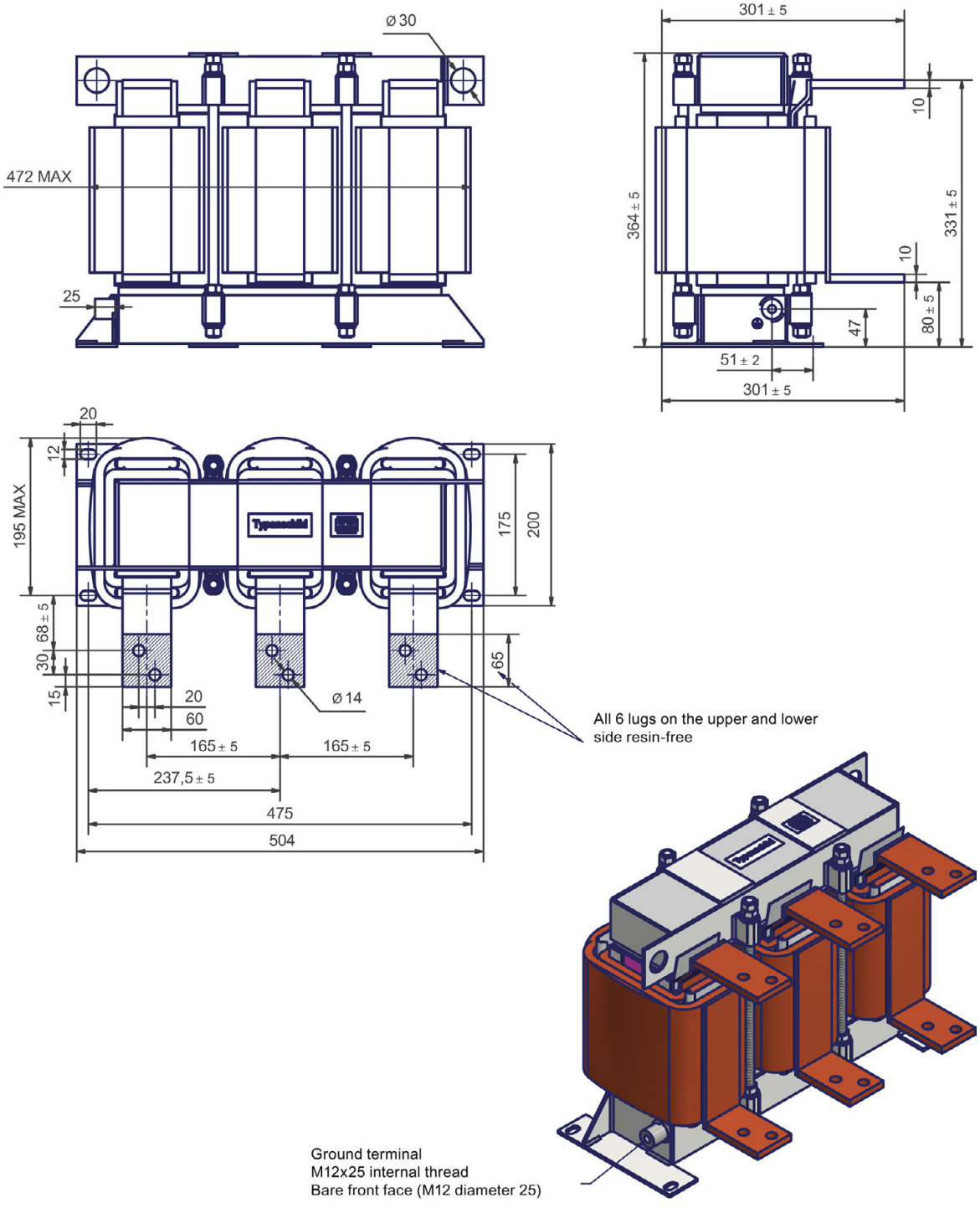
Type: 6RX1800-4KK00, 6RX1800-4KK01, 6RX1800-4GK07, 6RX1800-4GK08



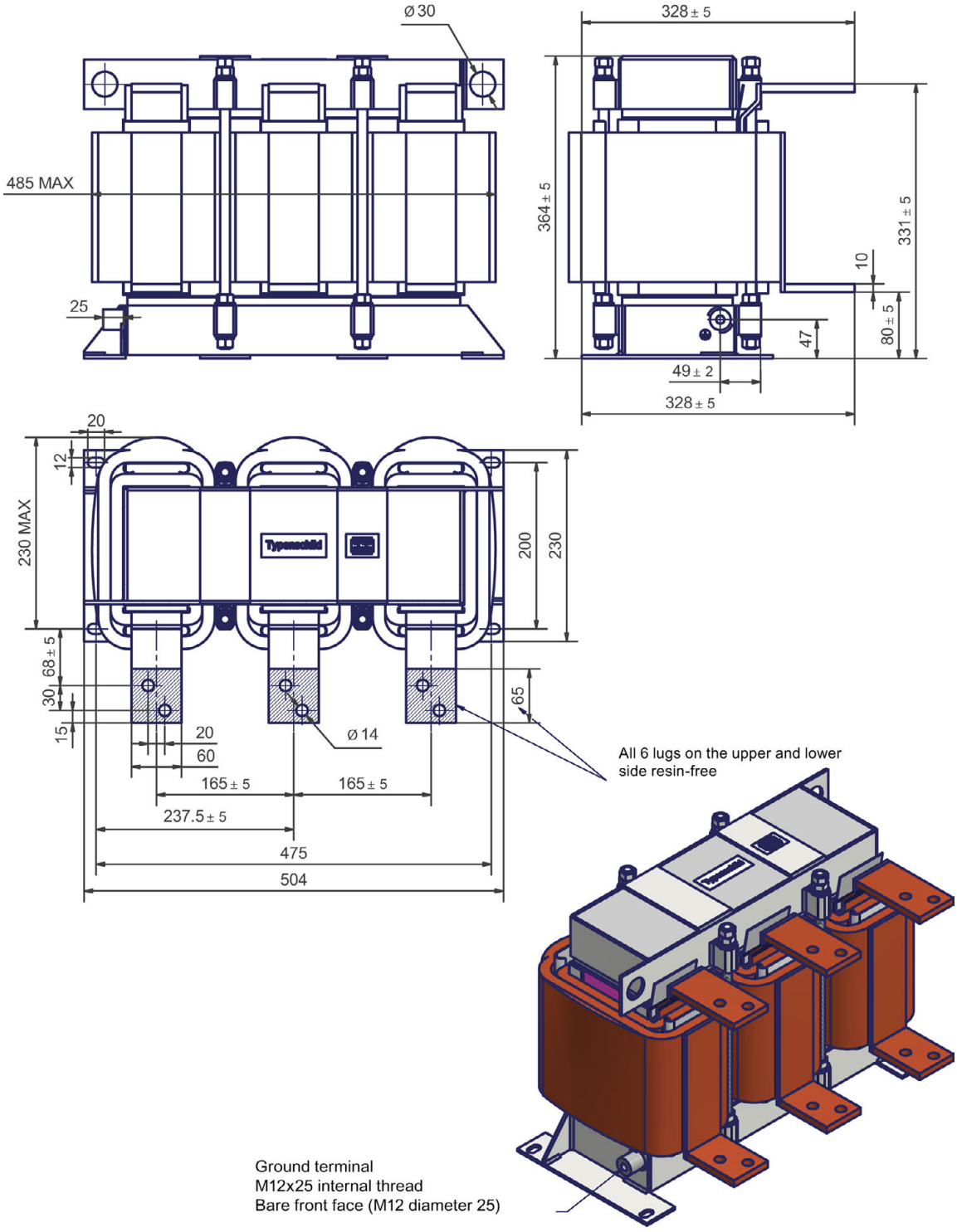
Type: 6RX1800-4FK13, 6RX1800-4DK12



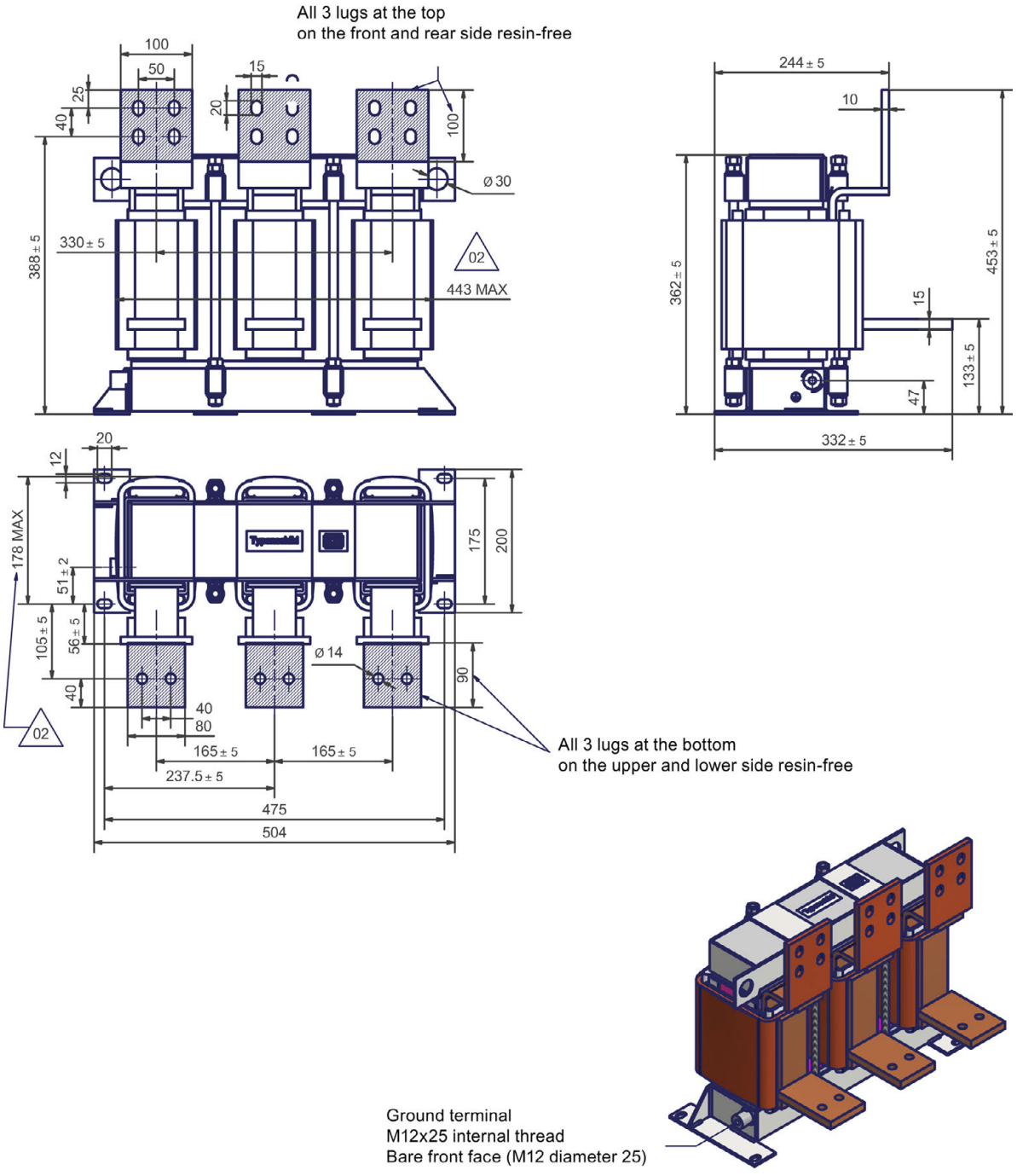
Type: 6RX1800-4KK02, 6RX1800-4GK10, 6RX1800-4KK03, 6RX1800-4GK11, 6RX1800-4FK14



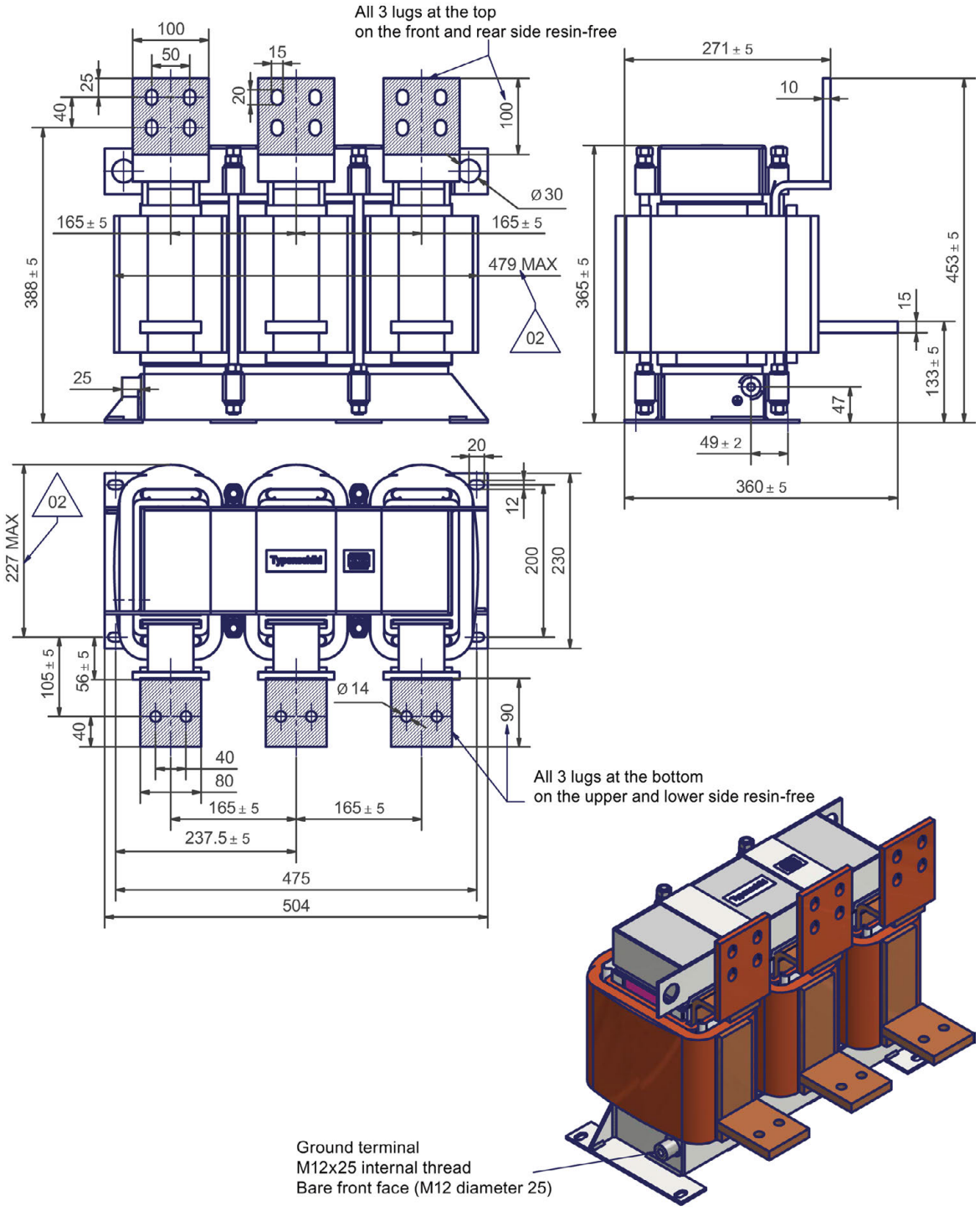
Type: 6RX1800-4LK00



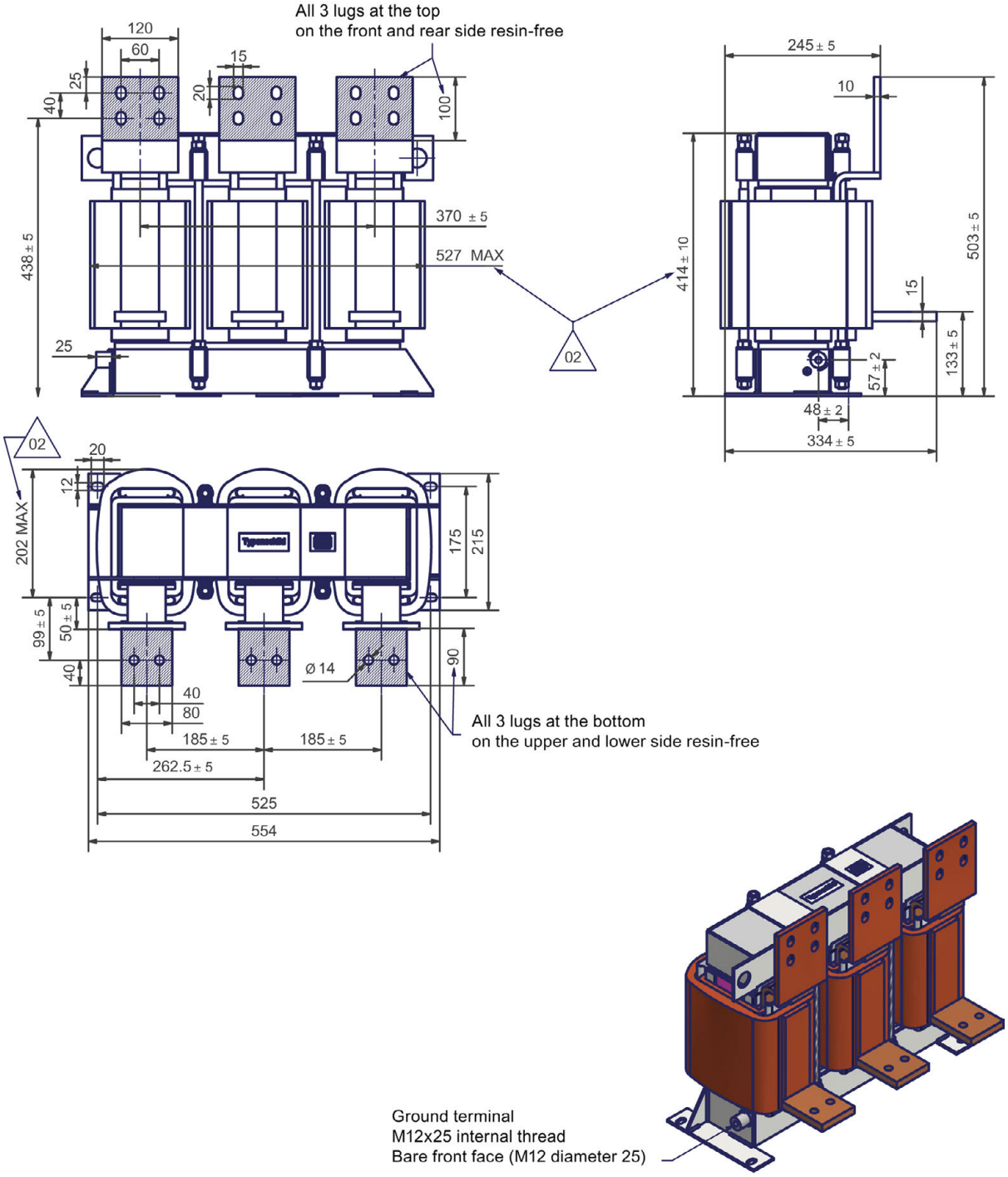
Type: 6RX1800-4DK13



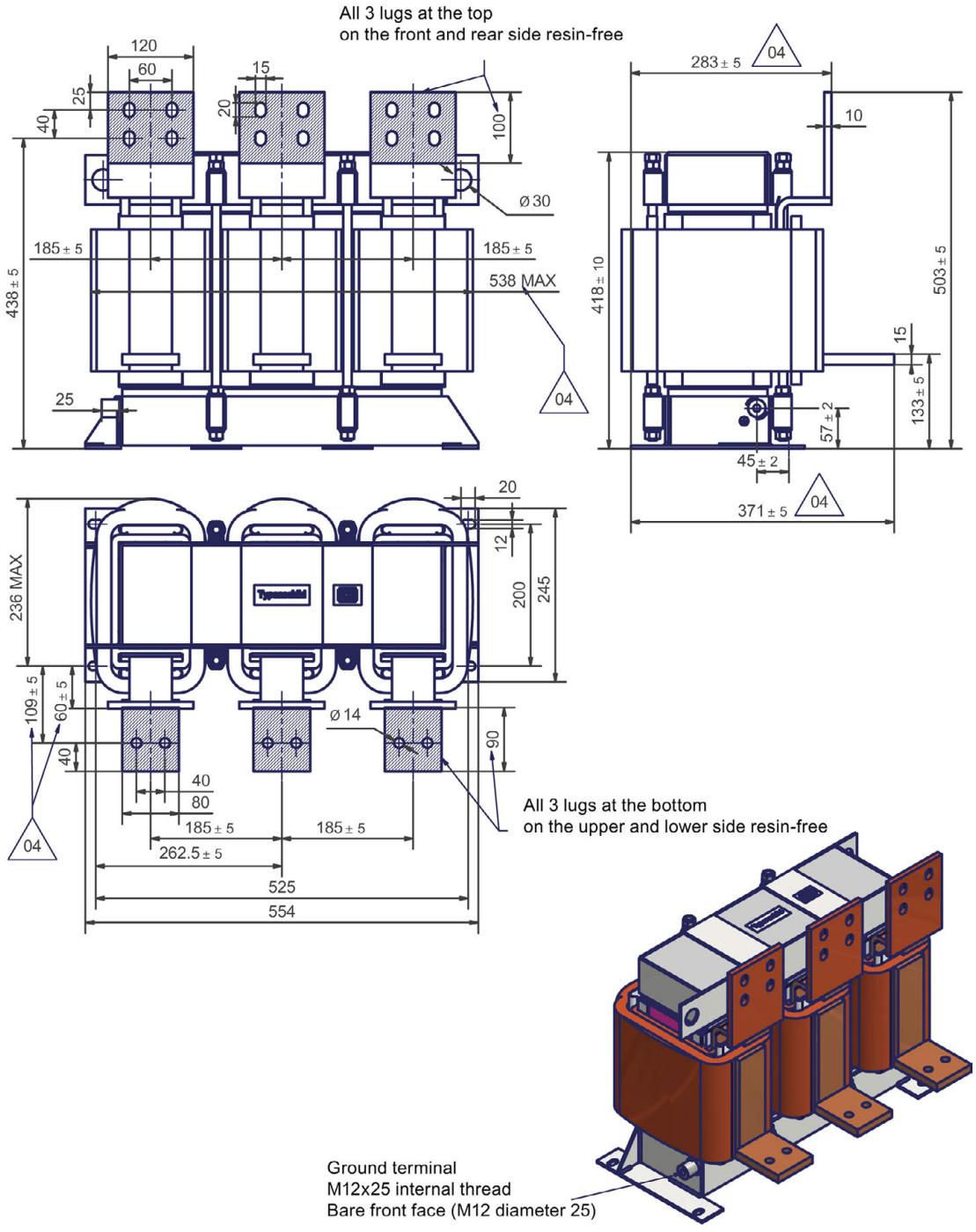
Type: 6RX1800-4DK14, 6RX1800-4GK12, 6RX1800-4FK15



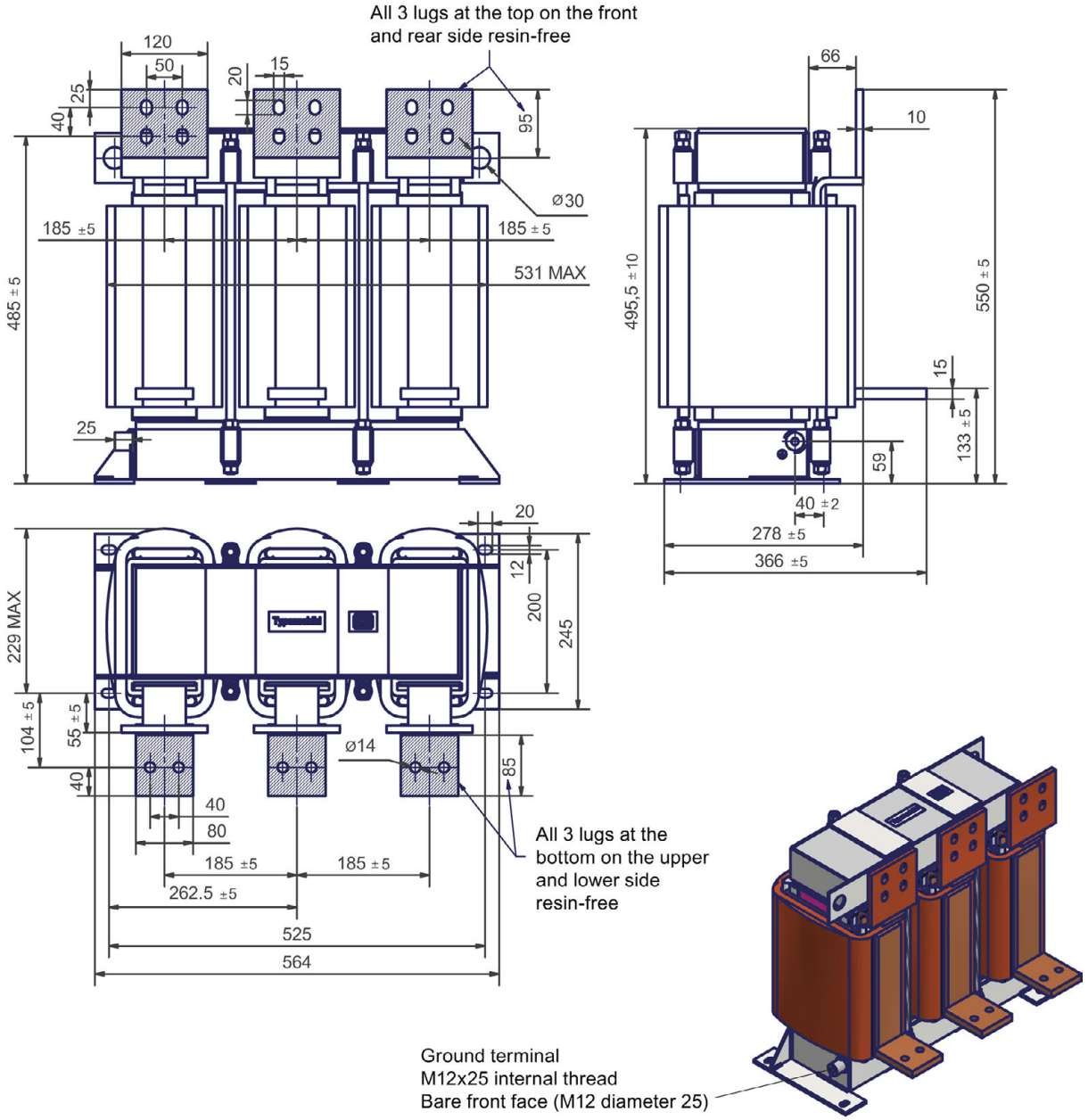
Type: 6RX1800-4KK04, 6RX1800-4GK13, 6RX1800-4FK16, 6RX1800-4FK17



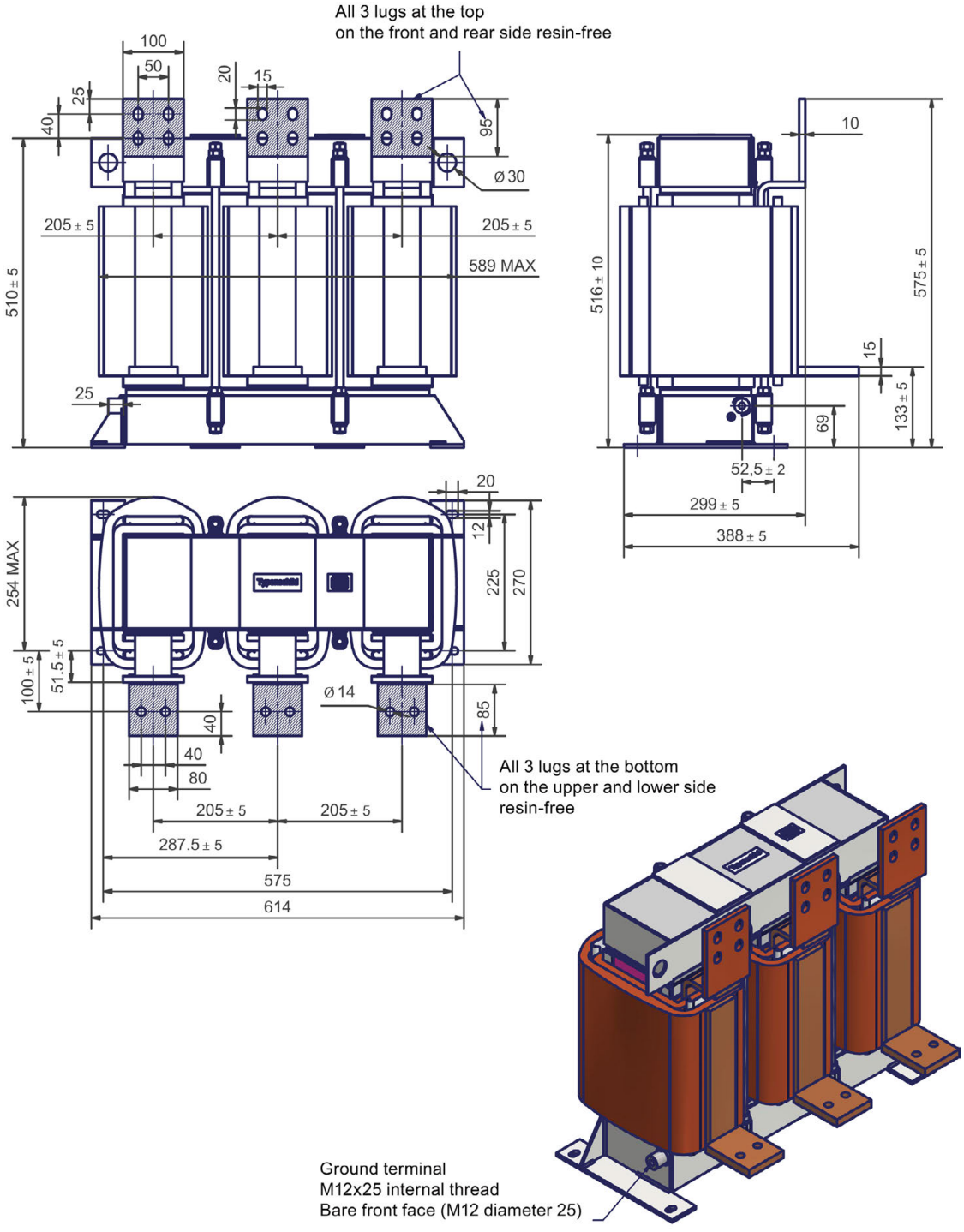
Type: 6RX1800-4LK01, 6RX1800-4KK05, 6RX1800-4GK14, 6RX1800-4KK06, 6RX1800-4GK15, 6RX1800-4FK18, 6RX1800-4DK15



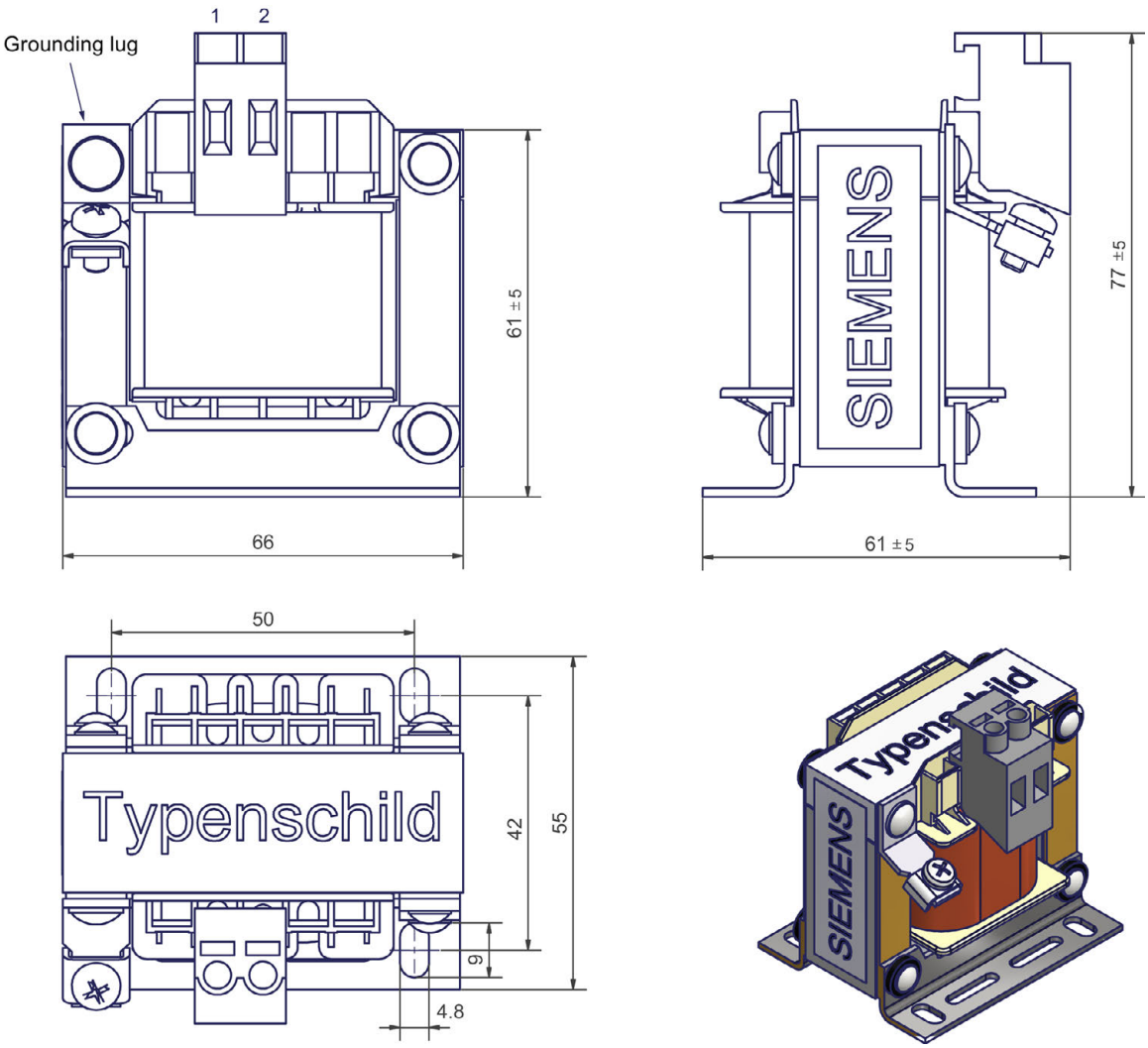
Type: 6RX1800-4LK02, 6RX1800-4GK16, 6RX1800-4GK17



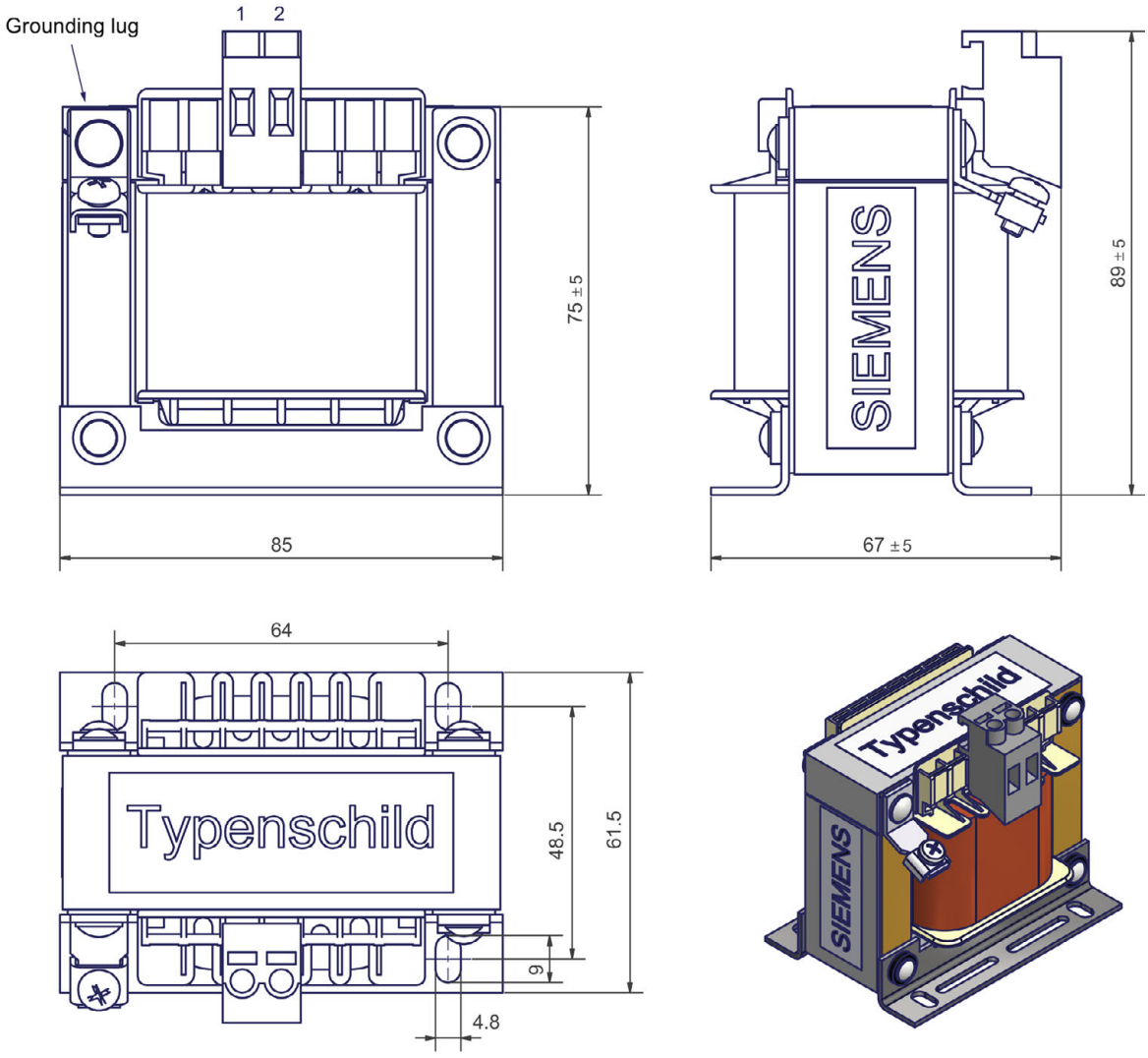
Type: 6RX1800-4LK03, 6RX1800-4MK00, 6RX1800-4KK07



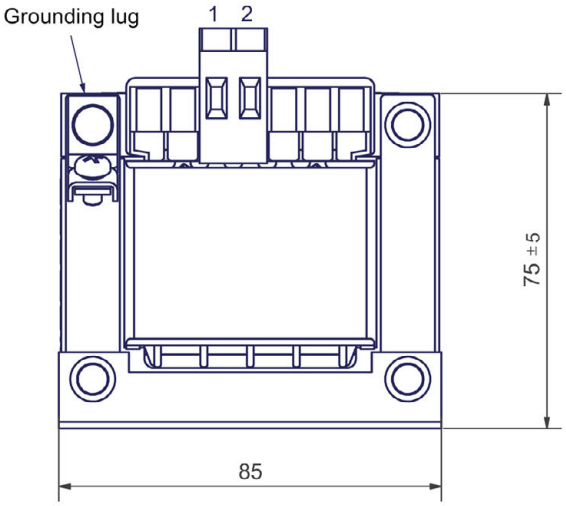
Type: 6RX1800-4DE00

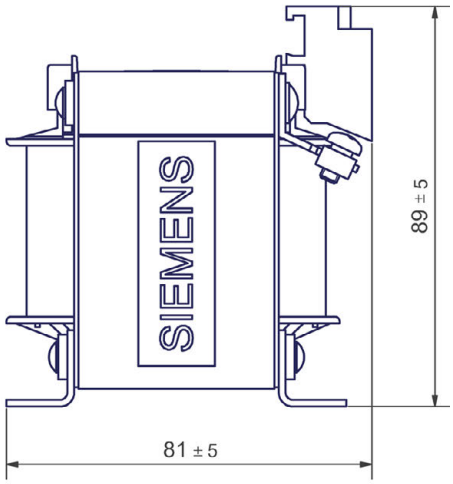


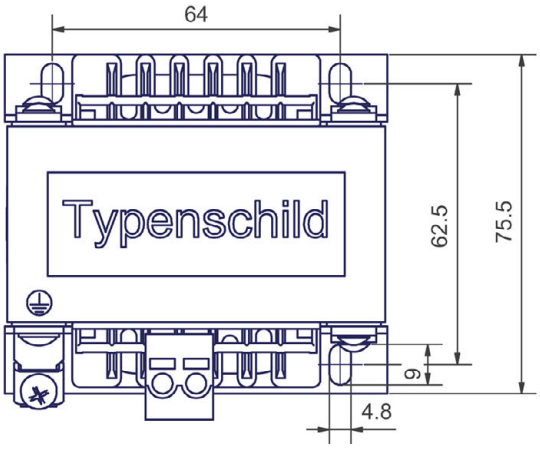
Type: 6RX1800-4DE01

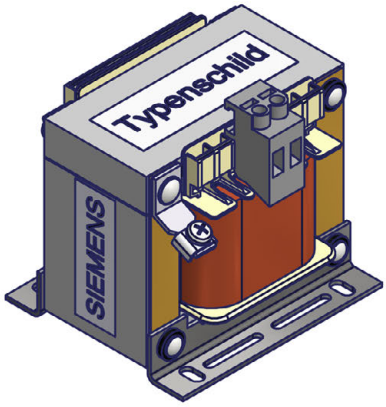


Type: 6RX1800-4DE02

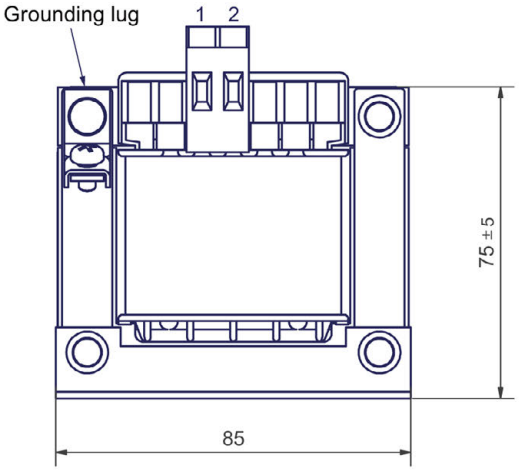


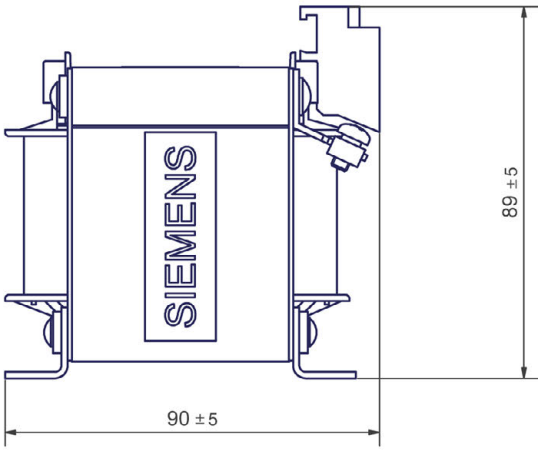


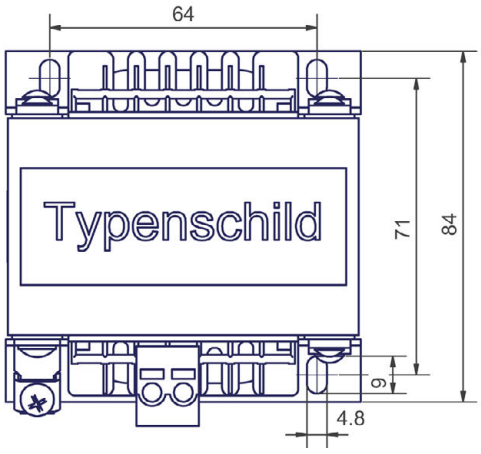


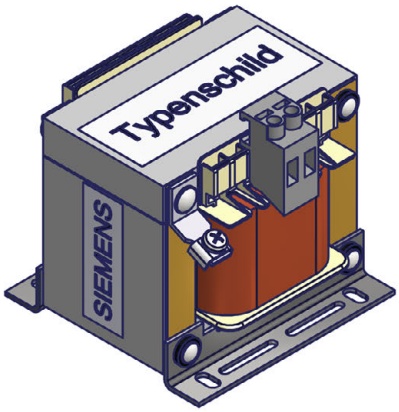


Type: 6RX1800-4DE03

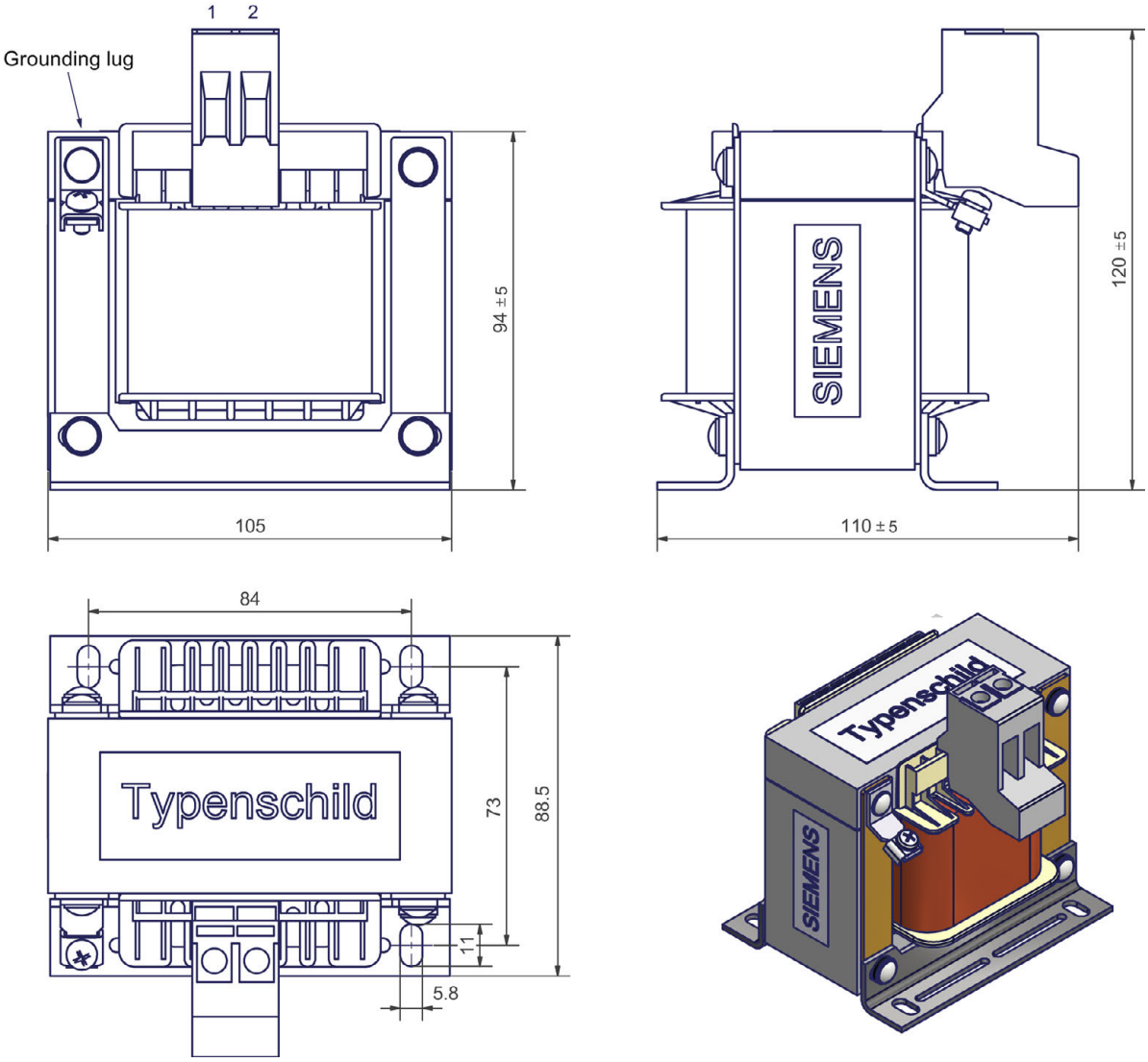




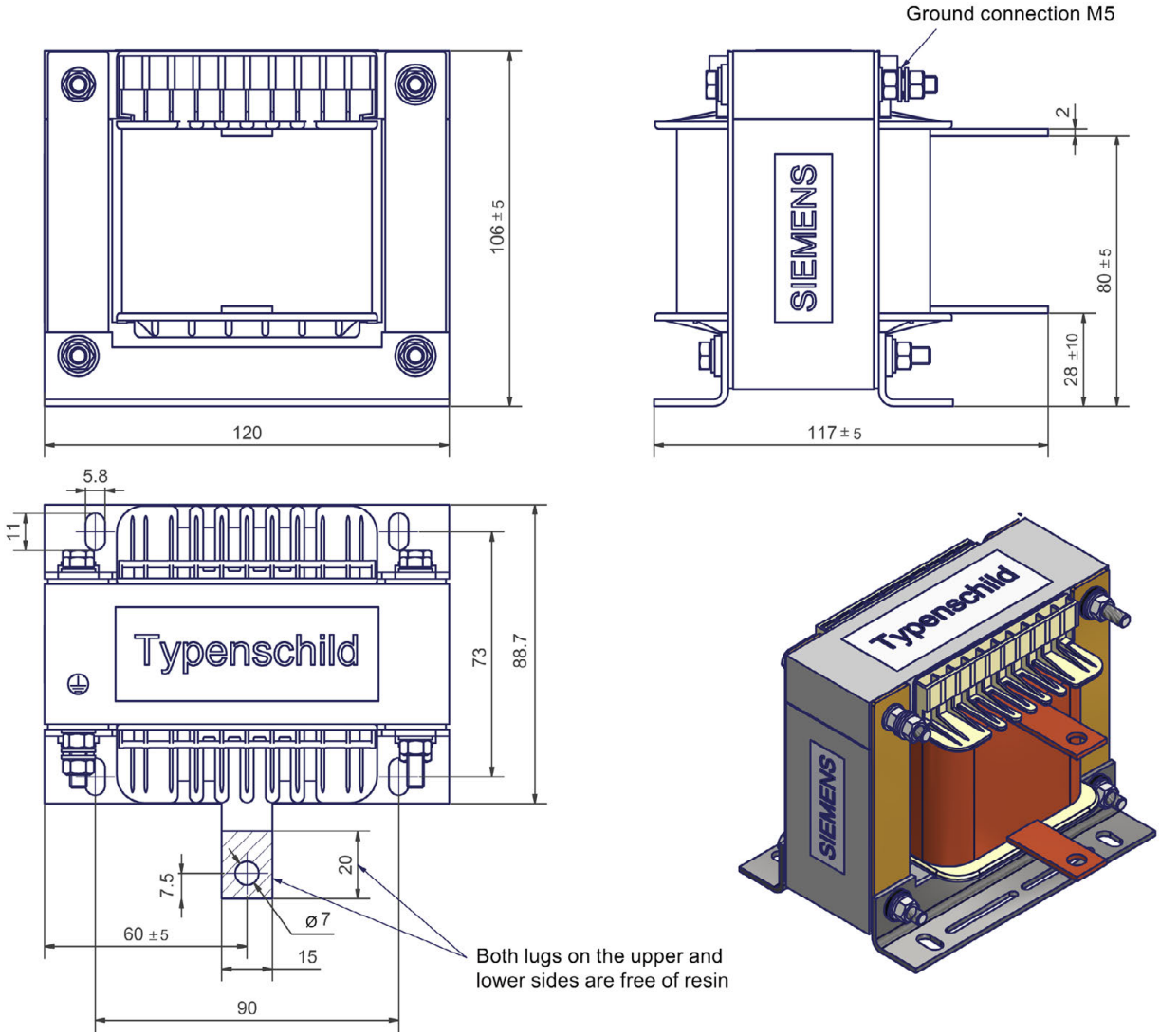




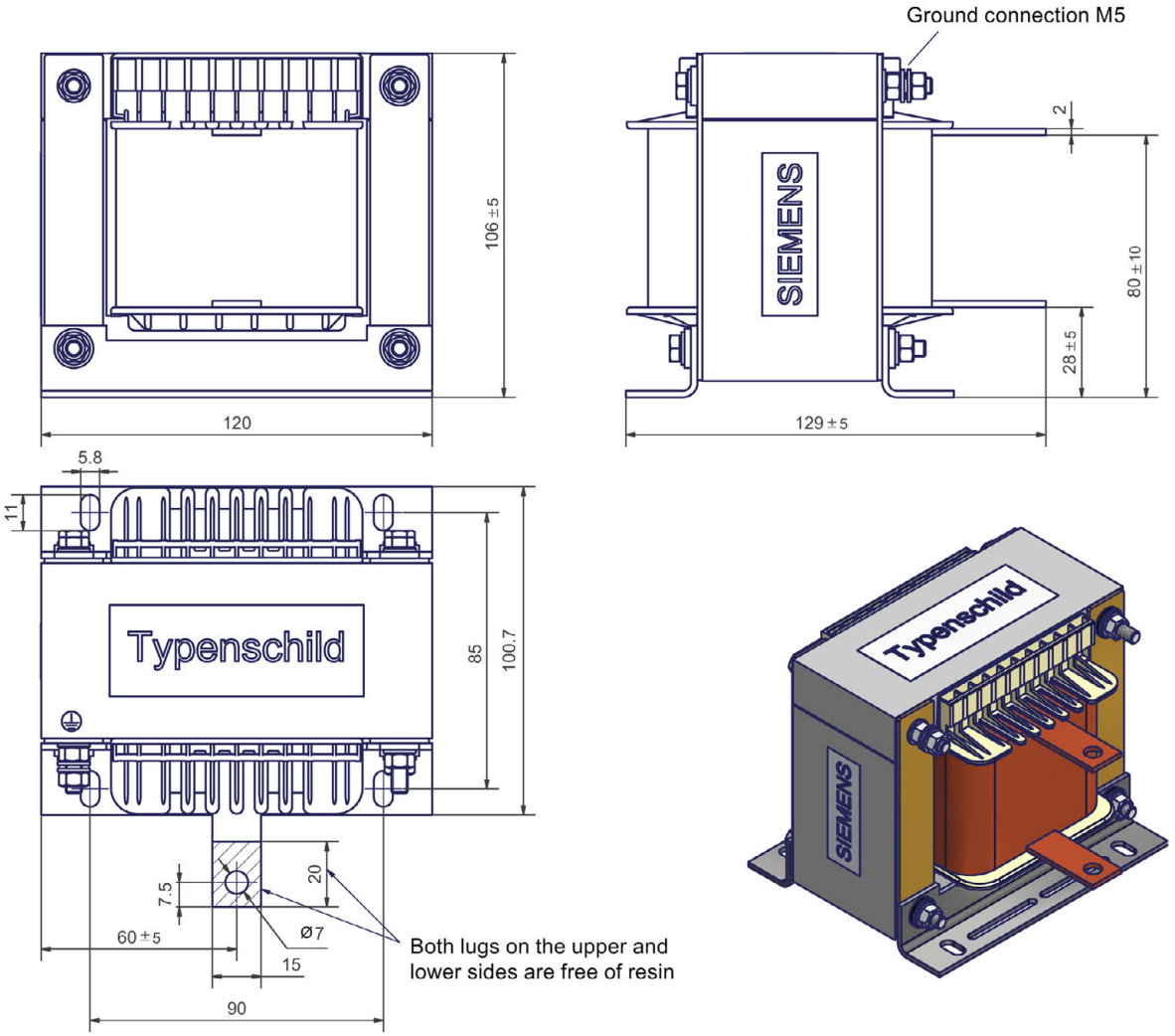
Type: 6RX1800-4DE04



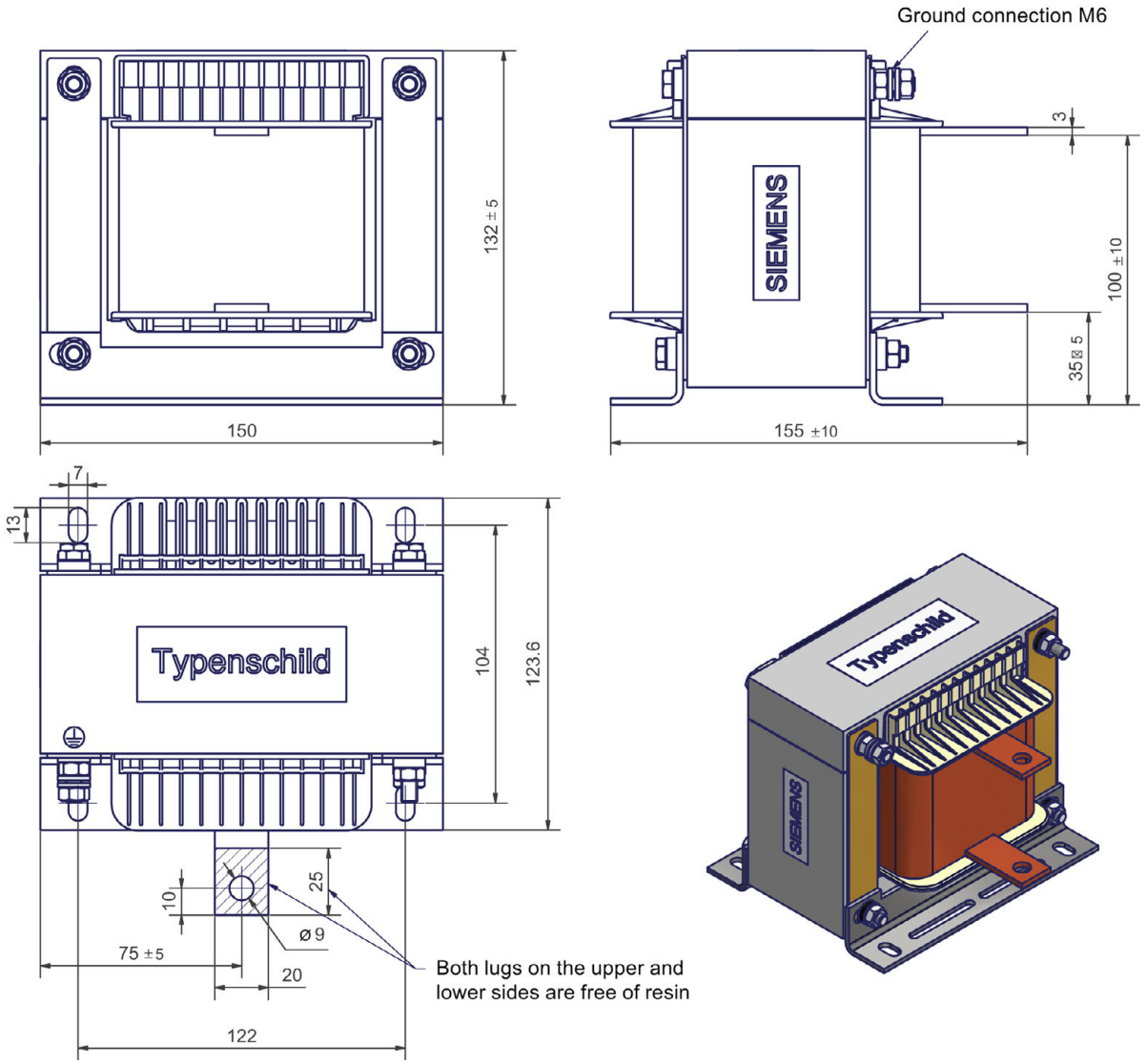
Type: 6RX1800-4DE05



Type: 6RX1800-4DE06



Type: 6RX1800-4DE07



Appendix

A

A.1 Customer Service

Service

You can find information on our services and regional contact persons in the Internet - (http://support.automation.siemens.com/WW/view/en/16604318)

Technical Support

Our technical support can provide you with technical assistance for products, systems, and solutions:

German (www.siemens.de/automation/support-request)
English (www.siemens.com/automation/support-request)

Central hotlines for SINAMICS DCM technical support

European and African time zone	Phone: +49 (0)911 895 7222 Fax: +49 (0)911 895 7223 email (mailto:support.automation@siemens.com)	8:00 to 17:00 CET
America time zone	**24-hour hotline: +1 800 333 7421**	
	Phone: +1 423 262 2960 Fax: +1 423 262 2200 email (mailto:support.america.automation@siemens.com)	8:00 to 17:00 Eastern Standard Time
Asia/Australia time zone	Phone: +86 1064 757575 Fax: +86 1064 747474 email (mailto:support.asia.automation@siemens.com)	7:30 to 17:30 Beijing local time

A.2 Environment

Siemens feels a responsibility to play a role in protecting our environment and saving our valuable natural resources. This is true for both our production and our products.

Even during development, we consider any possible environmental impact of future products/systems. Our aim is to prevent harmful environmental effects or at least to reduce them to an absolute minimum – above and beyond present regulations and legislation.

Environmental aspects during development

The use of hazardous substances (e.g. arsenic, asbestos, beryllium, cadmium, CFCS, halogen) has been avoided from the development stage onward.

Particular emphasis has been placed on ensuring that the range of metal and plastic parts is kept to a minimum. Pollutant-free materials have been used for all significant parts. No flame retardants containing halogen or insulation materials containing silicone have been used.

Environmental compatibility was a key criterion in selecting supplier parts.

Plastic parts:	Zytel 73G30L (E41938)
	Rynite FR530L (E41938)
	Revitex VPG (E121222)
	UTR 1494 (E23525)
	Voltaflex 2589
Impregnating resin:	Voltatex 4001 (E101752)

Shipping

For the selection and form of our packaging, we value environmental compatibility, reuse and, in particular, waste avoidance. The packing material itself is recyclable, and consists mainly of cardboard. Surface coatings have been omitted as far as possible.

A.3 Standards, certifications

EN 61558-1	Safety of transformers, reactors, power supplies and the associated combinations Part 1: General requirements
EN 61558-2-20	Safety of transformers, reactors, power supplies and the associated combinations Part 2-20: Special requirements and tests for small reactors
EP standard No. 1	Requirements placed on the environmental compatible product and system layout
EN 60721-3-1	Classification of environmental conditions
EN 60721-3-2	
EN 60721-3-3	
EN60939-2	Passive filters for the suppression of electromagnetic disturbances
ROHS	Restriction of Hazardous Substances
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
CSA 22.2 No. 66	Low Voltage Transformers - Part 1: General Requirements
UL5085-1	Low Voltage Transformers - Part 1: General Requirements

Siemens AG
Industry Sector
P.O. Box 48 48
90026 NUREMBERG
GERMANY

Subject to change
A5E32621741B
© Siemens AG 2013

DC Converters
SINAMICS DCM



www.siemens.com/automation