

SIEMENS

SIMOVERT MASTER DRIVES

Types J to M
DC-AC

Operating Instructions
Part 1



Overview of the MASTER DRIVES Operating Instructions:

Operating Instructions consists of

	Part 1	Part 2
6SE708_-_AD10	6SE708_-_AD70	6SE708_-_XX10
6SE708_-_AD20	6SE708_-_AD70	6SE708_-_XX20
6SE708_-_AD30	6SE708_-_AD70	6SE708_-_XX30
6SE708_-_BD10	6SE708_-_BD70	6SE708_-_XX10
6SE708_-_BD20	6SE708_-_BD70	6SE708_-_XX20
6SE708_-_BD30	6SE708_-_BD70	6SE708_-_XX30
6SE708_-_AH10	6SE708_-_AH70	6SE708_-_XX10
6SE708_-_AH20	6SE708_-_AH70	6SE708_-_XX20
6SE708_-_AH30	6SE708_-_AH70	6SE708_-_XX30
6SE708_-_BH10	6SE708_-_BH70	6SE708_-_XX10
6SE708_-_BH20	6SE708_-_BH70	6SE708_-_XX20
6SE708_-_BH30	6SE708_-_BH70	6SE708_-_XX30
6SE708_-_BM20	6SE708_-_BM70	6SE708_-_XX20



You will receive Parts 1 and 2 of the Operating Instructions when you use this Order No. Parts 1 and 2 can be individually ordered by specifying the particular Order No.

- stands for the language code, e.g. 0-0 for German Editions.

The following foreign language Editions of these Operating Instructions are available:

Language	German	French	Spanish	Italian
Language code	0-0	7-7	7-8	7-2

These Operating Instructions are valid for software release V1.2.

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We have checked the contents of this document to ensure that they coincide with the described hardware and software. However, differences cannot be completely excluded, so that we do not accept any guarantee for complete conformance. However, the information in this document is regularly checked and necessary corrections will be included in subsequent editions. We are grateful for any recommendations for improvement.

SIMOVERT® Registered Trade Mark

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0 Definitions

- **QUALIFIED PERSONAL**

For the purpose of these instructions and product labels, a "Qualified person" is someone who is familiar with the installation, mounting, start-up and operation of the equipment and the hazards involved. He or she must have the following qualifications:

1. Trained and authorized to energize, de-energize, clear, ground and tag circuits and equipment in accordance with established safety procedures.
2. Trained in the proper care and use of protective equipment in accordance with established safety procedures.
3. Trained in rendering first aid.

- **DANGER**

For the purpose of these instructions and product labels, "Danger" indicates death, severe personal injury or substantial property damage will result if proper precautions are not taken.

- **WARNING**

For the purpose of these instructions and product labels, "Warning" indicates death, severe personal injury or property damage can result if proper precautions are not taken.

- **CAUTION**

For the purpose of these instructions and product labels, "Caution" indicates that minor personal injury or material damage can result if proper precautions are not taken.

- **NOTE**

For the purpose of these instructions, "Note" indicates information about the product or the respective part of the Instruction Manual which is essential to highlight.

NOTE

These instructions do not purport to cover all details or variations in equipment, nor to provide for every possible contingency to be met in connection with installation, operation or maintenance.

Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to the local Siemens sales office.

The contents of this Instruction Manual shall not become part of or modify any prior or existing agreement, commitment or relationship. The sales contract contains the entire obligation of Siemens. The warranty contained in the contract between the parties is the sole warranty of Siemens. Any statements contained herein do not create new warranties or modify the existing warranty.



CAUTION

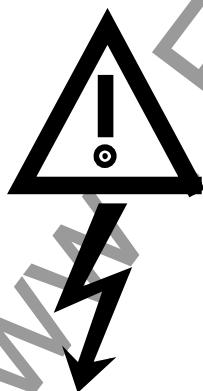
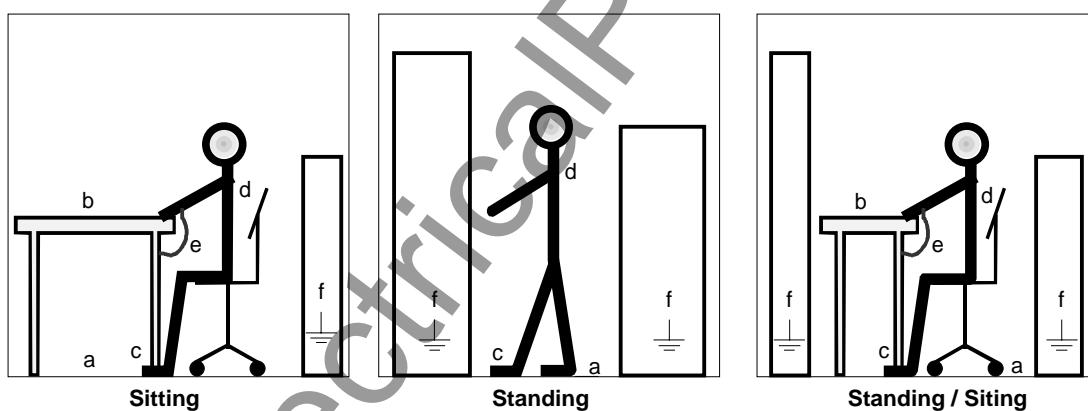
Components which can be destroyed by electrostatic discharge (ESD)

The converters contain components which can be destroyed by electrostatic discharge. These components can be easily destroyed if not carefully handled. If you have to handle electronic boards please observe the following:

- ◆ Electronic boards should only be touched when absolutely necessary.
- ◆ The human body must be electrically discharged before touching an electronic board
- ◆ Boards must not come into contact with highly insulating materials - e.g. plastic foils, insulated desktops, articles of clothing manufactured from man-made fibers
- ◆ Boards must only be placed on conductive surfaces
- ◆ When soldering, the soldering iron tip must be grounded
- ◆ Boards and components should only be stored and transported in conductive packaging (e.g. metalized plastic boxes, metal containers)
- ◆ If the packing material is not conductive, the boards must be wrapped with a conductive packaging material, e.g. conductive foam rubber or household aluminum foil.

The necessary ECB protective measures are clearly shown in the following diagram:

a = Conductive floor surface	d = ESD overall
b = ESD table	e = ESD chain
c = ESD shoes	f = Cubicle ground connection



WARNING

Hazardous voltages are present in this electrical equipment during operation.

Non-observance of the safety instructions can result in severe personal injury or property damage.

Only qualified personnel should work on or around the equipment after first becoming thoroughly familiar with all warning and safety notices and maintenance procedures contained herein.

The successful and safe operation of this equipment is dependent on proper handling, installation, operation and maintenance.

0.1 Safety and operating instructions for drive converters



Safety and operating instructions for drive converters

(in conformity with the low-voltage directive 73/23/EEC)

1. General

In operation, drive converters, depending on their degree of protection, may have live, uninsulated, and possibly also moving or rotating parts, as well as hot surfaces.

In case of inadmissible removal of the required covers, of improper use, wrong installation or maloperation, there is the danger of serious personal injury and damage to property.

For further information, see documentation.

All operations serving transport, installation and commissioning as well as maintenance are to be carried out by **skilled technical personnel** (Observe IEC 364 or CENELEC HD 384 or DIN VDE 0100 and IEC 664 or DIN/VDE 0110 and national accident prevention rules!).

For the purposes of these basic safety instructions, "skilled technical personnel" means persons who are familiar with the installation, mounting, commissioning and operation of the product and have the qualifications needed for the performance of their functions.

2. Intended use

Drive converters are components designed for inclusion in electrical installations or machinery.

In case of installation in machinery, commissioning of the drive converter (i.e. the starting of normal operation) is prohibited until the machinery has been proved to conform to the provisions of the directive 89/392/EEC (Machinery Safety Directive - MSD). Account is to be taken of EN 60204.

Commissioning (i.e. the starting of normal operation) is admissible only where conformity with the EMC directive (89/336/EEC) has been established.

The drive converters meet the requirements of the low-voltage directive 73/23/EEC. They are subject to the harmonized standards of the series prEN 50178/DIN VDE 0160 in conjunction with EN 60439-1/ VDE 0660, part 500, and EN 60146/ VDE 0558.

The technical data as well as information concerning the supply conditions shall be taken from the rating plate and from the documentation and shall be strictly observed.

3. Transport, storage

The instructions for transport, storage and proper use shall be complied with.

The climatic conditions shall be in conformity with prEN 50178.

4. Installation

The installation and cooling of the appliances shall be in accordance with the specifications in the pertinent documentation.

The drive converters shall be protected against excessive strains. In particular, no components must be bent or isolating distances altered in the course of transportation or handling. No contact shall be made with electronic components and contacts.

Drive converters contain electrostatic sensitive components which are liable to damage through improper use. Electric components must not be mechanically damaged or destroyed (potential health risks).

5. Electrical connection

When working on live drive converters, the applicable national accident prevention rules (e.g. VBG 4) must be complied with.

The electrical installation shall be carried out in accordance with the relevant requirements (e.g. cross-sectional areas of conductors, fusing, PE connection). For further information, see documentation.

Instructions for the installation in accordance with EMC requirements, like screening, earthing, location of filters and wiring, are contained in the drive converter documentation. They must always be complied with, also for drive converters bearing a CE marking. Observance of the limit values required by EMC law is the responsibility of the manufacturer of the installation or machine.

6. Operation

Installations which include drive converters shall be equipped with additional control and protective devices in accordance with the relevant applicable safety requirements, e.g. Act respecting technical equipment, accident prevention rules etc. Changes to the drive converters by means of the operating software are admissible.

After disconnection of the drive converter from the voltage supply, live appliance parts and power terminals must not be touched immediately because of possibly energized capacitors. In this respect, the corresponding signs and markings on the drive converter must be respected.

During operation, all covers and doors shall be kept closed.

7. Maintenance and servicing

The manufacturer's documentation shall be followed.

Keep safety instructions in a safe place!

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1 Description

SIMOVERT MASTER DRIVES are power electronic units. They are available as

- ◆ Compact units with three-phase- or DC current input
Output range: 2.2 kW to 37 kW
- ◆ Chassis units with three-phase- or DC current input
Output range: 45 kW to 200 kW
- ◆ Cabinet units with three-phase- or DC current input
Output range: 250 kW to 1500 kW

There are three versions depending on the particular application

- ◆ Frequency control FC simple applications (e.g. pumps and fans)
- ◆ Vector control VC high demands regarding dynamic performance and accuracy
- ◆ Servo Control SC servo drives

1.1 Applications

Drive converter with DC current input

DC drive converters generate a variable-frequency three-phase system at the motor side from a DC supply. This variable-frequency three-phase system is used to continuously control the speed of three-phase motors.:

SIMOVERT MASTER DRIVES can be used with a common DC link, as well as for single-motor and multi-motor drives.

Technological functions and expansions can be realized via defined interfaces in the open-loop control section.

1.2 Mode of operation

Converters with DC current input are suitable for coupling several converters to a common DC link bus. This permits energy transfer between drives in the motoring and generating modes which in turn means energy savings.

The DC converter must be connected to the DC bus through an E unit (rectifier unit) due to the pre-charging of the DC link capacitors. If an I/R unit (rectifier and regenerative feedback unit) is used instead of the E unit, power is fed back into the supply if the regenerative output for several drives is greater than the motor power required.

The converter is ready for operation after the DC link capacitors have been pre-charged.

The inverter, configured using IGBT modules, generates a three-phase system from the DC link voltage to feed the motor.

SIMOVERT VC

The inverter open-loop control uses a microprocessor and field-oriented vector control with an extremely fast closed-loop current control. The drive can be precisely adapted to the demanded load torque as a result of the field-oriented control, which in turn means that the drive has an extremely high dynamic performance. The pulse frequency is preset to 2.5 kHz when the unit is shipped.

SIMOVERT VC is suitable for:

- ◆ Induction motors in both single-motor or multi-motor drives.
For multi-motor drives, the motors within the group must be the same.

Some of the applications are, for example:

- ◆ Winder drives
- ◆ Rolling mill drives.

When the drive is shipped, closed-loop V/f control is preset. Closed-loop frequency control with field-oriented vector control must be parameterized.

The converter can be set, as a result of the precise motor simulation up to a maximum frequency of 300 Hz, with and without stall protection and with and without tachometer feedback.

1.3 Operator control- and open-loop control possibilities

The unit can be controlled via

- ◆ the parameterization unit (PMU)
- ◆ an optional operator control panel (OP1)
- ◆ terminal strip
- ◆ a serial interface.

When networked with automation systems, the unit open-loop control is realized via optional interfaces and technology boards.

1.4 Block diagram

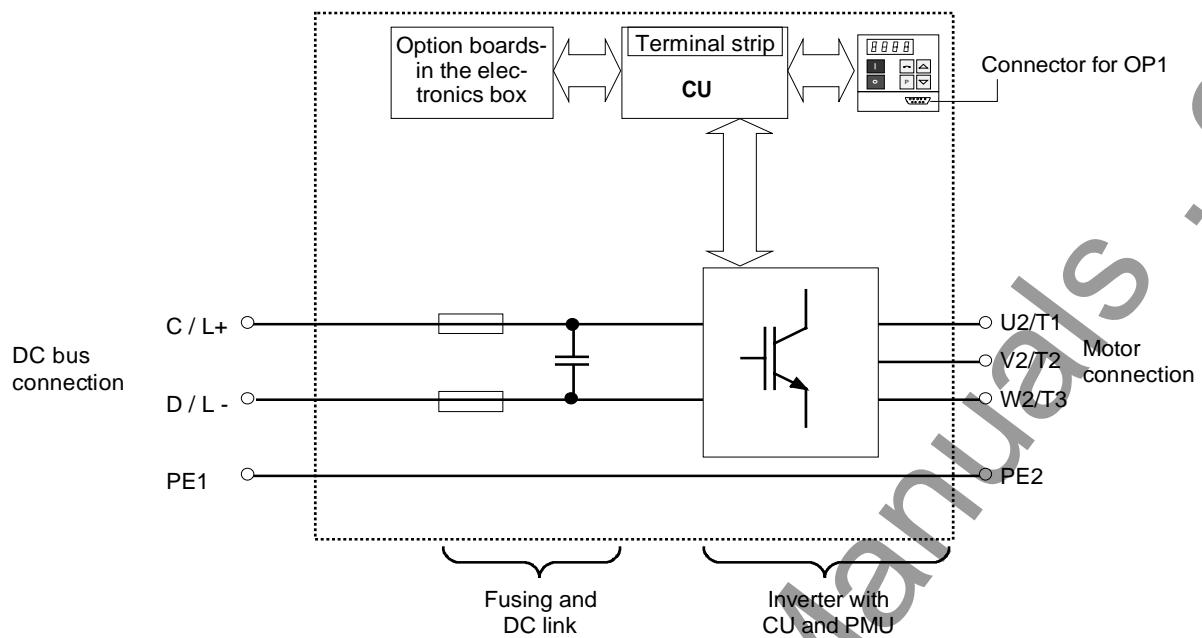


Fig. 1.1 Block diagram, types of construction J and K

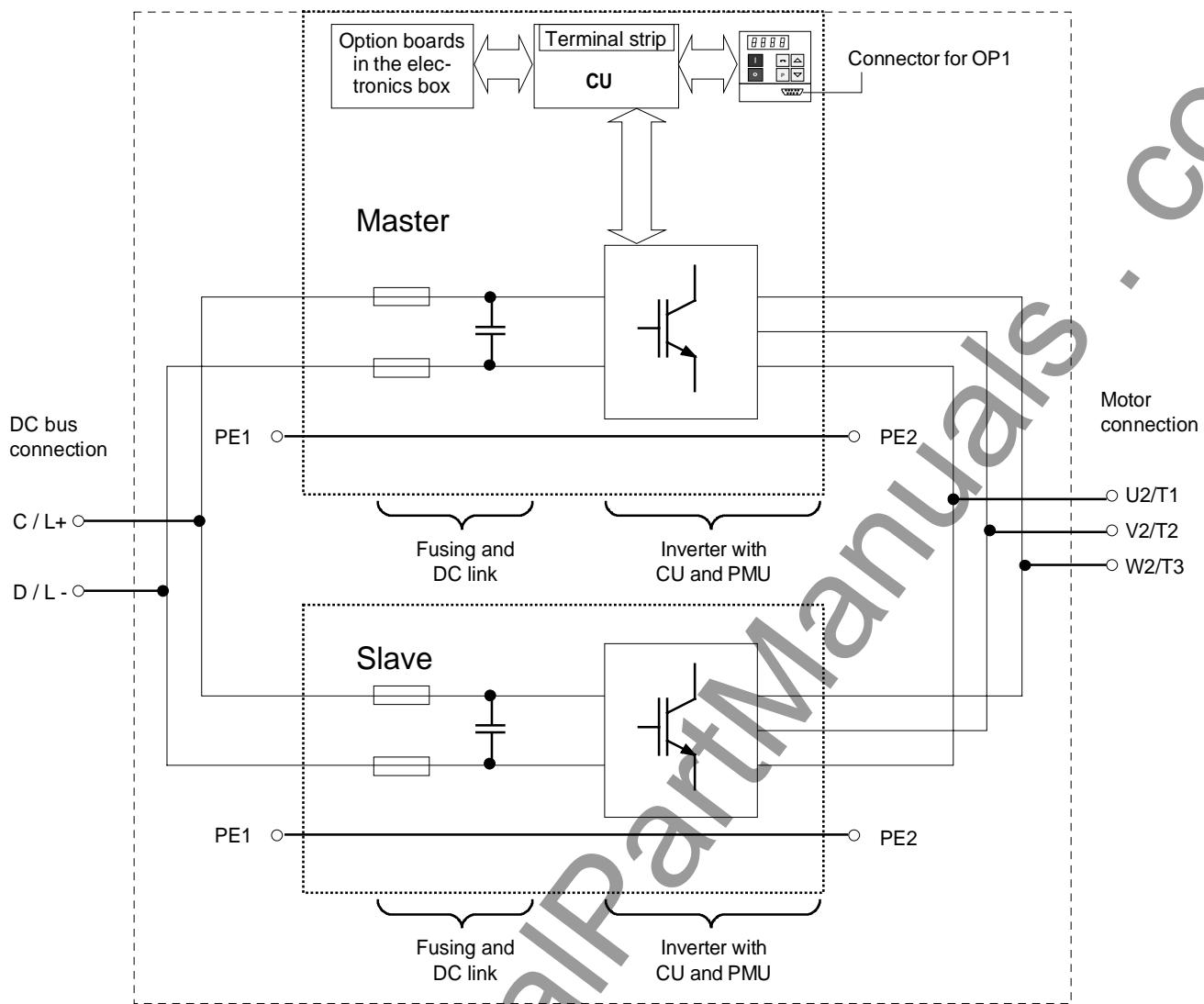


Fig. 1.2 Block diagram, type of construction M

2 Transport, Unpacking, Installation

2.1 Transport and unpacking

The units are packed in the manufacturing plant corresponding to that specified when ordered. A product packing label is located on the outside of the packing.

Please observe the instructions on the packaging for transport, storage and professional handling.

For transportation with a fork-lift truck the converter is mounted on a wooden pallet.

Vibration and jolts must be avoided during transport, e.g. when setting the unit down.

The converter can be installed after it has been unpacked and checked to ensure that everything is complete and that the converter is not damaged.

If the converter is damaged you must inform your shipping company immediately.

The packaging consists of a wooden floor section and a PE foil to protect the equipment from humidity. It can be disposed of in accordance with local regulations.

Depending on the degree of protection and type of construction, the units may be mounted on a pallet either with or without transport rails.

◆ Degree of prot. IP00 Pallet

- Type of construction J one unit
- Type of construction K one unit
- Type of construction M three units
 - master drive converter, type of construction K
 - reactor
 - slave drive converter, type of construction K without electronics box

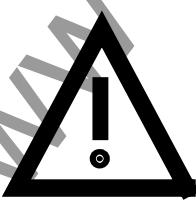
◆ Degree of prot. IP20 8MC cabinet on transport rails and pallet

- Type of construction J one 8MC cabinet
- Type of construction K one 8MC cabinet
- Type of construction M three 8MC cabinets combined to form a single unit
 - master type of construction K
 - reactor
 - slave drive converter, type of construction K without electronics box

Chassis units are supplied, as standard, with degree of protection IP00.

2.2 Storage

The converters must be stored in clean dry rooms. Temperatures between – 25 °C (–13 °F) and + 70 °C (158 °F) are permissible. Temperature fluctuations > 20 K per hour are not permissible.

	WARNING
<p>The equipment should not be stored for longer than one year. If it is stored for longer periods of time, the converter DC link capacitors must be formed at start-up.</p> <p>Capacitor forming is described in Part 2 of the Operating Instructions.</p>	

2.3 Mounting

The following are required for mounting:

- ◆ M8 bolt(s)
- ◆ Dimension drawings: Fig. 2.1 for type of construction J, Fig. 2.2 for type of construction K and Fig. 2.5 for type of construction M.
- ◆ Only type of construction M: Engineering support

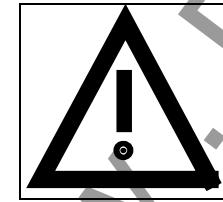
	WARNING <p>Safe converter operation requires that the equipment is mounted and commissioned by qualified personnel taking into account the warning information provided in this Instruction Manual.</p> <p>The general and domestic installation and safety regulations for work on electrical power equipment (e.g. VDE) must be observed as well as the professional handling of tools and the use of personal protective equipment.</p> <p>Death, severe bodily injury or significant material damage could result if these instructions are not followed.</p> <p>Chassis units do not provide any protection against direct contact. It is the user's responsibility to ensure and provide the correct protection against contact according to the relevant accident prevention regulations VBG4, by appropriately designing the enclosure or enclosures around the chassis unit.</p>
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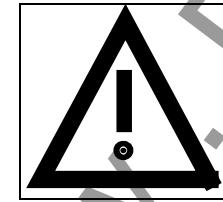
Remove shipping brace (marked).

The three units, type of construction M with degree of protection IP00, must be assembled according to the instructions specified in the engineering support documentation.

The control connections between the master and slave must then be established.

- ◆ Procedure: The control cables must be carefully routed through the cable duct in the reactor chassis in the master cabinet.
 - Insert connectors -X238 / -X234 / -X32 / -X42.
 - Insert the fiber-optic cables U41 / U51 / U61 / U42 / U43 / U52 / U53 / U62 / U63 in the master, at the IPI.

	NOTE <p>Inserting the fiber-optic cables: Insert the fiber-optic cable up to its end stop (approx. 16 mm), tighten up the union nut by hand.</p>
---	---

	CAUTION <p>Fiber-optic cables may not be bent through a sharp angle. Bending radius for fiber-optic cables ≥ 30 mm.</p>
---	--

The unit is mounted corresponding to the dimension drawings in Section 2.4.

Equipment rooms must be dry and dust-free. Ambient and cooling air must not contain any electrically conductive gases, vapors and dusts which could diminish the functionality. Dust-laden air must be filtered.

	WARNING
	<p>When mounting in cabinets, a clearance of above and below must be provided so that the cooling air flow is not restricted (refer to dimension drawings, Section 2.4).</p> <p>Dimension the cabinet cooling in line with the power loss! (☞ Section „Technical data“)</p>

The converter ambient climate in operating rooms may not exceed the values of code F according to DIN 40040. For temperatures > 40 °C (104 °F) and installation altitudes > 1000 m, de-rating is required (☞ Section „Technical data“).

2.4

Dimension drawings

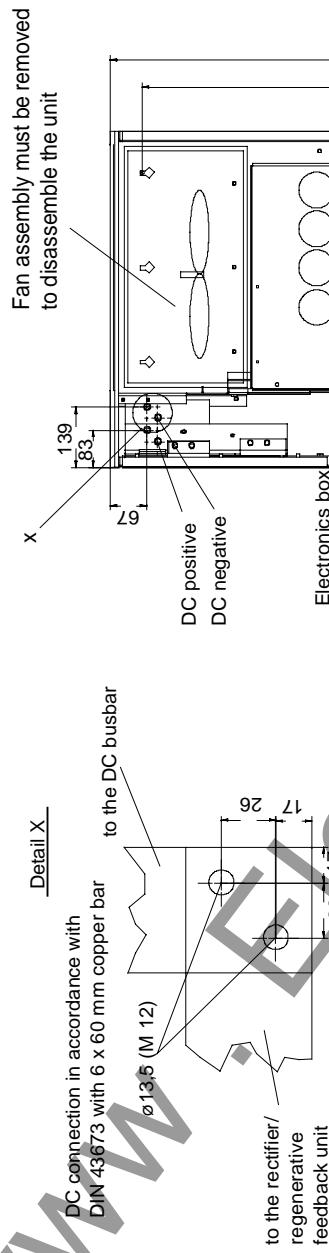
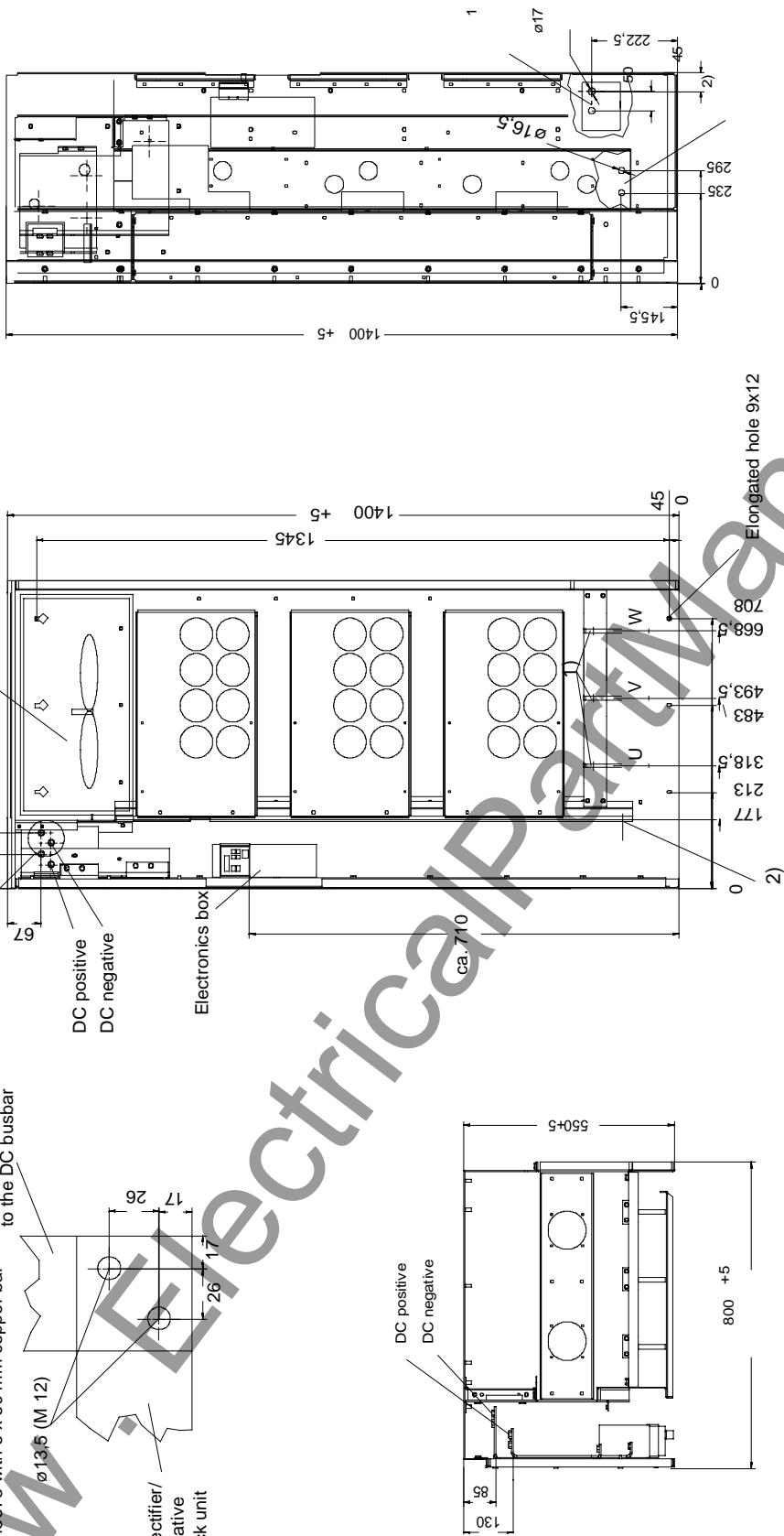


Fig. 2.1

Type of construction J



DC-AC chassis unit
Type of construction J
6SE70 - 1P00

Net weight, approx. 250 kg
With transport parts approx. 270 kg
1) - Connection for 4 x 300 mm 2)
Dimensions mm diameter 1 x 200 mm

Detail X

Fan assembly must be removed to disassemble the unit

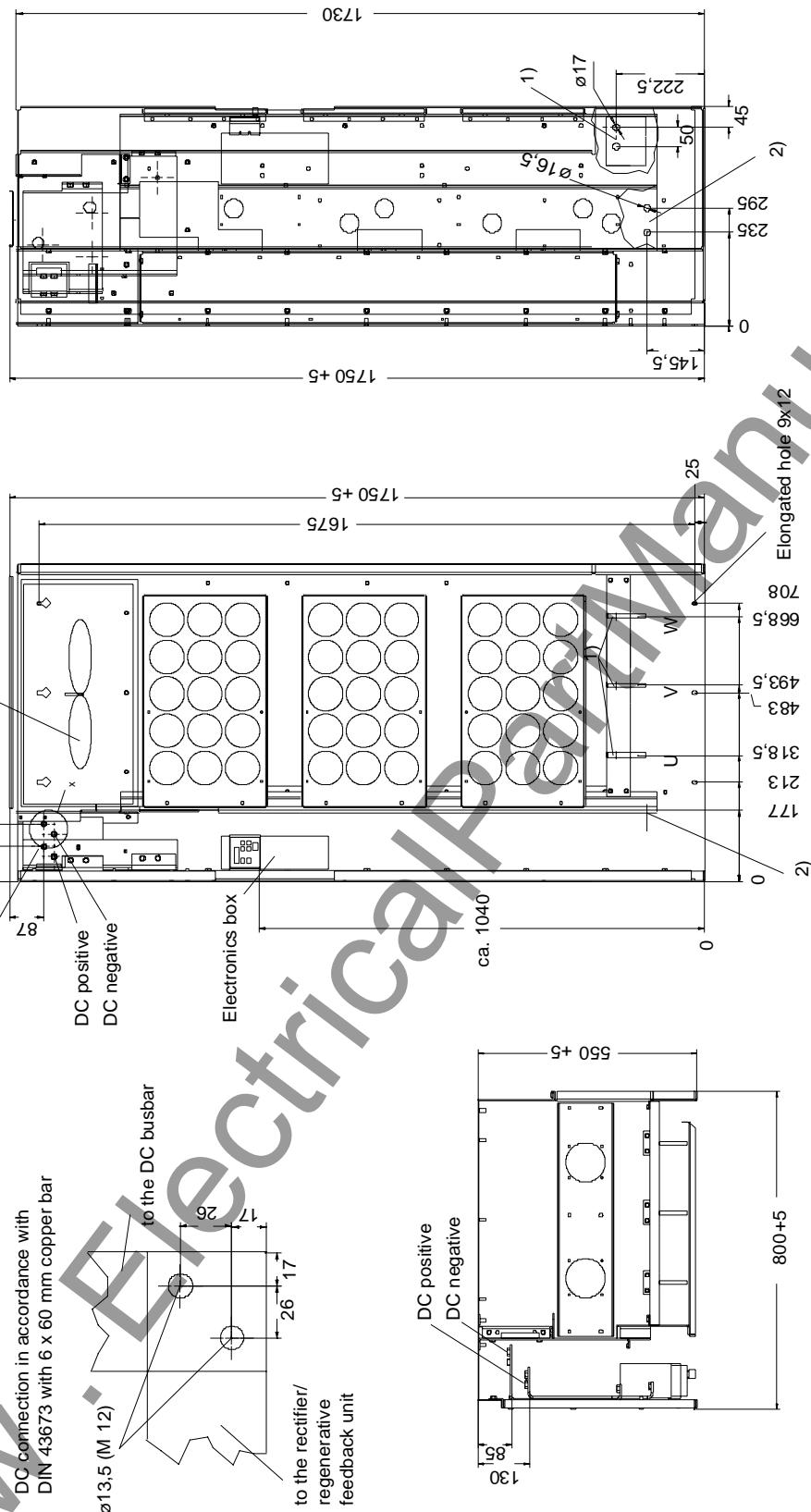
DC connection in accordance with DIN 43673 with 6 x 60 mm copper bar

$\varnothing 13.5$ (M 12) to the DC busbar

139
-83
L8

DC positive
DC negative

Fig. 2.2 Type of construction K



- 1) - Connection for 4 x 300 mm²
- 2) - Protective conductor, 4 x 300 mm²
- Net weight, approx. 250 kg
- With transport parts approx. 540 kg

DC-AC chassis unit
Type of construction
SSTG-1000

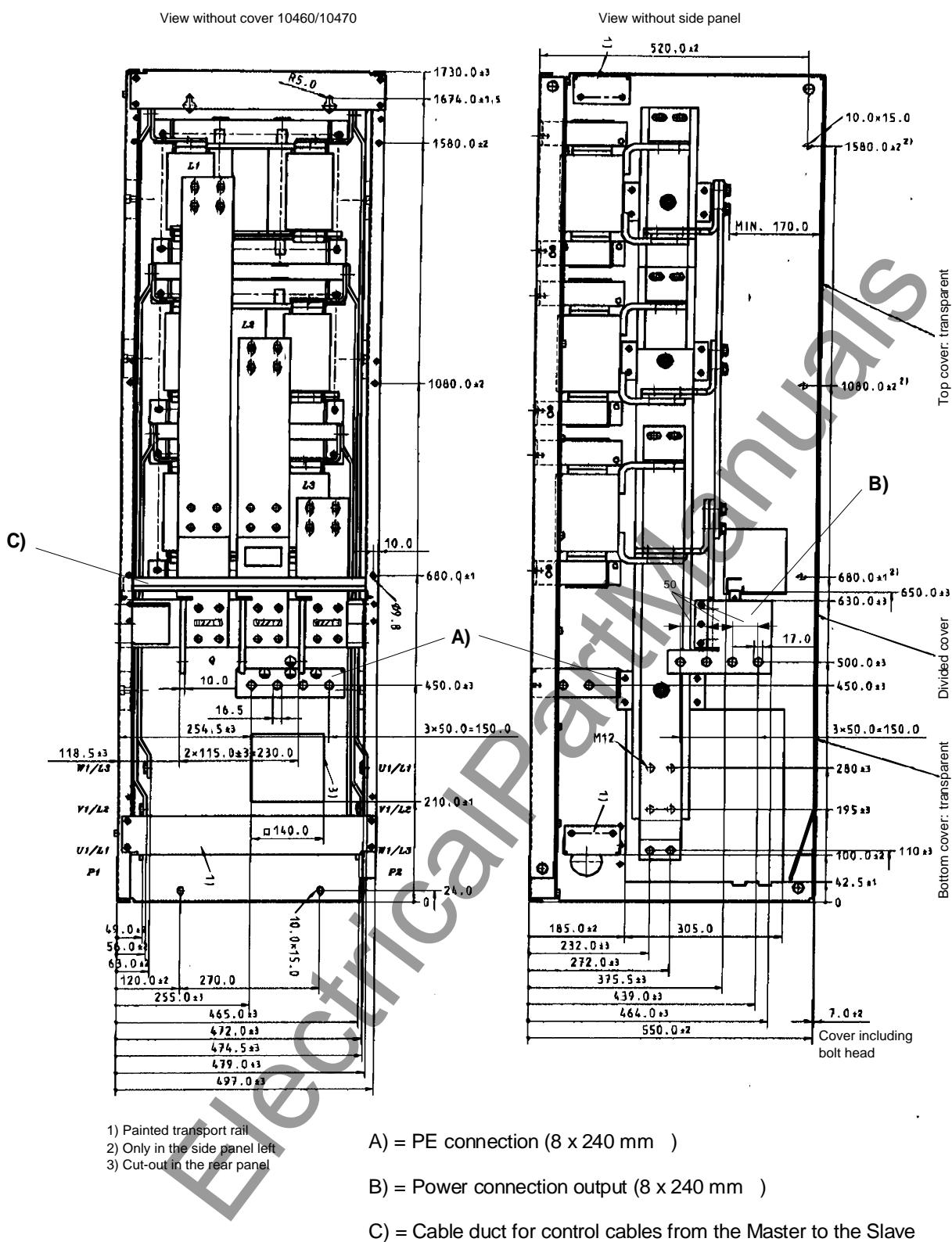


Fig. 2.3 Reactor chassis, Type of construction M

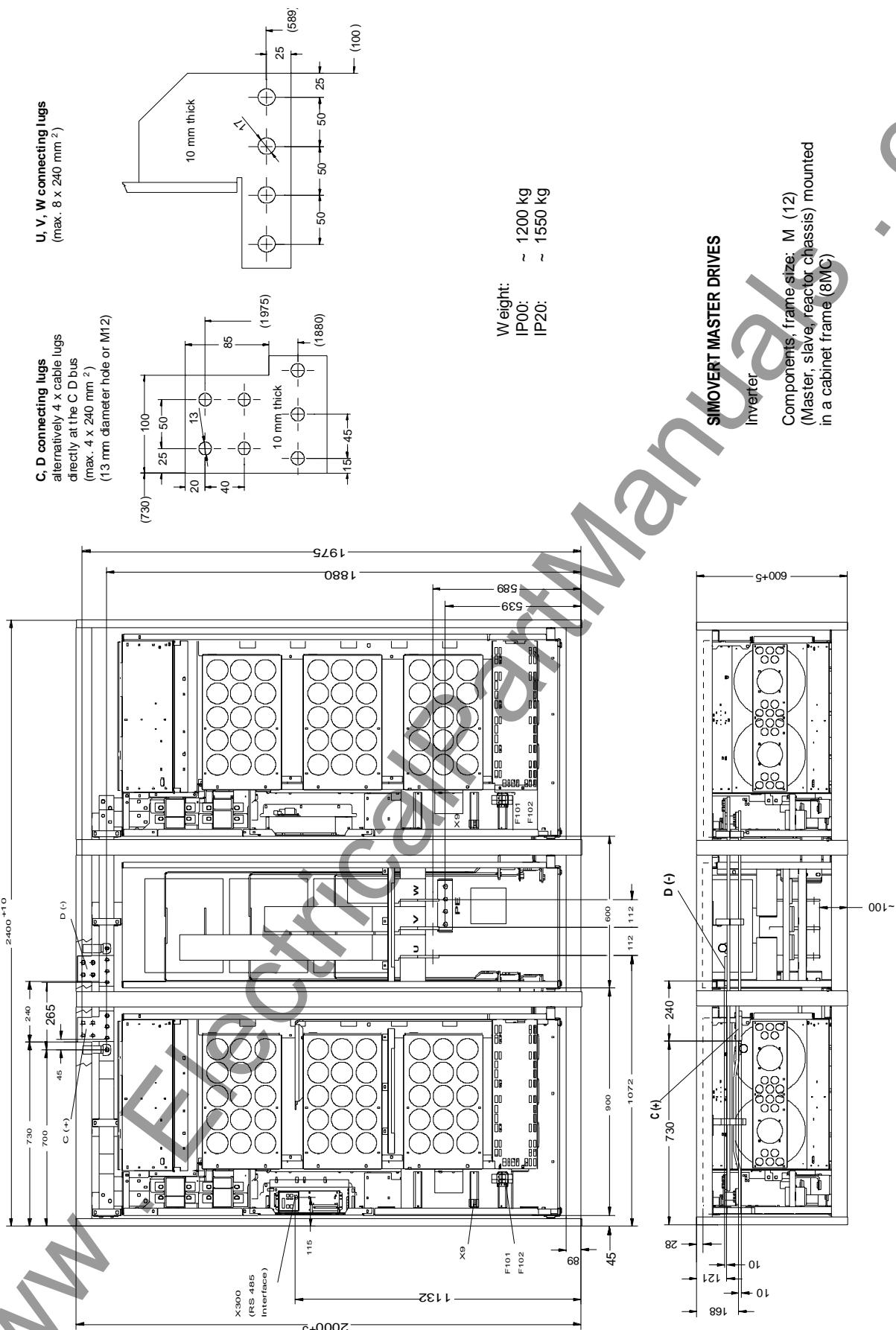


Fig. 2.4 Type of construction M

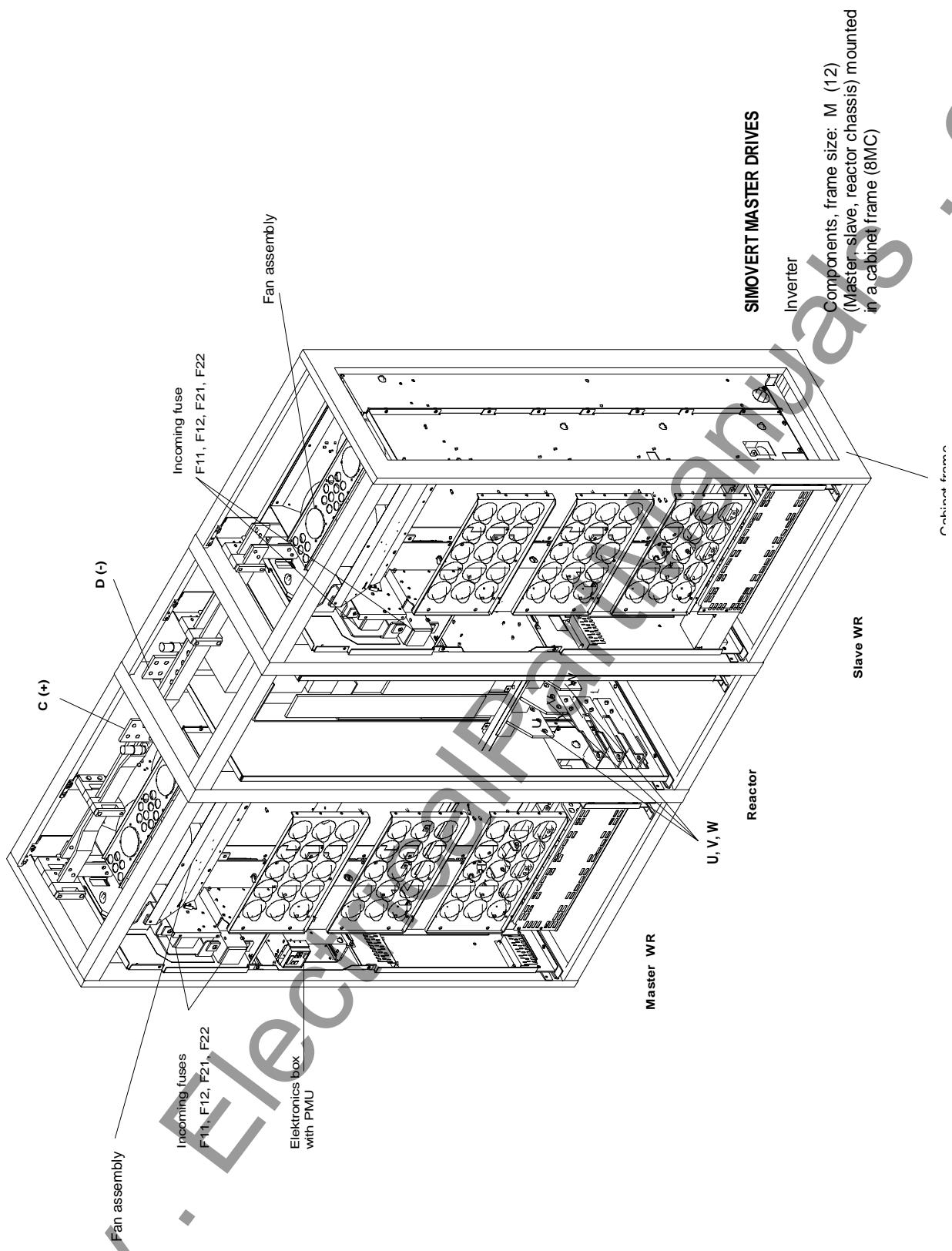
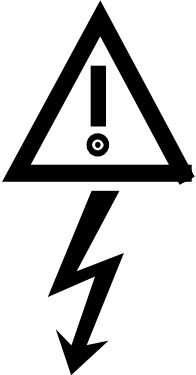


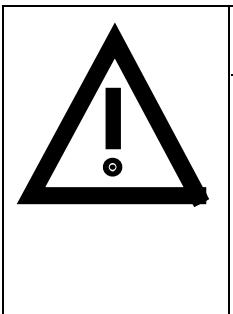
Fig. 2.5 Type of construction M

3 Connecting-up

	<p>WARNING</p> <p>SIMOVERT MASTER DRIVES are operated at high voltages. The equipment must be in a no-voltage condition (disconnected from the supply) before any work is carried-out! Only professionally trained, qualified personnel must work on or with the unit. Death, severe bodily injury or significant material damage could occur if these warning instructions are not observed.</p> <p>Extreme caution should be taken when working-on the unit when it is open, as external power supplies may be connected. The power terminals and control terminals can still be at hazardous potentials even when the motor is stationary. Hazardous voltages are still present in the unit up to 5 minutes after it has been powered-down due to the DC link capacitors. Thus, the appropriate delay time must be observed before opening-up the unit.</p> <p>Forming the DC link capacitors: The storage time should not exceed one year. The converter DC link capacitors must be formed at start-up if the unit has been stored for a longer period of time. Forming is described in the Instruction Manual, Part 2.</p> <p>When the DC link is supplied from a central unit, it must be ensured that the converter is reliably isolated from the DC link voltage!</p> <p>The user is responsible, that the motor, converter and any other associated devices or units are installed and connected-up according to all of the recognized regulations in that particular country as well as other regionally valid regulations. Cable dimensioning, fusing, grounding, shutdown, isolation and overcurrent protection should be especially observed.</p>

INFORMATION
<ul style="list-style-type: none"> ◆ In the factory setting, the converter protects the motor from overload: <ul style="list-style-type: none"> • P362 = 0 (self-ventilated motor) • P364.2 = 100 (motor load limit in %) No evaluation for P364.2 = 0. ◆ Supply rating: The converter is suitable for connecting to supplies with a short-circuit rating (supply) $\leq 100 \times$ rated output (converter). ◆ Thermal motor protection: Motor temperature sensor (theristor, type M135 or KTY84) can be connected at -X103:41-42. ◆ Cabling/wiring: Connecting cables should be dimensioned according to the local regulations and according to Table 3.1. The insulation should be suitable for 75°C.

3.1 Power connections

	WARNING
	<ul style="list-style-type: none">◆ By interchanging the input terminals, the converter or the rectifier will be destroyed!◆ The drive converter or rectifier unit could be destroyed if the input terminals are interchanged!◆ The coils of contacts and relays which are connected to the same supply as the converter or are located in the vicinity of the converter, must be provided with overvoltage limiters, e.g. RC elements.

The position of the connecting terminals can be seen in the dimension drawings (☞ Section 2.4).

DC connection: C/L+ D/L-

Motor connection: U2/T1 V2/T2 W2/T3

Protective conductor connection: PE1  PE2 

The power connections should be established using cable lugs with screws according to Table 3.2.

For type of construction J, jumpers are inserted after the inverter connections, which can be replaced by fuses.
For drive converters, type of construction K, fuses are installed as standard.

NOTE

The 230 V fans must be externally supplied with 230 V AC via terminal strip X9.

NOTE

Depending on the motor insulation strength and the length of the motor feeder cable, it may be necessary to install one of the following options between the motor and the converter:

- ◆ Output reactor
- ◆ dv/dt-filter

Information regarding selection and dimensioning is provided in Section „Options“.

Order No.	Rated DC Curr. (A)	Supply side								Motor side		
		Cross-section				Recommended fuse				Rated AC Curr. (A)	Cross-section	
6SE70	VDE (mm ²)	AWG MCM ¹	(A)	Type	North-America	Type	(V)	(A)	VDE (mm ²)	AWG MCM		
	Input voltage DC 510 V to 620 V									Output voltage 3 AC 0 V to 620 V		
35-1TJ20	607	4×300	4×800	2×450	2×3NE3233	2×170M6709	660	2×550	510	2×300	2×800	
36-0TK20	702	4×300	4×800	2×560	2×3NE3335	2×170M6710	660	2×630	590	4×300	4×800	
37-0TK20	821	4×300	4×800	2×560	2×3NE3335	2×170M6710	660	2×630	690	4×300	4×800	
38-6TK20	1023	4×300	4×800	2×710	2×3NE3337-8	2×170M6711	660	2×700	860	4×300	4×800	
41-1TK20	1309	6×300	6×800	2×800	2×3NE3338-8				1100	4×300	4×800	
41-1TM20	1310	6×300	6×800	2×560	2×3NE3335	2×170M6710	660	2×650	1100	4×300	4×800	
41-3TM20	1547	6×300	6×800	2×560	2×3NE3335	2×170M6710	660	2×650	1300	6×300	6×800	
	Input voltage DC 675 V to 780 V									Output voltage 3 AC 0 V to 780 V		
33-0UJ20	354	2×300	2×800	1×500	3NE3334-0B	170M5713	660	700	297	2×300	2×800	
33-5UJ20	421	2×300	2×800	1×630	3NE3336	170M5713	660	700	354	2×300	2×800	
34-5UK20	538	2×300	2×800	1×710	3NE3337-8	170M5714	660	900	452	2×300	2×800	
35-7UK20	678	4×300	4×800	2×450	2×3NE3233	2×170M5712	660	2×630	570	2×300	2×800	
36-5UK20	774	4×300	4×800	2×500	2×3NE3334-0B	2×170M5712	660	2×630	650	4×300	4×800	
38-6UK20	1023	4×300	4×800	2×630	2×3NE3336	2×170M6712	660	2×800	860	4×300	4×800	
41-0UM20	1178	6×300	6×800	1×710	3NE3337-8	170M5714	660	900	990	4×300	4×800	
41-1UM20	1285	6×300	6×800	2×450	2×3NE3233	2×170M5712	660	2×630	1080	4×300	4×800	
41-2UM20	1464	6×300	6×800	2×500	2×3NE3334-0B	2×170M5712	660	2×630	1230	6×800	6×800	
41-4UM20	1666	6×300	6×800	2×630	2×3NE3336	2×170M6712	660	2×800	1400	6×800	6×800	
41-6UM20	1880	8×300	8×800	2×630	2×3NE3336	2×170M6712	660	2×800	1580	6×800	6×800	
	Input voltage DC 890 V to 930 V									Output voltage 3 AC 0 V to 930 V		
33-0WJ20	354	2×300	2×800	1×500	3NE3334-0B	170M5713	660	700	297	2×300	2×800	
33-5WJ20	421	2×300	2×800	1×630	3NE3336	170M5713	660	700	354	2×300	2×800	
34-5WK20	538	2×300	2×800	1×710	3NE3337-8	170M5714	660	900	452	2×300	2×800	
35-7WK20	678	4×300	4×800	2×450	2×3NE3233	2×170M5712	660	2×630	570	2×300	2×800	
36-5WK20	774	4×300	4×800	2×500	2×3NE3334-0B	2×170M5712	660	2×630	650	4×300	4×800	
38-6WK20	1023	4×300	4×800	2×630	2×3NE3336	2×170M6712	660	2×800	860	4×300	4×800	
41-0WM20	1178	6×300	6×800	1×710	3NE3337-8	170M5714	660	900	990	4×300	4×800	
41-1WM20	1285	6×300	6×800	2×450	2×3NE3233	2×170M5712	660	2×630	1080	4×300	4×800	
41-2WM20	1464	6×300	6×800	2×500	2×3NE3334-0B	2×170M5712	660	2×630	1230	6×800	6×800	
41-4WM20	1666	6×300	6×800	2×630	2×3NE3336	2×170M6712	660	2×800	1400	6×800	6×800	
41-6WM20	1880	8×300	8×800	2×630	2×3NE3336	2×170M6712	660	2×800	1580	6×800	6×800	
NOTES												
<ul style="list-style-type: none"> ◆ Current- and voltage data in this table are rated values ◆ The cables to the drive converter are protected using fuses with gL characteristics. ◆ The cross-sections are determined for three-core copper cables, routed horizontally in air at 30 °C (86°F) ambient temperature (according to DIN VDE 0298 Part 2 / Group 5) and the recommended cable protection according to DIN VDE 0100 Part 430. ◆ AWG (American Wire Gauge): American wire gauge for cross sections up to 120 mm²; ◆ MCM (Mille Circular Mil): American wire gauge for cross-sections above 120 mm². 												

Table 3.1 Connection cross-sections and fuses

Type of construc.	Order No.	Max. cross-section (mm ²) acc. to VDE	MCM	Gland
J	6SE70_._._J20	4x300	4x800	M16
K	6SE70_._._K20	4x300	4x800	M16
M	6SE70_._._M20	8x300	8x800	M16

Table 3.2 Maximum cross-section and gland

3.1.1 Protective conductor connection

The protective conductor should be connected-up on both the supply- and motor sides. It should be dimensioned according to the power connections.

3.2 Auxiliary power supply/main contactor or bypass contactor

The auxiliary power supply and the main- or bypass contactor are connected through the 5-pin connector X9.

Connector X9 is supplied together with the connectors for the control terminal strip. Cables from 0.2 mm² to 2.5 mm² (AWG: 24 to 14) can be connected to X9.

The auxiliary power supply is required if the drive converter is fed through a main- and bypass contactor.

The main- or monitoring contactor is controlled through floating contacts -X9.4 and -X9.5 (software pre-setting).

More detailed information is provided in the Section „options“.

Term.	Function description
1	Types of construction J and K 24 V DC external ≥ 5 A (max. 8 A dependent on the options)
	Type of construction M 24 V DC external ≥ 10 A (max. 16 A dependent on the options)
2	Reference potential to DC
3	Unassigned
4	Main contactor control
5	Main contactor control

Table 3.3 Connector assignment for -X9

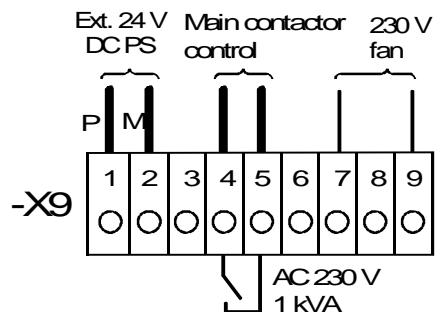


Fig. 3.1 Connecting an external 24 V power supply and main contactor control

NOTES

The main contactor coil must be provided with overvoltage limiters, e.g. RC element.

4 Operator control

The converter can be controlled via:

- ◆ the PMU (Parameterization Unit)
- ◆ the control terminal strip on the CU (☞ section “Control terminal strip”)
- ◆ the OP1 operator control panel (☞ section “Options”)
- ◆ the RS485 and RS232 serial interface on PMU-X300

Operator control using the PMU is described in this section.

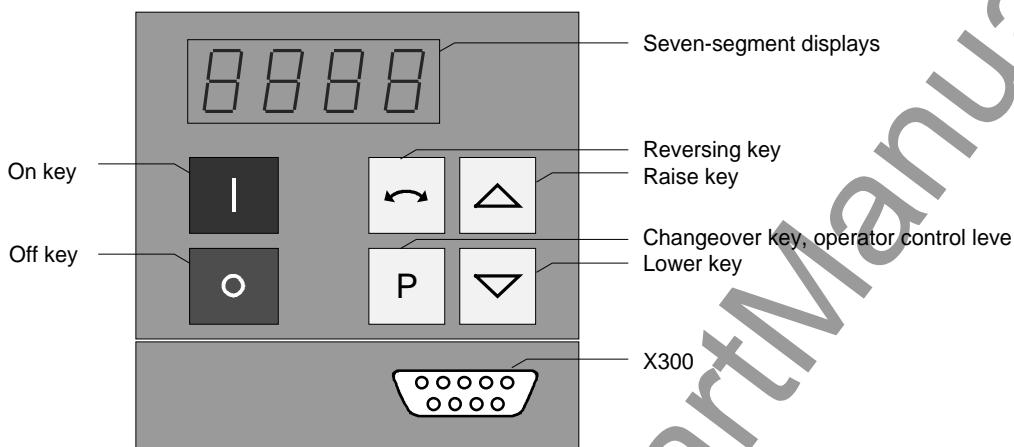


Fig. 4.1 Parameterization unit

4.1 Operator control elements

Operator control elements	Function
I	Converter switch on (standard). For faults: Return to the fault display. Command is effective when the key is released.
O	Converter shutdown depending on the parameterization of OFF 1, OFF 2 or OFF 3 (P554 to P560). Command becomes effective when the key is released.
↷	Field reversal / reversing for the appropriate parameterization. Command becomes effective when the key is released.
P	Changeover from parameter number to parameter value. In conjunction with other keys, additional functions (see Operating Instructions, Part 2). Command becomes effective when the key is released.
△, ▽	Values (raise, lower) change as long as the keys are depressed.
P + △ resp. P + ▽	Depress P and hold, then depress the second key. The command becomes effective when the key is released (e.g. fast changeover).

Table 4.1 Function of the operator control elements on the PMU

4.2 Displays 8.8.8.

		Parameter number		Index	Parameter value
		Pos. actual value e.g.	Neg. actual value e.g.	e.g..	e.g.
Visualization parameters	Basic converter	r.000	r.000	---	□.009
	Technology board	d.000	d.000		
Setting parameters	Basic converter	P.005	P.005	i.000	-2.08
	Technology board	H.002	H.002		

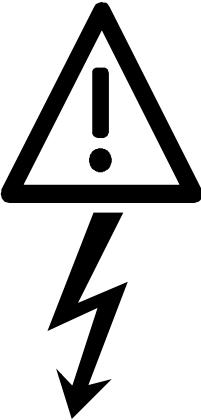
Table 4.2 Displaying visualization- and setting parameters on the PMU

	Actual value	Parameter value not possible	Alarm	Fault
Display	-2.08	-----	R022	F006

Table 4.3 Status display on the PMU

NOTE
The parameter description is provided in the Operating Instructions, Part 2.

5 Maintenance

	WARNING
	<p>SIMOVERT MASTER DRIVES are operated at high voltages.</p> <p>All work carried-out on or with the equipment must conform to all of the relevant national electrical codes (VBG4 in Germany).</p> <p>Maintenance and service work may only be executed by qualified personnel.</p>
	<p>Only spare parts authorized by the manufacturer may be used.</p> <p>The specified maintenance intervals and also the instructions for repair and replacement must be adhered to.</p> <p>The drive units have hazardous voltage levels up to 5 min after the converter has been powered-down due to the DC link capacitors so that the unit must only be opened after an appropriate delay time.</p> <p>The power- and control terminals can still be at hazardous voltage levels even though the motor is at a standstill.</p>
	<p>If it is absolutely necessary that the drive converter must be worked on when powered-up:</p> <ul style="list-style-type: none"> ◆ never touch any live components. ◆ only use the appropriate measuring and test equipment and protective clothing. ◆ always stand on an ungrounded, isolated and ESD-compatible pad. <p>If these warnings are not observed this can result in death, severe bodily injury or significant material damage.</p>

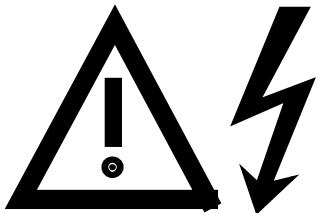
Always have your MASTER DRIVE converter Order No. and serial No. available when contacting the service department. These numbers and other important data are located on the drive converter rating plate.

5.1 Maintenance requirements

The fans are designed for a service life of 35000 hours at an ambient temperature of $T_U = 40^\circ\text{C}$. They must be replaced before their service life expires so that the drive converter availability is guaranteed.

INSTRUCTIONS for type of construction M	
<ul style="list-style-type: none"> ◆ Type of construction M consists of two chassis units (master, open-loop/closed-loop controlled and slave controlled), size K, a reactor chassis and the associated busbars ◆ The slave unit has no PMU and no electronics box. ◆ Service/maintenance is the same as chassis units, type of construction K. The differences are described. ◆ The busbar design and the design of the three components is described in the engineering support. ◆ The connection of the control cables between the slave and the master is described in Sections 2.1 and 2.3. 	

5.2 Replacing components

	WARNING
<p>The fan may only be replaced by qualified personnel.</p> <p>The drive converters are still at hazardous voltage levels up to 5 min. after the unit has been powered-down as a result of the DC link capacitors.</p> <p>If these warnings are not observed, death, severe bodily injury or considerable material damage could occur.</p>	

5.2.1 Replacing the fan

The fan assembly consists of:

- the fan housing
- a fan type of construction J
- one or two fans, type of construction K
- the starting capacitors

The fans are mounted in the fan assembly in the upper section of the chassis unit.

- Remove connector X20
- Release both mounting bolts (M8) of the fan assembly
- For type of construction K with **one** fan, the air deflection plate below the fan must be disassembled (2 × M8)
- Withdraw the fan assembly towards the front, and if required, tilt it gently downwards and place carefully on a flat surface

	CAUTION
<p>The fan assembly can weigh up to 38 kg depending on the drive converter rating.</p>	

- Remove the cable ties and fan connections
- Remove the fan mounting panel from the fan assembly and remove the fan from the mounting panel
- Install the new fan assembly in the inverse sequence
- Before commissioning the drive check that the fan can run freely and check the airflow direction. The air must be blown upwards out of the unit.

5.2.2 Replacing the fuses

The fuses are installed in a fuse holder. The fuse holder is mounted on a DIN mounting rail at the bottom left in the chassis unit. The fuse holder must be opened to replace fuses.

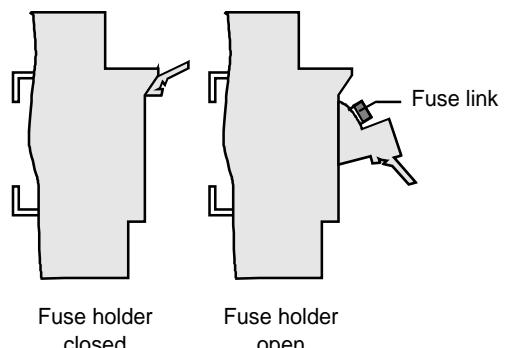


Fig. 5.1 Fuse holder

5.2.3 Replacing the starting capacitor

The starting capacitor is mounted next to the fan connection.

The starting capacitor is mounted on the fan assembly.

- Remove the plug connections from the starting capacitor
- Unbolt the starting capacitor
- Install a new starting capacitor in the inverse sequence

5.2.4 Replacing the capacitor bank

The capacitor assembly consists of three boards. Each board has a capacitor mounting element and a DC link bus connection.

- Remove the plug connections
- Release the mechanical retaining elements (three screws: two at the left, one at the right)
- Remove the capacitor by slightly raising them and withdrawing them from the drive converter towards the front.



CAUTION

The capacitors weight up to 30 kg depending on the drive converter rating.

- Install a new capacitor bank in the inverse sequence.

5.2.5 Replacing SML and SMU

SML Snubber Module Lower
SMU Snubber Module Upper

- Remove the capacitors
- Release the mounting screws (4 × M8 (torque: 8 - 10 Nm), 1 × M4 (max. 1.8 Nm))
- Remove the SML / SMU

Install the new board in the reverse sequence.

5.2.6 Removing and installing the module busbars

♦ Removal

- remove the capacitors
 - release the bolts holding the module busbars
- | | |
|-------|---------------------------------|
| Bolts | M8 power connections |
| | M6 mounting and distance pieces |
| | M4 snubber circuitry |
- remove the SMU / SML insulation
 - lift out the module busbars

♦ Installation

NOTE

There must be a 4 mm clearance between the positive and negative busbars. Thus, when installing the module busbars, a template must be used (refer to Fig. 5.2), e.g. a 4 mm-thick plastic piece.

- hold the module busbars and insulation in place SMU / SML (M6)
- the template is inserted in the module busbars instead of the DC link busbars
- insert the SML- and SMU board (tighten-up the module connections (M8, torque: 8-10 Nm)
- tighten-up the M6 nut on the distance studs (6 Nm)
- connect-up the snubber resistors (M4 bolts, torque: max. 1.8 Nm)
- tighten-up the power connections (M8 bolts, torque: 13 Nm)
- remove the template from the module busbars.

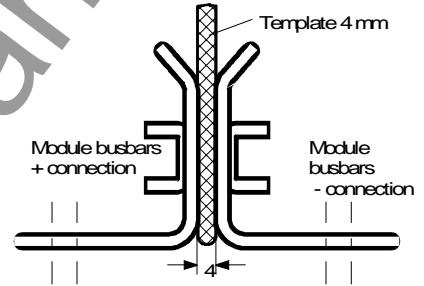


Fig. 5.2 Install the module busbars

5.2.6.1 Replacing the balancing resistor

The balancing resistor is located at the rear mounting plane on the heatsink between the inverter modules, i.e. behind the capacitors and the module busbars.

♦ Remove the capacitors

♦ Type of construction J

- remove the module busbars
- remove IGD
- release the mounting bolts and remove the balancing resistor.

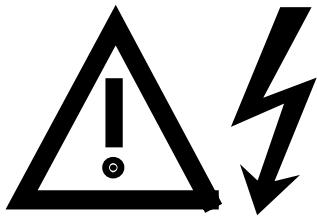
Installation in the reverse sequence.

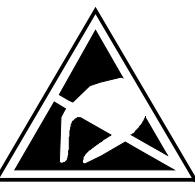
♦ The balancing resistor is tightened-up with 1.8 Nm.

A uniform coating of heat conducting paste must be applied to the base plate.

Observe the correct contact assignment!

5.2.7 Replacing boards

	WARNING
<p>The boards may only be replaced by qualified personnel.</p> <p>It is not permissible that the boards are withdrawn or inserted under voltage. Death, severe bodily injury or significant material damage might result if these instructions are not observed.</p>	

	CAUTION
<p>Boards contain components which could be damaged by electrostatic discharge. The human body must be discharged immediately before an electronics board is touched. This can be simply done by touching a conductive, grounded object immediately beforehand (e.g. bare metal cubicle components).</p>	

5.2.7.1 Replacing the IVI / IPI (type of construction M)

IVI Inverter-Value Interface

IPI Inverter-Parallel Interface (for type of construction M)

The IVI / IPI is bolted to the rear of the electronics box

- ◆ Remove the electronics module to the endstop
- ◆ Remove the ground connection at the electronics module
 - Remove all boards from the electronics box
 - Remove both mounting bolts from the electronics box (Fig. 5.4)
 - Release the electronics box and remove towards the front.
 - Release the cable ties
 - Remove the ABO / ABI (Adaption Board)
 - Release the fiber-optic cables
 - Unbolt the IVI and remove
 - Install the new IVI in the inverse sequence
 - Unbolt the IVI / IPI and remove
 - Install the new IVI / IPI in the inverse sequence

5.2.7.2 Replacing the VDU and VDU resistor

VDU Voltage-Dividing Unit

VDU and VDU resistor are only available for drive converters with higher supply voltages. The VDU mounting bracket is part of the electronic module assembly.

◆ VDU

- Remove the plug connectors
- Release the mounting bolt
- Remove the VDU

Install the new VDU in the inverse sequence.

◆ VDU resistor

- Release the cable ties
- Remove the plug connections
- Unbolt the VDU resistor

Install the new VDU resistor in the inverse sequence

5.2.7.3 Replacing the PSU

PSU Power-Supply Unit (Power Supply)

- ◆ Remove the VDU and VDU resistor (if available)
- ◆ Remove the VDU mounting panel
- ◆ Release the plug connections on the PSU
- ◆ Release the bolts (six Torx M4) on the PSU
- ◆ Remove the PSU

Install the new PSU in the inverse sequence

5.2.7.4 Replacing the IGD

IGD IGBT-Gate Drive

The IGD is located behind the module busbars and consists of

one board for type of construction J
three boards for type of construction K

• Remove the capacitors

• Remove SML and SMU

• Remove the module busing

◆ Type of construction J

- Remove nine fiber-optic cables at the top of the IGD
- Release the mounting bolts and remove the IGD.

◆ Type of construction K

- Remove the fiber-optic cables at the left of the IGD (three per IGD)
- Remove the P15 cable
- Release the mounting bolts
- Withdraw the IGD from the retaining bolts towards the right and remove
- Insert a new IGD, and insert towards the left in the groove of the mounting bolts under the incoming busbars.

Install a new IGD in the reverse sequence.

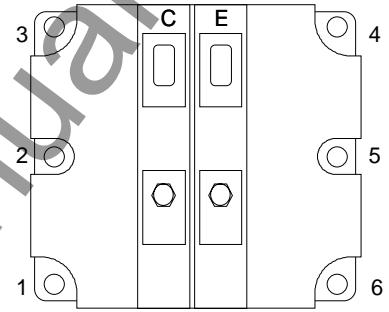
5.2.8 Replacing the snubber resistor

- ◆ Remove the capacitors
- ◆ Remove the SML- and SMU modules
- ◆ Remove the module busbars
- ◆ Release the mounting bolts ($2 \times M5$, torque: max. 1.8 Nm) and remove the snubber resistor
- ◆ A uniform coating of heat conducting paste must be applied to the resistor

Install the new snubber resistor in the inverse sequence.

5.2.8.1 Replacing the IGBT modules

- Replace as for IGD, but additionally
- Remove the mounting bolts of the defective IGBT modules and remove the IGBT.
- Install the new IGBT module. Observe the following:
 - Coat the module mounting surface with a **thin and uniform** coating of heat conducting paste.
 - Tighten-up the IGBT module mounting bolts with 3 Nm, observe the sequence (Fig. 5.3).



Tighten-up the IGBT modules
 1. By hand ($\approx 0,5$ Nm),
 sequence: 2 - 5 - 3 - 6 - 1 - 4
 2. tighten-up with 3 Nm,
 sequence: 2 - 5 - 3 - 6 - 1 - 4

Fig. 5.3 Tighten-up IGBT modules

5.2.8.2 Replacing boards in the electronics box

- ◆ Loosen the board retaining screws above and below the handles for inserting/withdrawing the boards
- ◆ Carefully remove the board using these handles making sure that the board doesn't catch on anything
- ◆ Carefully locate the new board on the guide rails and insert it completely into the electronics box
- ◆ Tighten the retaining screws above and below the handles.

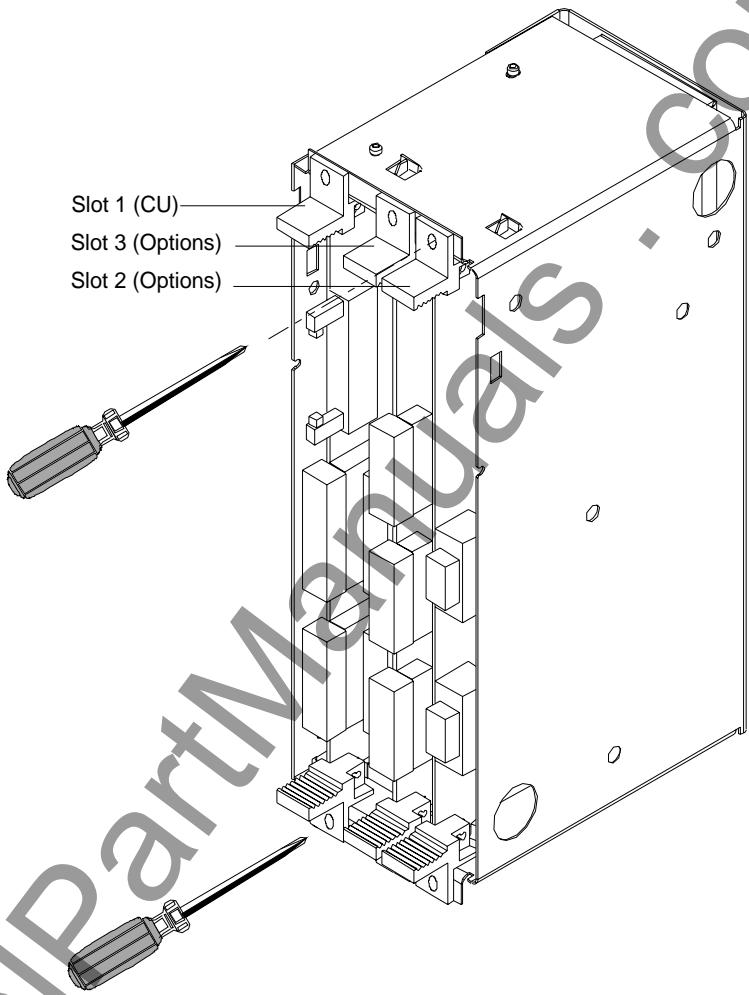


Fig. 5.4

Electronics box equipped with CU (slot 1) and options (slot 2 (right) and 3 (middle))

5.2.8.3 Replacing the PMU (Parameterization Unit)

- ◆ Remove the ground cable at the side panel.
- ◆ Carefully depress the snap on the adapter section and remove the PMU with adapter section from the electronics box.
- ◆ Withdraw connector X108 on the CU
- ◆ Carefully withdraw the PMU board out of the adapter section towards the front using a screwdriver.
- ◆ Install the new PMU board in the inverse sequence.

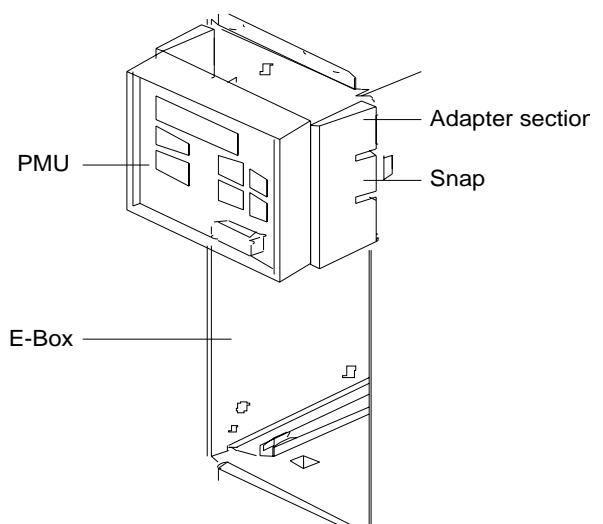


Fig. 5.5 PMU with adapter section on the E box

6 Options

6.1 Options which can be integrated into the electronics box

One or two option boards, listed in Table 6.1, can be inserted in the electronics box using the LBA option (local bus adapter).

Before installing option boards in the electronics box, the LBA (local Bus Adapter) has to be inserted.

Install the LBA bus expansion:

- ◆ Remove the CU (lefthand slot in the electronics box) using the handles after first removing the connecting cable to the PMU and both retaining screws.
- ◆ Insert the LBA bus expansion in the electronics box (position, refer to the diagram) so that it snaps into place.
- ◆ Re-insert the CU into the lefthand slot, screw the retaining screws on the handles tight, and insert the connecting cable to the PMU.
- ◆ Insert the option board in slot 2 (right) or slot 3 (center) of the electronics box, and screw into place. Each option board may only be inserted in the electronics box. If only one option is used, it must always be inserted at slot 2 (right).

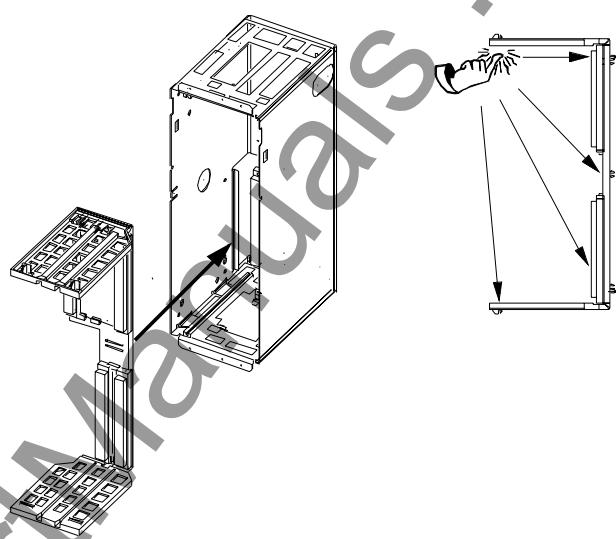


Fig. 6.1 *Installing the Local Bus Adapter*

Slots in the electronics box	Boards
Left Slot 1 (CU)	CU
Center Slot 3 (options)	CB1 / SCB1 / SCB2 / (TSY, not for T300)
Right Slots 2 (options)	CB1 / SCB1 / SCB2 / TSY / TB
NOTE	
Only one of each option board type may be inserted in the electronics box.	
TB (technology boards, e.g. T300) must always be inserted at slot 2. When a TB board is used, a TSY board may not be inserted.	
If only one option board is used it must always be inserted at slot 2.	

Table 6.1 *Possible arrangements of boards in the electronics box*

The options are supplied with the option description.

Designation	Description	Order No.	
LBA	Local bus adapter for the electronics box. This is required for installing T300, CB1, TSY, SCB1 and SCB2	Board description	6SE7090-0XX84-4HA0 6SE7087-6CX84-4HA0
T300	Technology board for controlling technological processes	Board description	6SE7090-0XX84-0AH0 6SE7087-6CX84-0AH0
TSY	Synchronizing board	Board description	6SE7090-0XX84-0BA0 6SE7087-6CX84-0BA0
SCB1	Serial communications board with fiber-optic cable for serial I/O system and peer-to-peer connection	Board description	6SE7090-0XX84-0BC0 6SE7087-6CX84-0BC0
SCB2	Serial communications board for peer-to-peer connection and USS protocol via RS485	Board description	6SE7090-0XX84-0BD0 6SE7087-6CX84-0BD0
	Use of the serial interface with USS protocol	Application description	6SE7087-6CX87-4KB0
CB1	Communications board with interface for SINEC- L2-DP, (Profibus)	Board description	6SE7090-0XX84-0AK0 6SE7087-6CX84-0AK0
	Use of the PROFIBUS DP interface	Application description	6SE7087-6CX87-0AK0

Table 6.2 Option boards and bus adapter

If the converter is supplied through an external main contactor, the option board in the electronics box must be supplied from an external power supply, according to Table 6.3.

These values are required in addition to the current drawn by the basic converter (☞ section "Technical Data").

Board	Current drain (mA)
CB1	190
SCB1	50
SCB2	150
TSY w/out tacho	150
T300 w/out tacho	620
Standard tacho Type: 1PX 8001-1	$I_0 \cdot 95$ (190 at 6000 RPM)

Table 6.3 Current drain of the option boards

6.2 Interface boards

The boards, listed in the following table must be externally mounted and wired-up on the external system side.

Designation	Description	Order No.	
SCI1	Serial I/O board (only in conjunction with SCB1). Analog and binary input and outputs for coupling to the SCB1 via fiber-optic cable	Board description	6SE7090-0XX84-3EA0 6SE7087-6CX84-0BC0
SCI2	Serial I/O board (only in conjunction with SCB1) Binary inputs and outputs for coupling to the SCB1 via fiber-optic cable.	Board description	6SE7090-0XX84-3EF0 6SE7087-6CX84-0BC0
DTI	Digital tachometer interface	Board description	6SE7090-0XX84-3DB0 6SE7087-6CX84-3DB0
ATI	Analog tachometer interface	Board description	6SE7090-0XX84-3DF0 6SE7087-6CX84-3DF0

Table 6.4 *Interface boards*

6.3 Power supplies

Designation	Description	Order number Option	Use with
Power supply, 0.3 A	115 V / 230 V AC - 24 V 0.3 A DC	6SX7010-0AC14	e.g.: DTI
Power supply 1 A	115 V / 230 V AC - 24 V 1 A DC	6SX7010-0AC15	e.g.: 1 x SCI
Power supply 5 A	115 V / 230 V AC - 24 V 5 A DC	6EP1333-1SL11	Basic conv
Power supply 8 A	115 V / 230 V AC - 24 V 8 A DC		Basic conv. + options

Table 6.5 *Recommended power supply*

6.4 Isolating amplifiers

Input	Output	Order number Option
Input isolating amplifiers for analog inputs		
-10 V to +10 V	-10 V to +10 V	6SX7010-0AC00
-20 mA to +20 mA	-10 V to +10 V	6SX7010-0AC02
4 mA to +20 mA	4 mA to +20 mA	6SX7010-0AC01
Output isolating amplifiers for analog outputs		
-10 V to +10 V	-10 V to +10 V	6SX7010-0AC00
-10 V to +10 V	-20 mA to +20 mA	6SX7010-0AC03
0 V to +10 V	4 mA to +20 mA	6SX7010-0AC04

Table 6.6 Overview of isolating amplifiers

Power supply:

V = 24 V DC ±20 %
I = 90 mA

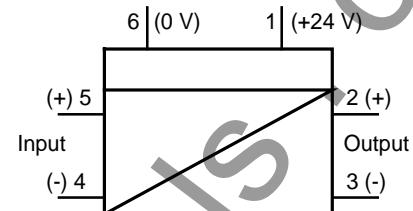


Fig. 6.2 Isolating amplifiers

6.5 Power section

Options	Description/function
Braking unit	For converting the regenerative energy into heat
Braking resistors	Load resistor for the braking unit
Electrical DC link coupling	Switching the DC-AC converter in and out under load
Mechanical DC link coupling	Switching the DC-AC converter in and out in a no-voltage condition
Input rectifier	Input rectifier for one or several DC-AC converters
Input rectifier with line-commutated feedback	Supply rectifier for one or several DC-AC converters for motor or generator operation

Table 6.7 Power section options

6.5.1 Output reactor, dv/dt filter

When longer feeder cables are used between the converter and motor:

- ◆ the converter has to cope with additional current peaks due to re-charging the cable capacitances
- ◆ the motor insulation is additionally stressed as a result of transient voltage spikes caused by reflection.

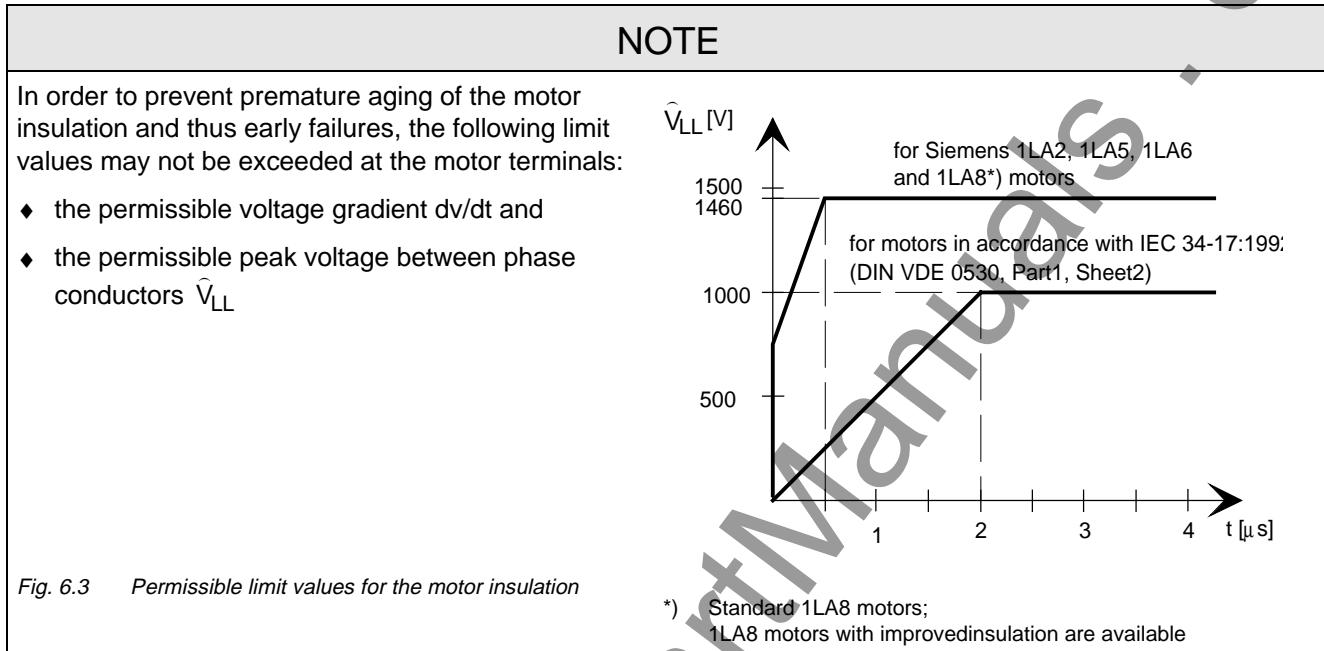


Fig. 6.3 Permissible limit values for the motor insulation

Depending on the application, the voltage rate-of-rise, voltage and current peaks can be reduced using the following options: Output reactor, dv/dt filter.

Characteristics of the output reactors and dv/dt filters:

	Output reactor	dv/dt filter
Reduces the current peaks for long cables	yes	yes
Reduces the voltage gradient (rate of rise) dv/dt at the motor terminals	slightly	yes
Limits the amplitude of the transient voltage peaks at the motor terminals to the following typical values $\leq 800 \text{ V}$ at 3AC 400 V to 460 V $\leq 1000 \text{ V}$ at 3AC 500 V to 575 V $\leq 1250 \text{ V}$ at 3AC 660 V to 690 V	no	yes
Reduces the supplementary losses in the motor	no	no
Reduces motor noise (corresponding to direct online operation)	no	no

Table 6.8

6.5.1.1 Output reactor

The output reactor is especially used to limit additional current spikes caused by the cable capacitances when long cables are used, i.e. it

- ◆ reduces the charge current spikes for long cables
- ◆ reduces the voltage rate-of-change dv/dt at the motor terminals.

It does **not** reduce the magnitude of the transient voltage spikes at the motor terminals.

In order that the reactor temperature rise remains within the specified limits, the pulse frequency f_p of the drive converter, rated motor frequency $f_{mot\ N}$ and the maximum drive converter output frequency f_{max} must lie within the specified limits:

	V/f = constant		V = constant	
	510 V to 620 V DC	675 V to 930 V DC	510 V to 620 V DC	675 V to 930 V DC
Standard reactor (iron) $f_p \leq 3\text{ kHz}$				
V/f / Vector control	$f_{mot\ N} \leq 87\text{ Hz}$	$f_{mot\ N} \leq 200\text{ Hz}$	$f_{max} \leq 200\text{ Hz}$	$f_{max} \leq 300\text{ Hz}$
V/f textile	$f_{mot\ N} = f_{max} \leq 120\text{ Hz}$	not possible	not possible	not possible
Ferrite reactor $f_p \leq 6\text{ kHz}$				
V/f / Vector control	$f_{mot\ N} \leq 150\text{ Hz}$		$f_{max} \leq 300\text{ Hz}$	
V/f textile	$f_{mot\ N} = f_{max} \leq 600\text{ Hz}$		not possible	

Table 6.9 Output reactor design

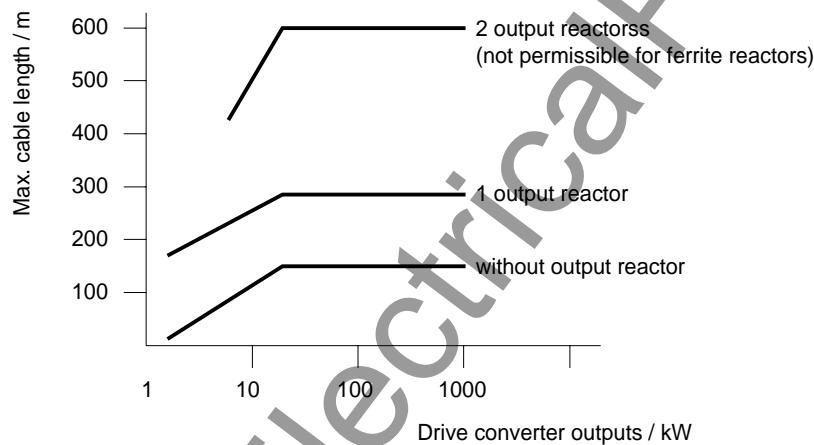


Fig. 6.4 Permissible cable lengths with and without output reactors

NOTE

The specified lengths are valid for unshielded cables; for shielded cables, these values must be reduced to 2/3. If several motors are connected to a drive converter, the sum of the cables lengths of all the motor feeder cables must be less than the permissible cable length.

6.5.1.2 dv/dt filter

The dv/dt filter protects the motor insulation by limiting the voltage gradient and the transient peak voltage at the motor winding to uncritical values in accordance with IEC 34-17:1992 (DIN VDE 0530, Part 1, Sheet 2):

- ◆ Voltage gradient (rate of rise) $dv/dt \leq 500 \text{ V}/\mu\text{s}$

- ◆ Transient peak voltage at the motor terminals:

$\hat{U}_{\text{typ.}} \leq 800 \text{ V}$ for $380 \text{ V} \leq U_N \leq 460 \text{ V}$ (3 ph. AC)

$\hat{U}_{\text{typ.}} \leq 1000 \text{ V}$ for $500 \text{ V} \leq U_N \leq 575 \text{ V}$ (3 ph. AC)

$\hat{U}_{\text{typ.}} \leq 1250 \text{ V}$ for $660 \text{ V} \leq U_N \leq 690 \text{ V}$ (3 ph. AC).

For long feeder cables, the dv/dt filter simultaneously reduces the current spikes, which additionally load the drive converter due to the re-charging of the cable capacitances.

The dv/dt filter can be used for the following control versions

- ◆ FC (Frequency Control) and
- ◆ VC (Vector Control)

The dv/dt filter is suitable for use with

- grounded supply networks (TN- and TT supply networks)
- ungrounded supplies (IT supplies)
(exceptions: 6SE70_ _ - _ B _ _ -1FD0 and 6SE70_ _ - _ C _ _ -1FD0 with version release A)

NOTE

The dv/dt filter is designed for a pulse frequency $f_p = 3 \text{ kHz}$ and an output frequency $f_A \leq 300 \text{ Hz}$.

In this case, when the drive converter is being set (P052 = 5), parameter **P092 should be set to 2**. Thus, parameter P761 (pulse frequency) is automatically limited to values $\leq 3 \text{ kHz}$.

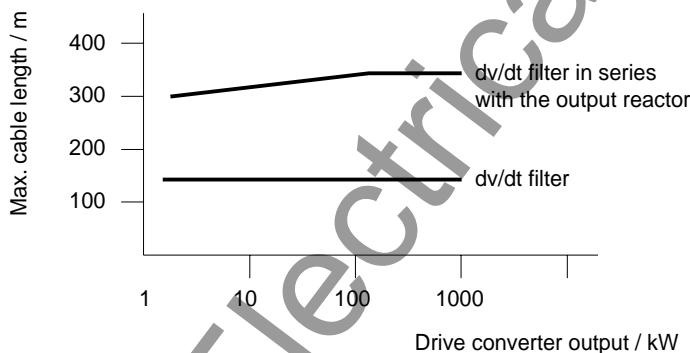


Fig. 6.5 Permissible cable lengths with dv/dt filter

NOTES

The specified cable lengths are valid for unshielded cables; for shielded cables, these values should be reduced to 2/3.

If several motors are connected to a drive converter, the sum of the cable lengths of all of the motor feeder cables must be less than the permissible cable length.

6.5.1.3 Selection criteria for the output reactor or dv/dt filter

The following table indicates the selection criteria for the output reactor or dv/dt filter

	Voltage range	510 V - 675 V (DC)	710 V - 780 V (DC)	890 V - 930 V (DC)
Motors, acc. to IEC 34-17:1992 (DIN VDE 0530, Part 1, Sheet 2)	dv/dt filter required! Cable lengths in accordance with the Section „dv/dt filter“, Fig. 6.5.	dv/dt filter required! Cable lengths in accordance with the Section „dv/dt filter“, Fig. 6.5.	dv/dt filter required! Cable lengths in accordance with the Section „dv/dt filter“, Fig. 6.5.	dv/dt filter required! Cable lengths in accordance with the Section „dv/dt filter“, Fig. 6.5.
Siemens motors 1LA2, 1LA5, 1LA6, 1LA8 1).	An output filter is not required. For longer motor cable lengths, output reactors are required in accordance with Section „Output reactor“, Fig. 6.4.	dv/dt filter required! Cable lengths in accordance with the Section „dv/dt filter“, Fig. 6.5.	dv/dt filter required! Cable lengths in accordance with the Section „dv/dt filter“, Fig. 6.5.	dv/dt filter required! Cable lengths in accordance with the Section „dv/dt filter“, Fig. 6.5.
Siemens motors 1LA8 2).	An output filter is not required. For longer motor cable lengths, output reactors are required in accordance with Section „Output reactor“, Fig. 6.4.	An output filter is not required. For longer motor cable lengths, output reactors are required in accordance with Section „Output reactor“, Fig. 6.4.	An output filter is not required. For longer motor cable lengths, output reactors are required in accordance with Section „Output reactor“, Fig. 6.4.	An output filter is not required. For longer motor cable lengths, output reactors are required in accordance with Section „Output reactor“, Fig. 6.4.
<p>1) Standard 1LA8 motors 2) 1LA8 motors with a better insulation</p>				

Table 6.10 Selection criteria for the following options: Output reactor and dv/dt filter between the converter and motor

6.6 Bypass- and output contactor

6.6.1 Bypass contactor (electrical DC link coupling)

Using the electrical DC link coupling, it is possible, for a multi-motor group with common DC bus, to connect or disconnect a converter with DC supply input to the DC bus.

This option is used when an inverter section has to be replaced.

Binary output -X9:4,5 is provided to control the contactor.

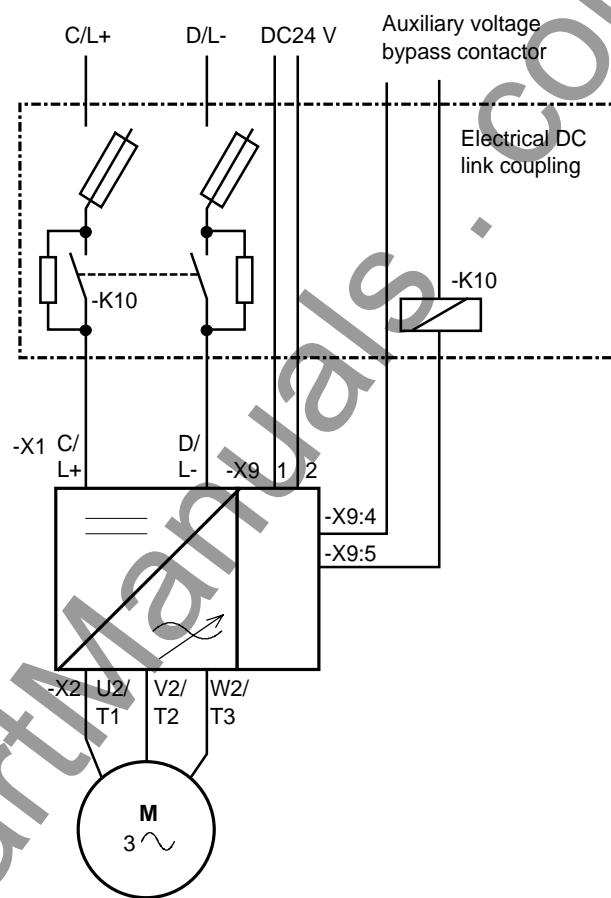


Fig. 6.6 Connecting-up example for the bypass contactor

6.6.1.1 Bypass contactor without I/R unit

Parameterization for operation with bypass contactor:

Parameter-		Terminal
No.	Name	Value
P612, i001	ST. MC energized	0000 X9: 4,5
P629, i001	ST.BC energized	1001 X9: 4,5

Table 6.11 Parameterization for the bypass contactor
(electrical DC link coupling)

6.6.1.2 Bypass contactor with I/R unit

NOTE

If individual inverters have to be isolated when the DC busbar is supplied through an input/regenerative feedback unit, the appropriate parameter sets of the infeed/regenerative feedback unit must be simultaneously switched-over using the binary input. An optimization run for each required constellation must be executed to determine the appropriate parameters. A maximum of four parameter sets can be selected.

If the DC busbar is to be fed from an infeed/regenerative feedback unit, the control parameter values must be determined for this infeed/regenerative feedback unit. During commissioning, the following steps are required:

- ♦ Re-parameterization for the optimization run:

Parameter-			Terminal	Information
No.	Name	Value		
P629, i001	ST.BC energized	0000	X9: 4,5	
P612, i001	ST.BC energized	1001	X9: 4,5	
P600, i001	ST. ready to switch-on	1001	X9: 4,5	Bypass contactor closes

Table 6.12 Parameterization for the optimization run

- ♦ Execute the optimization run to determine the values for the closed-loop control parameters for the infeed/regenerative feedback unit (☞ Instruction Manual, infeed/regenerative feedback unit).
- ♦ Re-parameterize for operation with the bypass contactor:

Parameter-			Terminal	Information
No.	Name	Value		
P600, i001	ST.ready-to-switch-on	0000	X9: 4,5	
P629, i001	ST.BC energiz.	1001	X9: 4,5	

NOTE				
In this case, the converter must be externally supplied with 24 V DC (connector -X9: 1,2)				

Table 6.13 Parameterization for the bypass contactor (electrical DC link coupling)

6.6.1.3 Connecting and disconnecting individual converters to the DC bus

Sequence control	
Switch the converter to the DC bus	Isolate the converter from the DC bus
Close the fuse disconnect switch	Output an off command
DC link is pre-charged through the pre-charging resistors	Bypass contactor drops out
Enter an on command	Open the fuse disconnect switch
Bypass contactor is closed	Converter is electrically isolated from the DC bus
	Wait until the DC link capacitors have completely discharged

Table 6.14 Sequence control for connecting/disconnecting individual converters to the bus

6.6.2 Output contactor

It is not necessary that the converter is operated with output contactor.

If the converter is operated with output contactor, binary output-X9:4,5 is provided for contactor control (re-assignment).

The checkback signal can be connected to a binary input (e.g. binary input 3).

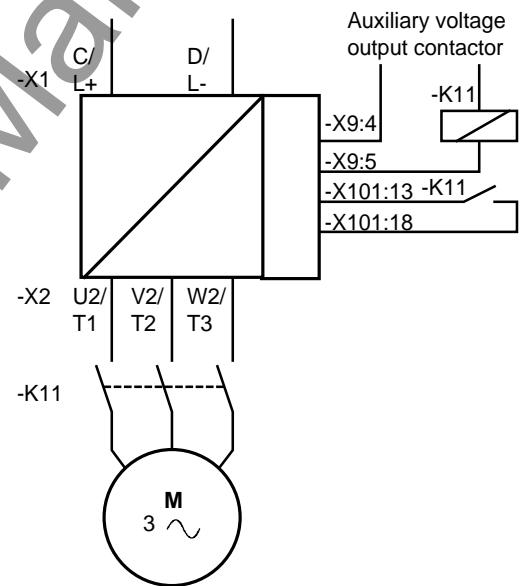


Fig. 6.7 Example for connecting-up a output contactor

Sequence control, on command-operation (effect on the bypass-or output contactor)

NOTES

For the special case, where a customer wishes to connect-up both an electrical DC link coupling as well as an output contactor, then one of the two must be energized through a binary output. For higher ratings, an additional auxiliary contactor must be provided due to the 230 V AC required (contactor coil).

6.7 Operator control

Option	Description
OP1	User-friendly operator control panel with plain text display
SIMOVIS	Floppy disk with program for operator control via PC

Table 6.15 Operator control options



Fig. 6.8 OP1

7 Spare Parts

7.1 Converter 510 V to 620 V DC

Part code No.	Designation	Order number	No.	Used in
+A10-U1 (-A100, -A101, -A110, -A111, -A200, -A201, -A210, -A211, -A300, -A301, -A310, -A311)	IGBT transistor module	6SY7000-0AB70	24	6SE7041-1TM20 6SE7041-3TM20
+A12-U1 (-A100, -A101, -A110, -A111, -A200, -A201, -A210, -A211, -A300, -A301, -A310, -A311)				
+A10-U1 (-A108, -A109, -A208, -A209, -A308, -A309)	SMU3 inverter snubber board	6SE7038-6EK84-1GF0	12	6SE7041-1TM20 6SE7041-3TM20
+A12-U1 (-A108, -A109, -A208, -A209, -A308, -A309)				
+A10-U1 (-A118, -A119, -A218, -A219, -A318, -A319)	SML3 inverter snubber board	6SE7038-6EK84-1GG0	12	6SE7041-1TM20
+A12-U1 (-A118, -A119, -A218, -A219, -A318, -A319)				
+A10-U1 (-A19, -A29, -A39)	IGD8 inverter gating board	6SE7037-0EK84-1JC0	6	6SE7041-1TM20 6SE7041-3TM20
+A12-U1 (-A19, -A29, -A39)				
+A10-U1 (-C110, -C120)	MKP capacitor for the fan	6SY7000-0AB64	4	6SE7041-1TM20 6SE7041-3TM20
+A12-U1 (-C110, -C120)				
+A10-U1 (-E1, -E2)	Radial fan	6SY7000-0AB68	4	6SE7041-1TM20 6SE7041-3TM20
+A12-U1 (-E1, -E2)				
+A10-U1 (-E1, -E2)	Nozzle for radial fan	6SY7000-0AB65	4	6SE7041-1TM20
+A12-U1 (-E1, -E2)				
+A10-U1 (-E1, -E2)	Nozzle for radial fan	6SY7000-0AB65	4	6SE7041-3TM20
+A12-U1 (-E1, -E2)				
+A10-U1 (-F101, -F102)	Fused load disconnector	6SY7000-0AA26	4	6SE7041-1TM20 6SE7041-3TM20
+A12-U1 (-F101, -F102)				
+A10-U1 (-F101, -F102)	Fuse insert	6SY7000-0AC34	4	6SE7041-1TM20 6SE7041-3TM20
+A12-U1 (-F101, -F102)				
+A10-U1 (-F41, -F42, -F43, -F44)	Fuse insert	6SY7000-0AB75	8	6SE7041-1TM20 6SE7041-3TM20
+A12-U1 (-F41, -F42, -F43, -F44)				
+A10-U1 (-R100, -R200, -R300)	Balancing resistor	6SY7000-0AB08	6	6SE7041-1TM20 6SE7041-3TM20
+A12-U1 (-R100, -R200, -R300)				
+A10-U1 (-R108, -R109, -R118, -R119, -R208, -R209, -R218, -R219, -R308, -R309, -R318, -R319)	Snubber resistor	6SY7000-0AB18	24	6SE7041-1TM20 6SE7041-3TM20
+A12-U1 (-R108, -R109, -R118, -R119, -R208, -R209, -R218, -R219, -R308, -R309, -R318, -R319)				
+A10-U1 -G25	PSU2 power supply board	6SE7038-6GL84-1JA0	2	6SE7041-1TM20 6SE7041-3TM20
+A12-U1 -G25				
-G25	PSU2 power supply board	6SE7038-6GL84-1JA0	1	6SE7035-1TJ20 6SE7036-0TK20 6SE7037-0TK20 6SE7038-6TK20
-G25				
-A10	CU2 open- and closed-loop control board (VC)	6SE7090-0XX84-0AF0	1	6SE7035-1TJ20 6SE7036-0TK20 6SE7037-0TK20 6SE7038-6TK20 6SE7041-1TK20 6SE7041-1TM20 6SE7041-3TM20
-A100, -A101, -A110, -A111, -A200, -A201, -A210, -A211, -A300, -A301, -A310, -A311	IGBT transistor module	6SY7000-0AB70	12	6SE7036-0TK20 6SE7037-0TK20
-A100, -A101, -A110, -A111, -A200, -A201, -A210, -A211, -A300, -A301, -A310, -A311				
-A100, -A101, -A110, -A111, -A200, -A201, -A210, -A211, -A300, -A301, -A310, -A311	IGBT transistor module	6SY7000-0AA82	12	6SE7038-6TK20
-A100, -A101, -A110, -A111, -A200, -A201, -A210, -A211, -A300, -A301, -A310, -A311				

Part code No.	Designation	Order number	No.	Used in
-A100, -A110, -A200, -A210, -A300, -A310	IGBT transistor module	6SY7000-0AB13	6	6SE7035-1TJ20
-A100, -A101, -A110, -A111, -A200, -A201, -A210, -A211, -A300, -A301, -A310, -A311	IGBT transistor module	6SY7000-0AB13	12	6SE7041-1TK20
-A108, -A109, -A208, -A209, -A308, -A309	SMU3 inverter snubber board	6SE7038-6EK84-1GF0	6	6SE7036-0TK20 6SE7037-0TK20 6SE7038-6TK20 6SE7041-1TK20
-A109, -A209, -A309	SMU3 inverter snubber board	6SE7038-6EK84-1GF0	3	6SE7035-1TJ20
-A118, -A119, -A218, -A219, -A318, -A319	SML3 inverter snubber board	6SE7038-6EK84-1GG0	6	6SE7036-0TK20 6SE7037-0TK20 6SE7038-6TK20 6SE7041-1TK20
-A119, -A219, -A319	SML3 inverter snubber board	6SE7038-6EK84-1GG0	3	6SE7035-1TJ20
-A19, -A29, -A39	IGD8 inverter gating board	6SE7037-0EK84-1JC0	3	6SE7036-0TK20 6SE7037-0TK20
-A19, -A29, -A39	IGD8 inverter gating board	6SE7038-6EK84-1JC0	3	6SE7038-6TK20 6SE7041-1TK20
-A20	IVI inverter interface board	6SE7038-6GL84-1BG0	1	6SE7035-1TJ20 6SE7036-0TK20 6SE7037-0TK20 6SE7038-6TK20
-A20	IVI inverter interface board	6SE7038-6GL84-1BG2	1	6SE7041-1TK20
-A22	IPI parallel switching board	6SE7090-0XX84-1CE0	1	6SE7041-1TM20 6SE7041-3TM20
-A25	ABI normalization board	6SE7041-1TM84-1CF0	1	6SE7041-1TM20
-A25	ABI normalization board	6SE7041-3TM84-1CF0	1	6SE7041-3TM20
-A26	ABO normalization board	6SE7035-1EJ84-1BH0	1	6SE7035-1TJ20
-A26	ABO normalization board	6SE7036-0TK84-1BH0	1	6SE7036-0TK20
-A26	ABO normalization board	6SE7037-0EK84-1BH0	1	6SE7037-0TK20
-A26	ABO normalization board	6SE7038-6EK84-1BH0	1	6SE7038-6TK20
-A26	ABO normalization board	6SE7041-1TK84-1BH0	1	6SE7041-1TK20
-A29	IGD7 inverter gating board	6SE7035-1EJ84-1JC0	1	6SE7035-1TJ20
-A30	PMU operator control/parameterizing unit	6SE7090-0XX84-2FA0	1	6SE7035-1TJ20 6SE7036-0TK20 6SE7037-0TK20 6SE7038-6TK20 6SE7041-1TK20 6SE7041-1TM20 6SE7041-3TM20
	DC link capacitors, complete with mounting assembly	6SY7000-0AC31	3	6SE7035-1TJ20
	DC link capacitors, complete with mounting assembly	6SY7000-0AC25	3	6SE7036-0TK20 6SE7037-0TK20
	DC link capacitors, complete with mounting assembly	6SY7000-0AC26	3	6SE7038-6TK20

Part code No.	Designation	Order number	No.	Used in
	DC link capacitors, complete with mounting assembly	6SY7000-0AC25	6	6SE7041-1TM20 6SE7041-3TM20
	DC link capacitors, complete with mounting assembly	6SY7000-0AC65	3	6SE7041-1TK20
-C110	MKP capacitor for the fan	6SY7000-0AB64	1	6SE7035-1TJ20
-C110, -C120	MKP capacitor for the fan	6SY7000-0AB64	2	6SE7036-0TK20 6SE7037-0TK20 6SE7038-6TK20
-C110, -C120	MKP capacitor for the fan	6SY7000-0AC38	2	6SE7041-1TK20
-E1	Nozzle for the radial fan	6SY7000-0AB65	1	6SE7035-1TJ20
-E1	Radial fan	6SY7000-0AB68	1	6SE7035-1TJ20
-E1, -E2	Nozzle for the radial fan	6SY7000-0AB65	2	6SE7036-0TK20 6SE7037-0TK20 6SE7038-6TK20
-E1, -E2	Nozzle for the radial fan	6SY7000-0AC41	2	6SE7041-1TK20
-E1, -E2	Radial fan	6SY7000-0AB68	2	6SE7036-0TK20 6SE7037-0TK20 6SE7038-6TK20
-E1, -E2	Radial fan	6SY7000-0AC40	2	6SE7041-1TK20
-F101, -F102	Fused load disconnecter	6SY7000-0AA26	2	6SE7035-1TJ20 6SE7036-0TK20 6SE7037-0TK20 6SE7038-6TK20 6SE7041-1TK20
-F101, -F102	Fuse insert	6SY7000-0AC34	2	6SE7035-1TJ20 6SE7036-0TK20 6SE7037-0TK20 6SE7038-6TK20
-F101, -F102	Fuse insert	6SY7000-0AC42	2	6SE7041-1TK20
-F41, -F42, -F43, -F44	Fuse insert	6SY7000-0AB75	4	6SE7036-0TK20 6SE7037-0TK20 6SE7035-1TJ20
-F41, -F42, -F43, -F44	Fuse insert	6SY7000-0AB88	4	6SE7038-6TK20
-F41, -F42, -F43, -F44	Fuse insert	6SY7000-0AC64	4	6SE7041-1TK20
-R100, -R200, -R300	Balancing resistor	6SY7000-0AB08	3	6SE7036-0TK20 6SE7037-0TK20
-R100, -R200, -R300	Balancing resistor	6SY9705	3	6SE7035-1TJ20
-R100, -R200, -R300	Balancing resistor	6SY7000-0AA77	3	6SE7038-6TK20
-R100, -R200, -R300	Balancing resistor	6SY7000-0AA76	3	6SE7041-1TK20
-R108, -R109, -R118, -R119, -R208, -R209, -R218, -R219, -R308, -R309, -R318, -R319	Snubber resistor	6SY7000-0AB18	12	6SE7036-0TK20 6SE7037-0TK20 6SE7038-6TK20 6SE7041-1TK20
-R109, -R119, -R209, -R219, -R309, -R319	Snubber resistor	6SY7000-0AB18	6	6SE7035-1TJ20
OPTION L31: +A10 -U1 (-F41, -F42, -F43, -F44), +A12 -U1 (-F41, -F42, -F43, -F44)	Fuse insert	6SY7000-0AC03	8	6SE7041-1TM20 6SE7041-3TM20
OPTION L31: -F41, -F42, -F43, -F44	Fuse insert	6SY7000-0AC20	4	6SE7038-6TK20
OPTION L31: -F41, -F42, -F43, -F44	Fuse insert	6SY7000-0AC05	4	6SE7035-1TJ20
OPTION L31: -F41, -F42, -F43, -F44	Fuse insert	6SY7000-0AC03	4	6SE7036-0TK20 6SE7037-0TK20

Part code No.	Designation	Order number	No.	Used in
ACCESSORIES	Connector set, SIMOVERT VC	6SY7000-0AC13	1	6SE7035-1TJ20 6SE7036-0TK20 6SE7037-0TK20 6SE7038-6TK20 6SE7041-1TM20 6SE7041-3TM20
ACCESSORIES	Connector set, SIMOVERT VC	6SY7000-0AC50	1	6SE7041-1TK20

Table 7.1 Spare parts

7.2 Converter 675 V to 780 V DC

Part code No.	Designation	Order No.	No.	Used in
+A10 -U1 (-A100, -A101, -A110, -A111, -A200, -A201, -A210, -A211, -A300, -A301, -A310, -A311)	IGBT transistor module	6SY7000-0AB71	24	6SE7041-0UM20 6SE7041-1UM20
+A12 -U1 (-A100, -A101, -A110, -A111, -A200, -A201, -A210, -A211, -A300, -A301, -A310, -A311)				
+A10 -U1 (-A100, -A101, -A110, -A111, -A200, -A201, -A210, -A211, -A300, -A301, -A310, -A311)	IGBT transistor module	6SY7000-0AC36	24	6SE7041-2UM20
+A12 -U1 (-A100, -A101, -A110, -A111, -A200, -A201, -A210, -A211, -A300, -A301, -A310, -A311)				
+A10 -U1 (-A100, -A101, -A110, -A111, -A200, -A201, -A210, -A211, -A300, -A301, -A310, -A311)	IGBT transistor module	6SY7000-0AC37	24	6SE7041-4UM20 6SE7041-6UM20
+A12 -U1 (-A100, -A101, -A110, -A111, -A200, -A201, -A210, -A211, -A300, -A301, -A310, -A311)				
+A10 -U1 (-A118, -A119, -A218, -A219, -A318, -A319), +A12 -U1 (-A118, -A119, -A218, -A219, -A318, -A319)	SML3 inverter snubber board	6SE7038-6GK84-1GG0	12	6SE7041-0UM20 6SE7041-1UM20 6SE7041-2UM20 6SE7041-4UM20 6SE7041-6UM20
+A10 -U1 (-A19, -A29, -A39), +A12 -U1 (-A19, -A29, -A39)	IGD8 inverter gating board	6SE7035-7GK84-1JC0	6	6SE7041-0UM20 6SE7041-1UM20
+A10 -U1 (-A19, -A29, -A39), +A12 -U1 (-A19, -A29, -A39)	IGD8 inverter gating board	6SE7038-6GK84-1JC0	6	6SE7041-2UM20 6SE7041-6UM20
+A10 -U1 (-A19, -A29, -A39), +A12 -U1 (-A19, -A29, -A39)	IGD8 inverter gating board	6SE7036-5GK84-1JC0	6	6SE7041-4UM20
+A10 -U1 (-C110, -C120), +A12 -U1 (-C110, -C120)	MKP capacitor for the fan	6SY7000-0AB64	4	6SE7041-0UM20 6SE7041-1UM20
+A10 -U1 (-C110, -C120), +A12 -U1 (-C110, -C120)	MKP capacitor for the fan	6SY7000-0AC35	4	6SE7041-2UM20
+A10 -U1 (-C110, -C120), +A12 -U1 (-C110, -C120)	MKP capacitor for the fan	6SY7000-0AC38	4	6SE7041-4UM20 6SE7041-6UM20 6SE7038-6UK20
+A10 -U1 (-E1, -E2), +A12 -U1 (-E1, -E2)	Nozzle for radial fan	6SY7000-0AB65	4	6SE7041-0UM20
+A10 -U1 (-E1, -E2), +A12 -U1 (-E1, -E2)	Radial fan	6SY7000-0AB68	4	6SE7041-0UM20 6SE7041-1UM20 6SE7041-2UM20
+A10 -U1 (-E1, -E2), +A12 -U1 (-E1, -E2)	Nozzle for radial fan	6SY7000-0AB65	4	6SE7041-1UM20

Part code No.	Designation	Order No.	No.	Used in
+A10 -U1 (-E1, -E2), +A12 -U1 (-E1, -E2)	Nozzle for radial fan	6SY7000-0AB65	4	6SE7041-2UM20
+A10 -U1 (-F101, -F102), +A12 -U1 (-F101, -F102)	Fused load disconnecter	6SY7000-0AA26	4	6SE7041-0UM20 6SE7041-1UM20 6SE7041-2UM20 6SE7041-4UM20 6SE7041-6UM20
+A10 -U1 (-F101, -F102), +A12 -U1 (-F101, -F102)	Fuse insert	6SY7000-0AC34	4	6SE7041-0UM20 6SE7041-1UM20 6SE7041-2UM20
+A10 -U1 (-F101, -F102), +A12 -U1 (-F101, -F102)	Fuse insert	6SY7000-0AC42	4	6SE7041-4UM20 6SE7041-6UM20
+A10 -U1 (-F41, -F42, -F43, -F44), +A12 -U1 (-F41, -F42, -F43, -F44)	Fuse insert	6SY7000-0AB77	8	6SE7041-0UM20 6SE7041-1UM20
+A10 -U1 (-F41, -F42, -F43, -F44), +A12 -U1 (-F41, -F42, -F43, -F44)	Fuse insert	6SY7000-0AB87	8	6SE7041-2UM20
+A10 -U1 (-F41, -F42, -F43, -F44), +A12 -U1 (-F41, -F42, -F43, -F44)	Fuse insert	6SY7000-0AB74	8	6SE7041-4UM20 6SE7041-6UM20
+A10 -U1 (-R100, -R200, -R300), +A12 -U1 (-R100, -R200, -R300)	Balancing resistor	6SY7000-0AA77	6	6SE7041-0UM20 6SE7041-1UM20 6SE7041-2UM20
+A10 -U1 (-R100, -R200, -R300), +A12 -U1 (-R100, -R200, -R300)	Balancing resistor	6SY7000-0AA76	6	6SE7041-4UM20 6SE7041-6UM20
+A10 -U1 (-R108, -R109, -R118, -R119, -R208, -R209, -R218, -R219, -R308, -R309, -R318, -R319) +A12 -u1 (-r108, -r109, -r118, -r119, -r208, -r209, -r218, -r219, -r308, -r309, -r318, -r319)	Snubber resistor	6SY7000-0AB18	24	6SE7041-0UM20 6SE7041-1UM20 6SE7041-2UM20 6SE7041-4UM20 6SE7041-6UM20
+A10 -U1 -A28, +A12 -U1 -A28	VDU voltage distribution board	6SE7038-6GL84-1JB0	2	6SE7041-0UM20 6SE7041-1UM20 6SE7041-2UM20 6SE7041-4UM20 6SE7041-6UM20
+A10 -U1 -G25, +A12 -U1 -G25	PSU2 power supply board	6SE7038-6GL84-1JA0	2	6SE7041-0UM20 6SE7041-1UM20 6SE7041-2UM20 6SE7041-4UM20 6SE7041-6UM20
G25	PSU2 power supply board	6SE7038-6GL84-1JA0	1	6SE7033-0UJ20 6SE7033-5UJ20 6SE7034-5UK20 6SE7035-7UK20 6SE7036-5UK20 6SE7038-6UK20
+A10 -U1 -R28, +A12 -U1 -R28	VDU resistor	6SY7000-0AC33	2	6SE7041-0UM20 6SE7041-1UM20 6SE7041-2UM20 6SE7041-4UM20 6SE7041-6UM20

Part code No.	Designation	Order No.	No.	Used in
-A10	CU2 open- and closed-loop control board (VC)	6SE7090-0XX84-0AF0	1	6SE7033-0UJ20 6SE7033-5UJ20 6SE7034-5UK20 6SE7035-7UK20 6SE7036-5UK20 6SE7038-6UK20 6SE7041-0UM20 6SE7041-1UM20 6SE7041-2UM20 6SE7041-4UM20 6SE7041-6UM20
-A100, -A101, -A110, -A111, -A200, -A201, -A210, -A211, -A300, -A301, -A310, -A311	IGBT transistor module	6SY7000-0AB12	12	6SE7034-5UK20
-A100, -A101, -A110, -A111, -A200, -A201, -A210, -A211, -A300, -A301, -A310, -A311	IGBT transistor module	6SY7000-0AB71	12	6SE7035-7UK20
-A100, -A101, -A110, -A111, -A200, -A201, -A210, -A211, -A300, -A301, -A310, -A311	IGBT transistor module	6SY7000-0AC36	12	6SE7036-5UK20
-A100, -A101, -A110, -A111, -A200, -A201, -A210, -A211, -A300, -A301, -A310, -A311	IGBT transistor module	6SY7000-0AC37	12	6SE7038-6UK20
-A100, -A110, -A200, -A210, -A300, -A310	IGBT transistor module	6SY7000-0AC36	6	6SE7033-0UJ20
-A100, -A110, -A200, -A210, -A300, -A310	IGBT transistor module	6SY7000-0AB14	6	6SE7033-5UJ20
-A108, -A109, -A208, -A209, -A308, -A309	SMU3 inverter snubber board	6SE7038-6GK84-1GF0	6	6SE7034-5UK20 6SE7035-7UK20 6SE7036-5UK20 6SE7038-6UK20
-A109, -A209, -A309	SMU3 inverter snubber board	6SE7038-6GK84-1GF0	3	6SE7033-0UJ20 6SE7033-5UJ20
-A118, -A119, -A218, -A219, -A318, -A319	SML3 inverter snubber board	6SE7038-6EK84-1GG0	6	
-A118, -A119, -A218, -A219, -A318, -A319	SML3 inverter snubber board	6SE7038-6GK84-1GG0	6	6SE7034-5UK20 6SE7035-7UK20 6SE7036-5UK20 6SE7038-6UK20
-A119, -A219, -A319	SML3 inverter snubber board	6SE7038-6GK84-1GG0	3	6SE7033-0UJ20 6SE7033-5UJ20
-A19, -A29, -A39	IGD8 inverter gating board	6SE7034-5GK84-1JC0	3	6SE7034-5UK20
-A19, -A29, -A39	IGD8 inverter gating board	6SE7035-7GK84-1JC0	3	6SE7035-7UK20
-A19, -A29, -A39	IGD8 inverter gating board	6SE7038-6GK84-1JC0	3	6SE7036-5UK20
-A19, -A29, -A39	IGD8 inverter gating board	6SE7036-5GK84-1JC0	3	6SE7038-6UK20
-A20	IVI inverter interface board	6SE7038-6GL84-1BG0	1	6SE7033-0UJ20 6SE7033-5UJ20 6SE7034-5UK20 6SE7035-7UK20 6SE7036-5UK20 6SE7038-6UK20
-A22	IPI parallel switching board	6SE7090-0XX84-1CE0	1	6SE7041-0UM20 6SE7041-1UM20 6SE7041-2UM20 6SE7041-4UM20 6SE7041-6UM20
-A25	ABI normalization board	6SE7041-0UM84-1CF0	1	6SE7041-0UM20
-A25	ABI normalization board	6SE7041-1UM84-1CF0	1	6SE7041-1UM20
-A25	ABI normalization board	6SE7041-2UM84-1CF0	1	6SE7041-2UM20
-A25	ABI normalization board	6SE7041-4UM84-1CF0	1	6SE7041-4UM20

Part code No.	Designation	Order No.	No.	Used in
-A25	ABI normalization board	6SE7041-6UM84-1CF0	1	6SE7041-6UM20
-A26	ABO normalization board	6SE7033-0UJ84-1BH0	1	6SE7033-0UJ20
-A26	ABO normalization board	6SE7033-5UJ84-1BH0	1	6SE7033-5UJ20
-A26	ABO normalization board	6SE7034-5UK84-1BH0	1	6SE7034-5UK20
-A26	ABO normalization board	6SE7035-7UK84-1BH0	1	6SE7035-7UK20
-A26	ABO normalization board	6SE7036-5UK84-1BH0	1	6SE7036-5UK20
-A26	ABO normalization board	6SE7038-6EK84-1BH0	1	6SE7038-6UK20
-A26	ABO normalization board	6SE7038-6UK84-1BH0	1	6SE7038-6UK20
-A28	VDU voltage divider board	6SE7038-6GL84-1JB0	1	6SE7033-0UJ20 6SE7033-5UJ20 6SE7034-5UK20 6SE7035-7UK20 6SE7036-5UK20 6SE7038-6UK20
-A29	IGD7 inverter gating board	6SE7033-5GJ84-1JC0	1	6SE7033-0UJ20 6SE7033-5UJ20
-A30	PMU operator control parameterizing unit	6SE7090-0XX84-2FA0	1	6SE7033-0UJ20 6SE7033-5UJ20 6SE7034-5UK20 6SE7035-7UK20 6SE7036-5UK20 6SE7038-6UK20 6SE7041-0UM20 6SE7041-1UM20 6SE7041-2UM20 6SE7041-4UM20 6SE7041-6UM20
	DC link capacitors complete with mounting assembly	6SY7000-0AC27	3	6SE7034-5UK20
	DC link capacitors complete with mounting assembly	6SY7000-0AC31	3	6SE7033-0UJ20 6SE7033-5UJ20
	DC link capacitors complete with mounting assembly	6SY7000-0AC28	3	6SE7035-7UK20 6SE7036-5UK20
	DC link capacitors complete with mounting assembly	6SY7000-0AC30	3	6SE7038-6UK20
	DC link capacitors complete with mounting assembly	6SY7000-0AC28	6	6SE7041-0UM20 6SE7041-1UM20 6SE7041-2UM20
	DC link capacitors complete with mounting assembly	6SY7000-0AC30	6	6SE7041-4UM20 6SE7041-6UM20
-C110	MKP capacitor for the fan	6SY7000-0AB64	1	6SE7033-0UJ20 6SE7033-5UJ20
-C110, -C120	MKP capacitor for the fan	6SY7000-0AB64	2	6SE7034-5UK20 6SE7035-7UK20

Part code No.	Designation	Order No.	No.	Used in
-C110, -C120	MKP capacitor for the fan	6SY7000-0AC35	2	6SE7036-5UK20
-E1	Nozzle for the radial fan	6SY7000-0AB65	1	6SE7033-0UJ20 6SE7033-5UJ20
-E1	Radial fan	6SY7000-0AB68	1	6SE7033-0UJ20 6SE7033-5UJ20
-E1	Radial fan	6SY7000-0AC40	1	6SE7038-6UK20 6SE7041-4UM20 6SE7041-6UM20
-E1	Nozzle for the radial fan	6SY7000-0AC41	1	6SE7038-6UK20
-E1, -E2	Nozzle for the radial fan	6SY7000-0AB65	2	6SE7034-5UK20 6SE7035-7UK20 6SE7036-5UK20
-E1, -E2	Radial fan	6SY7000-0AB68	2	6SE7034-5UK20 6SE7035-7UK20 6SE7036-5UK20
-E1, -E2	Nozzle for the radial fan	6SY7000-0AC41	2	6SE7041-4UM20 6SE7041-6UM20
-F101, -F102	Fused load disconnector	6SY7000-0AA26	2	6SE7033-0UJ20 6SE7033-5UJ20 6SE7034-5UK20 6SE7035-7UK20 6SE7036-5UK20 6SE7038-6UK20
-F101, -F102	Fuse insert	6SY7000-0AC34	2	6SE7033-0UJ20 6SE7033-5UJ20 6SE7034-5UK20 6SE7035-7UK20 6SE7036-5UK20
-F101, -F102	Fuse insert	6SY7000-0AC42	2	6SE7038-6UK20
-F41, -F42	Fuse insert	6SY7000-0AB87	2	6SE7033-0UJ20
-F41, -F42	Fuse insert	6SY7000-0AB74	2	6SE7033-5UJ20
-F41, -F42	Fuse insert	6SY7000-0AB88	2	6SE7034-5UK20
-F41, -F42, -F43, -F44	Fuse insert	6SY7000-0AB77	4	6SE7035-7UK20
-F41, -F42, -F43, -F44	Fuse insert	6SY7000-0AB87	4	6SE7036-5UK20
-F41, -F42, -F43, -F44	Fuse insert	6SY7000-0AB74	4	6SE7038-6UK20
-R100, -R200, -R300	Balancing resistor	6SY9705	3	6SE7033-0UJ20 6SE7033-5UJ20
-R100, -R200, -R300	Balancing resistor	6SY7000-0AB08	3	6SE7034-5UK20
-R100, -R200, -R300	Balancing resistor	6SY7000-0AA77	3	6SE7035-7UK20 6SE7036-5UK20
-R100, -R200, -R300	Balancing resistor	6SY7000-0AA76	3	6SE7038-6UK20
-R108, -R109, -R118, -R119, -R208, -R209, -R218, -R219, -R308, -R309, -R318, -R319	Snubber resistor	6SY7000-0AB18	12	6SE7034-5UK20 6SE7035-7UK20 6SE7036-5UK20 6SE7038-6UK20
-R109, -R119, -R209, -R219, -R309, -R319	Snubber resistor	6SY7000-0AB18	6	6SE7033-0UJ20 6SE7033-5UJ20

Part code No.	Designation	Order No.	No.	Used in
-R28	VDU resistor	6SY7000-0AC33	1	6SE7033-0UJ20 6SE7033-5UJ20 6SE7034-5UK20 6SE7035-7UK20 6SE7036-5UK20 6SE7038-6UK20
OPTION L31: +A10 -U1 (-F41, -F42, -F43, -F44), +A12 -U1 (-F41, -F42, -F43, -F44)	Fuse insert	6SY7000-0AC16	8	6SE7041-0UM20 6SE7041-1UM20 6SE7041-2UM20
OPTION L31: +A10 -U1 (-F41, -F42, -F43, -F44), +A12 -U1 (-F41, -F42, -F43, -F44)	Fuse insert	6SY7000-0AC20	8	6SE7041-4UM20 6SE7041-6UM20
OPTION L31: -F41, -F42	Fuse insert	6SY7000-0AC17	2	6SE7033-0UJ20 6SE7033-5UJ20 6SE7034-5UK20
OPTION L31: -F41, -F42, -F43, -F44	Fuse insert	6SY7000-0AC16	4	6SE7035-7UK20 6SE7036-5UK20
OPTION L31: -F41, -F42, -F43, -F44	Fuse insert	6SY7000-0AC20	4	6SE7038-6UK20
ACCESSORIES	Connector set, SIMOVERT VC	6SY7000-0AC13	1	6SE7033-0UJ20 6SE7033-5UJ20 6SE7034-5UK20 6SE7035-7UK20 6SE7036-5UK20 6SE7038-6UK20 6SE7041-0UM20 6SE7041-1UM20 6SE7041-2UM20 6SE7041-4UM20 6SE7041-6UM20

7.3 Converter 890 V to 930 V DC

Part code No.	Designation	Order No.	No.	Used in
+A10 -U1 (-A100, -A101, -A110, -A111, -A200, -A201, -A210, -A211, -A300, -A301, -A310, -A311)	IGBT transistor module	6SY7000-0AB71	24	6SE7041-0WM20 6SE7041-1WM20
+A12 -U1 (-A100, -A101, -A110, -A111, -A200, -A201, -A210, -A211, -A300, -A301, -A310, -A311)	IGBT transistor module	6SY7000-0AC36	24	6SE7041-2WM20
+A10 -U1 (-A100, -A101, -A110, -A111, -A200, -A201, -A210, -A211, -A300, -A301, -A310, -A311)	IGBT transistor module	6SY7000-0AC37	24	6SE7041-4WM20 6SE7041-6WM20
+A12 -U1 (-A100, -A101, -A110, -A111, -A200, -A201, -A210, -A211, -A300, -A301, -A310, -A311)	IGBT transistor module	6SY7000-0AC37	24	6SE7041-4WM20 6SE7041-6WM20
+A10 -U1 (-A108, -A109, -A208, -A209, -A308, -A309), +A12 -U1 (-A108, -A109, -A208, -A209, -A308, -A309)	SMU3 inverter snubber board	6SE7038-6GK84-1GF0	12	6SE7041-6WM20
+A10 -U1 (-A118, -A119, -A218, -A219, -A318, -A319), +A12 -U1 (-A118, -A119, -A218, -A219, -A318, -A319)	SML3 inverter snubber board	6SE7038-6GK84-1GG0	12	6SE7041-0WM20 6SE7041-1WM20 6SE7041-2WM20 6SE7041-4WM20 6SE7041-6WM20
+A10 -U1 (-A19, -A29, -A39), +A12 -U1 (-A19, -A29, -A39)	IGD8 inverter gating board	6SE7035-7GK84-1JC0	6	6SE7041-0WM20 6SE7041-1WM20
+A10 -U1 (-A19, -A29, -A39), +A12 -U1 (-A19, -A29, -A39)	IGD8 inverter gating board	6SE7038-6GK84-1JC0	6	6SE7041-2WM20 6SE7041-6WM20

Part code No.	Designation	Order No.	No.	Used in
+A10 -U1 (-A19, -A29, -A39), +A12 -U1 (-A19, -A29, -A39)	IGD8 inverter gating board	6SE7036-5GK84-1JC0	6	6SE7041-4WM20
+A10 -U1 (-C110, -C120), +A12 -U1 (-C110, -C120)	MKP capacitor for the fan	6SY7000-0AB64	4	6SE7041-0WM20 6SE7041-1WM20
+A10 -U1 (-C110, -C120), +A12 -U1 (-C110, -C120)	MKP capacitor for the fan	6SY7000-0AC35	4	6SE7041-2WM20
+A10 -U1 (-C110, -C120), +A12 -U1 (-C110, -C120)	MKP capacitor for the fan	6SY7000-0AC38	4	6SE7041-4WM20 6SE7041-6WM20 6SE7038-6WK20
+A10 -U1 (-E1, -E2), +A12 -U1 (-E1, -E2)	Radial fan	6SY7000-0AB68	4	6SE7041-0WM20 6SE7041-1WM20 6SE7041-2WM20
+A10 -U1 (-E1, -E2), +A12 -U1 (-E1, -E2)	Nozzle for the radial fan	6SY7000-0AB65	4	6SE7041-0WM20
+A10 -U1 (-E1, -E2), +A12 -U1 (-E1, -E2)	Nozzle for the radial fan	6SY7000-0AB65	4	6SE7041-1WM20
+A10 -U1 (-E1, -E2), +A12 -U1 (-E1, -E2)	Nozzle for the radial fan	6SY7000-0AB65	4	6SE7041-2WM20
+A10 -U1 (-F101, -F102), +A12 -U1 (-F101, -F102)	Fused load disconnector	6SY7000-0AA26	4	6SE7041-0WM20 6SE7041-1WM20 6SE7041-2WM20 6SE7041-4WM20 6SE7041-6WM20
+A10 -U1 (-F101, -F102), +A12 -U1 (-F101, -F102)	Fuse insert	6SY7000-0AC34	4	6SE7041-0WM20 6SE7041-1WM20 6SE7041-2WM20
+A10 -U1 (-F101, -F102), +A12 -U1 (-F101, -F102)	Fuse insert	6SY7000-0AC42	4	6SE7041-4WM20 6SE7041-6WM20
+A10 -U1 (-F41, -F42, -F43, -F44), +A12 -U1 (-F41, -F42, -F43, -F44)	Fuse insert	6SY7000-0AB77	8	6SE7041-0WM20 6SE7041-1WM20
+A10 -U1 (-F41, -F42, -F43, -F44), +A12 -U1 (-F41, -F42, -F43, -F44)	Fuse insert	6SY7000-0AB87	8	6SE7041-2WM20
+A10 -U1 (-F41, -F42, -F43, -F44), +A12 -U1 (-F41, -F42, -F43, -F44)	Fuse insert	6SY7000-0AB74	8	6SE7041-4WM20 6SE7041-6WM20
+A10 -U1 (-R100, -R200, -R300), +A12 -U1 (-R100, -R200, -R300)	Balancing resistor	6SY7000-0AA77	6	6SE7041-0WM20 6SE7041-1WM20 6SE7041-2WM20
+A10 -U1 (-R100, -R200, -R300), +A12 -U1 (-R100, -R200, -R300)	Balancing resistor	6SY7000-0AA76	6	6SE7041-4WM20 6SE7041-6WM20
+A10 -U1 -R108, -R109, -R118, -R119, -R208, -R209, -R218, -R219, -R308, -R309, -R318, -R319) +A12 -U1 (-R108, -R109, -R118, -R119, -R208, -R209, -R218, -R219, -R308, -R309, -R318, -R319)	Snubber resistor	6SY7000-0AB18	24	6SE7041-0WM20 6SE7041-1WM20 6SE7041-2WM20 6SE7041-4WM20 6SE7041-6WM20
+A10 -U1 -A28, +A12 -U1 -A28	VDU resistor	6SE7038-6GL84-1JB0	2	6SE7041-0WM20 6SE7041-1WM20 6SE7041-2WM20 6SE7041-4WM20 6SE7041-6WM20
+A10 -U1 -G25, +A12 -U1 -G25	PSU2 power supply board	6SE7038-6GL84-1JA0	2	6SE7041-0WM20 6SE7041-1WM20 6SE7041-2WM20 6SE7041-4WM20 6SE7041-6WM20

Part code No.	Designation	Order No.	No.	Used in
-G25	PSU2 power supply board	6SE7038-6GL84-1JA0	1	6SE7033-0WJ20 6SE7033-5WJ20 6SE7034-5WK20 6SE7035-7WK20 6SE7036-5WK20 6SE7038-6WK20
+A10 -U1 -R28, +A12 -U1 -R28	VDU resistor	6SY7000-0AC33	2	6SE7041-0WM20 6SE7041-1WM20 6SE7041-2WM20 6SE7041-4WM20 6SE7041-6WM20
-A10	CU2 open- and closed-loop control board(VC)	6SE7090-0XX84-0AF0	1	6SE7033-0WJ20 6SE7033-5WJ20 6SE7034-5WK20 6SE7035-7WK20 6SE7036-5WK20 6SE7038-6WK20 6SE7041-0WM20 6SE7041-1WM20 6SE7041-2WM20 6SE7041-4WM20 6SE7041-6WM20
-A100, -A101, -A110, -A111, -A200, -A201, -A210, -A211, -A300, -A301, -A310, -A311	IGBT transistor module	6SY7000-0AB12	12	6SE7034-5WK20
-A100, -A101, -A110, -A111, -A200, -A201, -A210, -A211, -A300, -A301, -A310, -A311	IGBT transistor module	6SY7000-0AB71	12	6SE7035-7WK20
-A100, -A101, -A110, -A111, -A200, -A201, -A210, -A211, -A300, -A301, -A310, -A311	IGBT transistor module	6SY7000-0AC36	12	6SE7036-5WK20
-A100, -A101, -A110, -A111, -A200, -A201, -A210, -A211, -A300, -A301, -A310, -A311	IGBT transistor module	6SY7000-0AC37	12	6SE7038-6WK20
-A100, -A110, -A200, -A210, -A300, -A310	IGBT transistor module	6SY7000-0AC36	6	6SE7033-0WJ20
-A100, -A110, -A200, -A210, -A300, -A310	IGBT transistor module fz1200r16kf1, 1200a, 1600v	6SY7000-0AB14	6	6SE7033-5WJ20
-A108, -A109, -A208, -A209, -A308, -A309	SMU3 inverter snubber board	6SE7038-6GK84-1GF0	6	6SE7034-5WK20 6SE7035-7WK20 6SE7036-5WK20 6SE7038-6WK20
-A109, -A209, -A309	SMU3 inverter snubber board	6SE7038-6GK84-1GF0	3	6SE7033-0WJ20 6SE7033-5WJ20
-A118, -A119, -A218, -A219, -A318, -A319	SML3 inverter snubber board	6SE7038-6GK84-1GG0	6	6SE7034-5WK20 6SE7035-7WK20 6SE7036-5WK20 6SE7038-6WK20
-A119, -A219, -A319	SML3 inverter snubber board	6SE7038-6GK84-1GG0	3	6SE7033-0WJ20 6SE7033-5WJ20
-A19, -A29, -A39	IGD8 inverter gating board	6SE7034-5GK84-1JC0	3	6SE7034-5WK20
-A19, -A29, -A39	IGD8 inverter gating board	6SE7035-7GK84-1JC0	3	6SE7035-7WK20
-A19, -A29, -A39	IGD8 inverter gating board	6SE7038-6GK84-1JC0	3	6SE7036-5WK20
-A19, -A29, -A39	IGD8 inverter gating board	6SE7036-5GK84-1JC0	3	6SE7038-6WK20
-A20	IVI inverter interface board	6SE7038-6GL84-1BG0	1	6SE7033-0WJ20 6SE7033-5WJ20 6SE7034-5WK20 6SE7035-7WK20 6SE7036-5WK20 6SE7038-6WK20

Part code No.	Designation	Order No.	No.	Used in
-A22	IPI parallel switching board	6SE7090-0XX84-1CE0	1	6SE7041-0WM20 6SE7041-1WM20 6SE7041-2WM20 6SE7041-4WM20 6SE7041-6WM20
-A25	ABI normalization board	6SE7041-0UM84-1CF0	1	6SE7041-0WM20
-A25	ABI normalization board	6SE7041-1WM84-1CF0	1	6SE7041-1WM20
-A25	ABI normalization board	6SE7041-2WM84-1CF0	1	6SE7041-2WM20
-A25	ABI normalization board	6SE7041-4WM84-1CF0	1	6SE7041-4WM20
-A25	ABI normalization board	6SE7041-6WM84-1CF0	1	6SE7041-6WM20
-A26	ABO normalization board 297a	6SE7033-0WJ84-1BH0	1	6SE7033-0WJ20
-A26	ABO normalization board	6SE7033-5WJ84-1BH0	1	6SE7033-5WJ20
-A26	ABO normalization board	6SE7034-5WK84-1BH0	1	6SE7034-5WK20
-A26	ABO normalization board	6SE7035-7WK84-1BH0	1	6SE7035-7WK20
-A26	ABO normalization board	6SE7036-5WK84-1BH0	1	6SE7036-5WK20
-A26	ABO normalization board	6SE7038-6UK84-1BH0	1	6SE7038-6WK20
-A28	VDU voltage divider board	6SE7038-6GL84-1JB0	1	6SE7033-0WJ20 6SE7033-5WJ20 6SE7034-5WK20 6SE7035-7WK20 6SE7036-5WK20 6SE7038-6WK20
-A29	IGD7 inverter gating board	6SE7033-5GJ84-1JC0	1	6SE7033-0WJ20 6SE7033-5WJ20
-A30	PNU operator control parameterizing unit	6SE7090-0XX84-2FA0	1	6SE7033-0WJ20 6SE7033-5WJ20 6SE7034-5WK20 6SE7035-7WK20 6SE7036-5WK20 6SE7038-6WK20 6SE7041-0WM20 6SE7041-1WM20 6SE7041-2WM20 6SE7041-4WM20 6SE7041-6WM20
	DC link capacitors with complete mounting assembly	6SY7000-0AC27	3	6SE7034-5WK20
	DC link capacitors with complete mounting assembly	6SY7000-0AC31	3	6SE7033-0WJ20 6SE7033-5WJ20
	DC link capacitors with complete mounting assembly	6SY7000-0AC28	3	6SE7035-7WK20 6SE7036-5WK20
	DC link capacitors with complete mounting assembly	6SY7000-0AC30	3	6SE7038-6WK20

Part code No.	Designation	Order No.	No.	Used in
	DC link capacitors with complete mounting assembly	6SY7000-0AC28	6	6SE7041-0WM20 6SE7041-1WM20 6SE7041-2WM20
	DC link capacitors with complete mounting assembly	6SY7000-0AC30	6	6SE7041-4WM20 6SE7041-6WM20
-C110	MKP capacitor for the fan	6SY7000-0AB64	1	6SE7033-0WJ20 6SE7033-5WJ20
-C110, -C120	MKP capacitor for the fan	6SY7000-0AB64	2	6SE7034-5WK20 6SE7035-7WK20
-C110, -C120	MKP capacitor for the fan	6SY7000-0AC35	2	6SE7036-5WK20
-E1	Nozzle for the radial fan	6SY7000-0AB65	1	6SE7033-0WJ20 6SE7033-5WJ20
-E1	Radial fan	6SY7000-0AB68	1	6SE7033-0WJ20 6SE7033-5WJ20
-E1	Radial fan	6SY7000-0AC40	1	6SE7038-6WK20 6SE7041-4WM20 6SE7041-6WM20
-E1	Nozzle for the radial fan	6SY7000-0AC41	1	6SE7038-6WK20
-E1, -E2	Nozzle for the radial fan	6SY7000-0AB65	2	6SE7034-5WK20 6SE7035-7WK20 6SE7036-5WK20
-E1, -E2	Radial fan	6SY7000-0AB68	2	6SE7034-5WK20 6SE7035-7WK20 6SE7036-5WK20
-E1, -E2	Nozzle for the radial fan	6SY7000-0AC41	2	6SE7041-4WM20 6SE7041-6WM20
-F101, -F102	Fused load disconnector	6SY7000-0AA26	2	6SE7033-0WJ20 6SE7033-5WJ20 6SE7034-5WK20 6SE7035-7WK20 6SE7036-5WK20 6SE7038-6WK20
-F101, -F102	Fuse insert	6SY7000-0AC34	2	6SE7033-0WJ20 6SE7033-5WJ20 6SE7034-5WK20 6SE7035-7WK20 6SE7036-5WK20
-F101, -F102	Fuse insert	6SY7000-0AC42	2	6SE7038-6WK20
-F41, -F42	Fuse insert	6SY7000-0AB87	2	6SE7033-0WJ20
-F41, -F42	Fuse insert	6SY7000-0AB74	2	6SE7033-5WJ20
-F41, -F42	Fuse insert	6SY7000-0AB88	2	6SE7034-5WK20
-F41, -F42, -F43, -F44	Fuse insert	6SY7000-0AB77	4	6SE7035-7WK20
-F41, -F42, -F43, -F44	Fuse insert	6SY7000-0AB87	4	6SE7036-5WK20
-F41, -F42, -F43, -F44	Fuse insert	6SY7000-0AB74	4	6SE7038-6WK20
-R100, -R200, -R300	Balancing resistor	6SY9705	3	6SE7033-0WJ20 6SE7033-5WJ20
-R100, -R200, -R300	Balancing resistor	6SY7000-0AB08	3	6SE7034-5WK20
-R100, -R200, -R300	Balancing resistor	6SY7000-0AA77	3	6SE7035-7WK20 6SE7036-5WK20
-R100, -R200, -R300	Balancing resistor	6SY7000-0AA76	3	6SE7038-6WK20

Part code No.	Designation	Order No.	No.	Used in
-R108, -R109, -R118, -R119, -R208, -R209, -R218, -R219, -R308, -R309, -R318, -R319	Snubber resistor	6SY7000-0AB18	12	6SE7034-5WK20 6SE7035-7WK20 6SE7036-5WK20 6SE7038-6WK20
-R109, -R119, -R209, -R219, -R309, -R319	Snubber resistor	6SY7000-0AB18	6	6SE7033-0WJ20 6SE7033-5WJ20
-R28	VDU resistor	6SY7000-0AC33	1	6SE7033-0WJ20 6SE7033-5WJ20 6SE7034-5WK20 6SE7035-7WK20 6SE7036-5WK20 6SE7038-6WK20
OPTION L31: +A10 -U1 (-F41, -F42, -F43, -F44), +A12 -U1 (-F41, -F42, -F43, -F44)	Fuse insert	6SY7000-0AC16	8	6SE7041-0WM20 6SE7041-1WM20 6SE7041-2WM20
OPTION L31: +A10 -U1 (-F41, -F42, -F43, -F44), +A12 -U1 (-F41, -F42, -F43, -F44)	Fuse insert	6SY7000-0AC20	8	6SE7041-4WM20 6SE7041-6WM20
OPTION L31: -F41, -F42	Fuse insert	6SY7000-0AC17	2	6SE7033-0WJ20 6SE7033-5WJ20 6SE7034-5WK20
OPTION L31: -F41, -F42, -F43, -F44	Fuse insert	6SY7000-0AC16	4	6SE7035-7WK20 6SE7036-5WK20
OPTION L31: -F41, -F42, -F43, -F44	Fuse insert	6SY7000-0AC20	4	6SE7038-6WK20
ACCESSORIES	Connector set, SIMOVERT VC	6SY7000-0AC13	1	6SE7033-0WJ20 6SE7033-5WJ20 6SE7034-5WK20 6SE7035-7WK20 6SE7036-5WK20 6SE7038-6WK20 6SE7041-0WM20 6SE7041-1WM20 6SE7041-2WM20 6SE7041-4WM20 6SE7041-6WM20

8 Environmental friendliness

Environmental aspects during the development

The number of components has been significantly reduced over earlier converter series by the use of highly integrated components and the modular design of the complete series. Thus, the energy requirement during production has been reduced.

Special significance was placed on the reduction of the volume, weight and variety of metal and plastic components.

Plastic components:

ABS: PMU support panel
LOGO

PC: Covers

LDPE: Capacitor ring

PP: Insulating boards
bus retrofit

PA6.6: Fuse holders, mounting rail, capacitor holder, cable retainer, connecting strips, terminal strip, supports, PMU adapter, covers

PS: Fan housing

UP: Tensioning profile
retaining bolts

Halogen-containing flame retardants were, for all essential components, replaced by environmentally-friendly flame retardants.

Environmental compatibility was an important criterium when selecting the supplied components.

Environmental aspects during production

Purchased components are generally supplied in recyclable packaging materials (board).

Surface finishes and coatings were eliminated with the exception of the galvanized sheet steel side panels.

ASIC devices and SMD devices were used on the boards.

The product is emission-free.

Environmental aspects for disposal

The unit can be broken-down into recyclable mechanical components as a result of the easily releasable screw- and snap connections.

The plastic components and moulded housing are to DIN 54840 and have a recycling symbol.

Units can be disposed of through certified disposal companies. Addresses are available from your local Siemens partner.

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9 Technical Data

The drive converters correspond to the listed conditions as well as the specified domestic and international standards.

Switching at the input	No./min	2
Cooling medium temperature		0 °C to +40 °C
Storage temperature		– 25 °C to +70 °C
Transport temperature		– 25 °C to +70 °C
Environmental class	3K3	DIN IEC 721-3-3 Moisture condensation not permissible
Pollution level	2	DIN VDE 0110 Part 1
Overvoltage category	III	DIN VDE 0110 Part 2
Overvoltage property class	1	E DIN VDE 0160
Protection class	I	DIN VDE 0106 Section 1
Radio interference level		DIN VDE 0875 Section 11 ▲ EN 55011
– standard	without	
Noise immunity		EN50082-2
Mechanical strength		DIN IEC 68-2-6 / 06.90

	Frequency range Hz	Constant amplitude of the deflection mm	acceleration m/s ² (g)
– when stationary (in op.)	10 to 58	0.075	
	above 58 to 500		9.8 (1)
– during transport	5 to 9	3.5	
	above 9 to 500		9.8 (1)

Inverter types	6SE70...	35-1TJ20	36-0TK20	37-0TK20	38-6TK20	41-1TK20	41-1TM20	41-3TM20			
Rated voltage, rated frequency, rated current											
Rated voltage in V _n Input Output	V	DC 510 ... 620 ±15 % 3 AC 0 ... Rated voltage / 1.35									
Rated frequency f _n Input Output: U/f = konst U = konst	Hz	0 ... 600 8 ... 300									
Rated current I _n Input Output	A	607 510	702 590	821 690	1023 860	1309 1100	1309 1100	1547 1300			
DC link voltage V _{dn}	V	= Rated voltage									
Rated output	kVA	336...406	388...470	454...550	566...685	724...876	724...876	856...1036			
Auxiliary power supply DC 24 V (20 V - 30 V)	A	5 without Options; with Options refer to Section 6.1				5 + 3 without Options; with Options refer to Section 6.1					
Auxiliary power supply	V	AC 230 ±15%									
Loading Class II acc. to EN 60146-1-1											
Rated current	A	464	538	628	783	1001	1001	1183			
Base load time	s				240						
Overcurrent	A	694	802	938	1169	1496	1496	1768			
Overcurrent time	s				60						
Losses, cooling, power factor											
Power factor Converter cosφU		< 0.92 ind.	< 0.92 ind.	< 0.92 ind.	< 0.92 ind.	< 0.92 ind.	< 0.92 ind.	< 0.92 ind.			
Efficiency η – Pulse frequency 2.5 kHz		0.98	0.98	0.98	0.98	0.98	0.98	0.98			
Power loss – Pulse frequency 2.5 kHz	kW	6	8	9	10	16	15	17			
Required cooling air flow	m ³ /s	0.6	0.75	0.75	0.75	0.92	1.5	1.5			
Pressure drop Δp	Pa	350	640	640	640	950	640	640			
Sound pressure level, dimensions, weights											
Sound pressure level	dB(A)	80	83	83	83	85	85	85			
Type		J	K	K	K	K	M	M			
Width for IP00	mm	800	800	800	800	800	2300	2300			
Height		1400	1750	1750	1790	1790	1910	1910			
Depth		550	550	550	550	550	580	580			
Ground – IP00	kg	350	520	520	520	535	ca. 1500	ca. 1500			
Required current for fan (typical)											
230 V / 50 Hz	A	2.6	5.2	5.2	5.2	13.4	10.4	10.4			
230 V / 60 Hz	A	3.4	6.7	6.7	6.7	20.0	13.4	13.4			

Inverter types	6SE70...	33-0UJ20	33-5UJ20	34-5UK20	35-7UK20	36-5UK20	38-6UK20
Rated voltage, rated frequency, rated current, rated output							
Rated voltage in V_n Input Output	V	DC 675...780 ±15 % 3 AC 0 ... Rated voltage / 1.35					
Rated frequency f_n Input Output: $U/f = \text{konst}$ $U = \text{konst}$	Hz	0 ... 600 8 ... 300					
Rated current I_n Input Output	A	354 297	421 354	538 452	678 570	774 650	1023 860
DC link voltage V_{dn}	V	= Rated voltage					
Rated output	kVA	257...296	307...353	391...450	494...568	563...647	745...857
Auxiliary power supply DC 24 V (20 V - 30 V)	A	5 without Options; with Options refer to Section 6.1					
Auxiliary power supply	V	AC 230 ±15%					
Loading Class II acc. to EN 60146-1-1							
Rated current	A	270	322	411	519	591	783
Base load time	s	240					
Overcurrent	A	404	481	614	775	884	1170
Overcurrent time	s	60					
Losses, cooling, power factor							
Power factor Converter $\cos\phi_U$		< 0.92 ind.	< 0.92 ind.	< 0.92 ind.	< 0.92 ind.	< 0.92 ind.	< 0.92 ind.
Efficiency η – Pulse frequency 2.5 kHz		0.98	0.98	0.98	0.98	0.98	0.98
Power loss – Pulse frequency 2.5 kHz	kW	5.6	6.6	7.7	9.0	11.5	15.9
Required cooling air flow	m^3/s	0.6	0.6	0.75	0.75	0.75	0.92
Pressure drop Δp	Pa	350	350	640	640	640	950
Sound pressure level, dimensions, weights							
Sound pressure level	dB(A)	80	80	83	83	83	85
Type		J	J	K	K	K	K
Width	mm	800	800	800	800	800	800
Height		1400	1400	1750	1750	1750	1790
Depth		550	550	550	550	550	550
Ground – IP00	kg	350	350	520	520	520	535
Required current for fan (typical)							
230 V / 50 Hz	A	2.6	2.6	5.2	5.2	5.2	13.4
230 V / 60 Hz	A	3.4	3.4	6.7	6.7	6.7	20.0

Inverter types	6SE70...	41-0UM20	41-1UM20	41-2UM20	41-4UM20	41-6UM20	
Rated voltage, rated frequency, rated current, rated output							
Rated voltage in V _n Input Output	V	DC 675...780 ±15 % 3 AC 0 ... Rated voltage / 1.35					
Rated frequency f _n Input Output: U/f = konst U = konst	Hz	0 ... 600 8 ... 300					
Rated current I _n Input Output	A	1178 990	1285 1080	1464 1230	1666 1400	1880 1580	
DC link voltage V _{dn}	V	= Rated voltage					
Rated output	kVA	857...986	935...1076	1065..1225	1212..1394	1368..1574	
Auxiliary power supply DC 24 V (20 V - 30 V)	A	5 + 3 without Options; with Options refer to Section 6.1					
Auxiliary power supply	V	AC 230 ±15%					
Loading Class II acc. to EN 60146-1-1							
Rated current	A	901	983	1119	1274	1438	
Base load time	s			240			
Overcurrent	A	1346	1469	1673	1904	2149	
Overcurrent time	s			60			
Losses, cooling, power factor							
Power factor Converter cosφU		< 0.92 ind.	< 0.92 ind.	< 0.92 ind.	< 0.92 ind.	< 0.92 ind.	
Efficiency η – Pulse frequency 2.5 kHz		0.98	0.98	0.98	0.98	0.98	
Power loss – Pulse frequency 2.5 kHz	kW	14	17	21	25	28	
Required cooling air flow	m ³ /s	1.5	1.5	1.5	1.7	1.7	
Pressure drop Δp	Pa	640	640	640	950	950	
Sound pressure level, dimensions, weights							
Sound pressure level	dB(A)	85	85	85	88	88	
Type		M	M	M	M	M	
Width	mm	2300	2300	2300	2300	2300	
Height		1910	1910	1910	1910	1910	
Depth		580	580	580	580	580	
Ground – IP00	kg	ca. 1500	ca. 1500	ca. 1500	ca. 1500	ca. 1500	
Required current for fan (typical)							
230 V / 50 Hz	A	10.4	10.4	10.4	26.8	26.8	
230 V / 60 Hz	A	13.4	13.4	13.4	40.0	40.0	

Inverter types	6SE70...	33-0WJ20	33-5WJ20	34-5WK20	35-7WK20	36-5WK20	38-6WK20
Rated voltage, rated frequency, rated current, rated output							
Rated voltage in V _n Input Output	V	DC 890...930 ±15 % 3 AC 0 ... Rated voltage / 1.35					
Rated frequency f _n Input Output: U/f = konst U = konst	Hz	0 ... 600 8 ... 300					
Rated current I _n Input Output	A	354 297	421 354	538 452	678 570	774 650	1023 860
DC link voltage V _{dn}	V	= Rated voltage					
Rated output	kVA	305...355	405...423	517...540	652...681	743...777	983...1028
Auxiliary power supply DC 24 V (20 V - 30 V)	A	5 without Options; with Options refer to Section 6.1					
Auxiliary power supply	V	AC 230 ±15%					
Loading Class II acc. to EN 60146-1-1							
Rated current	A	270	322	411	519	591	783
Base load time	s			240			
Overcurrent	A	404	481	614	775	884	1170
Overcurrent time	s			60			
Losses, cooling, power factor							
Power factor Converter cosφU		< 0.92 ind.	< 0.92 ind.	< 0.92 ind.	< 0.92 ind.	< 0.92 ind.	< 0.92 ind.
Efficiency η – Pulse frequency 2.5 kHz		0.98	0.98	0.98	0.98	0.98	0.98
Power loss – Pulse frequency 2.5 kHz	kW	5.8	7.0	7.9	10.2	12.6	17.2
Required cooling air flow	m ³ /s	0.6	0.6	0.78	0.78	0.78	0.92
Pressure drop Δp	Pa	300	300	580	580	580	950
Sound pressure level, dimensions, weights							
Sound pressure level	dB(A)	80	80	83	83	83	85
Type		J	J	K	K	K	K
Width	mm	800	800	800	800	800	800
Height		1400	1400	1750	1750	1750	1790
Depth		550	550	550	550	550	550
Ground – IP00	kg	350	350	520	520	520	535
Required current for fan (typical)							
230 V / 50 Hz	A	2.6	2.6	5.2	5.2	5.2	13.4
230 V / 60 Hz	A	3.4	3.4	6.7	6.7	6.7	20.0

Inverter types	6SE70...	41-0WM20	41-1WM20	41-2WM20	41-4WM20	41-6WM20	
Rated voltage, rated frequency, rated current, rated output							
Rated voltage in V _n Input Output	V	DC 890...930 ±15 % 3 AC 0 ... Rated voltage / 1.35					
Rated frequency f _n Input Output: U/f = konst U = konst	Hz	0 ... 600 8 ... 300					
Rated current I _n Input Output	A	1178 990	1285 1080	1464 1230	1666 1400	1880 1580	
DC link voltage V _{dn}	V	= Rated voltage					
Rated output	kVA	1132..1183	1235..1291	1406..1470	1600..1673	1806..1888	
Auxiliary power supply DC 24 V (20 V - 30 V)	A	5 + 3 without Options; with Options refer to Section 6.1					
Auxiliary power supply	V	AC 230 ±15%					
Loading Class II acc. to EN 60146-1-1							
Rated current	A	901	983	1119	1274	1438	
Base load time	s			240			
Overcurrent	A	1346	1469	1673	1904	2149	
Overcurrent time	s			60			
Losses, cooling, power factor							
Power factor Converter cosφU		< 0.92 ind.	< 0.92 ind.	< 0.92 ind.	< 0.92 ind.	< 0.92 ind.	
Efficiency η – Pulse frequency 2.5 kHz		0.98	0.98	0.98	0.98	0.98	
Power loss – Pulse frequency 2.5 kHz	kW	16	20	23.9	29	33.3	
Required cooling air flow	m ³ /s	1.5	1.5	1.5	1.7	1.7	
Pressure drop Δp	Pa	640	640	640	950	950	
Sound pressure level, dimensions, weights							
Sound pressure level	dB(A)	85	85	85	88	88	
Type		M	M	M	M	M	
Width	mm	2300	2300	2300	2300	2300	
Height		1910	1910	1910	1910	1910	
Depth		580	580	580	580	580	
Ground – IP00	kg	ca. 1500	ca. 1500	ca. 1500	ca. 1500	ca. 1500	
Required current for fan (typical)							
230 V / 50 Hz	A	10.4	10.4	10.4	26.8	26.8	
230 V / 60 Hz	A	13.4	13.4	13.4	40.0	40.0	

9.1 De-rating for an increased cooling medium temperature

permissible rated current
in %

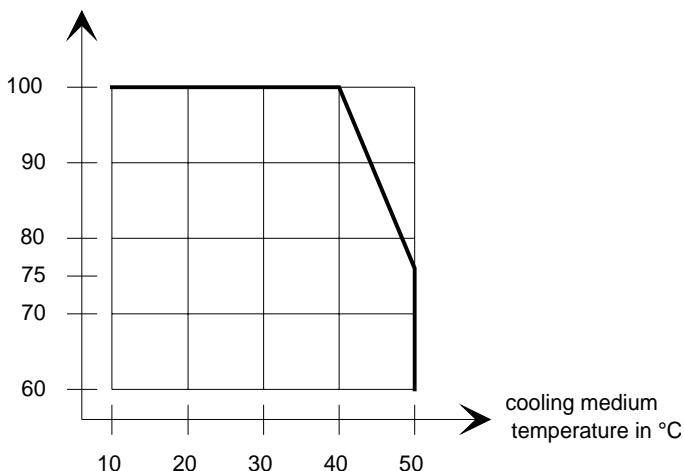
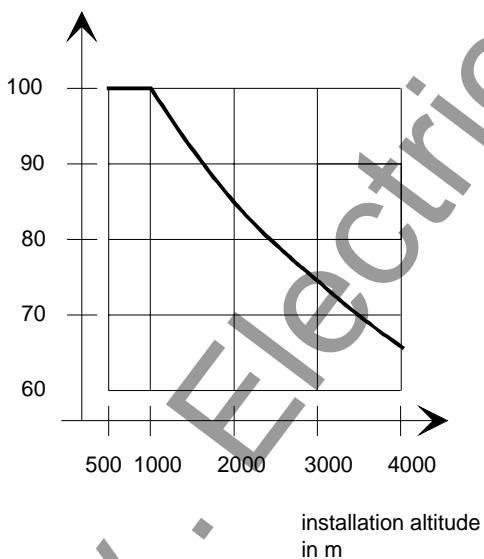


Fig. 9.1 Max. permissible rated current as a function of the cooling medium temperature

9.2 De-rating at installation altitudes > 1000 m above sea level

For installation altitudes > 1000 m above sea level, the rated current must be reduced. For installation altitudes > 2000 m above sea level, the rated voltage must be reduced (see Fig. 9.2). Installation altitudes > 4000 m above sea level are not permissible.

permissible rated current
in %



permissible rated voltage
in %

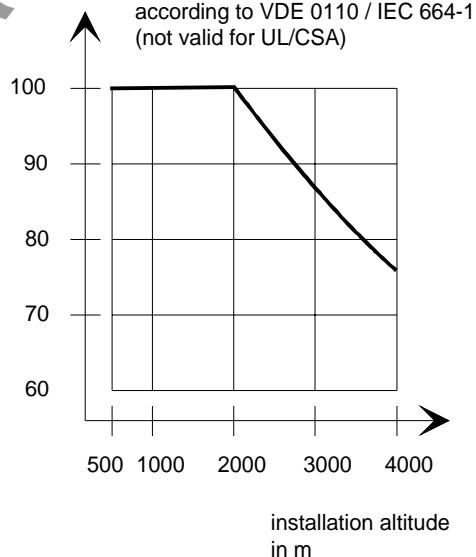


Fig. 9.2 Max. permissible rated current and rated voltage as a function of the installation altitude

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10.2 List of abbreviations

A	Alarm
AA	Analog output
AC	Alternating current
AE	Analog input
AFE	Active front end
AS	Sequence control
ASIC	Application specific integrated circuit
ASM	Asynchronous motor
ATI	Analog tacho-Interface
AWG	American wire gauge
BA	Binary output
BC	Bypass contactor
BE	Binary input
BF	Type of construction
CAN	Controller area network
CB	Communication board (option)
CU	Control unit
CUA	Control unit AFE (control unit of AFE)
DC	Direct current
DPR	Dual-port-RAM
DPRAM	Dual-port-RAM
EA	First run-up
EEPROM	Electrically erasable programmable read-only memory
EMC	Electromagnetic compatibility
EMF	Electromotive force
EPROM	Erasable programmable read-only memory
ESD	Electrostatic sensitive devices
F	Fault
FC	Frequency control (control version of SIMOVERT MASTER DRIVES)
FF	Fatal fault

FI	Fault current
FSW	Fixed setpoint
G/R	Basic/reserve
GSST(1/2)	Basic drive converter serial interface (1/2)
H	High (binary signal level)
HLG	Ramp-function generator
HTL	High-voltage transistor logic
HW	Hardware
I/O	Input/output
IGBT	Insulated gate bipolar transistor
IGD	IGBT gate drive
IVI	Inverter interface
KIP	Kinetic buffering
L	Low (binary signal level)
LBA	Local bus adapter (option)
LED	Light emitting diode
LSB	Least significant bit
MC	Main contactor
MDS	Motor data set
MLFB	Machine-readable product designation (machine-readable designation)
MSB	Most significant bit
NN	Sea level
OP(1)	Operation panel (1)
Par	Parameter
PC	Personal computer
PEU	Power electronic unit
PG	Programming unit (programmer)
PKW	Parameter ID value
PMU	Parameterization unit
PROFIBUS	Process field bus
PS	Power supply
PSU	Power supply unit
PWE	Parameter value
PZD	Process data
Q	Source
RC	Combination, resistor ® and capacitor (C)
RDS	Reserve data set
RFG	Ramp-function generator

SC	Servo control (control version of SIMOVERT MASTER DRIVES)
SCB(1/2)	Serial communication board (option)
SCI(1/2)	Serial communication Interface (1/2)
SDS	Setpoint data set
SL	Slave
SM	Synchronous motor
SMD	Surface mounted device
SML	Snubber module low
SMU	Snubber module up
SST1/2	Serial interface 1/2
SW	Software
TB	Technology board (option)
TLG	Telegram
TRC	Trace
TSY	Tacho and synchronization (option)
TTL	Transistor-Transistor-Logic
UCE	Voltage (V) collector->emitter (desaturation signal of the transistors)
UMR	Drive converter
USS	Universal serial interface
VC	Vector control (control version of SIMOVERT MASTER DRIVES)
VDU	Voltage-dividing-unit
VS	Precharging contactor
Vsa	Line supply voltage components in the a axis
Vsb	Line supply voltage components in the b axis
VSB	voltage sensing board (line supply voltage sensing board)
WEA	Automatic restart function
WR	Inverter
X9	Terminal strip on the PEU (types A to D), PSU1 (types E to H) and PSU2 (types J to M)
ZK	DC link

11 Addresses

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12 Certificates

SIEMENS

Drive and Standard Products Group

Test certificate

Erlangen, 01.07.1995

Equipment

- Type

AC drive converter

**SIMOVERT
MASTER DRIVES**

- Order No.:

6SE70...¹⁾

The routine testing according to these test instructions

Tests performed: I. Product check

475 100.9000.00 QP for size A - D
476 100.9000.00 QP for size E - H
476 200.9000.00 QP for size J - M

- checking of presence of all components acc. to parts list

II. Isolation test

- DIN VDE 0160 draft 04.91, par. 7.6.1
- CSA 22.2-14.M91, par. 6.8

III. Functional test
acc. to DIN VDE 0558,
part1

- power supply
- customer terminals and interfaces
- power conversion section
- protective and monitoring functions

IV. RUN-IN

- Ambient temperature 55 °C cycled
- Duration 24 up to 72 hours
- Scampling 10 % to 100 %

The equipment complied with the test requirements.

Test results are documented within the production data file.

1) For complete type, serial number and technical data please see rating plate.

ASI 1 PE D F



Schlögel



ASI 1
System-Based
Drive Technology



Drive and Standard Products Group

Confirmation

Erlangen, 01.07.1995

This confirms that

Equipment

- Type

AC drive converter

SIMOVERT
MASTER DRIVES

- Order No.:

6SE70...

is manufactured in conformance with DIN VDE 0558 Part 2 and DIN VDE 0113 Part 6.2.

This equipment fulfills the shock hazard protection requirements according to DIN VDE 0106 Part 100 when the following safety rules are observed:

- Service work in operation is only permissible at the electronics box
- The converter must be switched into a no-voltage condition and isolated from the supply when replacing any part/component
- All panels must be closed during operation.

Thus, this equipment conforms to the appropriate regulations in Germany according to VBG 4 §2 (2) (VBG is a German regulatory body for safety-related issues).

The local operating regulations (e.g. DIN VDE 0105) must be observed when operating the equipment.

ASI 1 PE DT

Dr. Link





EEC Manufacturer's Declaration

(acc. to Article 4, Section 2 of the EEC Directive 89/392/EEC MSR)

4SE.476 000 0000.00 HE

Manufacturer: Siemens Aktiengesellschaft
 Drives and Standard Products Group
 Business Division Drive systems
 Sub-Division Variable-speed drives

Address: Postfach 3269
 D-91050 Erlangen

Product name: SIMOVERT
 Type 6SE70 chassis units AC-AC and DC-AC

The designated product is exclusively designed for installation in another machine. Start-up is absolutely prohibited until it has been determined that the final product conforms with the Directive 89/392/EEC of the Council.

We confirm the conformance of the above designated product with the relevant Standards:

EN 60204-1 (DIN EN 60204 Part 1 / VDE 0113 Part 1)

VDE 0160

VDE 0558 Part 1

Erlangen, 10. 02. 1995

Siemens Aktiengesellschaft

i. V.
 H. Mickal

Head of the production unit
 Variable-speed drives

i. V.
 G. Löw

Head of the commercial department
 Variable-speed drives

This declaration does not guarantee specific equipment characteristics and features.

The safety instructions provided with the product documentation must be observed.



EC Declaration of Conformity

(acc. to Article 10 of the EEC Directive 73/23/EEC with all revisions NSR)

4SE.476 000 0000.00 KE NSR

Manufacturer: Siemens Aktiengesellschaft
Drives and Standard Products Group
Business Division Variable-speed drives
Sub-Division Drive systems

Address: Postfach 3269
D-91050 Erlangen

Product name: SIMOVERT
Type 6SE70 chassis units AC-AC and DC-AC

The designated product fulfills the regulations and rules of the following European Directives:

73/23/EEC Directive of the council for the harmonisation of the binding regulations of member states regarding electrical equipment for use within certain voltage limits, modified by RL 93/68/EEC of the Council.

We confirm the conformance of the above designated product with the relevant Standards:

EN 60204-1 Edition date 06/93

CE mark attached: 1996

Erlangen, 21.12.1995

Siemens Aktiengesellschaft

i. V.
H. McKal

Head of the Drive System Production Unit

Dr. H. Preß

Head of the commercial department

The LVD Appendix is part of this declaration.

This declaration does not guarantee specific equipment characteristics and features.

The information and instructions in the product documentation must be observed.



Factory certificate *
regarding electromagnetic compatibility

4SE.476 000 0000.00 WB EMC

Manufacturer: Siemens Aktiengesellschaft
Drives and Standard Products Group
Business Division Variable-speed drives
Sub-Division Drive systems

Address: Postfach 3269
D-91050 Erlangen

Product name: SIMOVERT
Type 6SE70 chassis units AC-AC and DC-AC

When correctly used, the designated product fulfills all the requirements of Directive 89/336/EEC regarding electromagnetic compatibility.

We confirm the conformance of the above designated product with the relevant Standards:

EN 55011 (DIN VDE 0875 Part 11)

E DIN/IEC 22G /21/ CDV: 1995-10

EN 61000-4-2 (old IEC 801-2)

EN 61000-4-4 (old IEC 801-4)

EN 61000-4-5 (old IEC 801-5)

IEC 1000-4-3 (old IEC 801-3)

Note:

The instructions relating to EMC-correct installation, correct operation, connecting-up conditions and associated instructions in the product documentation supplied must be observed.

Erlangen, 21. 12. 1995

i. V.

H. Mickal

Head of the Drive System Production Unit

This declaration does not guarantee specific equipment characteristics and features.

*) acc. to EN 10204 (DIN 50049)

The following versions have appeared so far:

Version	Internal Item number
AB	476 969.4100.76 J AB-76

Version AB consists of the following chapters

Chapters	Changes	Pages	Version date
0 General			12.96
1 Description	First Edition	4	08.96
2 Transport, Unpacking, Installation	Reviewed Edition	8	12.96
3 Connecting-up	First Edition	4	08.96
4 Operator control	First Edition	2	08.96
5 Maintenance	Reviewed Edition	8	12.96
6 Options	First Edition	12	08.96
7 Spare Parts	First Edition	14	08.96
8 Environmental friendliness	First Edition	1	08.96
9 Technical Data	Reviewed Edition	7	12.96
10 Appendix	Reviewed Edition	4	12.96
11 Adresses	First Edition	2	08.96
12 Certificates	Reviewed Edition	5	12.96

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