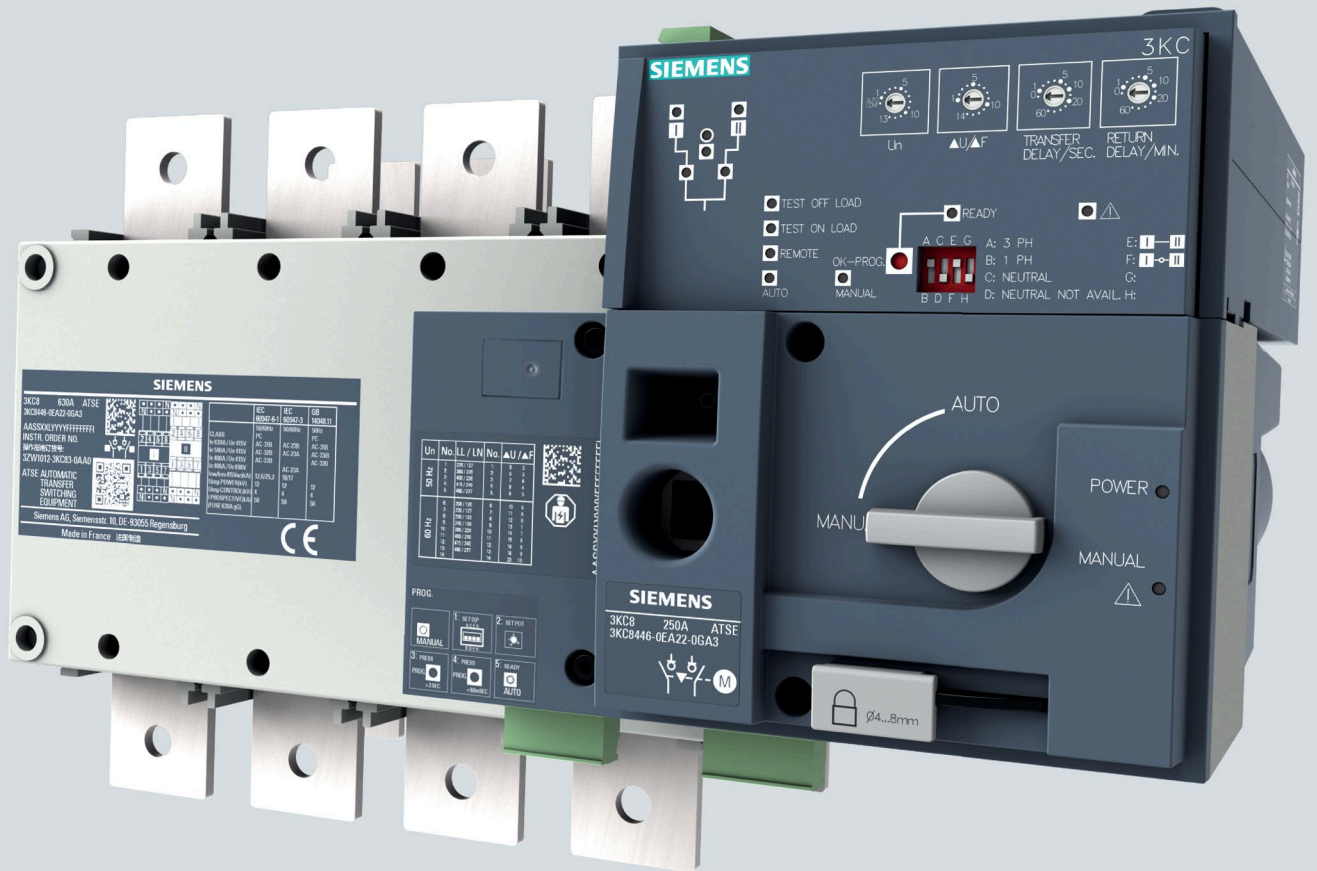


SIEMENS



Manual

SENTRON

Transfer Switching Equipment and Load Transfer Switches

3KC4 and 3KC8 Transfer Switching Equipment

Edition

11/2020

[siemens.com/lowvoltage](https://www.siemens.com/lowvoltage)

<u>Introduction</u>	1
<u>General information</u>	2
<u>Product information</u>	3
<u>Functions</u>	4
<u>Mounting</u>	5
<u>Connection</u>	6
<u>Operation</u>	7
<u>Commissioning</u>	8
<u>Accessories</u>	9
<u>Service and maintenance</u>	10
<u>Technical specifications</u>	11
<u>Dimension drawings</u>	12
<u>Applications</u>	13
<u>Appendix</u>	A
<u>ESD guidelines</u>	B
<u>List of abbreviations</u>	C

Legal information

Warning notice system

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

DANGER

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

WARNING

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

CAUTION

indicates that minor personal injury can result if proper precautions are not taken.

NOTICE

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

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

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

Proper use of Siemens products

Note the following:

WARNING

Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

Trademarks

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

Disclaimer of Liability

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

Table of contents

1	Introduction	7
2	General information	9
2.1	Certification	9
3	Product information	11
3.1	Product description	11
3.1.1	Design of the 3KC4 and 3KC8 transfer switching equipment.....	11
3.1.2	Current ratings of the 3KC4 and 3KC8 transfer switching equipment	15
3.2	Product family	17
3.2.1	The product families 3KC4 and 3KC8 from 250 A to 3200 A.....	17
3.2.2	Use of 3KC4 and 3KC8 transfer switching equipment	18
3.2.3	Properties of the 3KC4 and 3KC8 transfer switching equipment.....	18
3.2.4	Application areas of the 3KC4 and 3KC8 transfer switching equipment	19
4	Functions	21
5	Mounting	23
5.1	Mounting position	23
5.2	Installing the 3KC4 and 3KC8 transfer switching equipment	23
5.3	Dimensions of the cover frame for door cut-out	26
6	Connection	27
6.1	Network types	27
6.1.1	Three-phase 4-wire network with neutral (3PH + N)	27
6.1.1.1	Circuit diagram for the 3KC4 transfer switching equipment - 4-pole transfer switching equipment.....	28
6.1.1.2	Circuit diagram for the 3KC8 transfer switching equipment - 4-pole transfer switching equipment.....	29
6.1.2	Three-phase 3-wire network without neutral (3PH)	29
6.1.2.1	Circuit diagram for the 3KC4 transfer switching equipment - 3-pole transfer switching equipment.....	30
6.1.2.2	Circuit diagram for the 3KC8 transfer switching equipment - 4-pole transfer switching equipment.....	31
6.1.2.3	Circuit diagram for the 3KC8 transfer switching equipment - 3-pole transfer switching equipment.....	32
6.1.3	Single-phase network with neutral (1PH + N)	33
6.1.3.1	Circuit diagram for the 3KC4 transfer switching equipment - 3-pole transfer switching equipment.....	33
6.1.3.2	Circuit diagram for the 3KC8 transfer switching equipment - 3-pole transfer switching equipment.....	34
6.2	Connecting the main circuit	35
6.2.1	Connecting terminals of the transfer switching equipment.....	35
6.2.2	Load connection	36
6.2.3	Arrangement of the power supply systems.....	36

6.2.4	Connection of transfer switching equipment for current ratings 250 A to 1600 A.....	37
6.2.4.1	Connecting bridging bars on the load side.....	38
6.2.4.2	Connecting current ratings 250 A to 1600 A to the main circuit.....	41
6.2.5	Connection of transfer switching equipment for current ratings 2000 A to 3200 A.....	44
6.2.5.1	Copper bar connection kit.....	44
6.2.5.2	Connecting current ratings 2000 A to 3200 A to the main circuit (on the line side)	50
6.2.5.3	Connecting current ratings 2000 A to 3200 A to the main circuit (on the load side)	59
6.3	Connecting the control circuit.....	66
6.3.1	Inputs and outputs of the motor operator	66
6.3.1.1	Overview of motor operator.....	66
6.3.1.2	Connecting the inputs and outputs of the motor operator	67
6.3.2	Power supply of the motor operator (3KC4 only)	69
6.3.2.1	Mounting and connecting the dual power supply (DPS).....	71
6.3.2.2	Installing and connecting an autotransformer (400 V / 230 V)	73
6.3.3	Auxiliary switch of the transfer switching equipment.....	75
6.3.3.1	Installing auxiliary switches 250 A to 630 A.....	76
6.3.3.2	Installing auxiliary switches of current rating 800 A to 1600 A	78
6.3.4	Inputs and outputs of the electronic module (3KC8 only)	82
6.3.5	Connecting the inputs and outputs of the electronic module (3KC8 only)	82
6.3.5.1	Installing accessories for the electronic module.....	83
6.3.5.2	Connecting power supply kit 3KC9830-, 3KC9831- (4-pole).....	85
6.3.5.3	Connecting the auxiliary conductor terminal 3KC9822-, 3KC9832- for a three-phase 3- wire network (3-pole)	89
6.3.5.4	Connecting power supply kit 3KC9833-, 3KC9834- for single-phase network	92
7	Operation.....	95
7.1	Operating modes of the transfer switching equipment	95
7.1.1	Remote mode	96
7.1.2	Manual operation	97
7.1.3	Padlocking mode	98
7.1.4	Automatic mode (3KC8 only)	99
7.2	Functions of the inputs and outputs.....	100
7.2.1	Inputs and outputs of the motor operator	101
7.2.1.1	Outputs of the motor operator.....	105
7.2.2	Auxiliary switches	108
7.2.3	Inputs and outputs of the electronic module (3KC8 only)	108
7.2.3.1	Inputs for voltage measurement and power supply	109
7.2.3.2	Control inputs of the electronic module	112
7.2.3.3	Functions of the control inputs for network / generator application	113
7.2.3.4	Functions of the control inputs for network / network application.....	114
7.2.3.5	Outputs of the electronic module.....	116
7.3	Remote mode.....	118
7.3.1	Impulse logic	119
7.3.2	Continuous operation logic.....	122
7.4	Automatic mode - programming of the electronic module (3KC8 only).....	125
7.4.1	Step 1: Preset network conditions	126
7.4.2	Step 2: Setting the potentiometer	128
7.4.3	Step 3: Automatic configuration of the transfer switching equipment (only with potentiometer $U_n = 0$)	130
7.4.4	Step 4: Saving the configuration	132

7.4.5	Step 5: Switching the 3KC8 transfer switching equipment to automatic mode	132
8	Commissioning	133
8.1	Commissioning the 3KC4 transfer switching equipment	133
8.2	Commissioning the 3KC8 transfer switching equipment	135
9	Accessories	139
9.1	Terminal covers	140
9.1.1	Mounting terminal covers	140
9.2	Phase barriers	142
9.2.1	Mounting phase barriers	142
9.3	Terminal plates	143
9.3.1	Mounting terminal plates	144
9.4	Mounting set	147
9.4.1	Replacing the mounting set	148
9.5	Bridging bars	150
9.6	Copper bar connection kit	151
9.7	Autotransformer	153
9.8	Dual power supply (DPS, 3KC4 only)	153
9.9	Power supply kit 3KC9830-, 3KC9831- (4-pole, 3KC8 only)	154
9.10	Auxiliary conductor terminal 3KC9822-, 3KC9832- (3-pole, 3KC8 only)	155
9.11	Power supply kit 3KC9833-, 3KC9834- (2-pole, 3KC8 only)	156
9.12	Cover frame (3KC8 only)	156
9.13	Auxiliary switches	157
9.14	Display (3KC8 only)	158
9.15	Connection cable (3KC8 only)	161
9.16	Sealable cover (3KC8 only)	162
9.17	Motor operator	164
9.18	Electronic module (3KC8 only)	169
10	Service and maintenance	173
10.1	Fault rectification	173
10.1.1	Fault states and fault detection on the 3KC4 transfer switching equipment	173
10.1.2	Fault states and fault detection on the 3KC8 transfer switching equipment	175
10.2	Regular service and maintenance	177
11	Technical specifications	179
11.1	Technical specifications 3KC4 and 3KC8 from 250 A to 1000 A	179
11.2	Technical specifications 3KC4 and 3KC8 from 1250 A to 3200 A	181
11.3	Technical specifications of the electronic module	184
12	Dimension drawings	187

12.1	Dimension drawings of the 3KC4 transfer switching equipment	187
12.2	Dimension drawings of the 3KC8 transfer switching equipment	191
13	Applications	197
13.1	Transfer between two sources with one outgoing load	198
13.2	Transfer between two sources with two outgoing loads	199
13.3	Transfer between three sources with one outgoing load	200
13.4	Transfer between three sources with two outgoing loads	201
13.5	Transfer between two loads with one incoming source (with 3KC4 transfer switching equipment only)	204
A	Appendix	205
A.1	Environmental conditions	205
A.2	Operating conditions	205
A.2.1	Temperature	205
A.2.2	Humidity	206
A.2.3	Altitude conditions	206
A.3	Storage conditions	206
A.3.1	Temperature	206
A.3.2	Storage conditions	206
A.3.3	Storage position	207
B	ESD guidelines	209
B.1	Electrostatic sensitive devices (ESD)	209
C	List of abbreviations	211
	Index	213

Introduction

Purpose of this manual

This manual describes the functions, installation, commissioning, and operation of the following transfer switching equipment:

- 3KC4 remotely operated transfer switching equipment (RTSE)
- 3KC8 automatic transfer switching equipment (ATSE)

The following topics are described in the manual:

- Product specifications
- Mounting
- Connection
- Operation
- Commissioning
- Accessories
- Corrective maintenance and fault rectification
- Application examples

Target groups and required basic knowledge

This manual is intended for:

- Users
- Qualified electricians
- Switchgear manufacturers
- Maintenance personnel

A general knowledge of low-voltage power distribution is required to understand this manual.

Technical support

You can find further support on the Internet at:

Technical support (<https://www.siemens.com/lowvoltage/technical-support>)

Applicable documents

You can find more information on the Internet via the following link:

Manual "3KC Transfer Switching Equipment up to 3200 A"
(<https://support.industry.siemens.com/cs/de/en/ps/19749>)

General information

The transfer switching equipment and its accessories comply with the following international standards:

Standard	Designation
IEC 60269-1	Low-voltage fuses - Part 1: General requirements
IEC 60269-2	Low-voltage fuses - Part 2: Supplementary requirements for fuses for use by qualified electrical technicians or electrically trained persons (fuses predominantly for industrial use)
IEC 60947-1	Low-voltage switchgear and controlgear - Part 1: General requirements
IEC 60947-3	Low-voltage switchgear and controlgear - Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units
IEC 60947-5-1	Low-voltage switchgear and controlgear - Part 5-1: Control circuit devices and switching elements - electromechanical control circuit devices
IEC 60947-6-1	Low-voltage switchgear and controlgear - Part 6-1: Multiple function equipment - Transfer switching equipment
IEC 61010-1	Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1: General requirements
IEC 61326-1	Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1 General requirements
EN 61558-1	Safety of transformers, power supplies, reactors and similar products - Part 1: General requirements and tests
EN 61558-2-13	Safety of transformers, reactors, power supplies and similar products for supply voltages up to 1100 V - Part 2-13: Particular requirements and tests for autotransformers and power supply units incorporating autotransformers.

2.1 Certification



Product information

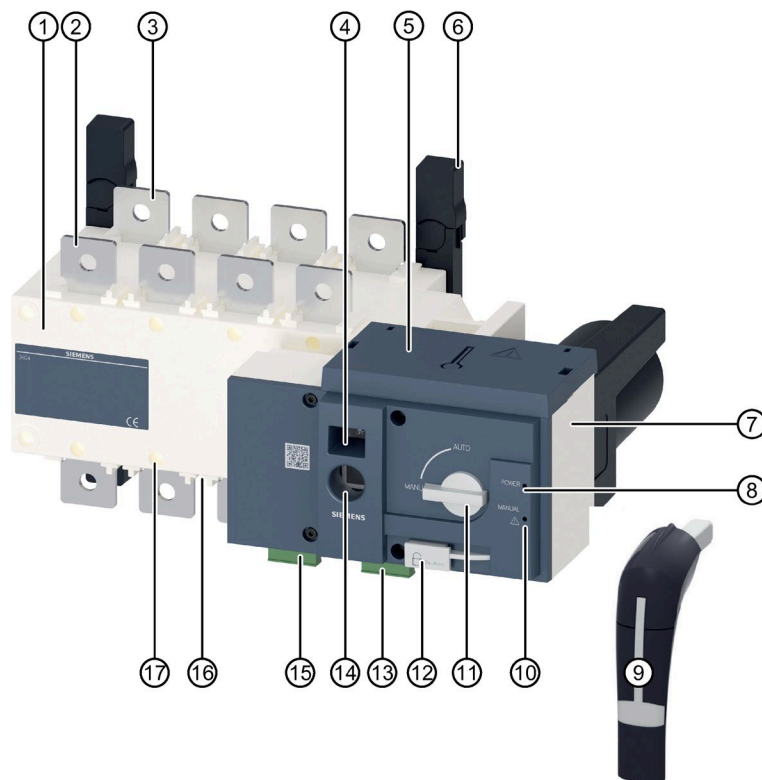
3.1 Product description

The following features of the 3KC4 and 3KC8 transfer switching equipment are described in this chapter:

- Design
- Current ratings

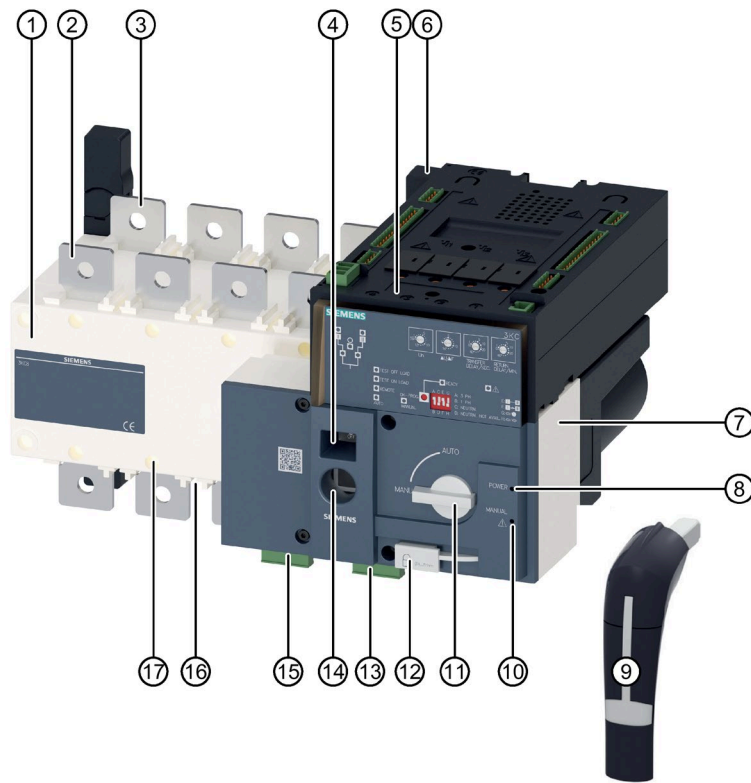
3.1.1 Design of the 3KC4 and 3KC8 transfer switching equipment

3KC4 remotely operated transfer switching equipment (RTSE):



3KC8 automatic transfer switching equipment (ATSE):

3.1 Product description



- | | |
|--|--|
| <ul style="list-style-type: none"> ① Switching unit ② Connecting terminal of the main source (source I) ③ Connecting terminal of the alternative source (source II) ④ Indication of the selected source: O = Off / I = source I / II = source II ⑤ 3KC4: Cover of the power supply connection
3KC8: Electronic module (below this is located the power supply connection) ⑥ Assembly for mounting ⑦ Motor operator ⑧ "Power" LED ⑨ Plug-on handle for manual changeover | <ul style="list-style-type: none"> ⑩ Warning LED ⑪ Switch for selecting the mode (Manual / Automatic) ⑫ Padlock assembly ⑬ 4 outputs for <ul style="list-style-type: none"> • "Switch position" (I / O / II) indicator • "Product availability" indicator ⑭ Connection for attachable handle ⑮ 5 inputs for <ul style="list-style-type: none"> • Positioning commands (I / O / II) • Activation of remote control • Priority command for the OFF position ⑯ Mounting channels for terminal protection / phase barriers ⑰ Fixing assembly for terminal plate |
|--|--|

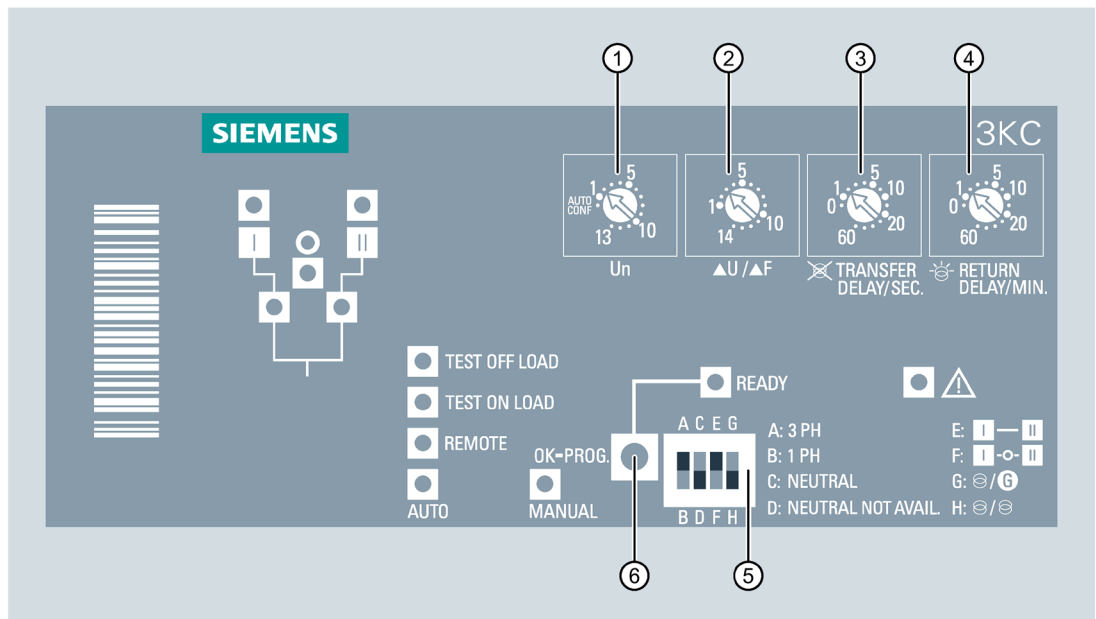
The 3KC8 automatic transfer switching equipment (ATSE) is based on the 3KC4 (RTSE) transfer switching equipment. In contrast to the 3KC4, an electronic module is additionally integrated into the 3KC8.

The electronic module enables monitoring of 2 sources as well as automatic transfer switching. In addition, the electronic module supplies the 3KC8 transfer switching equipment with power.

Electronic module

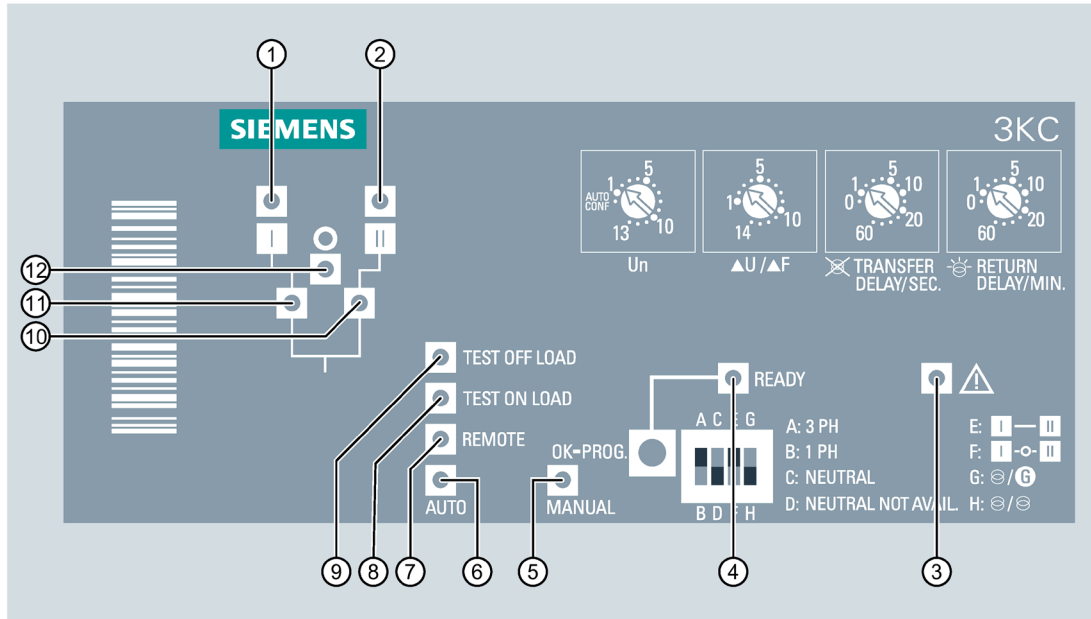
The 3KC8 transfer switching equipment is programmed using the electronic module. You can find more information on programming in the section titled Automatic mode - programming of the electronic module (3KC8 only) (Page 125).


Operator controls



- ① Potentiometer 1: Presetting of line voltage/frequency (AutoConf, 1 to 13)
- ② Potentiometer 2: Presetting of voltage/frequency limits (1 to 14)
- ③ Potentiometer 3: Presetting of the transfer time delay for source failure (0 to 60 s)
- ④ Potentiometer 4: Presetting of the return switching time delay for prioritized source recovered (0 to 60 min)
- ⑤ DIP switch for configuration
- ⑥ "OK-Prog" pushbutton: Saves the current settings

Indicators (LEDs)



	Designation	Function	Meaning
①	I	Availability source I	Shows a continuous green light if source I is available and is within the accepted tolerance.
②	II	Availability source II	Shows a continuous green light if source II is available and is within the accepted tolerance.
③		Fault indicator	<ul style="list-style-type: none"> Flashes red if there is an external fault (e.g. incorrect position of the neutral conductor). Shows a continuous red light if there is an internal fault of the electronic module.
④	READY	"Ready" mode	<p>Indicates the status of the transfer switching equipment:</p> <ul style="list-style-type: none"> Shows a continuous green light if the transfer switching equipment is in "Auto" mode and is ready for source transfer. Flashes green if defaults haven't been saved or a new change has been made.
⑤	MANUAL	"Manual" mode	Shows a continuous yellow light if the transfer switching equipment is in "Manual" mode.
⑥	AUTO	"Auto" mode	<p>Indicates the activity of "Auto" mode:</p> <ul style="list-style-type: none"> Shows a continuous green light if the transfer switching equipment is in "Auto" mode and no timer is active. Flashes green if the transfer switching equipment is in "Auto" mode and the timer is active.
⑦	REMOTE	"Remote" mode	Shows a continuous yellow light if the transfer switching equipment is in remote mode (controlled via inputs).
⑧	TEST ON LOAD	"Test on load" mode	Shows a continuous yellow light if the transfer switching equipment is in "Test on load" mode.

⑨	TEST OFF LOAD	"Test off load" mode	Shows a continuous yellow light if the transfer switching equipment is in "Test off load" mode.
⑩	-	Position II indication	Shows a continuous green light if the switch is in position II.
⑪	-	Position I indication	Shows a continuous green light if the switch is in position I.
⑫	O	Position "0" indication	Shows a continuous yellow light if the switch is in position "0" (OFF).

3.1.2 Current ratings of the 3KC4 and 3KC8 transfer switching equipment

The 3KC4 and 3KC8 transfer switching equipment are available in 10 current ratings. The table shows the types of transfer switching equipment according to the current ratings:

Current rating	Device type			
	3KC4 (RTSE)		3KC8 (ATSE)	
	3-pole	4-pole	3-pole	4-pole
250 A	✓	✓	✓	✓
400 A	✓	✓	✓	✓
630 A	✓	✓	✓	✓
800 A	✓	✓	✓	✓
1000 A	✓	✓	✓	✓
1250 A	✓	✓	✓	✓
1600 A	✓	✓	✓	✓
2000 A	✓	✓	✓	✓
2500 A	✓	✓	✓	✓
3200 A	✓	✓	✓	✓

Designs

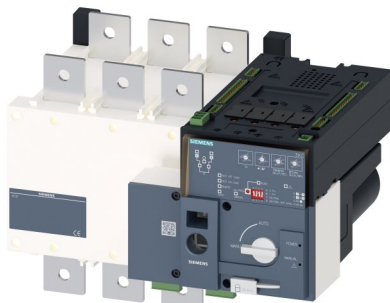
The following figures show the different designs of the transfer switching equipment depicted according to current rating using the example of the 3KC8 transfer switching equipment:



3KC8 250 A



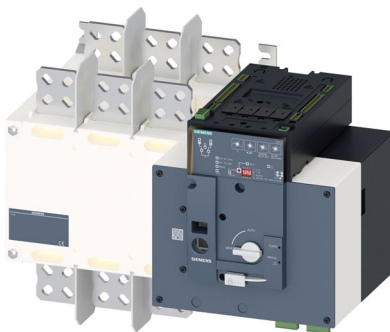
3KC8 400 A



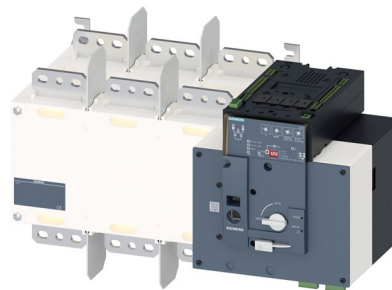
3KC8 630 A



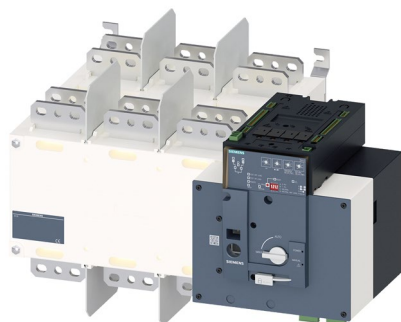
3KC8 800 A / 1000 A



3KC8 1250 A



3KC8 1600 A



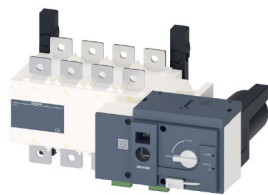
3KC8 2000 A / 2500 A / 3200 A

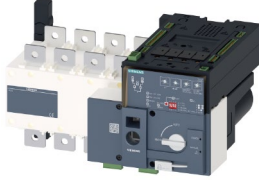
3.2 Product family

3.2.1 The product families 3KC4 and 3KC8 from 250 A to 3200 A

The Siemens product families 3KC4 and 3KC8 from 250 A to 3200 A encompass two types of transfer switching equipment:

Product family	Type	Designation	Current rating	Number of poles
3KC4	Remotely operated transfer switching equipment (RTSE)	RTSE: Remotely Operated Transfer Switching Equipment	250 ... 3200 A	3; 4



Product family	Type	Designation	Current rating	Number of poles
3KC8	Automatic transfer switching equipment (ATSE) 	ATSE: Automatic Transfer Switching Equipment	250 ... 3200 A	3; 4

3.2.2 Use of 3KC4 and 3KC8 transfer switching equipment

The 3KC4 and 3KC8 transfer switching equipment is used to ensure a continuous supply of power. The equipment enables reliable transfer between a main source and an alternative source, thus a power supply is provided by means of an emergency source if the main source is not available.

The three switch positions of the 3KC4 and 3KC8 series enable maximum stability of the load power supply, in which case only minimum interruption to the power supply occurs.

Type	Product family	Application areas of transfer switching	
		Network/network	Network/generator
Remotely operated transfer switching equipment (RTSE)	3KC4	✓	✓ ¹⁾
Automatic transfer switching equipment (ATSE)	3KC8	✓	✓

¹⁾ Possible with the appropriate separate transfer control device

3.2.3 Properties of the 3KC4 and 3KC8 transfer switching equipment

The 3KC4 and 3KC8 transfer switching equipment enables a continuous power supply to be maintained. The main features are as follows:

- Reliable transfer between two sources with transfer through the OFF position
- Simple installation
- Transfer with open transition
- Minimal interruption in the power supply
- Three- and four-pole designs
- Current ratings from 250 A to 3200 A

- Transfer with the supplied handle
- Extensive accessories and spare parts
- Programming in just 5 steps (3KC8 only)
- Suitability for all load types including inductive loads (AC-33)
- Safe maintenance work thanks to locking with padlocks in position 0 (OFF)
- Control signals for starting/stopping the generator, as well as generator and switch device tests on-load and off-load (3KC8 only)

3.2.4 Application areas of the 3KC4 and 3KC8 transfer switching equipment

The 3KC4 and 3KC8 transfer switching equipment can be used in all areas where a continuous power supply must be ensured.

Service sector

- Public facilities
- Computing centers (data/server rooms)
- Shopping malls

Infrastructure

- Airports
- Subways

Industry

- Production lines in continuous operation
- Engine rooms
- Pumps

Functions

The 3KC4 and 3KC8 transfer switching equipment offers the following functions for maintaining a power supply:

Function	3KC4	3KC8
Remotely operated transfer switching (RTSE)	✓	-
Automatic transfer switching (ATSE)	-	✓
Power supply via 2 inputs (internal dual power supply)	-	✓
Remote control (via inputs)	✓	✓
Network / network applications	✓	✓
Generator/generator applications	✓ ¹⁾	-
Network / generator applications	✓ ¹⁾	✓
Self-configuration of voltage and frequency settings	-	✓
Monitoring of voltage and frequency	-	✓
Monitoring of the phase sequence	-	✓
Configuration using potentiometer and DIP switch	-	✓
LED indicator for source availability	-	✓
LED indicator for the switch positions	-	✓
Test on-load (network/generator application) (via inputs)	-	✓
Test off-load (network/generator application) (via inputs)	-	✓
Connection for an optional external display	-	✓
Setting of the OFF position with priority (via inputs)	✓	✓
Indication of availability of the motor operator (via output)	✓	✓
Switch position indication of the transfer switching equipment (via outputs)	✓	✓
Inhibition of automatic mode (via inputs)	-	✓
Inhibition of automatic return transfer to the prioritized sources (via inputs).	-	✓
Selection of the prioritized source (network/network application) (via inputs)	-	✓
Deactivation of the delay for stabilizing the alternative source (network/generator application)	-	✓

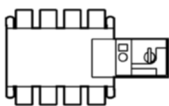
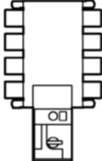
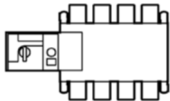
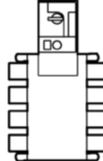
¹⁾ Possible with the adequate controller

Mounting

The following content is described in this chapter:

- Mounting positions for the 3KC4 and 3KC8 transfer switching equipment
- Installation of the 3KC4 and 3KC8 transfer switching equipment

5.1 Mounting position

Current rating	Mounting position			
	Motor operator right	Motor operator bottom	Motor operator left	Motor operator top
				
250 ... 630 A	✓	✓	✓	-
800 ... 3200 A	✓	-	✓	✓

5.2 Installing the 3KC4 and 3KC8 transfer switching equipment

Note

The 3KC4 transfer switching equipment is depicted in the following installation instructions.

The 3KC8 transfer switching equipment differs from the 3KC4 transfer switching equipment in its additional electronic module, but it is installed in the same way as the 3KC4 transfer switching equipment.

Installing the current ratings 250 A to 630 A

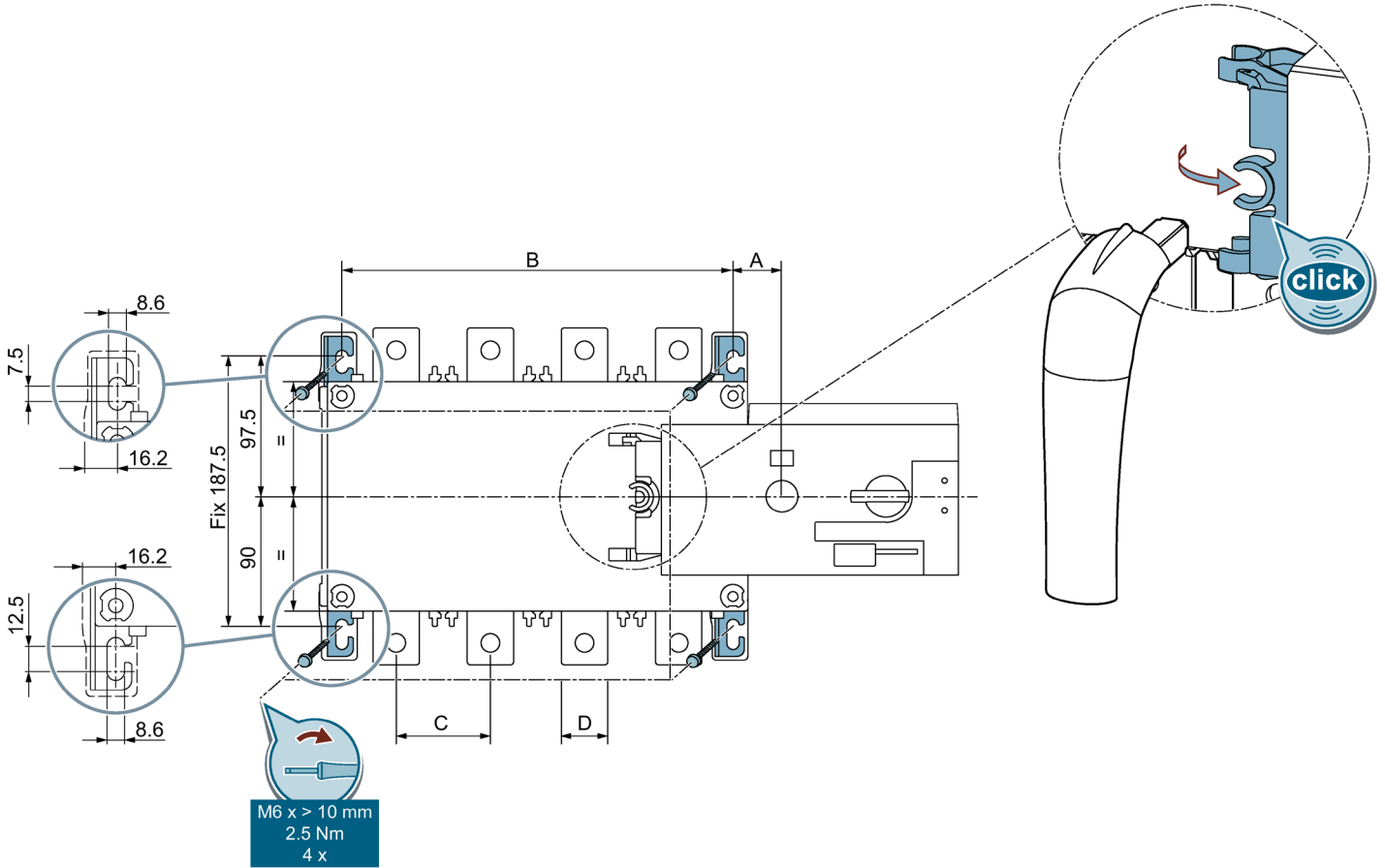


Figure 5-1 Installing the current ratings 250 A to 630 A

The dimensions vary according to the current rating and the number of poles. They can be found in the table below.

mm	250 A		400 A		630 A	
	3P	4P	3P	4P	3P	4P
A	35	35	35	35	34	34
B	160	210	160	210	210	270
C	50	50	50	50	65	65
D	25	25	35	35	45	45

Proceed as follows to install the current ratings 250 A to 630 A:

1. Mount the transfer switching equipment with four bolts in the desired position as shown in the figure (see also the section titled Mounting position (Page 23)).
2. Fit all four plastic covers of the mounting set as illustrated in chapter Mounting set (Page 147).
3. Fasten the holder for the handle on the transfer switching equipment, and insert the handle into the holder.

5.2 Installing the 3KC4 and 3KC8 transfer switching equipment

The handle and its holder are included in the scope of supply. The bolts are not included in the scope of supply.

Installing the current ratings 800 A to 3200 A

Proceed as follows to install the 3KC4 and 3KC8 transfer switching equipment of current ratings 800 A to 3200 A:

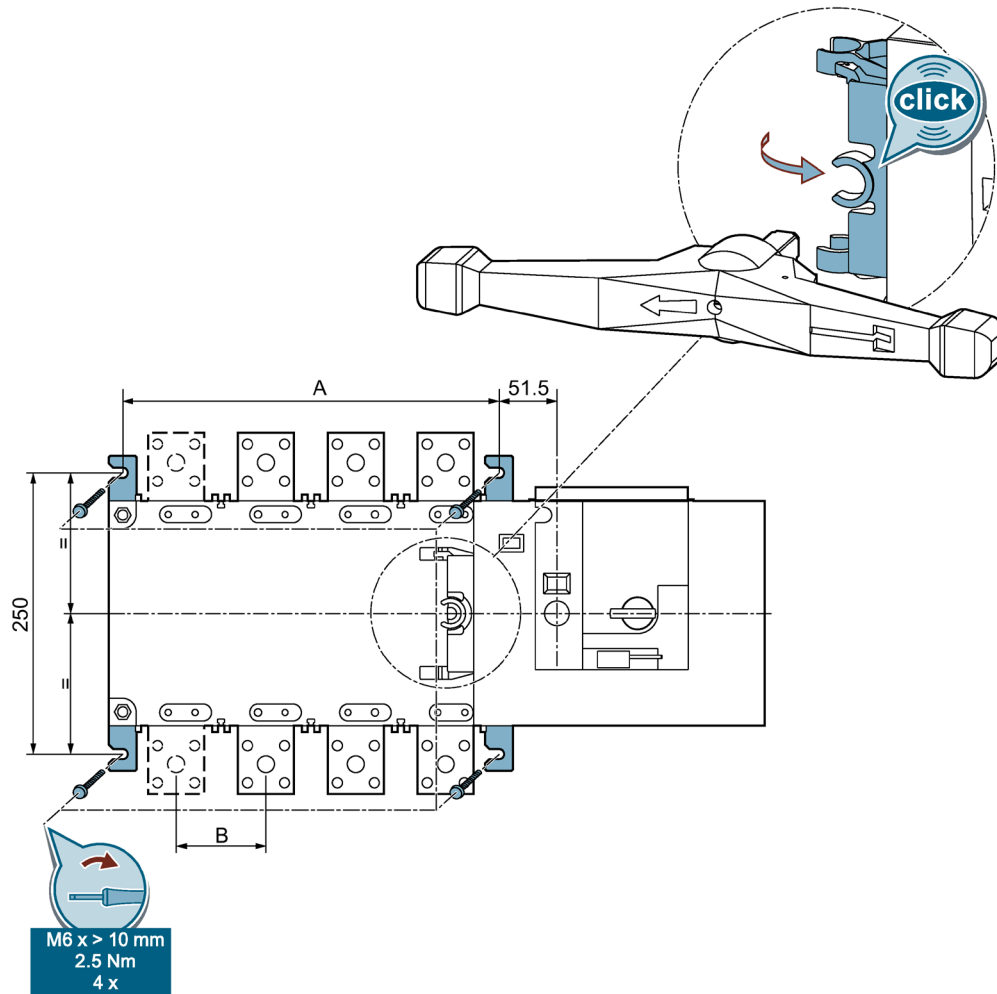


Figure 5-2 Installing the current ratings 800 A to 3200 A

The dimensions vary according to the current rating and the number of poles. They can be found in the table below.

mm	800 A		1000 A		1250 A		1600 A		2000 A		2500		3200 A	
	3P	4P	3P	4P	3P	4P	3P	4P	3P	4P	3P	4P	3P	4P
A	255	335	255	335	255	335	347	467	347	467	347	467	347	467
B	80	80	80	80	80	80	120	120	120	120	120	120	120	120

The installation steps are identical to those for installing the current ratings 250 A to 630 A (see above), the only difference being that the plastic covers are not fitted (step 2).

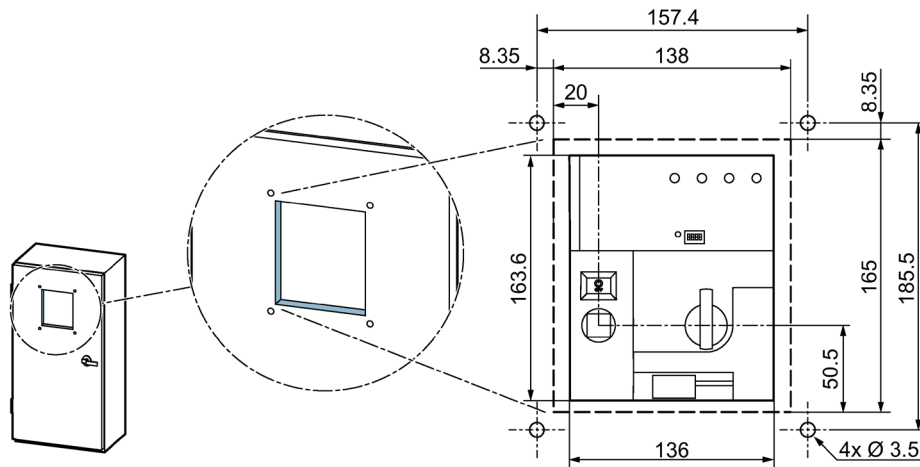
5.3 Dimensions of the cover frame for door cut-out

The following figures show the dimensions of the cover frame for door cut-out for the 3KC4 and 3KC8 transfer switching equipment.

Note

On the 3KC8 transfer switching equipment there is an additional electronic module that enables source monitoring.

Current ratings 250 A to 630 A



Current ratings 800 A to 3200 A

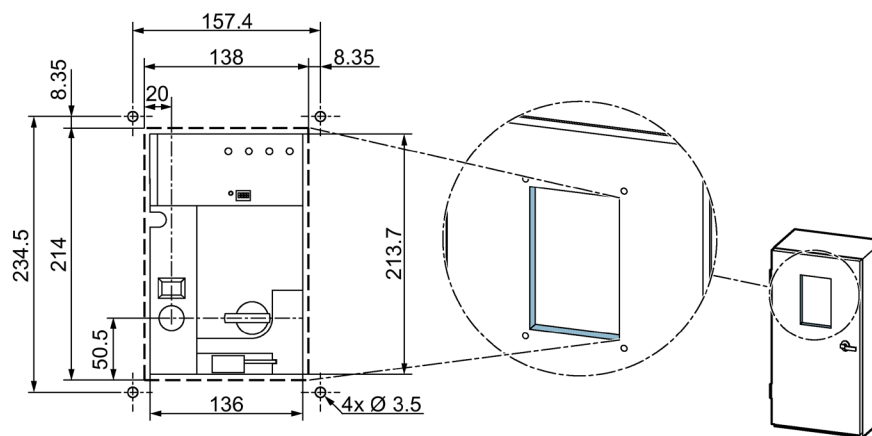


Figure 5-3 Dimensions of the cover frame for door cutout 800 A to 3200 A

Connection

The following content is described in this chapter:

- Network types
- Connection to the source (connecting terminals, connection instructions for each current rating, required accessories)
- Inputs and outputs of the motor operator and accessories
- Inputs and outputs of the electronic module
- Connection of the transfer switching equipment (motor operator, electronic module, required accessories)

6.1 Network types

The 3KC4 and 3KC8 transfer switching equipment can be connected to the following network types:

- Three-phase 4-wire network with 3 phases with neutral (3PH + N)
- Three-phase 3-wire network with 3 phases without neutral (3PH)
- Single-phase network with 1 phase and neutral (1PH + N)

NOTICE

Possible damage to the device

The product is designed for a rated impulse voltage resistance U_{imp} of 12 kV for the main circuit and 4 kV for the electronics and/or motor unit. The dual power supply (DPS) accessory is designed for a rated impulse voltage resistance U_{imp} of 4 kV, and the autotransformer accessory is designed for 2.5 kV.

When using the product in an application in which overvoltages of > 4 kV or > 2.5 kV can occur, suitable measures must additionally be taken to limit these overvoltages to no more than 4 kV or 2.5 kV, respectively.

6.1.1 Three-phase 4-wire network with neutral (3PH + N)

The 3KC4 and 3KC8 transfer switching equipment can be used in a network comprising three phases and a neutral conductor.

6.1.1.1 Circuit diagram for the 3KC4 transfer switching equipment - 4-pole transfer switching equipment

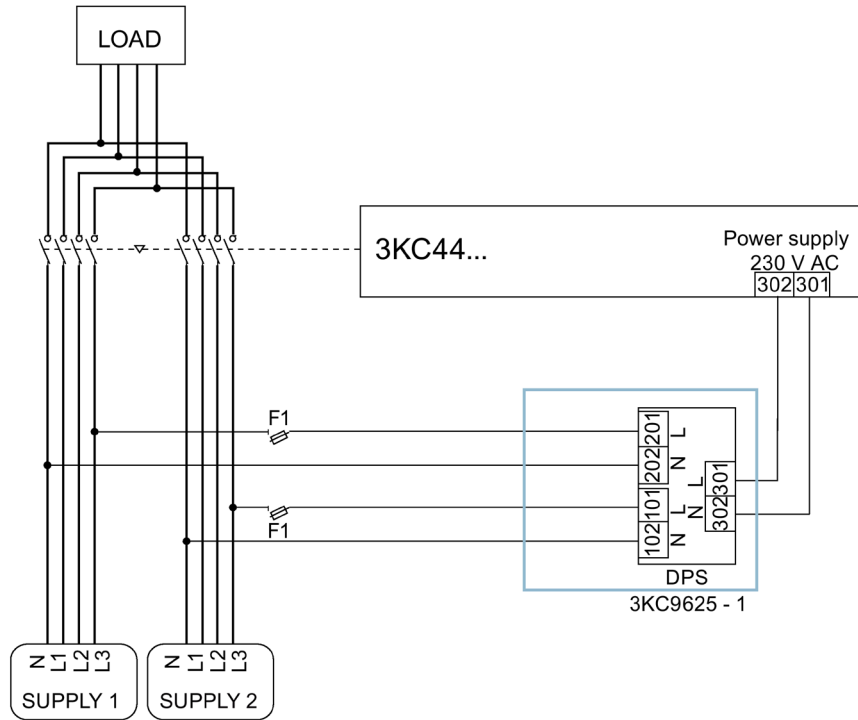


Figure 6-1 Three-phase 4-wire network with neutral for the 3KC4 transfer switching equipment

F1	1 x 3NW6004-1 1 x 3NW7013	4 A, gG
----	------------------------------	---------

For the power supply of the transfer switching equipment, the dual power supply accessory 3KC9625-1 is required. You can find a detailed description in the section titled Mounting and connecting the dual power supply (DPS) (Page 71).

Note

The F1 fuses must be installed as closely as possible to the tap.

6.1.1.2 Circuit diagram for the 3KC8 transfer switching equipment - 4-pole transfer switching equipment

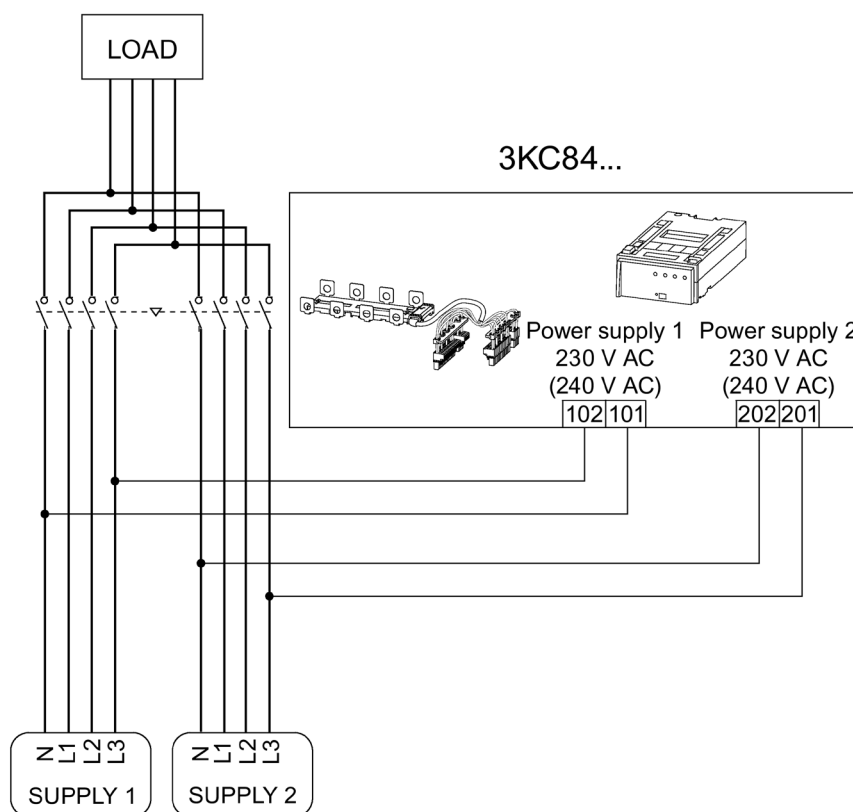


Figure 6-2 Three-phase 4-wire network with neutral for the 3KC8 transfer switching equipment

The power supply kit accessories 3KC9830-, 3KC9831- can be used for the power supply of the transfer switching equipment. You can find a detailed description in the section titled Connecting power supply kit 3KC9830-, 3KC9831- (4-pole) (Page 85).

The dual power supply (DPS) accessory is not required with the 3KC8 transfer switching equipment since it is supplied with power via two inputs of the electronic module.

6.1.2 Three-phase 3-wire network without neutral (3PH)

The 3KC4 and 3KC8 transfer switching equipment can be used in a network comprising 3 phases. It can be used both in networks with balanced load, as well as in networks with unbalanced load.

Note

The fictitiously generated fourth pole is used only for the power supply of the transfer switching equipment and must not be run to the main load.

6.1.2.1 Circuit diagram for the 3KC4 transfer switching equipment - 3-pole transfer switching equipment

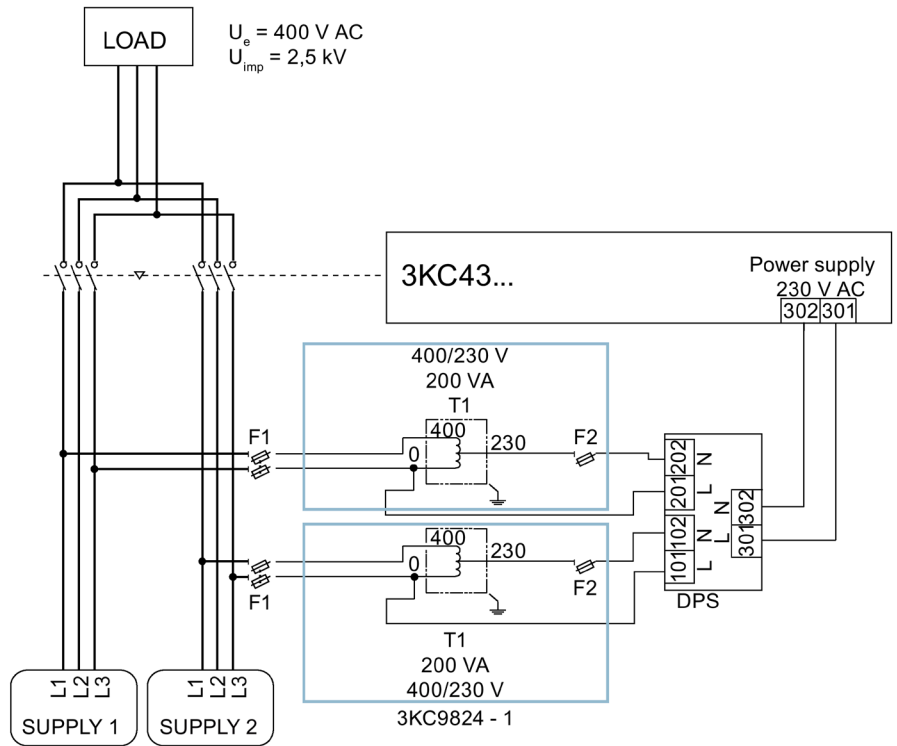


Figure 6-3 Three-phase 3-wire network without neutral for the 3KC4 transfer switching equipment

F1	2 x 3NW6002-1 1 x 3NW7023	2 A, gG
F2	1 x 3NW6004-1 1 x 3NW7013	4 A, gG

With this arrangement there is no neutral conductor available. For this reason, the following optional accessories can/must be used for establishing this network:

- 2 x autotransformer 3KC9824-1. For information, see the section titled Installing and connecting an autotransformer (400 V / 230 V) (Page 73).
- 1 x dual power supply 3KC9625-1. For information, see the section titled Mounting and connecting the dual power supply (DPS) (Page 71).

Note

The F1 fuses must be installed as closely as possible to the tap.

The F2 fuses must be fitted as closely as possible to the output of the autotransformer.

6.1.2.2 Circuit diagram for the 3K8 transfer switching equipment - 4-pole transfer switching equipment

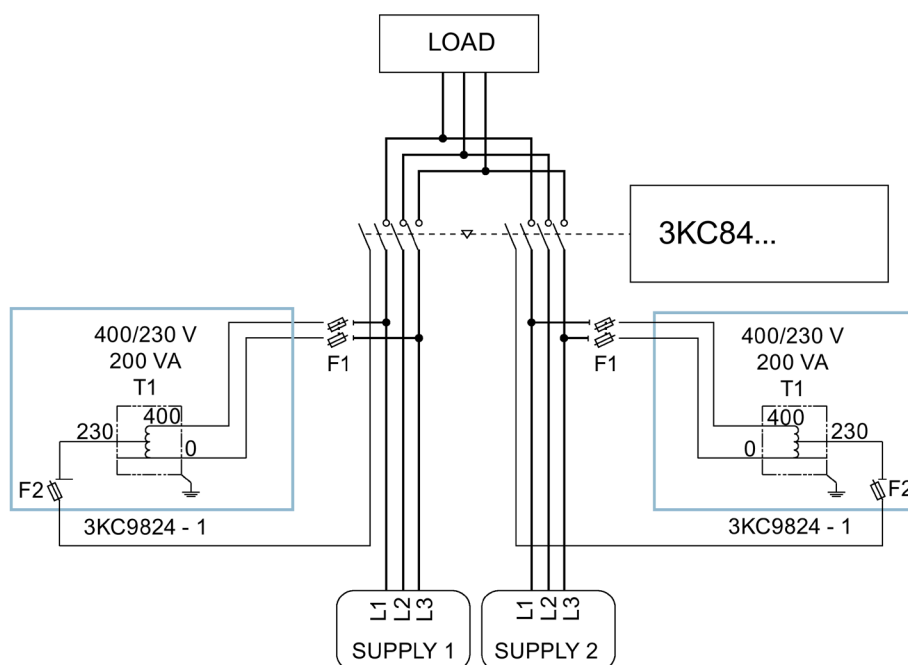


Figure 6-4 Three-phase 3-wire network without neutral for the 3K8 transfer switching equipment (4-pole)

F1	2 x 3NW6002-1 1 x 3NW7023	2 A, gG
F2	1 x 3NW6004-1 1 x 3NW7013	4 A, gG

With this arrangement there is no neutral conductor available. For this reason, the following optional accessories can be used for establishing this network:

- 2 x autotransformer 3K9824-1. For information, see the section titled Installing and connecting an autotransformer (400 V / 230 V) (Page 73).
- For the power supply: Power supply kit 3K9830-, 3K9831-. For information, see the section titled Connecting power supply kit 3K9830-, 3K9831- (4-pole) (Page 85).

Note

The F1 fuses must be installed as closely as possible to the tap.

The F2 fuses must be fitted as closely as possible to the output of the autotransformer.

The dual power supply (DPS) accessory is not required with the 3K8 transfer switching equipment since it is supplied with power via two inputs of the electronic module.

6.1.2.3 Circuit diagram for the 3KC8 transfer switching equipment - 3-pole transfer switching equipment

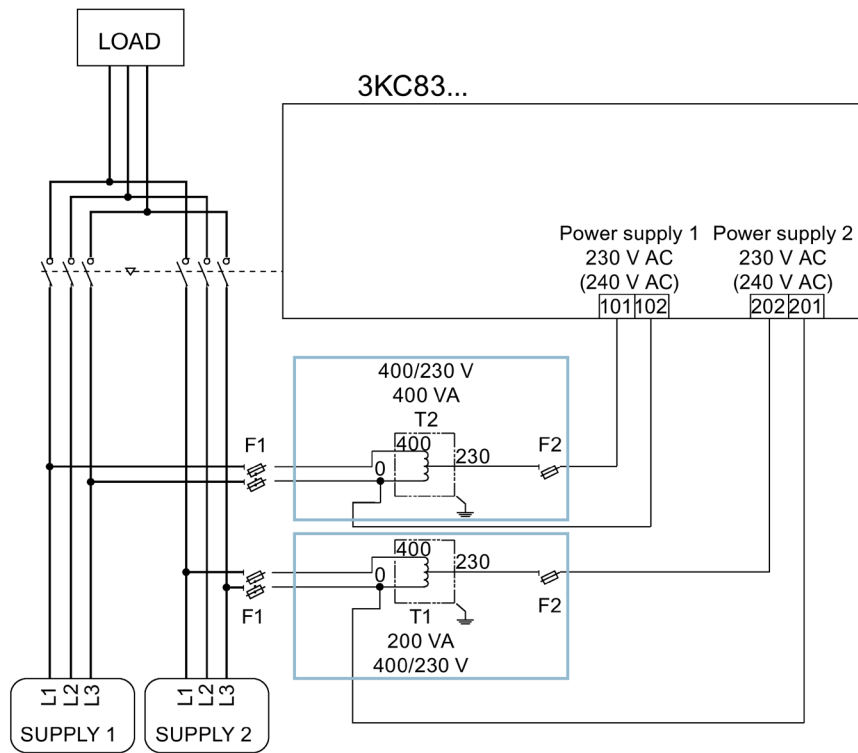


Figure 6-5 Three-phase 3-wire network without neutral for the 3KC8 transfer switching equipment (3-pole)

F1	2 x 3NW6002-1 1 x 3NW7023	2 A, gG
F2	1 x 3NW6004-1 1 x 3NW7013	4 A, gG

With this arrangement there is no neutral conductor available. For this reason, the following optional accessories can/must be used for establishing this network:

- 2 x autotransformer 3KC9824-1. For information, see the section titled Installing and connecting an autotransformer (400 V / 230 V) (Page 73).
- The auxiliary conductor terminal kit is required in the case of the 3-pole variant for connecting the electronic module, and it must be mounted before connection to the source. See the section titled Connecting the auxiliary conductor terminal 3KC9822-, 3KC9832- for a three-phase 3-wire network (3-pole) (Page 89).

The dual power supply (DPS) accessory is not required with the 3KC8 transfer switching equipment since it is supplied with power via two inputs of the electronic module.

6.1.3 Single-phase network with neutral (1PH + N)

The 3KC4 and 3KC8 transfer switching equipment can be used in a single-phase network comprising one phase and a neutral conductor. Since there is no 2-pole design available for the transfer switching equipment, the 3KC4 and 3KC8 transfer switching equipment in 3-pole design is the best choice.

6.1.3.1 Circuit diagram for the 3KC4 transfer switching equipment - 3-pole transfer switching equipment

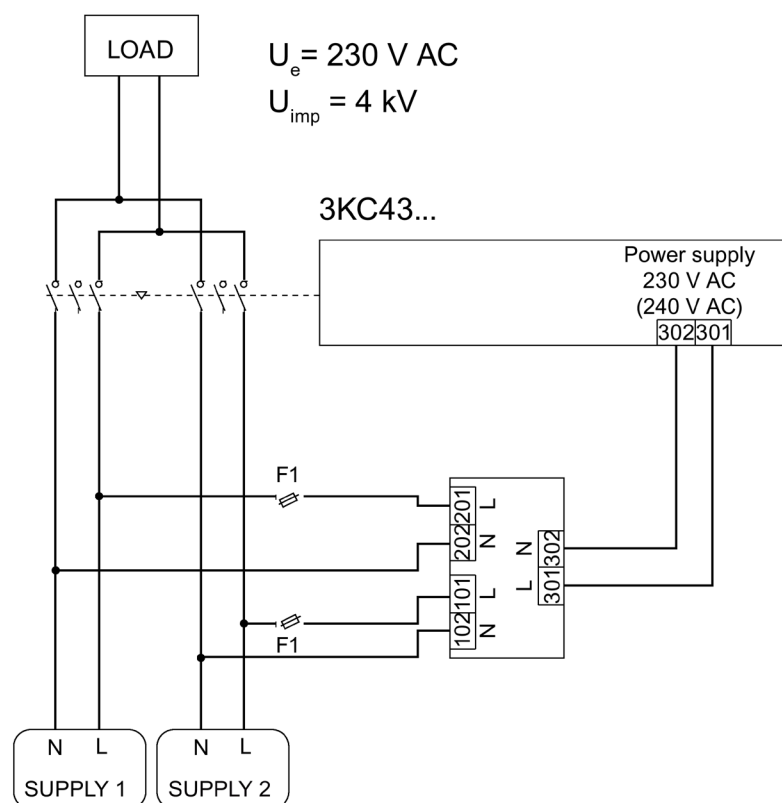


Figure 6-6 Single-phase network without neutral for 3KC4 transfer switching equipment

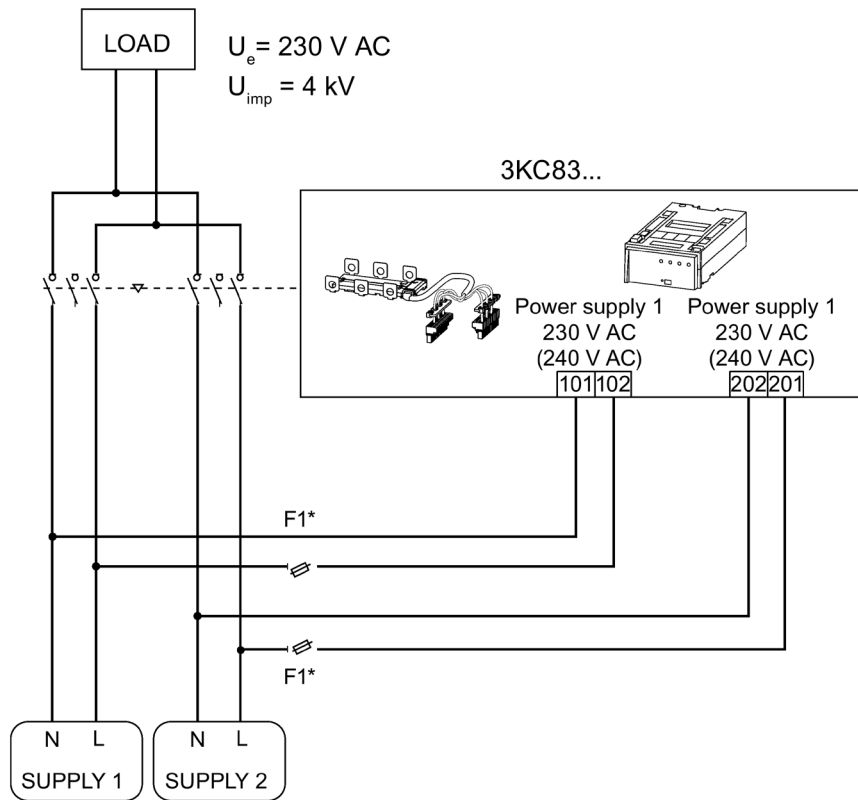
F1	1 x 3NW6004-1 1 x 3NW7013	4 A, gG
----	------------------------------	---------

For the power supply of the 3KC4 transfer switching equipment, the dual power supply accessory 3KC9625-1 is required. You can find a detailed description of this in the section titled Mounting and connecting the dual power supply (DPS) (Page 71).

Note

The F1 fuses must be installed as closely as possible to the tap.

6.1.3.2 Circuit diagram for the 3KC8 transfer switching equipment - 3-pole transfer switching equipment



* No fuse required if the power supply kit accessories 3KC9833-, 3KC9834- are used

Figure 6-7 Single-phase system without 3KC8 transfer switching equipment

F1	1 x 3NW6004-1 1 x 3NW7013	4 A, gG
----	------------------------------	---------

The dual power supply (DPS) accessory is not required with the 3KC8 transfer switching equipment since it is supplied with power via two inputs of the electronic module. Before connecting, the pins 101/102 and 201/202 must be connected to the main circuit. This can be done most easily with the 3KC9833-, 3KC9834- power supply kit. See the section titled Connecting power supply kit 3KC9833-, 3KC9834- for single-phase network (Page 92) in this regard.

Note

The F1 fuses must be installed as closely as possible to the tap.

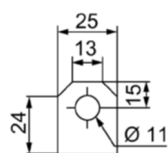
6.2 Connecting the main circuit

In the following chapter, you will find a description of the connection options for the 3KC4 and 3KC8 transfer switching equipment.

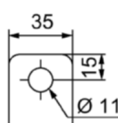
6.2.1 Connecting terminals of the transfer switching equipment

The connecting terminals of the 3KC4 and 3KC8 transfer switching equipment differ depending on the current rating. The different connecting terminals are shown below.

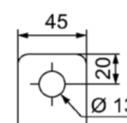
Connecting terminals for current ratings 250 A to 630 A



250 A

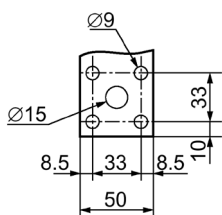


400 A

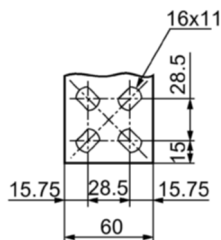


630 A

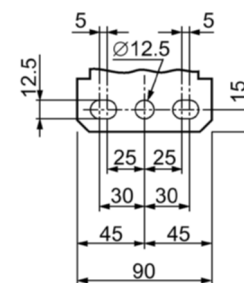
Connecting terminals for current ratings 800 A to 1600 A



800 A – 1000 A

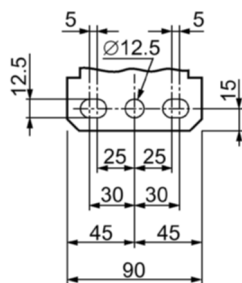


1250 A



1600 A

Connecting terminals for current ratings 2000 A to 3200 A



2000 A to 3200 A

6.2.2 Load connection

The following figure shows the two fundamentally possible arrangements for the connected load. It can be connected at the top or bottom.

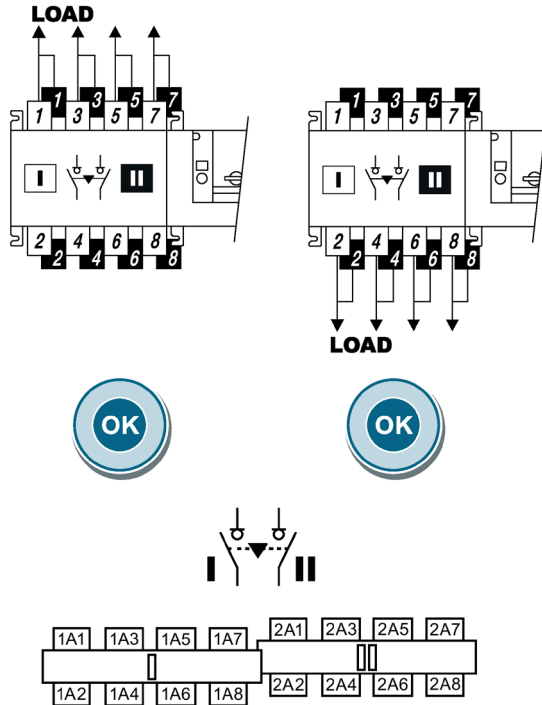


Figure 6-8 Arrangements for load connection

6.2.3 Arrangement of the power supply systems

Since both the 3KC4 and the 3KC8 have a flat connector, they can be connected to the power supply system using cable lugs or busbars.

Transfer switching equipment of 2000 A and higher is connected using the optionally available copper bar connection kit.

Note

The transfer switching equipment for 2000 A and higher comprises 2 switches (switch 1 and switch 2) in each case. These must be bridged using the copper bar connection kit.

NOTICE

Incorrect connection in the case of network/generator applications of the 3KC8 transfer switching equipment

The main current source must be connected to switch 1. Only then is the transfer switching equipment functional. Connection of the generator to switch 2 is absolutely necessary for controlling the generator.

With network/network applications, any arrangement of the connection can be selected.

With the 3KC8 transfer switching equipment, prioritization of the source can be implemented via the corresponding inputs. For information, see the section titled Functions of the control inputs for network / generator application (Page 113).

Connecting the 3KC8 transfer switching equipment

Note

Before you connect the 3KC8 transfer switching equipment to the power supply systems, you must attach the corresponding accessories to make the electronic module functional. The required accessories depend on the current rating and the network type. Observe the information in the section titled Connecting the inputs and outputs of the electronic module (3KC8 only) (Page 82) before connecting the transfer switching equipment to the power supply systems.

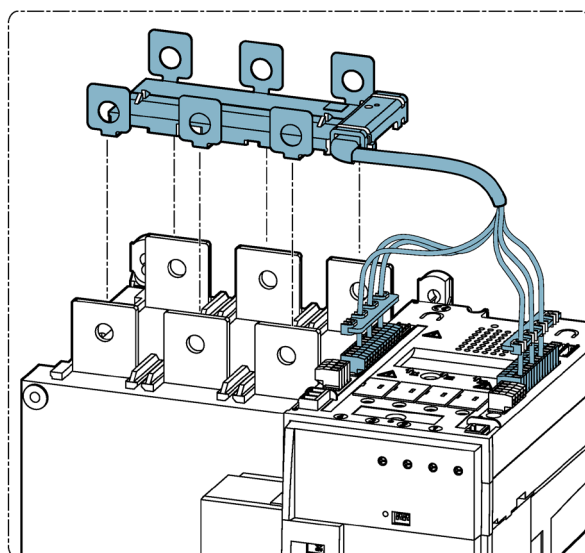


Figure 6-9 Line-side connection of the main circuit with the 3KC8 transfer switching equipment

6.2.4 Connection of transfer switching equipment for current ratings 250 A to 1600 A

The connection of current ratings 250 A to 1600 A to the main circuit is described in the following section.

To connect the 3KC4 and 3KC8 transfer switching equipment properly, you must first mount the bridging bar accessories on the load side. The steps listed below describe the mounting of the bridging bars and connection to the power supply systems.

6.2.4.1 Connecting bridging bars on the load side

<p>⚠ WARNING</p> <p>Hazardous voltage!</p> <p>Ensure there is no live voltage before beginning to mount the bridging bars.</p>
--

Current ratings 250 A to 1600 A require bridging bars. These serve as a bridge for the load-side connection and they can be mounted either on the top or bottom of the transfer switching equipment.

The bridging bars are not included with the transfer switch and must be ordered as accessories.



Figure 6-10 Bridging bar current ratings 250 A to 630 A



Figure 6-11 Bridging bar current ratings 800 A to 1600 A

Mounting bridging bars for current ratings 250 A to 630 A

The following steps are necessary for mounting the bridging bars on the transfer switching equipment. Refer to the table for information about the bolts, tools, and tightening torques.

The bolts are not included with the transfer switch. You can find more detailed information on the bridging bars in the section titled Bridging bars (Page 150).

Requirements

- Power supply is switched off
- Transfer switching equipment is in the "Manual" position

Procedure

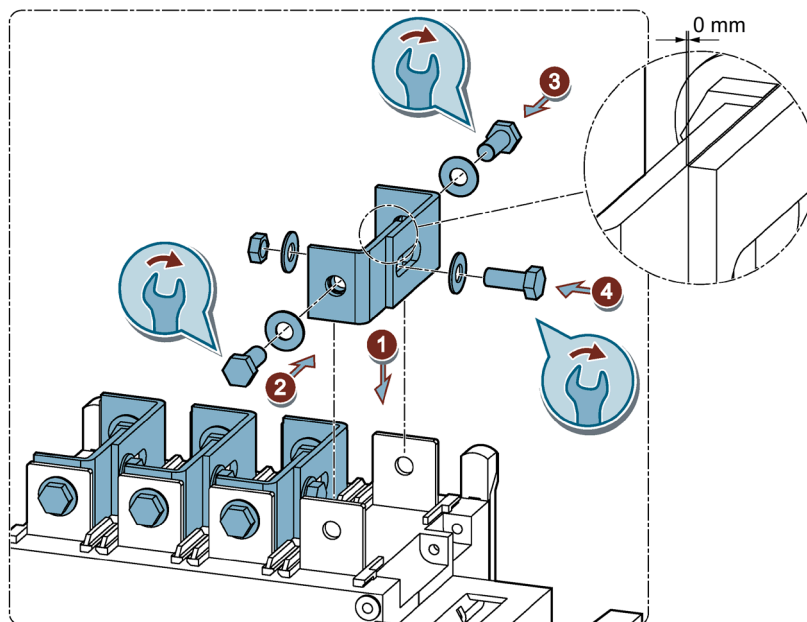





Figure 6-12 Mounting bridging bars for current ratings 250 A to 630 A

Current rating			
250 A	M10 x 20 mm	17	20 ... 26
400 A	M10 x 25 mm		
630 A	M12 x 30 mm	19	40 ... 45

1. Position the bridging bar on the connecting terminal.
2. Fix the first half of the bridging bar to the connecting terminal with the bolt and washer.
3. Fix the second half of the bridging bar to the connecting terminal with the bolt and washer.

Note

The two halves of the bridging bar must come into contact **completely** before work step 4.

4. Connect the two parts of the bridging bar with 1 bolt, 2 washers and 1 nut in accordance with the figure.

Mounting bridging bars for current ratings 800 A to 1600 A

The following steps are necessary for mounting the bridging bars on the transfer switching equipment. Refer to the table for information about the bolts, tools, and tightening torques.

The bolts for mounting the bridging bars are included in the scope of supply.

6.2 Connecting the main circuit

Bolts with washers and nuts are additionally required in the following quantities for fixing the bridging bars to the connecting terminal:

- 4 x for current ratings 800 A to 1250 A
- 2 x for current rating 1600 A

Requirements

- Power supply is switched off
- Transfer switching equipment is in the "Manual" position

Procedure

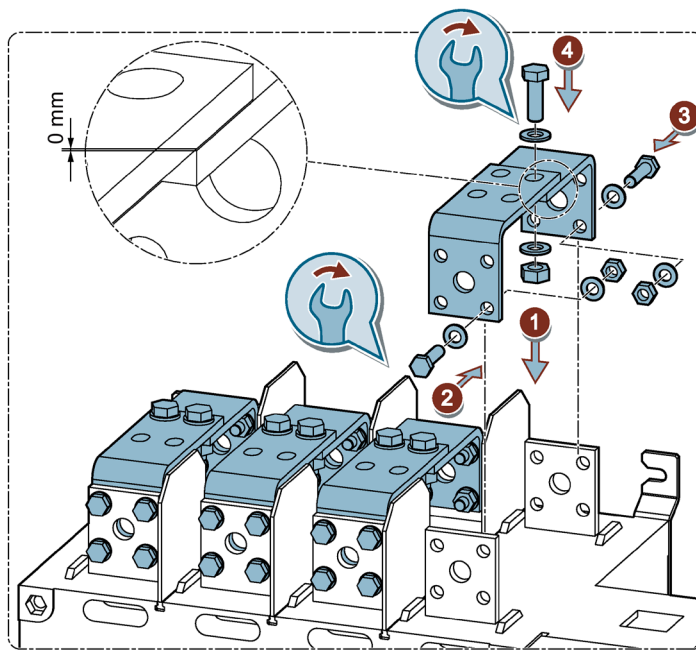





Figure 6-13 Mounting bridging bars for current ratings 800 A to 1600 A

Current rating			
800 A ... 1000 A	M8 x 35 mm	13	8.3 ... 13
1250 A	M10 x 40 mm	17	20 ... 26
1600 A	M12 x 45 mm	19	40 ... 45

1. Position the bridging bar on the connecting terminal.
2. Fix the first half of the bridging bar to the connecting terminal.
 - For current ratings of 800 A to 1250 A with 4 bolts, 8 washers, and 4 nuts.
 - For current ratings of 1600 A with 2 bolts, 4 washers, and 2 nuts.
3. Fix the second half of the bridging bar to the connecting terminal.
 - For current ratings of 800 A to 1250 A with 4 bolts, 8 washers, and 4 nuts.
 - For current ratings of 1600 A with 2 bolts, 4 washers, and 2 nuts.


Note

The two halves of the bridging bar must come into contact **completely** before work step 4.

4. Connect the two parts of the bridging bar with the bolts supplied.

6.2.4.2 Connecting current ratings 250 A to 1600 A to the main circuit

The following steps are necessary for connecting the transfer switching equipment to the main circuit. Refer to the respective table for information about the permissible copper connections, required tools, and tightening torques.

 WARNING
Hazardous voltage! Ensure there is no live voltage before connecting the transfer switching equipment to the main circuit.

NOTICE
System damage Connect the power supply systems with phase equality.

Note**Using bridging bars**

Mount the bridging bars **before** connecting the transfer switching equipment to the main circuit. For information, see the section titled Connecting bridging bars on the load side (Page 38).

Note

If you are using the 3KC8 transfer switching equipment, mount the corresponding accessories for the electronic module (see the section titled Connecting the inputs and outputs of the electronic module (3KC8 only) (Page 82)).

Current ratings 250 A to 630 A

Requirements

- Main circuit is disconnected
- Transfer switching equipment is in the "Manual" position

Procedure

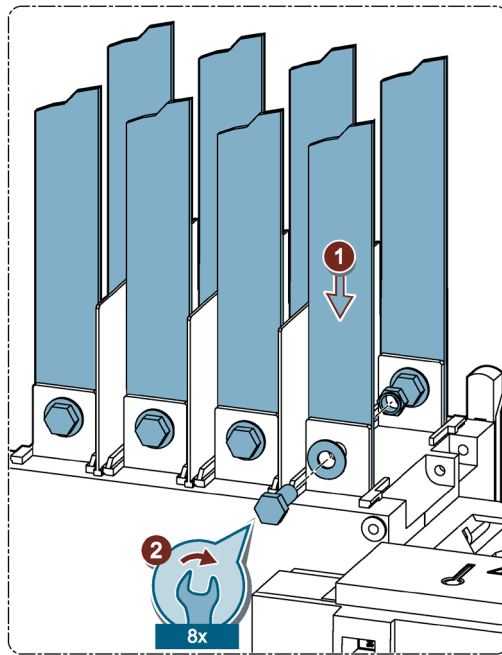


Figure 6-14 Connecting current ratings 250 A to 630 A

Current rating	 W x T / mm	DIN 46234 NF C20-130 mm ²		 Nm
250 A	1 x 30 x 4 ... 1 x 32 x 5	120 ... 150	M10	20 ... 26
400 A	1 x 30 x 8 ... 1 x 32 x 8	240	M10	20 ... 26
630 A	2 x 40 x 5 ... 2 x 50 x 8	2 x 185 ... 2 x 300	M12	40 ... 45

1. Mount the cable lug or the busbar according to the figure.
2. Secure the connection with 1 bolt, 2 washers, and 1 nut on the cable lug or the busbar.

Current ratings 800 A to 1600 A

Requirements

- Main circuit is disconnected
- Transfer switching equipment is in the "Manual" position

Procedure

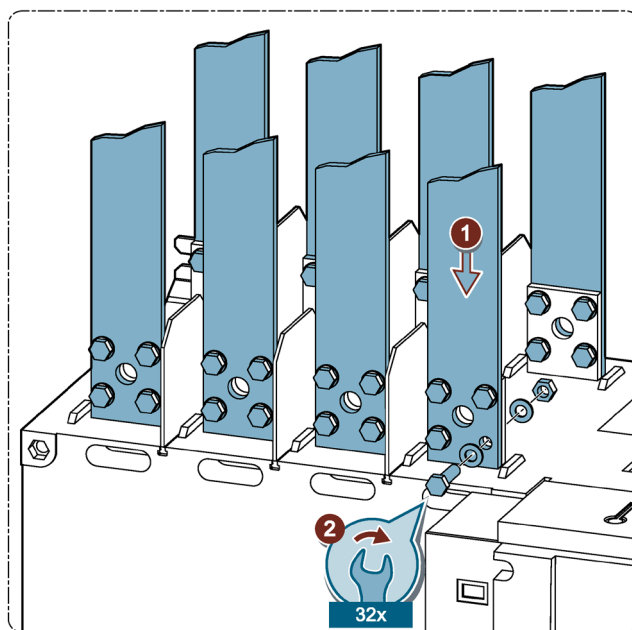
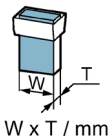





Figure 6-15 Connecting current ratings 800 A to 1600 A

Current rating	 W x T / mm	DIN 46234 NF C20-130  mm ²		 Nm
800 A	2 x 50 x 5	2 x 240 ... 2 x 300	M8	8.3 ... 13
1000 A	2 x 60 x 5	4 x 185	M8	8.3 ... 13
1250 A	2 x 60 x 7	4 x 185	M10	20 ... 26
1600 A	2 x 100 x 5	6 x 185	M12	40 ... 45

1. Mount the cable lug or the busbar according to the figure.
2. Secure the connection with a cable lug or the busbar.
 - For current ratings of 800 A to 1250 A with 4 bolts, 8 washers, and 4 nuts in each case.
 - For current ratings of 1600 A with 2 bolts, 4 washers, and 2 nuts.

6.2.5 Connection of transfer switching equipment for current ratings 2000 A to 3200 A

The connection of current ratings 2000 A to 3200 A to the main circuit is described in the following section.

So that you can connect the 3KC4 and 3KC8 transfer switching equipment to the power supply systems properly, you must first mount the copper bar connection kit accessory. The steps listed below describe the mounting of the copper bar connection kit and connection to the power supply systems.

6.2.5.1 Copper bar connection kit

For current ratings 2000 A to 3200 A, the copper bar connection kit may be mounted on the line or load side, depending on the connection type. This is not fully included with the transfer switch and must be ordered separately.

The copper bar connection kit is made up of 5 separately available parts. The different components of the copper bar connection kit enable a host of connection options.

Overview of the copper bar connection kit



Figure 6-16 Connection, part A (3KC9811-0, included in the scope of supply for current rating 3200 A)

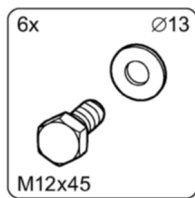


Figure 6-17 Bolt set, part B, 45 mm (3KC9811-1)

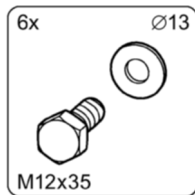


Figure 6-18 Bolt set, part B, 35 mm short length (3KC9811-2)

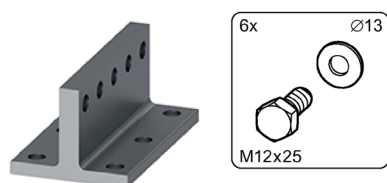


Figure 6-19 T piece, part C (3KC9811-3)

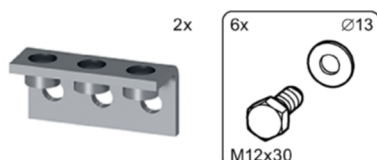


Figure 6-20 Bracket, part D (3KC9811-4)

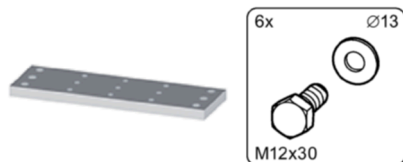


Figure 6-21 Bridging bar, part E (3KC9818-8)

The required bolts for the T piece (3KC9811-3), the bracket (3KC9811-4), and the bridging bar (3KC9818-8) are already included in the scope of supply of the transfer switch.

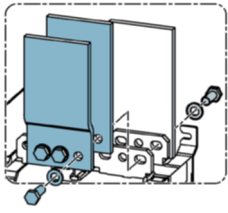
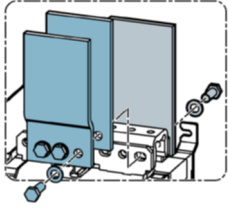
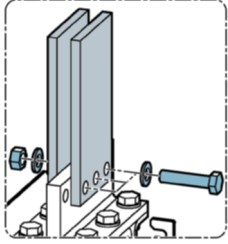
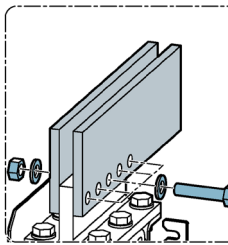
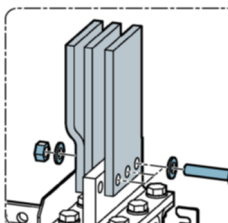
The different solutions offered by the copper bar connection kit for current ratings 2000 A to 3200 A are shown below.

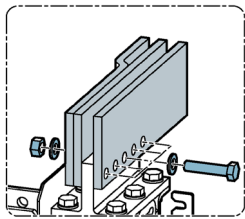
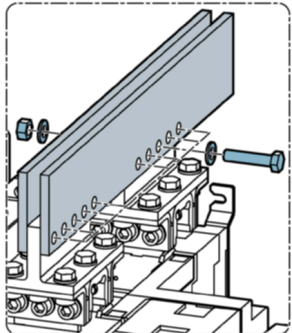
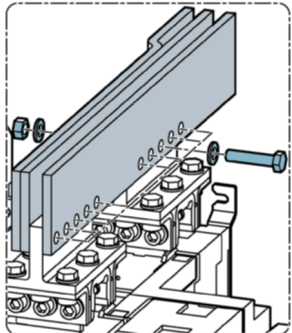
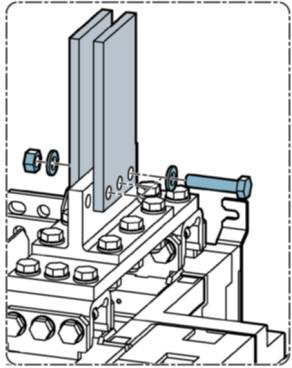
Note

With the 3KC4 and 3KC8 transfer switching equipment of current rating 3200 A, the connection, part A (3KC9811-0) is already included with the transfer switch and must be mounted on the 3200 A transfer switching equipment on the line and load side.

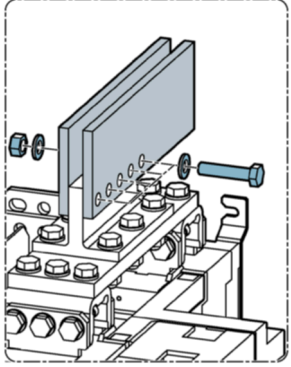
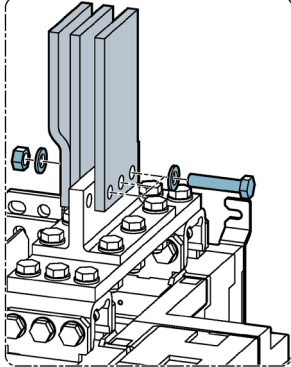
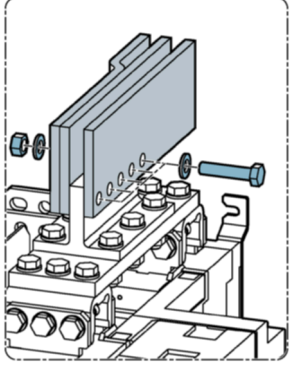
Connection options

The following connections are possible with the copper bar connection kit:

Version	Position of the connection	Current rating	Fig.
1	Line side	2000 A ... 2500 A	
2	Line side	3200 A	
3	Line side	2000 A ... 2500 A	
4	Line side	2000 A ... 2500 A	
5	Line side	3200 A (2900 A max.)	

Version	Position of the connection	Current rating	Fig.
6	Line side	3200 A	
7	Load side	2000 A ... 2500 A	
8	Load side	3200 A	
9	Load side	2000 A ... 2500 A	

6.2 Connecting the main circuit

Version	Position of the connection	Current rating	Fig.
10	Load side	2000 A ... 2500 A	
11	Load side	3200 A	
12	Load side	3200 A	

Dimensions of the 3KC4 and 3KC8 transfer switching equipment with copper bar connection kit

Use of the copper bar connection kit changes the dimensions of the 3KC4 and 3KC8 transfer switching equipment.

Dimensions version 1

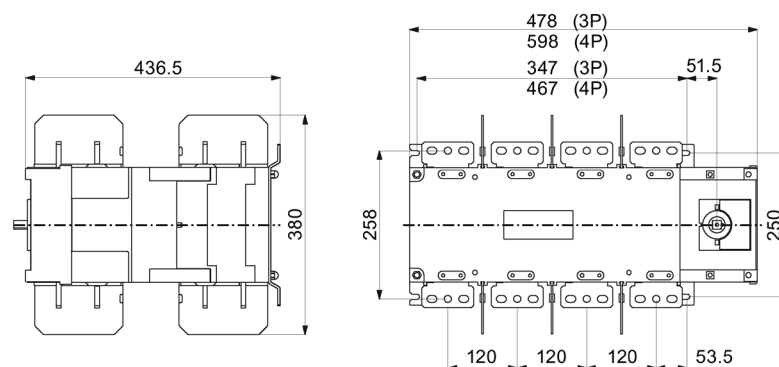


Figure 6-22 Dimensions with copper bar connection kit, version 1

Dimensions version 2

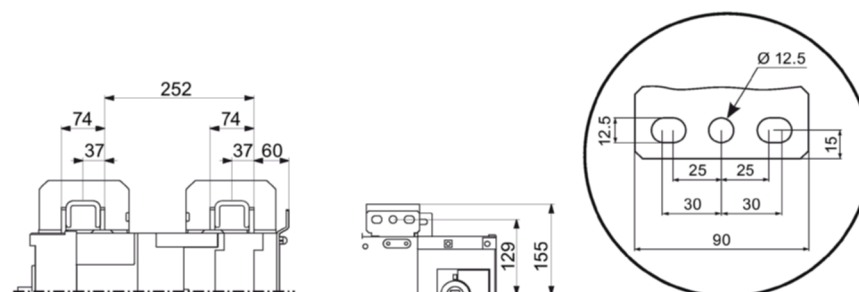


Figure 6-23 Dimensions with copper bar connection kit, version 2

Dimensions of version 3 to 8

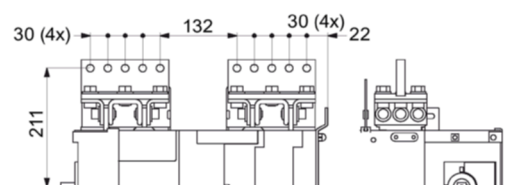


Figure 6-24 Dimensions with copper bar connection kit, versions 3 to 8

Dimensions of version 9 to 12

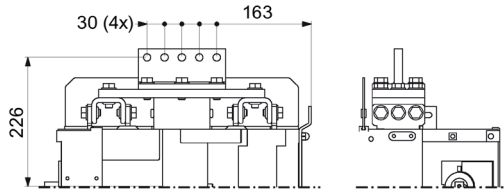


Figure 6-25 Dimensions with copper bar connection kit, versions 9 to 12

6.2.5.2 Connecting current ratings 2000 A to 3200 A to the main circuit (on the line side)

The connection of current ratings 2000 A to 3200 A on the line side to the main circuit is described in the following section. Different connection variants are possible here (versions listed in the form of a table in the section titled Copper bar connection kit (Page 44)).

⚠ WARNING
Hazardous voltage! Ensure there is no live voltage before connecting the transfer switching equipment to the main circuit.

NOTICE
System damage Connect the power supply systems with phase equality.

Note

If you are using the 3KC8 transfer switching equipment, mount the corresponding accessories for the electronic module. For information, see the section titled Connecting the inputs and outputs of the electronic module (3KC8 only) (Page 82).

Busbar requirements

Busbars with the following minimum dimensions must be used for line-side connection:

- Minimum copper busbar for I_{th} 2000 A = 3 x 100 x 5 mm
- Minimum copper busbar for I_{th} 2500 A = 4 x 100 x 5 mm
- Minimum copper busbar for I_{th} 3200 A = 3 x 100 x 10 mm

Mounting and connecting version 1 (2000 A to 2500 A)

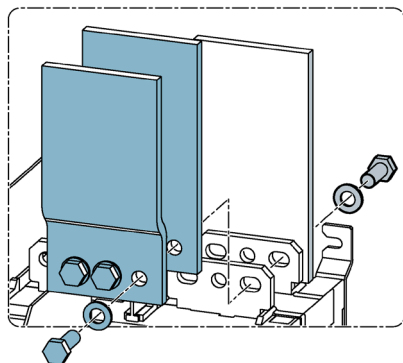


Figure 6-26 Connecting busbar, version 1

The following components of the copper bar connection kit are required in the following quantities for these versions:

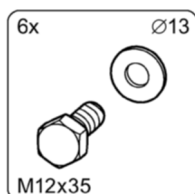


Figure 6-27 Bolt set, part B, 35 mm short length, 3KC9811-2

Number of poles	Current rating	Bolt set, part B, 35 mm (3KC9811-2) ¹⁾
3-pole	2000 A ... 2500 A	6 x
4-pole	2000 A ... 2500 A	8 x

¹⁾ Contains only the quantity for line-side connection

This variant is connected directly to the power supply systems via the busbars.

Requirements

- Main circuit is disconnected
- Transfer switching equipment is in the "Manual" position

Procedure

1. Mount one busbar on each connecting terminal of the 3KC4 or 3KC8 transfer switching equipment with 6 bolts and 6 washers of the bolt set, part B, 35 mm (3KC9811-2).

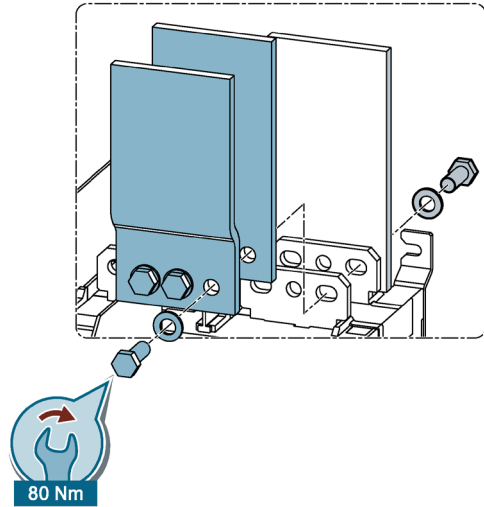


Figure 6-28 Connecting busbar, version 1

Mounting and connecting version 2 (3200 A)

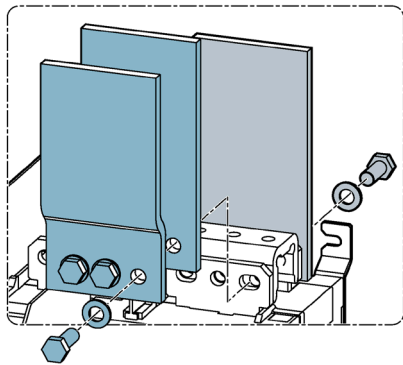


Figure 6-29 Connecting busbar, version 2

The following components of the copper bar connection kit are required in the following quantities for these versions:

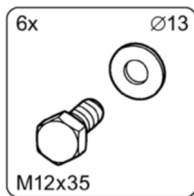


Figure 6-30 Bolt set, part B, 35 mm short length, 3KC9811-2

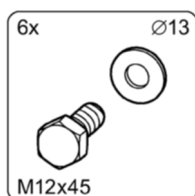


Figure 6-31 Bolt set, part B, 45 mm, 3KC9811-1

Number of poles	Current rating	Bolt set, part B, 35 mm (3KC9811-2) ¹⁾	Bolt set, part B, 45 mm (3KC9811-1) ¹⁾
3-pole	3200 A	3 x	3 x
4-pole	3200 A	4 x	4 x

1) Contains only the quantity for line-side connection

This variant is connected directly to the power supply systems via the busbars. Part A is included with the transfer switch and must be secured.

Requirements

- Main circuit is disconnected
- Transfer switching equipment is in the "Manual" position

Procedure

1. Insert the connection, part A (3KC9811-0, already included with the transfer switch) between the two connecting terminals.

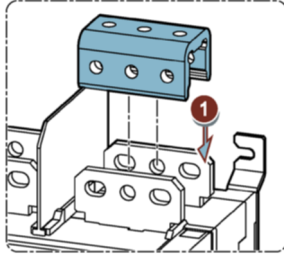


Figure 6-32 Inserting connection, part A

2. Mount 2 busbars with 3 bolts and 3 washers of the bolt set, part B, 45 mm (3KC9811-1) on the front connecting terminal.
3. Mount 1 busbar with 3 bolts and 3 washers of the bolt set, part B, 35 mm (3KC9811-2) on the rear connecting terminal.

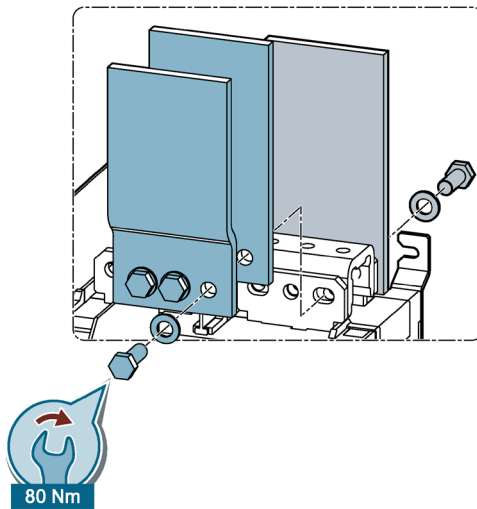
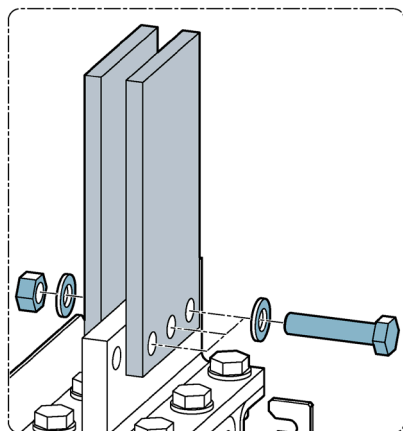
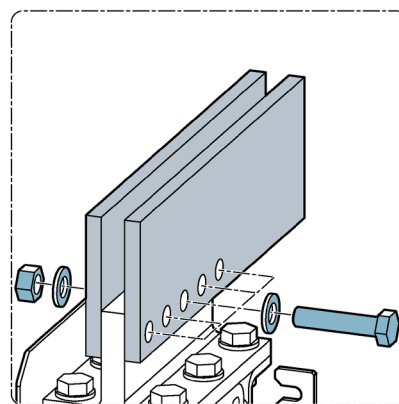


Figure 6-33 Connecting busbar, version 2

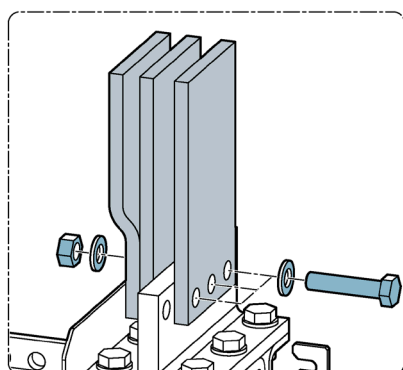
Mounting and connecting version 3 to 6 (2000 A to 3200 A)



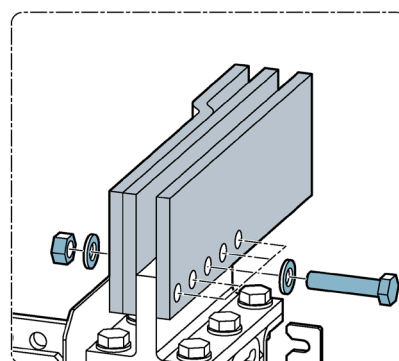
Version 3: 2000 A to 2500 A



Version 4: 2000 A to 2500 A



Version 5: 2900 A max.



Version 6: 3200 A

The following components of the copper bar connection kit are required for these versions:



Figure 6-34 Connection, part A, 3KC9811-0 (already included with the transfer switch for 3200 A)

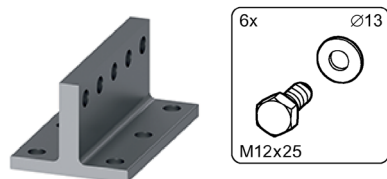


Figure 6-35 T piece, part C 3KC9811-3

6.2 Connecting the main circuit

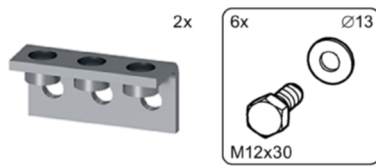


Figure 6-36 Bracket, part D, 3KC9811-4

Number of poles	Current rating	Connection, part A (3KC9811-0) ¹⁾	T piece, part C (3KC9811-3) ¹⁾	Bracket, part D (3KC9811-4) ¹⁾
3-pole	2000 A ... 2500 A	6 x	6 x	6 x
3-pole	3200 A	Included with the transfer switch	6 x	6 x
4-pole	2000 A ... 2500 A	8 x	8 x	8 x
4-pole	3200 A	Included with the transfer switch	8 x	8 x

1) Contains only the quantity for line-side connection

Mounting version 3 to 6 of copper bar connection kit

1. Insert the connection, part A (3KC9811-0) between the two connecting terminals.

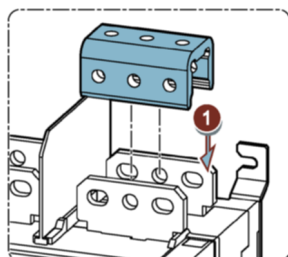


Figure 6-37 Inserting connection, part A

2. Mount the bracket, part D (3KC9811-4), with the supplied bolts on the outside of the connecting terminals to secure the connection, part A.

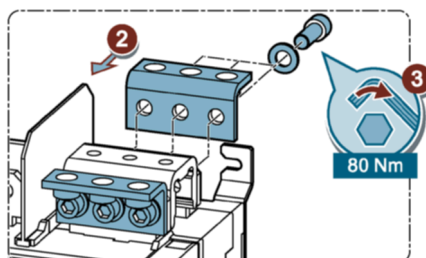


Figure 6-38 Mounting bracket, part D

3. Position the T piece, part C (3KC9811-3) with the supplied bolts as shown in the figure on top of the already mounted parts A and D.

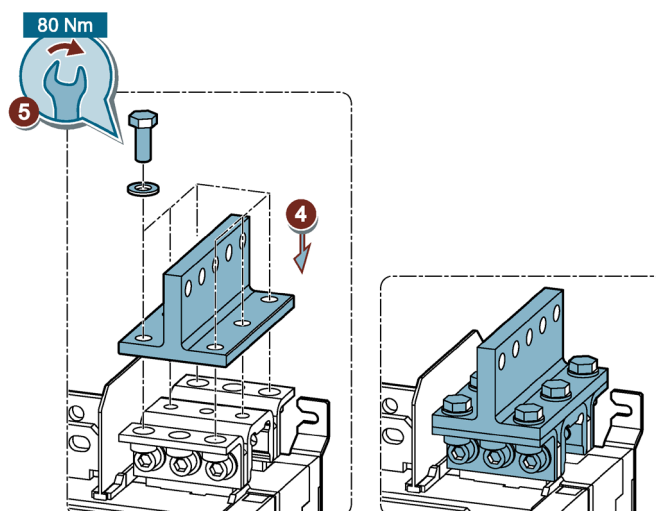


Figure 6-39 Mounting the T piece

6.2 Connecting the main circuit

Connecting versions 3 to 6

Versions 3 and 5, as well as versions 4 and 6, are connected to the power supply systems in two different ways:

- Version 3 and 5: Vertically aligned
- Version 4 and 6: Horizontally aligned

Requirements

- Main circuit is disconnected
- Transfer switching equipment is in the "Manual" position
- Copper bar connection kit is mounted

Procedure

The bolt set required for mounting is not included with the transfer switch. You can find the bolt set requirements in the following table:

Version	Bolt	Washer	Nut
3 (vertical) 2000 ... 2500 A	3 x H M12-55 6.8	6 x	3 x
4 (horizontal) 2000 ... 2500 A	5 x H M12-55 6.8	10 x	5 x
5 (vertical) 2900 A	3 x H M12-65 6.8	6 x	3 x
6 (horizontal) 3200 A	5 x H M12-65 6.8	10 x	5 x

1. Mount the busbar on the transfer switching equipment.
 - Version 3 and 5 (vertical alignment) each with 3 bolts, 6 washers and 3 nuts.
 - Version 4 and 6 (horizontal alignment) each with 5 bolts, 10 washers and 5 nuts.

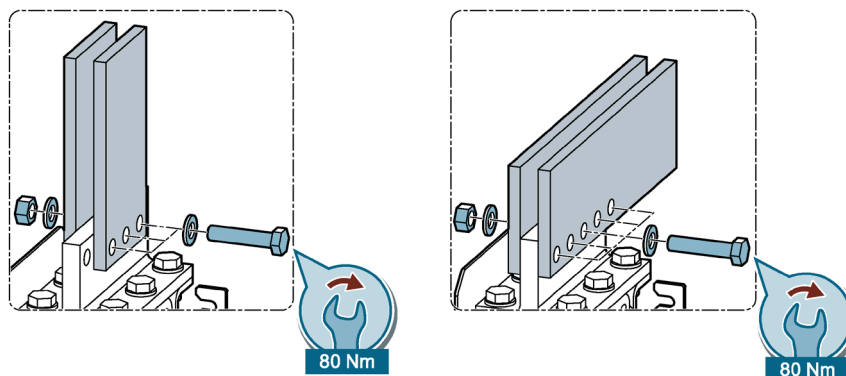


Figure 6-40 Connecting versions 3 and 4 (2000 A to 2500 A)

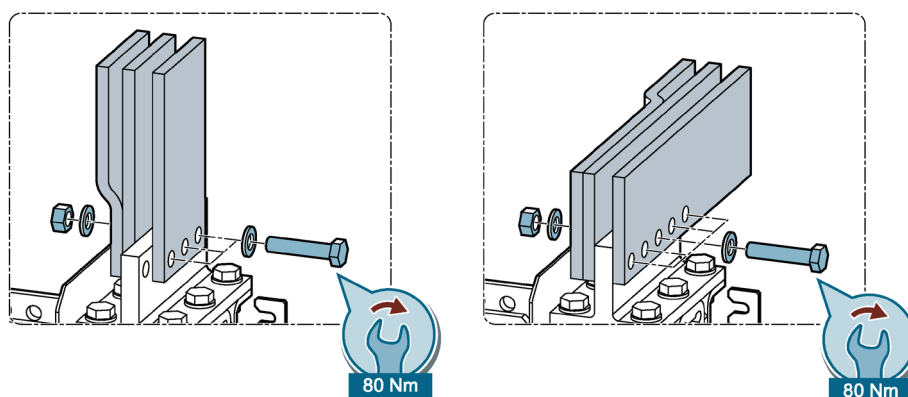


Figure 6-41 Connecting versions 5 and 6 (2900 A or 3200 A)

2. Connect the mounted transfer switching equipment to the power supply systems.
 - For the 3-pole type with 6 x the above listed bolt set.
 - For the 4-pole type with 8 x the above listed bolt set.

6.2.5.3 Connecting current ratings 2000 A to 3200 A to the main circuit (on the load side)

The load-side connection of current ratings 2000 A to 3200 A to the main circuit is described in the following section. Different connection variants are possible here (versions listed in the form of a table in the section titled Copper bar connection kit (Page 44)).

WARNING

Hazardous voltage!

Ensure there is no live voltage before connecting the transfer switching equipment to the main circuit.

NOTICE

System damage

Connect the power supply systems with phase equality.

Note

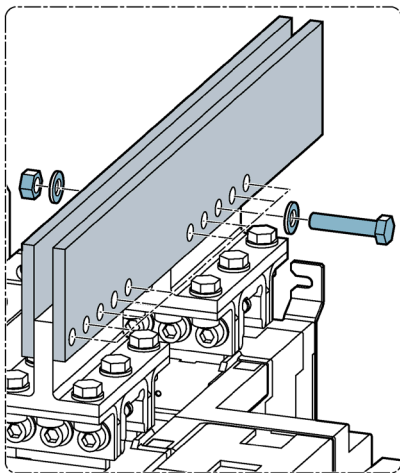
If you are using the 3KC8 transfer switching equipment, mount the corresponding accessories for the electronic module. For information, see the section titled Connecting the inputs and outputs of the electronic module (3KC8 only) (Page 82).

Busbar requirements

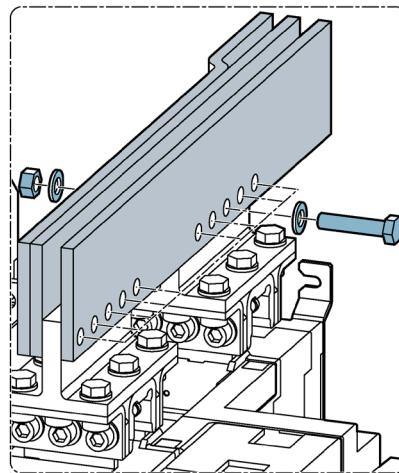
Busbars with the following minimum dimensions must be used for load-side connection:

- Minimum copper busbar for I_{th} 2000 A = 3 x 100 x 5 mm
- Minimum copper busbar for I_{th} 2500 A = 4 x 100 x 5 mm
- Minimum copper busbar for I_{th} 3200 A = 3 x 100 x 10 mm

Mounting and connecting sizes 7 and 8



Version 7: 2000 A to 2500 A



Version 8: 3200 A

The same components of the copper bar connection kit are required for versions 7 to 8 as for versions 3 to 6. Mounting is also identical to mounting of versions 3 to 6. You can find more detailed information in the section titled Connecting current ratings 250 A to 1600 A to the main circuit (Page 41).

Connecting versions 7 and 8

Requirements

- Main circuit is disconnected
- Transfer switching equipment is in the "Manual" position
- Copper bar connection kit is mounted

Procedure

The bolt set required for mounting is not included with the transfer switch. You can find the bolt set requirements in the following table:

Version	Bolt	Washer	Nut
7 (horizontal) 2000 ... 2500 A	10 x H M12-55 6.8	20 x	10 x
8 (horizontal) 3200 A	10 x H M12-65 6.8	20 x	10 x

1. Mount the busbar with 10 bolts, 20 washers and 10 nuts on the transfer switching equipment.

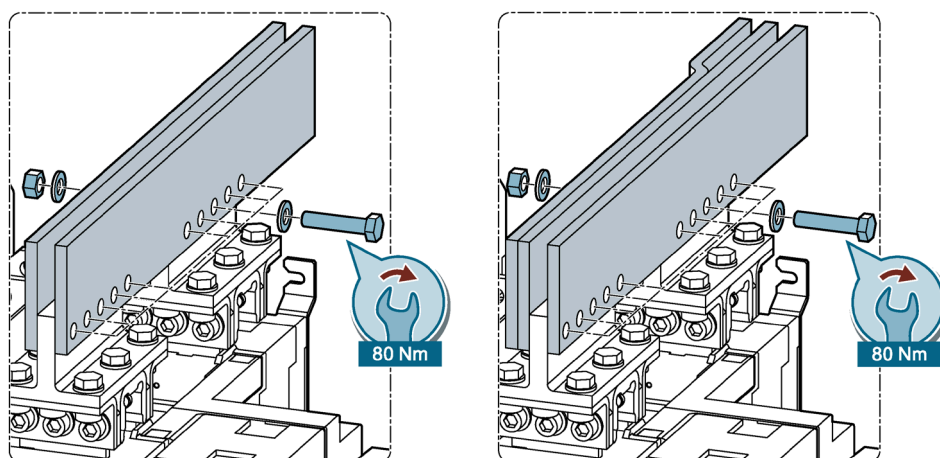
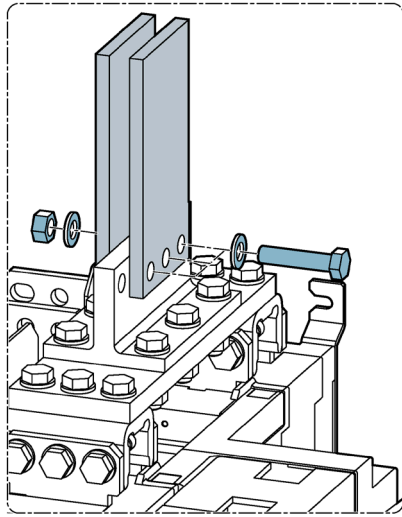


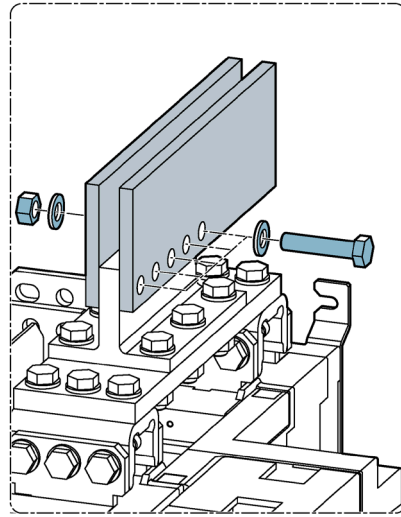
Figure 6-42 Connecting versions 7 and 8

2. Connect the mounted transfer switching equipment to the power supply systems.
 - For the 3-pole type with 3 x the above listed bolt set.
 - For the 4-pole type with 4 x the above listed bolt set.

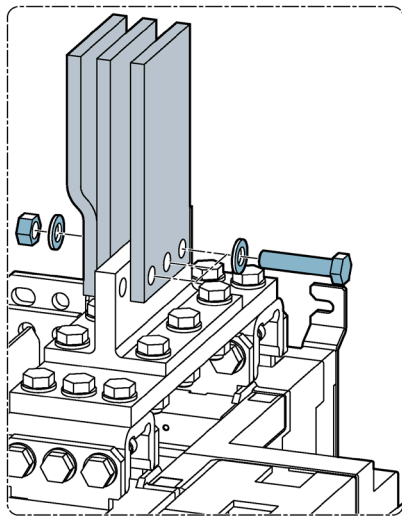
Mounting and connecting version 9 to 12



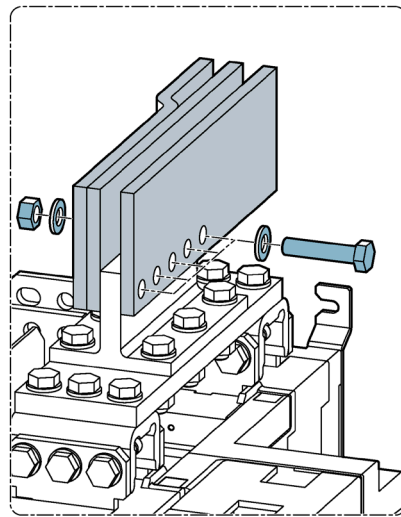
Version 9: 2000 A to 2500 A



Version 10: 2000 A to 2500 A



Version 11: 3200 A



Version 12: 3200 A

The following components of the copper bar connection kit are required for these versions:



Figure 6-43 Connection, part A, 3KC9811-0

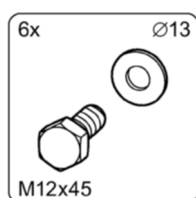


Figure 6-44 Bolt set, part B, 45 mm, 3KC9811-1

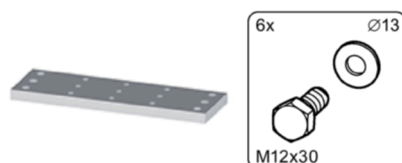


Figure 6-45 Bridging bar, part E, 3KC9818-8

Number of poles	Current rating	Connection, part A (3KC9811-0)	Bolt set, part B, 45 mm (3KC9811-1)	Bridging bar, part E (3KC9818-8)
3-pole	2000 A ... 2500 A	6 x	6 x	3 x
3-pole	3200 A	Included with the transfer switch	6 x	3 x
4-pole	2000 A ... 2500 A	8 x	8 x	4 x
4-pole	3200 A	Included with the transfer switch	8 x	4 x

Mounting versions 9 to 12 copper bar connection kit

1. Insert a connection, part A (3KC9811-0) between every pair of opposite connecting terminals.

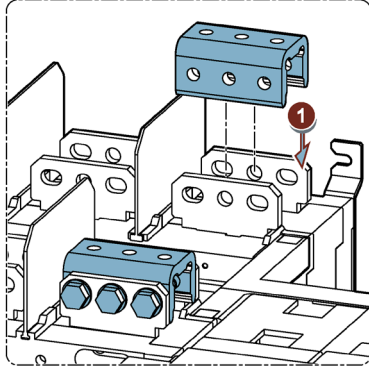


Figure 6-46 Inserting connection, part A

2. Position the bridging bar, part E (3KC9818-8) as shown in the figure on the already mounted parts A.

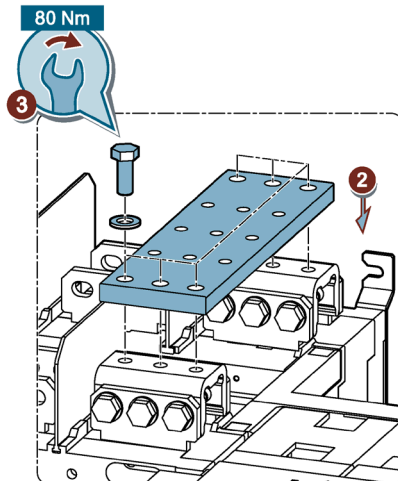


Figure 6-47 Mounting bridging bar, part E

3. Mount the bridging bar with the supplied bolts and washers on the parts A.

- Position the T piece, part C (3KC9811-3) as shown in the figure on the mounted bridging bar.

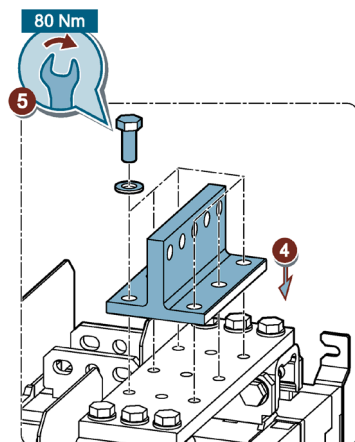


Figure 6-48 Mounting the T piece

- Mount the T piece on the bridging bar with the supplied bolts and washers.

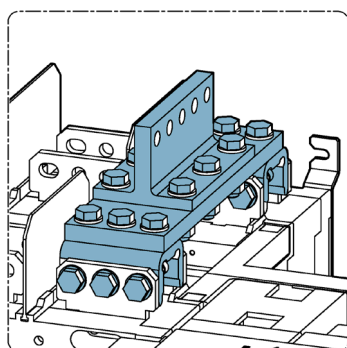


Figure 6-49 Mounting copper bar connection kit, versions 9 to 12, complete

Connecting versions 9 to 12

Versions 9 and 11 as well as versions 10 and 12 are connected to the power supply systems in two different ways:

- Version 9 and 11: Vertically aligned
- Version 10 and 12: Horizontally aligned

The same components are required for versions 9 to 12 as for versions 3 to 6. Mounting is also identical to mounting of versions 3 to 6.

The following versions correspond here:

- Version 9 corresponds to version 3 (vertical, 2000 A to 2500 A)
- Version 10 corresponds to version 4 (horizontal, 2000 A to 2500 A)
- Version 11 corresponds to version 5 (vertical, 3200 A)
- Version 12 corresponds to version 6 (horizontal, 3200 A)

You will find the installation instructions for versions 3 to 6 in the section titled Connecting current ratings 250 A to 1600 A to the main circuit (Page 41).

6.3 Connecting the control circuit

In the following chapter, you will find a description about the connection of the motor operator of the 3KC4 and 3KC8 transfer switching equipment.

Note

The procedure when connecting the motor operator differs in part between the 3KC4 and 3KC8 transfer switching equipment. Please pay particular attention to these important notices.

6.3.1 Inputs and outputs of the motor operator

6.3.1.1 Overview of motor operator

The motor operator has the following Inputs and outputs:

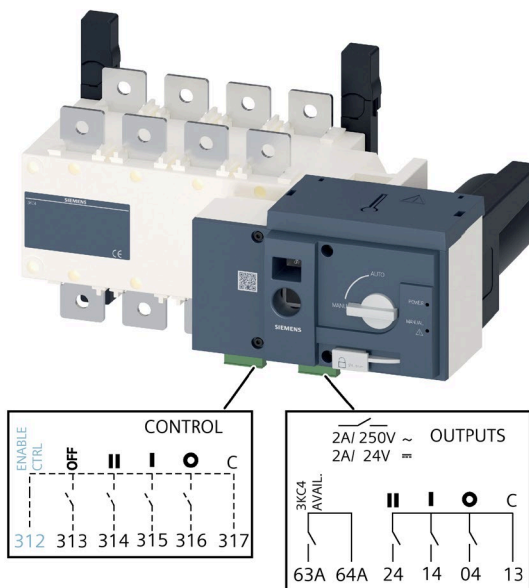



Figure 6-50 Overview of inputs and outputs for 3KC4 and 3KC8 transfer switching equipment

Note

You can find more information on the function of the inputs and outputs in the section titled Functions of the inputs and outputs (Page 100).



6.3.1.2 Connecting the inputs and outputs of the motor operator

The connection of the motor operator of the 3KC4 and 3KC8 transfer switching equipment is described in the following section. The connectors required for this are included in the scope of supply.

 WARNING
Hazardous voltage! Ensure there is no live voltage before connecting the motor operator to the control circuit.

NOTICE
Damage to the device The product is designed for a rated impulse voltage resistance U_{imp} of 12 kV for the main circuit and 4 kV for the motor operator. If you use the product in an application with possible overvoltages of > 4 kV, you must additionally employ suitable measures such as surge arresters to limit these overvoltages to no more than 4 kV.

See the table below for the requirements of the supply lines needed for the connection:

Cu		I_{max}
	1.5 ... 2.5 mm ²	≤ 100 m

Requirements

- Main circuit is disconnected

6.3 Connecting the control circuit

Procedure

1. Check whether the switch on the transfer switching equipment is in the "Manual" position and whether the switch is in the "OFF" position.

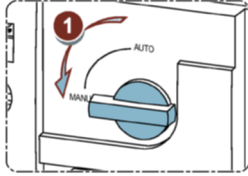
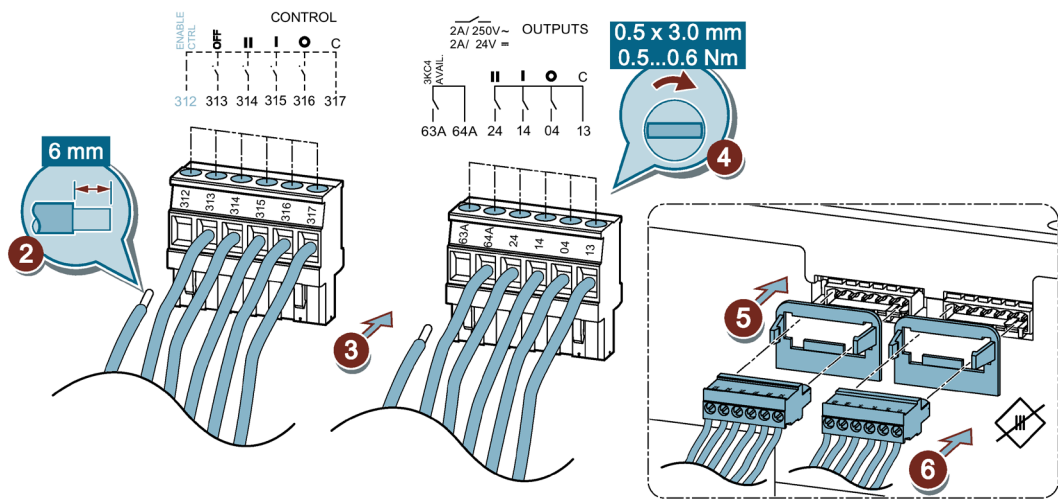


Figure 6-51 Set the switch to the "Manual" position

2. Connect the supply lines with the connector for the control inputs.



 For 3KC8 only

Figure 6-52 Connecting supply cables

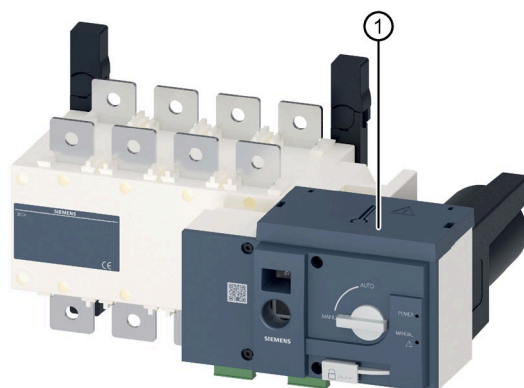
3. Connect the supply lines with the connector for the outputs of the motor operator. You can see the designations of the inputs and outputs in the figure.
4. Tighten the contacts with a screwdriver.
5. Insert the connector in the terminal of the control inputs.
6. Insert the connector in the terminal of the outputs.

6.3.2 Power supply of the motor operator (3KC4 only)

The control circuit of the 3KC4 transfer switching equipment has two inputs for one power supply. These are located under the cover.

Note

On the 3KC8 transfer switching equipment, the control circuit including the motor operator is supplied with power via the inputs of the electronic module.



① Cover

Figure 6-53 Input of power supply, 3KC4 transfer switching equipment

After connecting the inputs and outputs of the transfer switching equipment, the power supply of the motor operator must be connected.

NOTICE
Damage to the device
The transfer switching equipment must only be supplied with a voltage of 230 V. At voltages of 400 V, an additional autotransformer is necessary.

Requirements

- Inputs and outputs are connected

Procedure

1. Press the pushbutton.

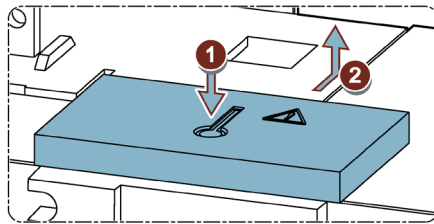


Figure 6-54 Removing the cover cap

2. Slide the flap carefully backwards and remove it.
Inputs 301 and 302 are now accessible.
3. Remove the connector

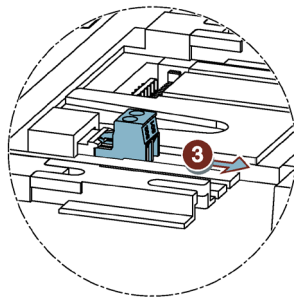


Figure 6-55 Remove the connector

4. Prepare the supply lines in accordance with the figure: N on 302, L on 301.
5. Connect the supply lines with the connector
6. Tighten the terminals.

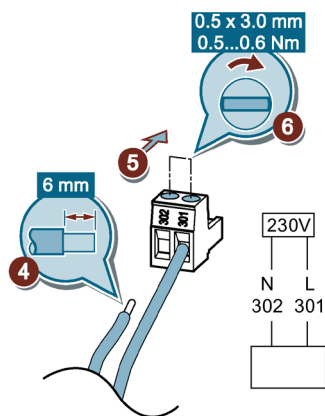


Figure 6-56 Connecting supply cables with connector

7. Connect the connector in accordance with the figure until it audibly engages.

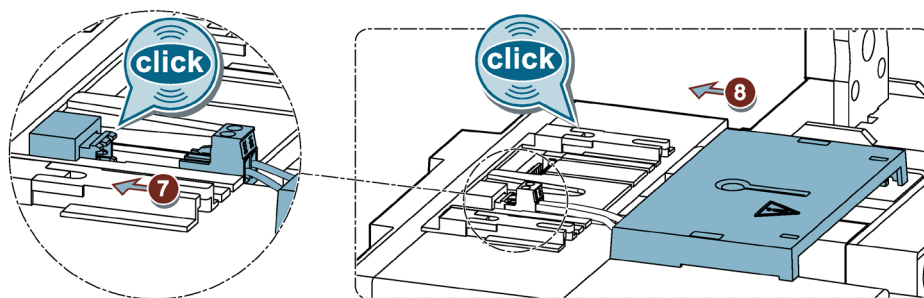


Figure 6-57 Connecting the connector with the transfer switching equipment

8. Replace the cover on the transfer switching equipment.

Note

If the power supply of the 3KC4 transfer switching equipment is not drawn from an external power supply system, separately available accessories are necessary. This is described in the following sections.

6.3.2.1 Mounting and connecting the dual power supply (DPS)

The 3KC4 transfer switching equipment can be supplied from two 230 V AC power supply systems with the dual power supply (3KC9625-1). The dual power supply can be used for all 3KC4 devices.

Properties of the dual power supply

- Active starting from 200 V AC
- Maximum voltage: 288 V AC, frequency: 45 to 65 Hz
- Internal fuse: Each input is protected with a fuse up to 3.15 A.

Mounting the dual power supply

The dual power supply must be mounted on a standard mounting rail.

1. Place the dual power supply (3KC9625-1) from above onto the standard mounting rail using the connection assembly.

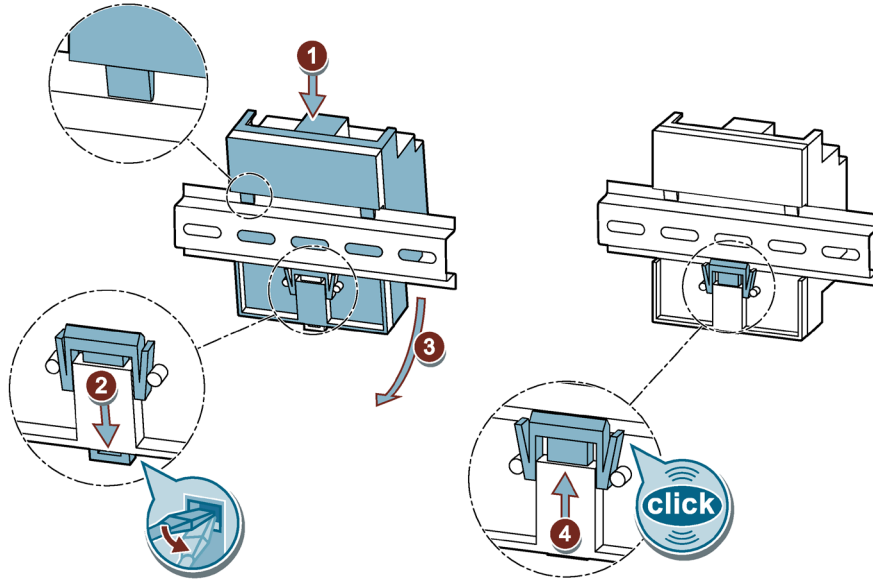


Figure 6-58 Mounting the dual power supply (DPS) on the standard mounting rail

2. Align the clip assembly with a screwdriver as shown in the figure.
3. If you have aligned the plug-in assembly on the underside, press the device carefully to the rear until the plug-in assembly audibly engages also on the underside.

Connecting the dual power supply

See the table below for the requirements of the supply lines needed for the connection:

Cu		U_e = 240 V AC U_{imp} = 4 kV
	0.5 ... 2.5 mm ²	I _e = 3 A
	0.5 ... 1.5 mm ²	

1. Connect the dual power supply (3KC9625-1) with the appropriate tool in accordance with the figure.

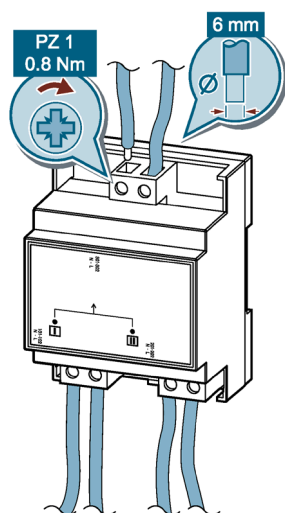


Figure 6-59 Connecting the dual power supply (DPS)

6.3.2.2 Installing and connecting an autotransformer (400 V / 230 V)

The 3-pole transfer switching equipment requires a voltage of 230 V AC to supply the transfer switching equipment. The autotransformer (3KC9824-1) converts the voltage of 400 V AC that is active between the phases to the required voltage of 230 V AC.

Installing an autotransformer

1. Mount the autotransformer at the desired position with 4 bolts in accordance with the figure.

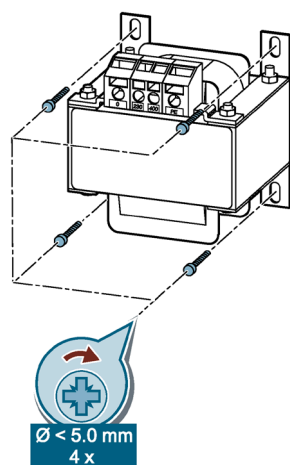





Figure 6-60 Installing an autotransformer

Connecting an autotransformer

See the table below for the requirements of the supply lines needed for the connection:

Cu		200 VA U_e = 400 / 230 V U_{imp} = 2.5 kV
	0.5 ... 2.5 mm ²	
	0.5 ... 1.5 mm ²	

On the autotransformer, phase L1 is transformed in each case, and phase L3 is used as the conductor. Please proceed as follows to connect the autotransformer correctly:

1. Connect the supply lines with the autotransformer in accordance with the figure.

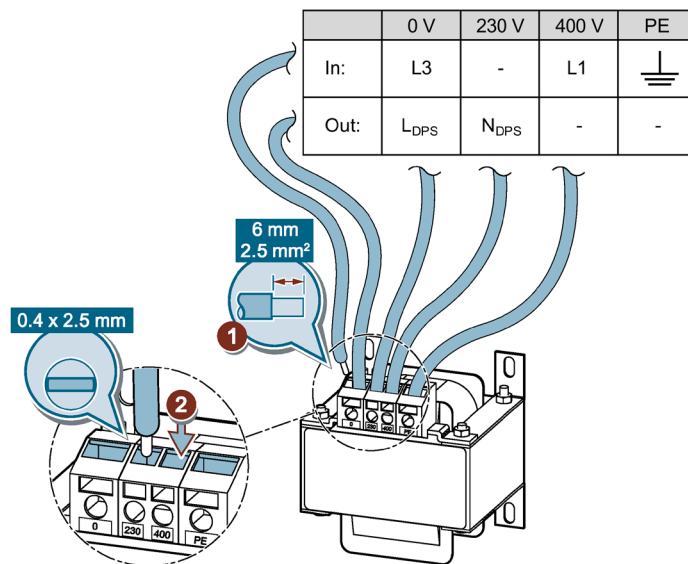


Figure 6-61 Connecting an autotransformer

2. Tighten the contacts with a screwdriver.

6.3.3 Auxiliary switch of the transfer switching equipment

As well as the named outputs, the transfer switching equipment of sizes 2000 A to 3200 A contain further outputs of already installed auxiliary switches that indicate switch positions I and II.

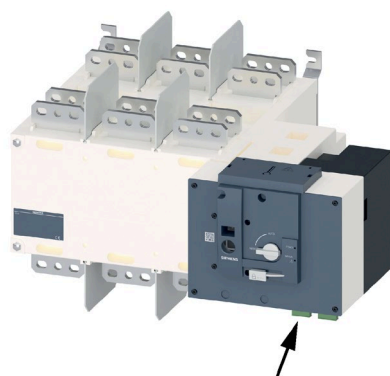


Figure 6-62 Auxiliary switches, current ratings 2000 A to 3200 A

The auxiliary switch has the following outputs:

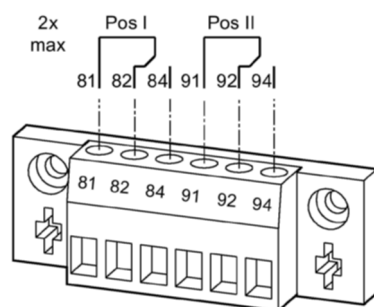


Figure 6-63 Outputs of the auxiliary switch

The outputs have the same PIN designation twice.

If auxiliary switches in addition to the above listed outputs are required for current ratings 250 A to 1600 A, you can optionally install up to 2 auxiliary switches.

6.3.3.1 Installing auxiliary switches 250 A to 630 A

The scope of supply of the 3KC9803-1 auxiliary switch includes the auxiliary switch with connected plug and the bolts required for mounting.

You can install no more than 2 auxiliary switches one above the other.



Figure 6-64 3KC9803-1 auxiliary switch

! WARNING

Hazardous voltage!

Ensure there is no active voltage before beginning to install the auxiliary switches.

Requirements

- Power supply is switched off

Procedure

1. Disassemble the motor operator in accordance with the section titled Motor operator (Page 164).
2. Place the auxiliary switch at the corresponding position.

3. Fix the auxiliary switch to the transfer switching equipment.
 - When installing 1 auxiliary switch use 4 short bolts M3 x 18 mm.
 - When installing 2 auxiliary switches use 4 long bolts M3 x 30 mm.

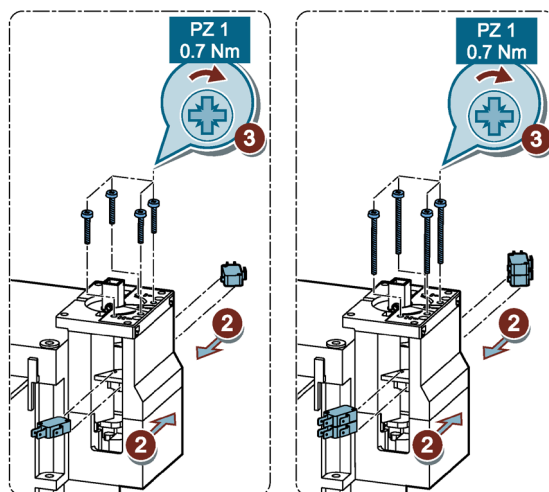


Figure 6-65 Installing auxiliary switches

4. After installing the auxiliary switch, place the motor operator on the transfer switching equipment again.

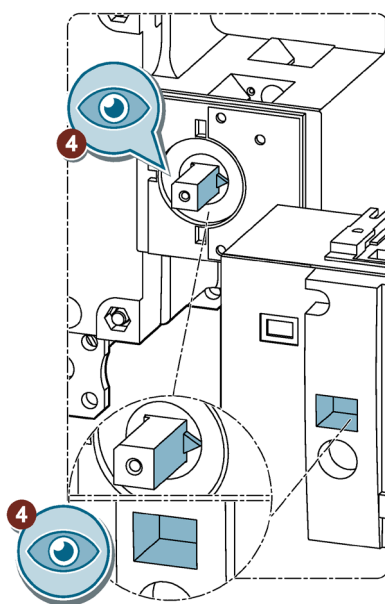


Figure 6-66 Installing the motor operator on the transfer switching equipment

Note

Make sure the switch position shown in the auxiliary switch display is identical to that of the transfer switching equipment.

5. Install the motor operator on the transfer switching equipment with the bolts.

6.3.3.2 Installing auxiliary switches of current rating 800 A to 1600 A

The scope of supply of the 3KC9803-2 auxiliary switch includes the auxiliary switch with connected plug and the bolts required for mounting.

You can install no more than 2 auxiliary switches one above the other.



Figure 6-67 Auxiliary switch 3KC9803-2

! WARNING

Hazardous voltage!

Ensure there is no active voltage before beginning to install the auxiliary switches.

Requirements

- Power supply is switched off

Procedure

1. Disassemble the motor operator in accordance with the section titled Motor operator (Page 164).
2. Place the auxiliary switch at the corresponding position and secure it to the transfer switching equipment.
 - When installing 1 auxiliary switch use 4 short bolts M3 x 18 mm.
 - When installing 2 auxiliary switches use 4 long bolts M3 x 30 mm.

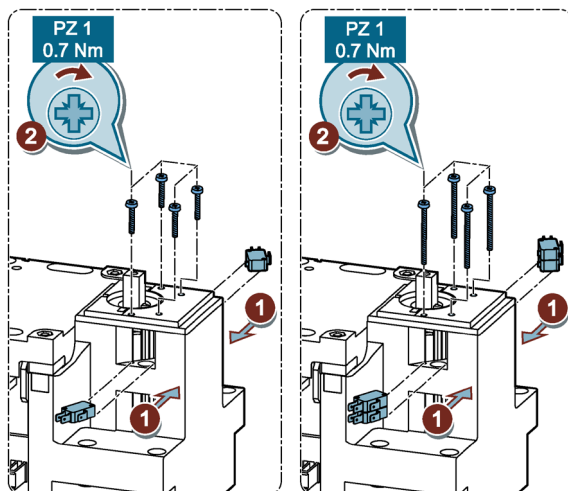


Figure 6-68 Installing auxiliary switches 800 A to 1600 A

3. Lay the cable of the auxiliary switch around the transfer switching equipment in accordance with the figure.

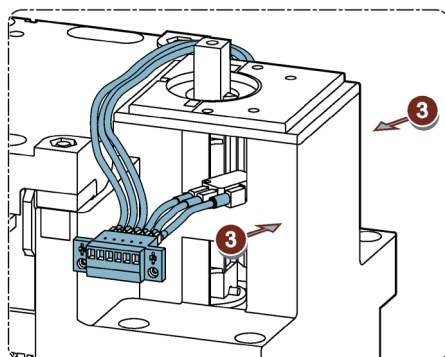


Figure 6-69 Arranging auxiliary switch cables 800 A to 1600 A

6.3 Connecting the control circuit

4. Remove the H piece of the transfer switching equipment and drill out the pre-drilled holes.

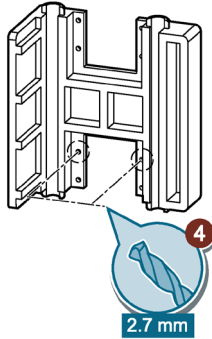


Figure 6-70 Drilling out H piece

5. Mount the terminal of the auxiliary switch in the H piece in accordance with the figure.
 - When installing 1 auxiliary switch, mount the terminal in the lower hollow of the H piece.
 - When installing 2 auxiliary switches, mount the terminals in the lower or upper hollow of the H piece.

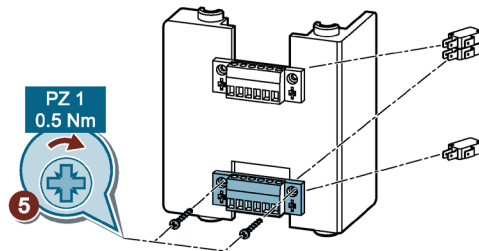


Figure 6-71 Mounting the auxiliary switch terminal on the H piece

6. Secure the H piece again on the transfer switching equipment.

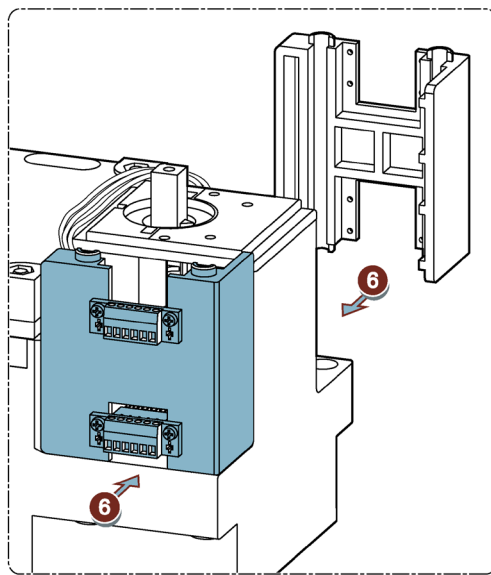


Figure 6-72 Securing H piece

7. After installing the auxiliary switch, place the motor operator on the transfer switching equipment again.

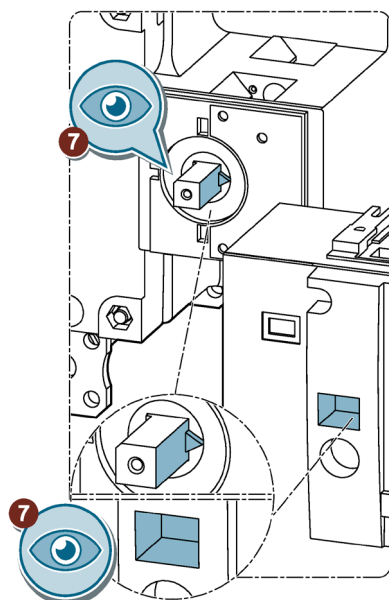


Figure 6-73 Installing the motor operator on the transfer switching equipment

Note

Make sure the switch position shown in the auxiliary switch display is identical to that of the transfer switching equipment.

8. Install the motor operator on the transfer switching equipment with the bolts.

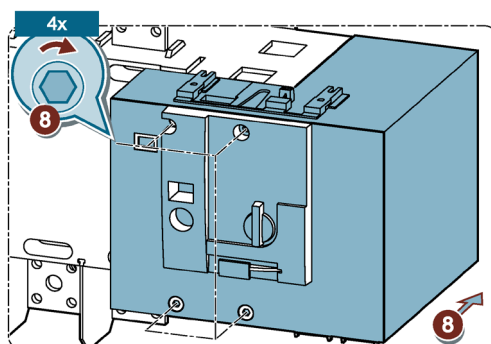


Figure 6-74 Installing motor operator

6.3.4 Inputs and outputs of the electronic module (3KC8 only)

The following inputs and outputs are located on the top of the electronic module of the 3KC8 automatic transfer switching equipment.

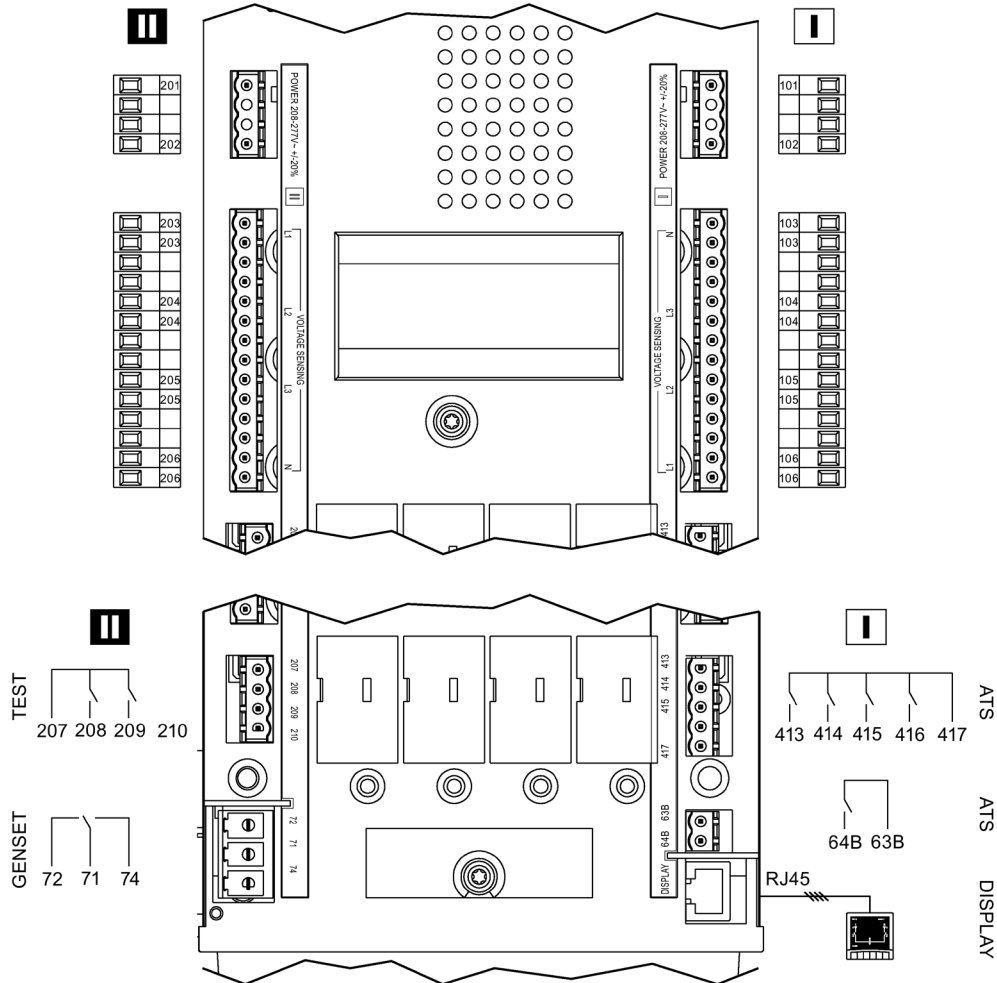


Figure 6-75 Inputs and outputs of the electronic module

The description of the inputs and outputs of the electronic module (3KC8 only) can be found in chapter Inputs and outputs of the electronic module (3KC8 only) (Page 108).

6.3.5 Connecting the inputs and outputs of the electronic module (3KC8 only)

Additional accessories are required to connect the electronic module of the 3KC8 transfer switching equipment and thus also the transfer switching equipment itself. Different versions can be selected depending on type and requirement.

Requirements for connecting the accessories

Network types:

- Three-phase 4-wire network with neutral
- Three-phase 3-wire network without neutral
- Single-phase network with neutral

Connecting the load:

- Load on the top
- Load on the bottom

The required accessories and their installation are described in the following sections.

See also the section titled Accessories (Page 139).

6.3.5.1 Installing accessories for the electronic module

The accessories required for connecting the electronic module depend on the current rating, the number of poles and the load failure at the top/bottom.

Note

The accessories must always be attached on the line side.

Note

When correctly installed, the cables for connecting the electronic module are always on the right-hand side (on the electronic module side).

Installing accessories of sizes 250 A to 3200 A

1. Attach the power supply kit between the connecting terminals of source I and source II.
Connect the **black** cables with the terminals of **source I** and the **red** cables with the terminals of **source II**.
2. Install the accessories between the connecting terminals in accordance with the figure.
From size 800 A, FASTON plug-in connectors are used.

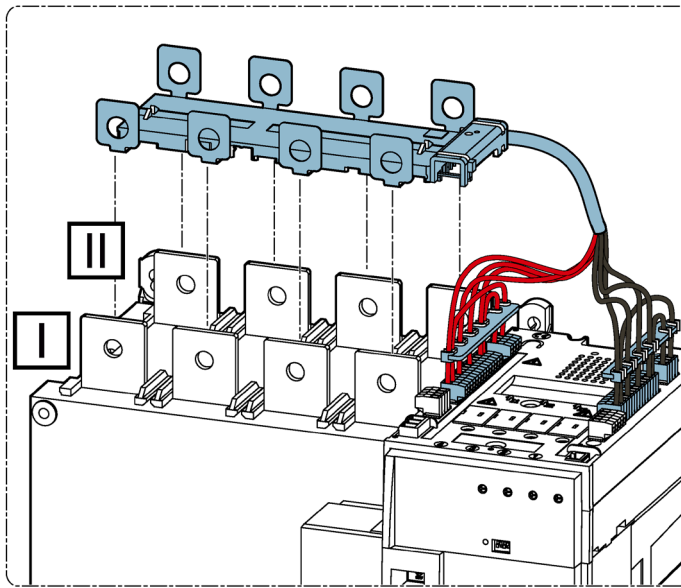


Figure 6-76 Installing size 250 A to 630 A (4-pole)

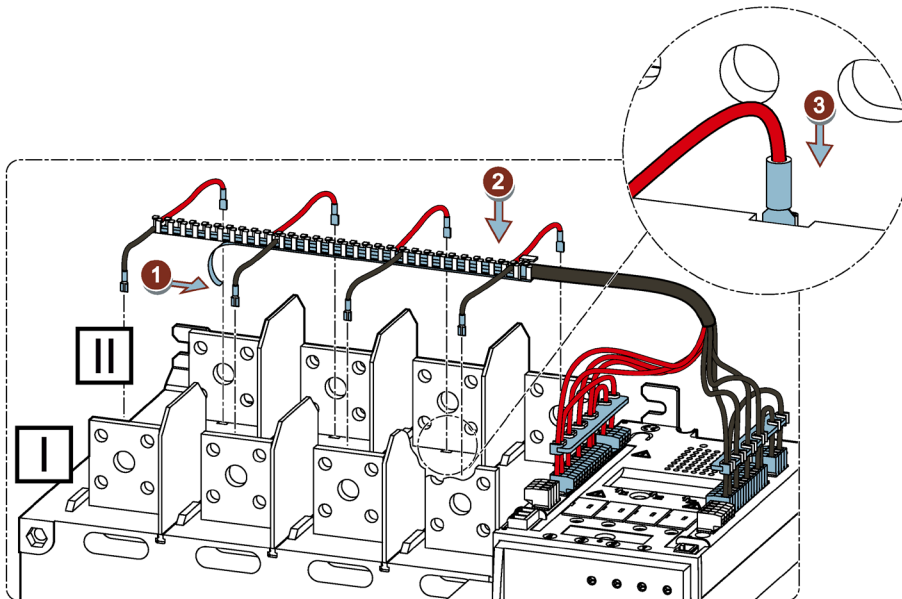


Figure 6-77 Installing size 800 A to 1600 A (4-pole)

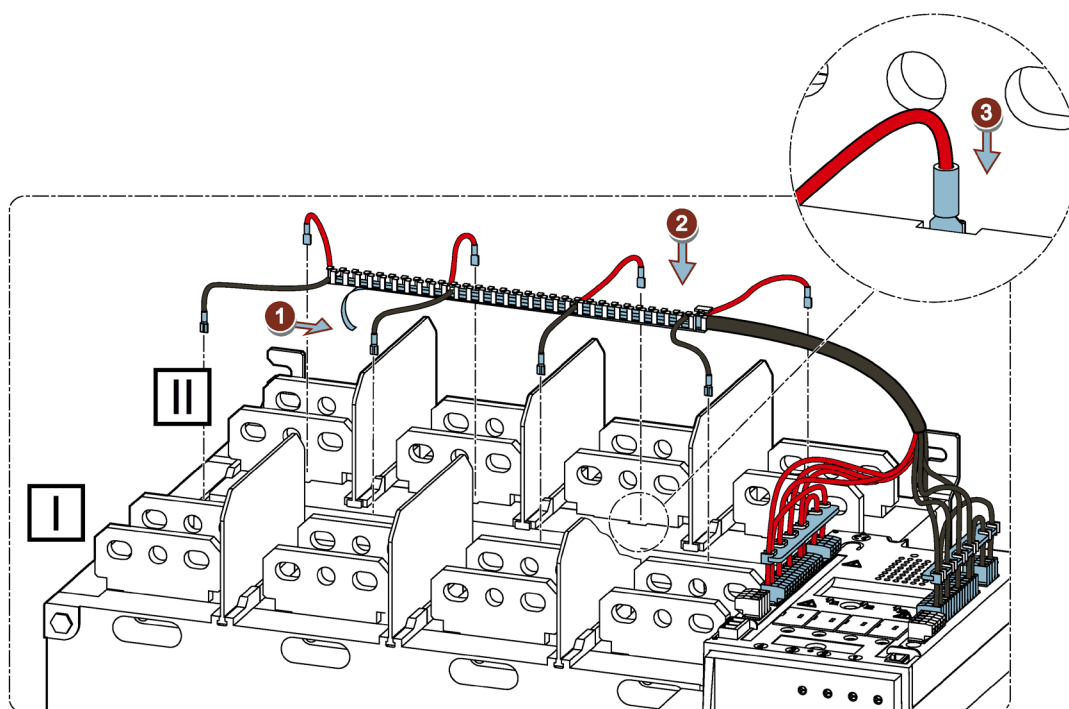


Figure 6-78 Installing size 2000 A to 3200 A (4-pole)

3. Connect the main circuit as described in the sections Connecting current ratings 250 A to 1600 A to the main circuit (Page 41) or Connecting current ratings 2000 A to 3200 A to the main circuit (on the line side) (Page 50).

Note

On the 3KC8 transfer switching equipment of sizes ≥ 2000 A, the accessories must be attached between the two terminals that are connected using the copper bar connection kit.

6.3.5.2 Connecting power supply kit 3KC9830-, 3KC9831- (4-pole)

The power supply kit 3KC9830-, 3KC9831- for 4-pole applications with neutral conductor enables voltage measurement and thus automatic transfer of the transfer switching equipment (ATSE).

As well as the voltage measurement, the electronic module is supplied with power via inputs 101-102 and 201-202.

After you have installed the power supply kit between the connecting terminals in accordance with the section titled Installing accessories for the electronic module (Page 83), you can connect it with the electronic module. The following inputs are connected with the cable:

- Inputs for the power supply (101-102 and 201-202)
- Inputs for voltage measurement (103-106 and 203-206)

6.3 Connecting the control circuit

1. To connect the accessories with the electronic module, proceed as shown in the figure.

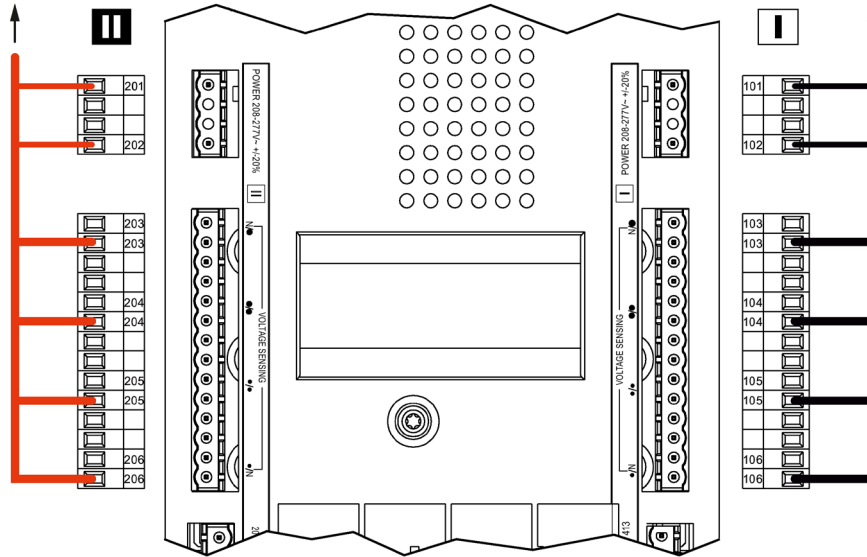


Figure 6-79 Connecting power supply kit 3KC9830-, 3KC9831-.

The following figure shows a 3KC9830-, 3KC9831- power supply kit for 4-pole applications with neutral.

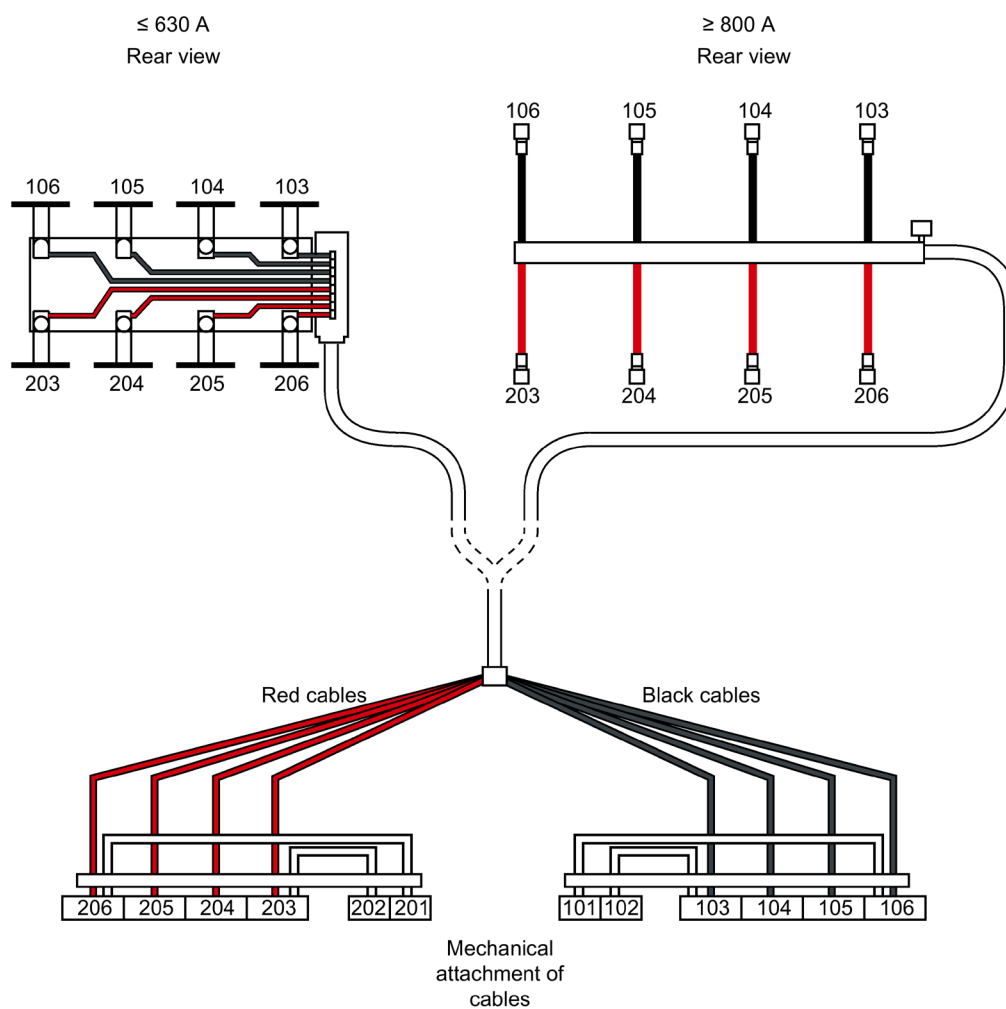
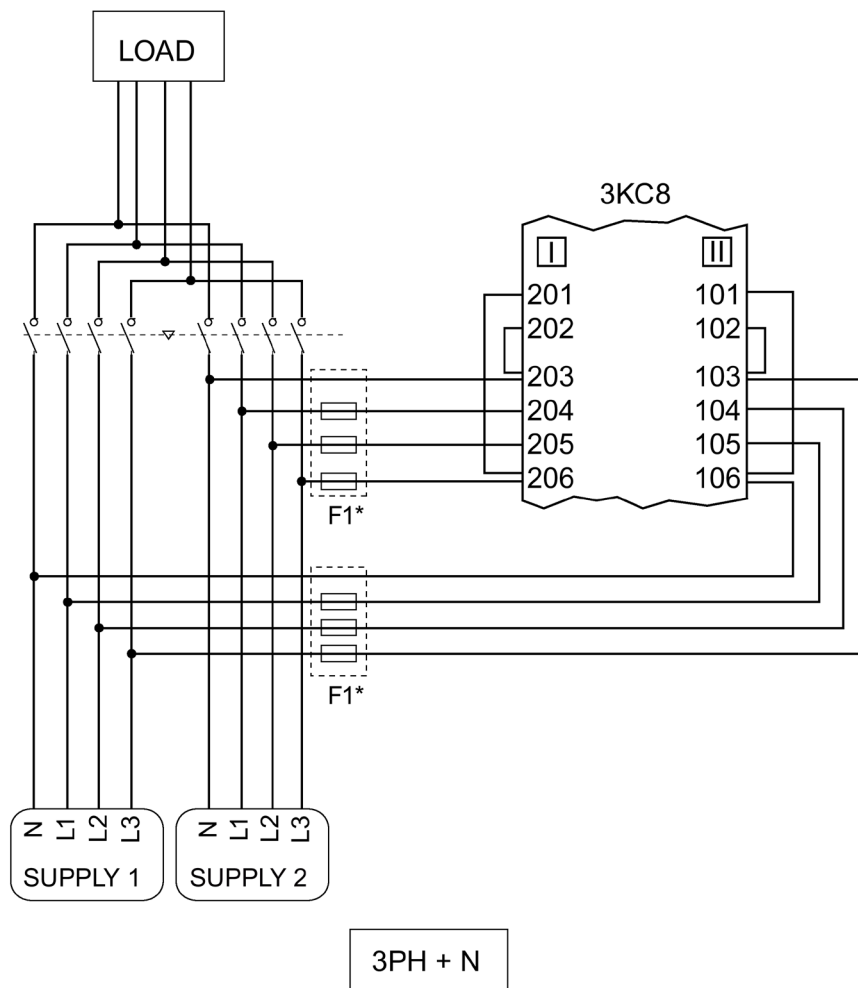


Figure 6-80 3KC9830-, 3KC9831- power supply kit for 4-pole applications (3KC9831- for fastening on top of the transfer switching equipment is shown here)

A typical connection of sources I and II (3PH + N) to the electronic module of the 3KC8 is shown in the circuit diagram below:

6.3 Connecting the control circuit



* The F1 fuses are not required when using the 3KC9830-, 3KC9831- power supply kits.

Figure 6-81 Circuit diagram for a typical connection of the sources (3PH + N) to the electronic module

If the power supply kit is not used, the following fuses are to be fitted:

F1	3 x 3NW6004-1 1 x 3NW7033	4 A, gG
----	------------------------------	---------

Note

The F1 fuses must be installed as closely as possible to the tap.

6.3.5.3 Connecting the auxiliary conductor terminal 3KC9822-, 3KC9832- for a three-phase 3-wire network (3-pole)

The auxiliary conductor terminal connection kit 3KC9822-, 3KC9832- for three-phase 3-wire networks without neutral enables voltage measurement and thus automatic transfer of the transfer switching equipment (ATSE).

Note

The auxiliary conductor terminal connection kit contains only voltage measurement by inputs 103-106 and 203-206. The power supply for the transfer switching equipment must be implemented using two 3KC9824-1 autotransformers (400 V / 230 V).

After you have mounted the auxiliary conductor terminal connection kit between the connecting terminals in accordance with the section titled Installing accessories for the electronic module (Page 83), you can connect the electronic module with the accessories. In doing so, the inputs for voltage measurement (103-106 and 203-206) are connected.

1. To connect the accessories with the electronic module, proceed as shown in the figure.
 - With infeed at the bottom: Connect the electronic module with the 3KC9822- auxiliary conductor terminal connection kit

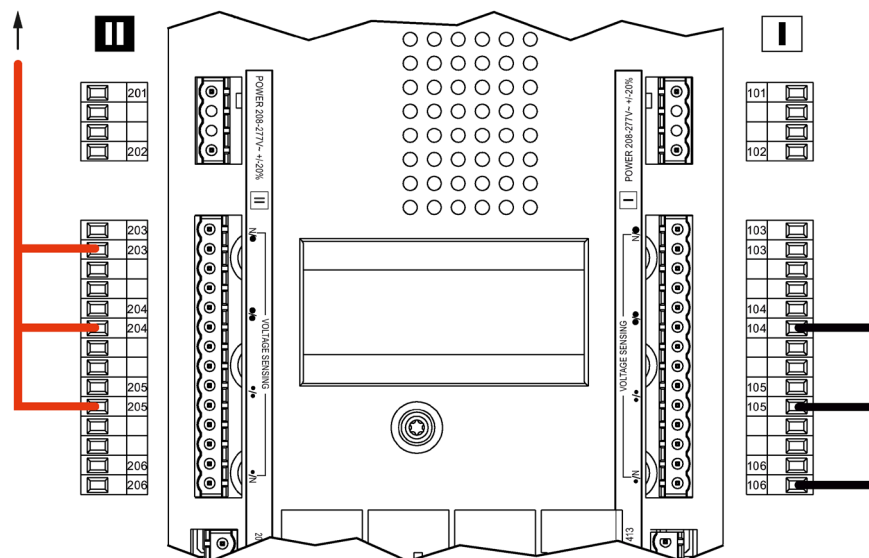


Figure 6-82 Connecting the auxiliary conductor terminal connection kit for three-phase 3-wire networks

The following figure shows the 3KC9822-, 3KC9832- auxiliary conductor terminal connection kit for 3-pole applications without neutral.

6.3 Connecting the control circuit

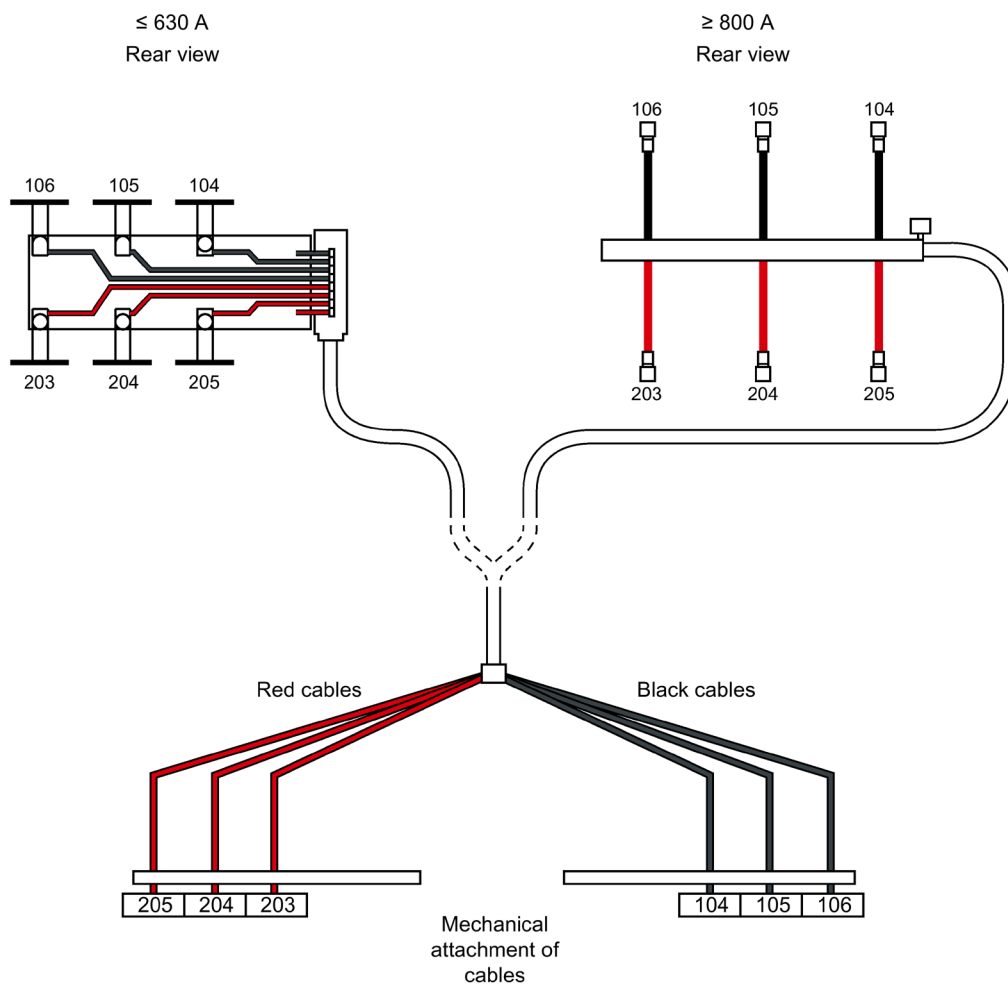
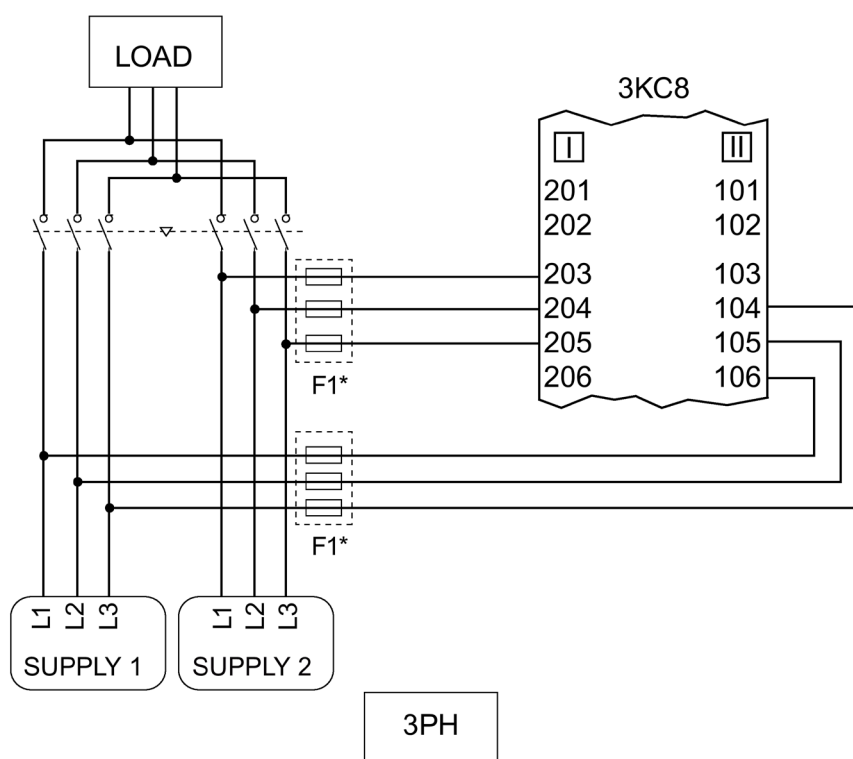


Figure 6-83 3KC9822-, 3KC9832- auxiliary conductor terminal connection kit for 3-pole applications without neutral (3KC9832- for fastening on top of the transfer switching equipment is shown here)

A typical connection of sources I and II (3PH) to the electronic module of the 3KC8 is shown in the circuit diagram below:



* The F1 fuses are not required when using the 3KC9822-, 3KC9832- auxiliary conductor terminal connection kits.

Figure 6-84 Circuit diagram for a typical connection of the sources (3PH) to the electronic module

Note

The complete circuit diagram with connection to the power supply can be found in section Circuit diagram for the 3KC8 transfer switching equipment - 3-pole transfer switching equipment (Page 32).

If the auxiliary conductor terminal connection kit is not used, the following fuses are to be fitted:

F1	3 x 3NW6004-1 1 x 3NW7033	4 A, gG
----	------------------------------	---------

Note

The F1 fuses must be installed as closely as possible to the tap.

6.3.5.4 Connecting power supply kit 3KC9833-, 3KC9834- for single-phase network

The power supply kit 3KC9833-, 3KC9834- for 2-pole applications consists of one phase and a neutral conductor. On the one hand, it includes voltage measurement by the relevant inputs (103 and 106 as well as 203 and 206), and on the other, it supplies the electronic module with power.

After you have mounted the power supply kit between the connecting terminals in accordance with the section titled Installing accessories for the electronic module (Page 83), you can connect the electronic module with the accessories. The following inputs are connected with the cable:

- Inputs for power supply (101 and 102 as well as 201 and 202)
- Inputs for voltage measurement (103 and 106 as well as 203 and 206)

1. To connect the accessories with the electronic module, proceed as shown in the figure.

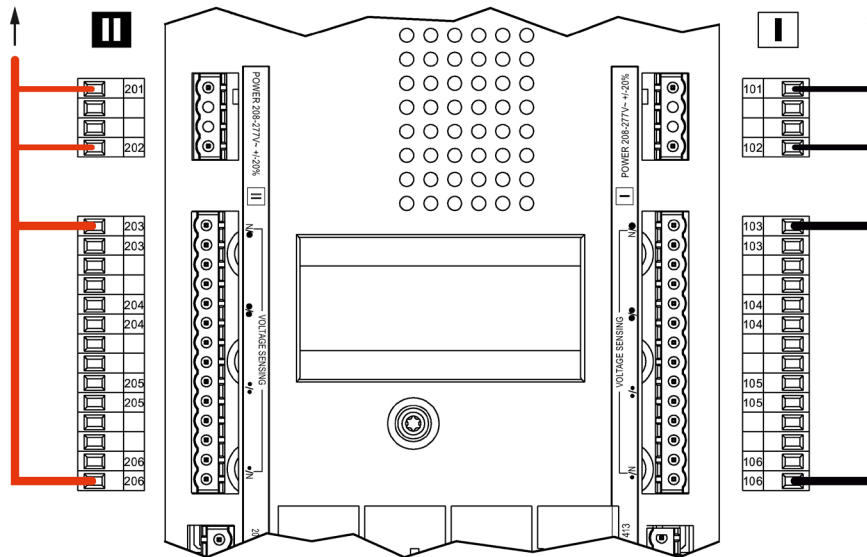


Figure 6-85 Connecting the power supply kit for single-phase networks

The following figure shows a 3KC9833-, 3KC9834- power supply kit for a single-phase network

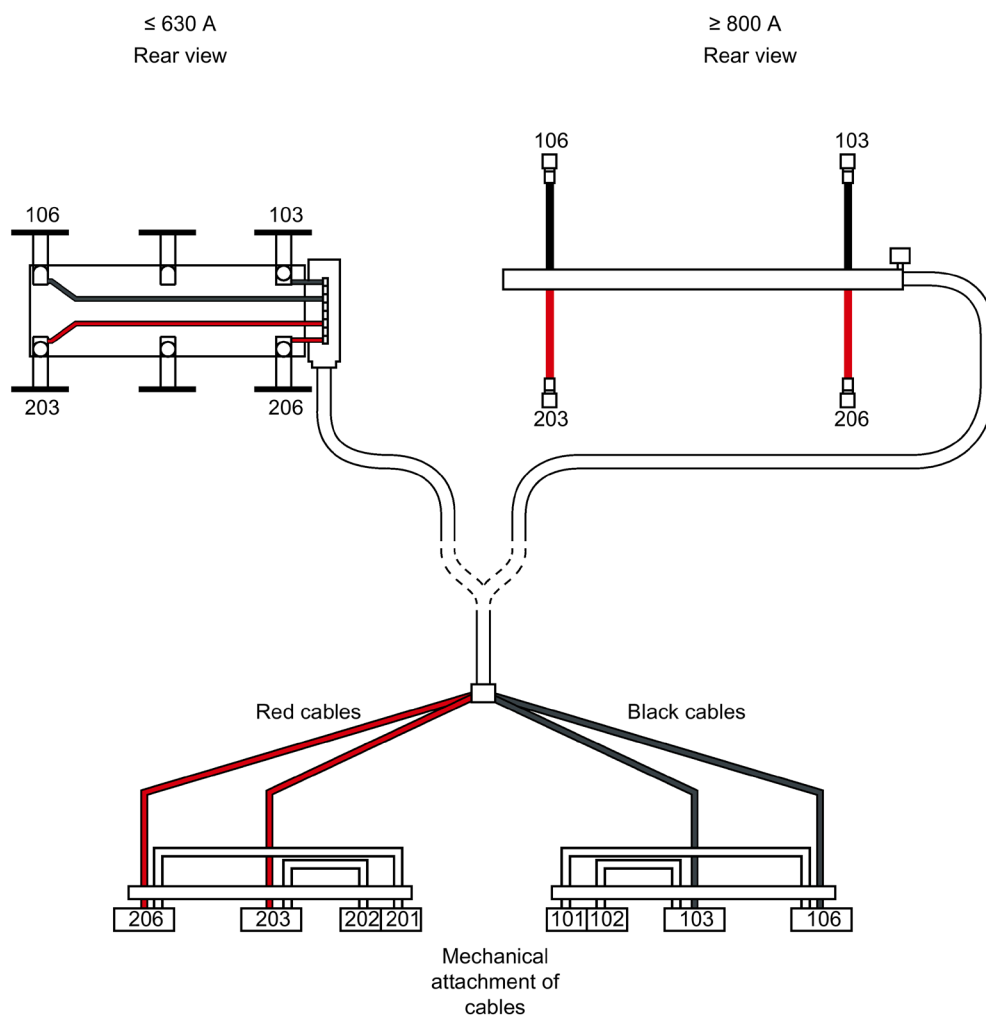
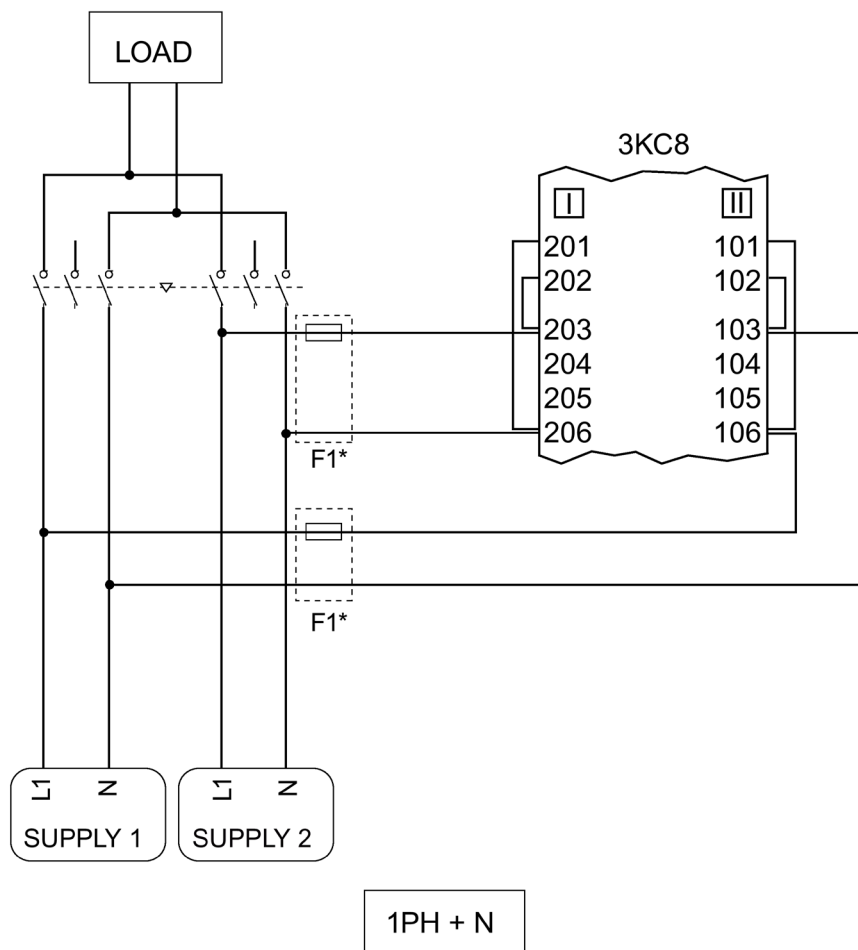


Figure 6-86 3KC9833-, 3KC9834- power supply kit for a single-phase network (3KC9834- for fastening on top of the transfer switching equipment is shown here)

A typical connection of sources I and II (1PH + N) to the electronic module of the 3KC8 is shown in the circuit diagram below:

6.3 Connecting the control circuit



* The F1 fuses are not required when using the 3KC9833-, 3KC9834- power supply kits.

Figure 6-87 Circuit diagram for a typical connection of the sources (1PH + N) to the electronic module

If the power supply kit is not used, the following fuses are to be fitted:

F1	1 x 3NW6004-1 1 x 3NW7013	4 A, gG
----	------------------------------	---------

Note

The F1 fuses must be installed as closely as possible to the tap.

Operation

The following content is described in this chapter:

- Operating modes of the 3KC4 and 3KC8 transfer switching equipment
- Names and descriptions of the functions of the inputs and outputs
- Programming the electronic module (3KC8 transfer switching equipment only)

7.1 Operating modes of the transfer switching equipment

The performance range of the Siemens 3KC4 and 3KC8 transfer switching equipment encompasses in principle 3 operating modes:

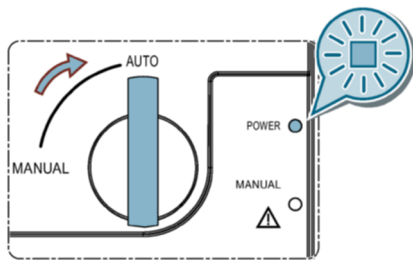


Figure 7-1 Automatic mode (3KC8) / remote mode (3KC4)

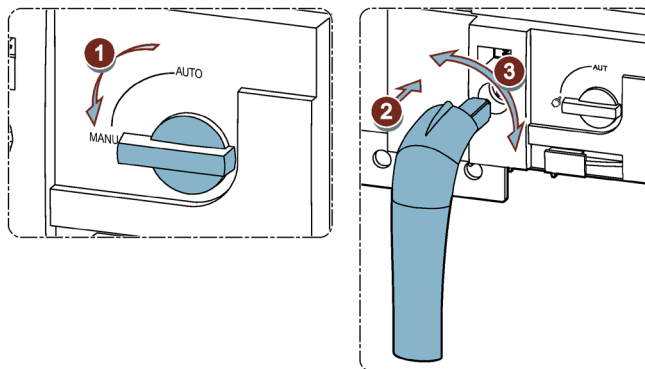


Figure 7-2 Manual operation

7.1 Operating modes of the transfer switching equipment

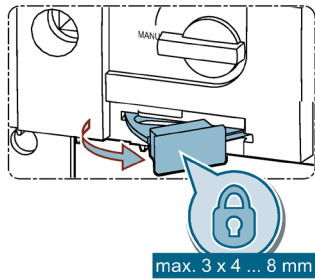


Figure 7-3 Padlocking mode

7.1.1 Remote mode

Remote mode of the 3KC4 and 3KC8 transfer switching equipment is enabled by inputs 312 - 317 on the motor operator. The transfer switching equipment is switched to the different switch positions by means of these inputs.

The control logic is described in the section titled Remote mode (Page 118) and the control inputs are described in the section titled Inputs and outputs of the motor operator (Page 101).

Note

For the 3KC8 transfer switching equipment: By closing contacts 312 and 317 on the motor operator, automatic mode of the electronic module is prevented, and the 3KC8 transfer switching equipment can be used as remotely operated transfer switching equipment (RTSE).

Activating remote mode

1. Turn the switch on the motor operator from the "Manual" position to the "Auto" position to change from manual operation to remote mode.

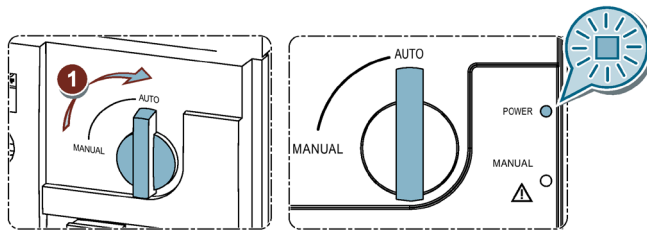


Figure 7-4 Changing to the "Auto" position

The "Power" LED is lit.

2. Close inputs 312 and 317. The operation can be controlled using inputs 313-316. The "Remote" LED on the electronic module lights up and the "Auto" LED is off.

Note

You **cannot** activate remote mode in the following cases:

- The handle is located in the assembly.
 - The transfer switching equipment is locked using a padlock (padlocking mode).
-

7.1.2 Manual operation

In "Manual operation" mode, the transfer switching equipment can be changed manually to a switch position using the handle included. You can read the direction of rotation using the marking on the handle.

Manual operation can be activated for maintenance work, for example, or in emergencies.

Manual operation

- blocks remote control using the inputs (312-317) as well as automatic mode of the electronic module (3KC8 only),
- allows attachment of the handle.
- allows locking using a padlock if the handle is not attached (padlocking mode).

Setting "Manual operation" mode

1. Turn the switch on the motor operator from the "Auto" position to the "Manual" position to change from remote / automatic mode (3KC8 only) to manual operation.
2. Attach the handle.

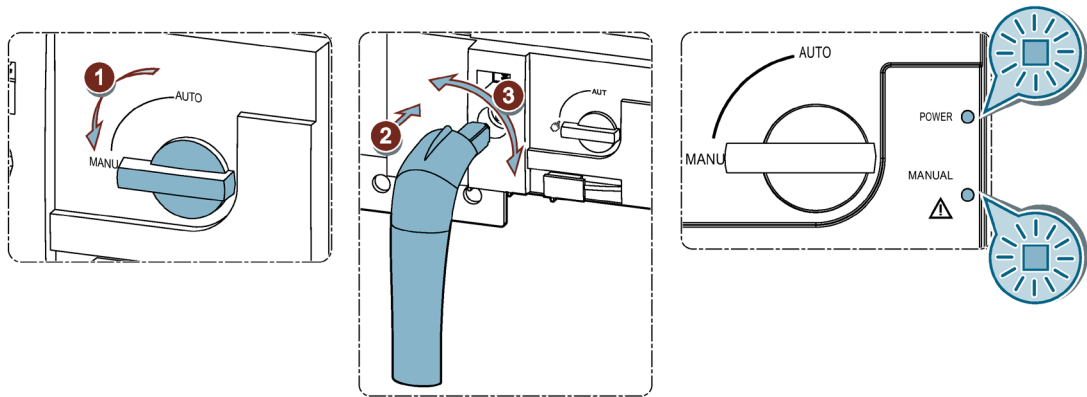


Figure 7-5 Setting manual operation

The "Power" LED and the warning LED light up on the motor operator. On the 3KC8 transfer switching equipment, the "Manual" LED on the electronic module also lights up.

3. Turn the handle 90° clockwise/counter-clockwise according to the switch position to carry out a transfer.

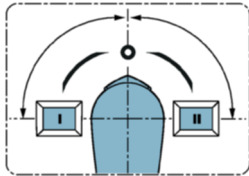


Figure 7-6 Direction of manual transfer

7.1.3 Padlocking mode

The 3KC4 and 3KC8 transfer switching equipment can be secured in position O (OFF) using a padlock. This can effectively prevent operation of the transfer switching equipment by unauthorized persons.

Up to 3 padlocks with diameters between 4 and 8 mm can be attached on the motor operator assembly.

Padlocking mode

- blocks remote control using inputs (312-317) as well as automatic mode of the electronic module (3KC8 transfer switching equipment only),
- prevents attachment of the handle.

Note

The transfer switching equipment can only be locked under the following conditions:

- The transfer switching equipment is in "manual operation" mode
- The handle is removed.

Setting padlocking mode

1. Remove the handle if applicable
2. Turn the switch on the motor operator from the "Auto" position to the "Manual" position to change from remote / automatic mode (3KC8 transfer switching equipment only) to manual operation.

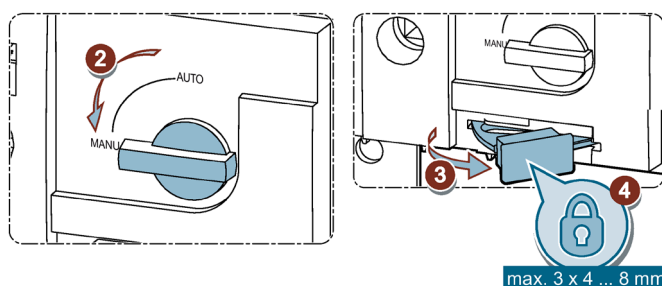


Figure 7-7 Setting padlocking mode

3. Pull the locking device out of the motor operator and secure it with a padlock.

7.1.4 Automatic mode (3KC8 only)

In automatic mode, the 3KC8 transfer switching equipment is controlled by the automatic system of the electronic module. This switches the transfer switching equipment to the different switch positions depending on source availability.

To enable a transfer, the electronic module must be programmed according to source requirements. Programming is described in the section titled Automatic mode - programming of the electronic module (3KC8 only) (Page 125).

Automatic mode

- activates the controller and automatic mode of the electronic module,
- prevents padlocking mode,
- prevents attaching of the handle.

Setting automatic mode

1. Turn the switch on the motor operator from the "Manual" position to the "Auto" position to change from manual operation to automatic mode.

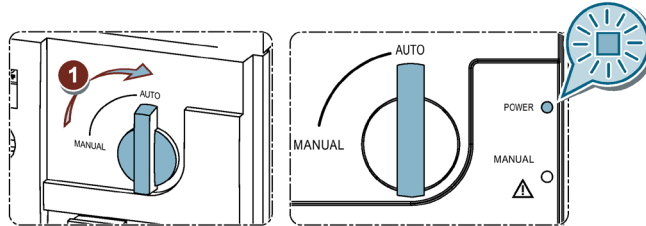


Figure 7-8 Activating automatic mode

The "Power" LED on the motor operator shows a continuous green light.

The "Auto" LED on the electronic module shows a continuous green light or flashes green (depending on the default with regard to the timer).

The "Ready" LED on the electronic module shows a continuous green light.

Note

You **cannot** activate remote mode in the following cases:

- The handle is located in the assembly.
 - The transfer switching equipment is locked using a padlock (padlocking mode).
-

7.2 Functions of the inputs and outputs

In this section, the functions of the inputs and outputs described in the section titled Connecting the control circuit (Page 66) are explained in more detail.

Note

Some points in this chapter are only relevant for the 3KC4 or 3KC8 transfer switching equipment. Please pay particular attention to these important notices.

7.2.1 Inputs and outputs of the motor operator

The inputs of the motor operator are located in the following positions:

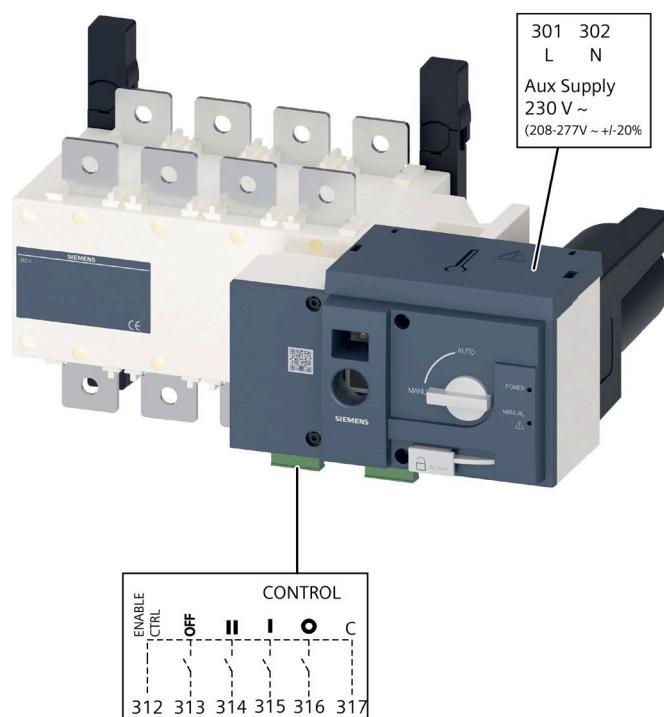


Figure 7-9 Inputs of the motor operator

Note

In the case of the 3KC8 transfer switching equipment, the inputs for the power supply are located on the electronic module. These are described in the section titled Inputs for voltage measurement and power supply (Page 109).

On the one hand, the motor operator is supplied with power via its inputs (3KC4 only), and on the other, remotely operated transfer switching is enabled via these inputs.

Designation	Pin	Meaning	Explanation	Properties	Recommended cable cross-section
Power supply (3KC4 only)	301	-	Power supply	208 – 277 V AC ± 20%; 45 ... 65 Hz	1.5 - 2.5 mm ²
	302	-	Power supply		
Control inputs of the motor operator	312	Enable Ctrl	Remote mode enabled (if connected to 317)	Use only with floating contacts and supply via pin 317	1.5 - 2.5 mm ²
	313	OFF	Priority command for the OFF position (if connected to input 317)		

7.2 Functions of the inputs and outputs

Designation	Pin	Meaning	Explanation	Properties	Recommended cable cross-section
	314	II	Command for switch to position II (if connected to input 317)	Maximum cable length: 100 m	
	315	I	Command for switch to position I (if connected to input 317)		
	316	O	Command for switch to position O (if connected to input 317)		
	317	C	Common control terminal for inputs 312-316		

NOTICE

Damage to the device

Do not connect inputs 312 to 317 to the power supply.

Functions of the inputs for the power supply of the motor operator (3KC4 only)

Inputs 301 and 302

Inputs 301 and 302 are used for supplying power to the motor operator. This must be between the following ranges:

- 208 – 277 V AC \pm 20 % (166 – 332 V AC)
- 45 – 65 Hz

Current input:

- 10 mA (standby mode)
- 15 A max. (transfer mode)

Overvoltage protection:

- 4.8 kV - 1.2 / 50 μ s

Permissible cable cross-section:

- Minimum: 1.5 mm²
- Maximum: 2.5 mm²

Functions of the control inputs of the motor operator

There are 5 control inputs on the motor operator of the 3KC4 and 3KC8 transfer switching equipment. Pin 317 is used as the common control terminal for control inputs 312-316.

NOTICE
Damage to the device
Do not connect the control inputs to an external power supply.

On the 3KC8 transfer switching equipment, the transfer is implemented using the electronic module. By closing contacts 312 and 317, the electronic module can be bridged and the transfer switching equipment can be used as remotely operated transfer switching equipment (RTSE). This means the electronic module of the 3KC8 transfer switching equipment is not active while contacts 312 and 317 are connected.

Note

When using automatic mode of the electronic module of the 3KC8 transfer switching equipment, leave control inputs 312-317 open.

Pin 312 - Enable Ctrl: Activating remote mode

This input enables remotely operated transfer switching for the 3KC4 and 3KC8 transfer switching equipment. To activate the remote control, pin 312 must be connected to pin 317 and the switch on the motor operator must be turned to the "Auto" position.

Inputs 314-316 (command for transfer to position III/O) can be activated using input 312. If pin 312 is not closed, remotely-operated transfer switching cannot take place (exception: OFF command with priority - Pin 313).

On the 3KC8 transfer switching equipment, automatic mode of the electronic module is deactivated by closing pins 312 and 317. The "Remote" LED is lit.

Pin 313 - OFF: Command for the OFF position with priority

Closing of this contact has the result that the transfer switching equipment is switched to the OFF (O) position with priority over all other electrical commands (inputs 312 - 316, electronic module). To enable execution of this priority command, this pin must be shorted to pin 317.

This input is independent of input 312 and can thus also be activated when that input is not shorted. However, this requires the transfer switching equipment to be in the "Auto" position.

The transfer switching equipment remains in position O when pins 313 and 317 are shorted. Transfer to other switch positions is prevented. Only after opening the pin can the transfer switching equipment implement new commands.

As long as pins 313 and 317 are shorted, the warning LED on the motor operator is lit.

On the 3KC8 transfer switching equipment, automatic mode of the electronic module is deactivated by short-circuiting pins 313 and 317. The "Remote" LED is lit.

Pin 314 - II: Command for transfer to position II

Closing of this contact has the result that the transfer switching equipment is switched to the II position. This command is activated if the following requirements are met:

- The switch on the motor operator is in the "Auto" position
- Contacts 312, 314 and 317 are connected to one another
- Contact 313 is open

Pin 315 - I: Command for transfer to position I

Closing of this contact has the result that the transfer switching equipment is switched to the I position. This command is activated if the following requirements are met:

- The switch on the motor operator is in the "Auto" position
- Contacts 312, 315 and 317 are connected to one another
- Contact 313 is open

Pin 316 - O: Command for transfer to position O

Closing of this contact has the result that the transfer switching equipment is switched to the O position. This command is activated if the following requirements are met:

- The switch on the motor operator is in the "Auto" position
- Contacts 312, 316 and 317 are connected to one another
- Contact 313 is open

Pin 317 - COM: Common control terminal for inputs 312-316

Input 317 is used as the common control terminal for inputs 312-316.

Technical specifications for the control inputs of the motor operator

	Motor operator
Number of inputs	5
Direct current I_{in}	0.35 - 0.5 mA
Line resistance	1 k Ω
Length of cable	Maximum 100 m, cable cross-section min.: 1.5 mm ² Δ 16AWG
Minimum pulse duration	60 ms
Power per input	0.06 VA
Overvoltage protection	4.8 kV (1.2 μ s / 50 μ s)
ESD proof voltage (contact / air)	2 kV / 4 kV
Impulse voltage resistance U_{imp} between inputs and other current-carrying parts	4.8 kV (1.2 μ s / 50 μ s), increased insulation
Permissible cable cross-section	min. 1.5 mm ² / max. 2.5 mm ²

7.2.1.1 Outputs of the motor operator

The outputs of the motor operator are located in the following position:

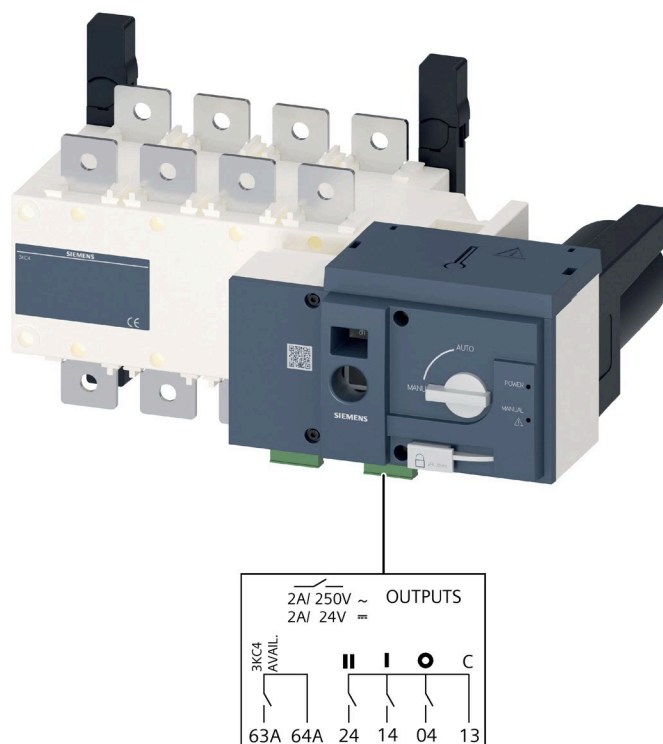


Figure 7-10 Outputs of the motor operator

Designation	Pin	Meaning	Explanation	Properties	Recommended cable cross-section
Outputs of motor operator	04	O	Auxiliary contact position O – normally open	Floating contacts 2 A AC1 / 250 V	1.5 - 2.5 mm ²
	13	C	Common control terminal for pins 04, 14 and 24		
	14	I	Auxiliary contact position I – normally open (NO) contact		
	24	II	Auxiliary contact position II – normally open (NO) contact		
	63A 64A	AVAIL.	Availability of the motor operator: <ul style="list-style-type: none"> Opened if the motor operator of the transfer switching equipment is not available. Closed if the switch on the motor operator is at the "Auto" position and the motor is ready 		

Functions of the outputs of the motor operator

Outputs 04, 13, 14, 24

The device contains three auxiliary contacts for indicating switch positions O-I-II. These contacts 04, 14 and 24 are auxiliary contacts for the corresponding positions and are controlled via three microswitches.

Output 13 is used as the common control terminal for outputs 04, 14, 24.

The contacts are open in the normal state.

	Motor operator
Mechanical endurance	100k cycles
Response time	5 - 10 ms
Start duration	200 ms
Power supply voltage / switching voltage	250 V AC
Rated current	2 A
Overvoltage protection	4.8 kV (1.2 μ s / 50 μ s overvoltage)
ESD proof voltage (touch / air)	2 kV / 4 kV
Impulse voltage resistance U_{imp} between outputs and other current-carrying parts	4.8 kV (1.2 μ s / 50 μ s), increased insulation
Permissible cable cross-section	min. 1.5 mm ² / max. 2.5 mm ²

Outputs 63A -64A

These outputs provide permanent feedback about the product availability of the motor operator and its switching capacity. The functional capability of the electronic module is ignored here.

The transfer switching equipment checks product availability in the case of the following events:

- When switching on
- When changing the switch on the motor operator from the "Manual" position to the "Auto" position, and every 5 minutes thereafter

The internal availability test indicates whether the transfer switching equipment is ready with regard to the control inputs. If a test shows a fault, a further test is carried out to confirm the fault state. If the fault persists, contacts 63A-64A are opened:

- On 3KC4 and 3KC8 transfer switching equipment, the warning LED is lit on the motor operator.
- On the 3KC8 transfer switching equipment, the "Ready" LED on the electronic module also goes out and the fault indicator on the electronic module lights up.
- The warning LED is lit until the fault state is reset.

To reset the fault state, switch the transfer switching equipment from automatic mode to manual operation and back again to automatic mode. Alternatively, the transfer switching equipment can be reset on the hardware by switching off the power supply to the transfer switching equipment for more than 3 minutes.

The table below provides an overview of fault states that result in opening of the 63A-64A outputs. To guarantee high safety standards, these outputs are used for information purposes

only; they do not prevent switching. When requested, the transfer switching equipment will always attempt to switch.

The transfer switching equipment can be operated manually in every case with the supplied handle.

States in which the motor operator is not available	Remarks	Relay 63 A - 64 A open	Warning LED lights up
Transfer switching equipment is in "manual operation" mode	The user has intentionally turned the switch on the motor operator from the "Auto" position to the "Manual" position. As the transfer switching equipment is not available for remote control, this state is indicated with the opening of the relay. If the switch is turned to the "Auto" position, the state resets itself.	Yes	Yes
Motor operator has not been recognized	The internal availability test is performed when switching on, when changing the switch on the motor operator from the "Manual" position to the "Auto" position, and every 5 minutes as long as the switch is in the "Auto" position. The internal availability test checks the status of the motor.	Yes	Yes
Supply voltage of the motor operator outside the limit	A supply voltage of the motor operator of less than 166 V AC or more than 332 V AC sets the transfer switching equipment in a non-available state.	Yes	Yes
Operating fault (caused by too many operations per minute)	The transfer switching equipment has been operated more frequently than 10 times in one minute. The transfer switching equipment is not available for one minute. It then resets itself.	Yes	Yes
Autotest of the inputs on the motor operator failed (pin 312 to 317)	The inputs are tested periodically (every 5 min.) and automatically by the software to ensure they are functioning correctly.	Yes	Yes
Operating fault on the "Manual"/"Auto" switch	Motorized transfer identified although the switch on the motor operator is at the "Manual" position.	Yes	Yes
	Padlocking mode active, but the "Auto" position is detected internally.	Yes	Yes
Switched switch position not reached	The expected switch position of the transfer switching equipment has not been reached.	Yes	Yes
Priority command OFF position active (pin 313 - 317)	The priority command to switch to the "0" position is activated by closing of the pins 313 and 317. As this command has the highest priority, the transfer switching equipment is not available until the pins are connected.	Yes	Yes
Unexpected current flow through the motor when it is in no-load operation		Yes	Yes
No power supply of the motor operator	Without power supply, the relay is open and therefore the "Not available" state is indicated.	Yes	No

7.2.2 Auxiliary switches

In this section, the functions of the auxiliary switches described in the section titled Auxiliary switch of the transfer switching equipment (Page 75) are explained in more detail.

A leading changeover (CO) contact is included for switch positions I and II for each auxiliary switch.

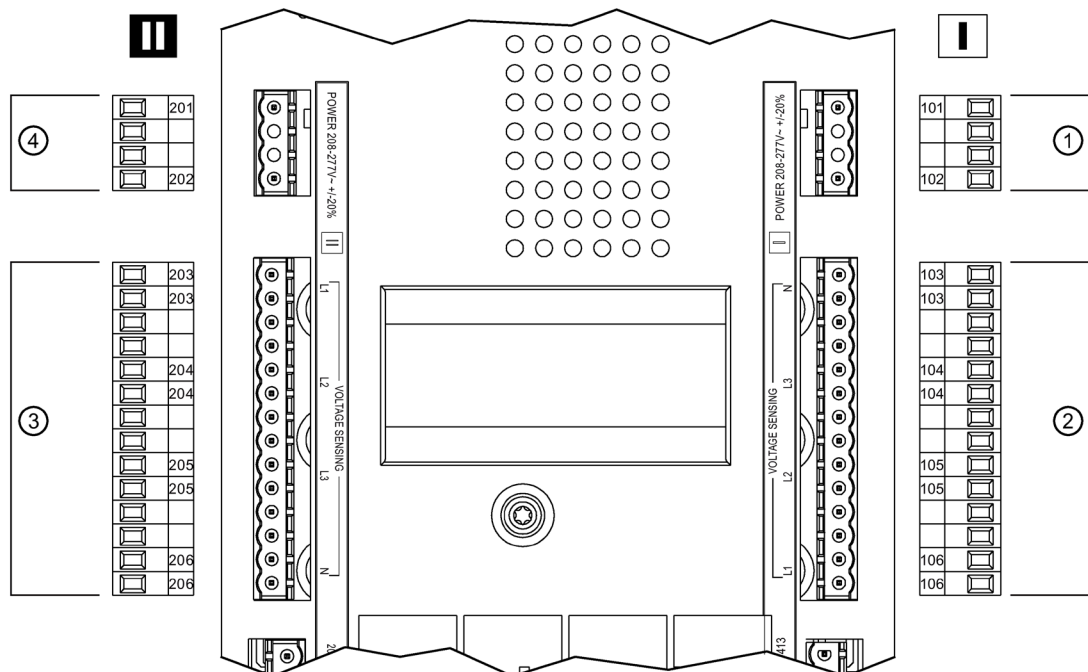
Designation	Pin	Explanation	Properties	Recommended cable cross-section
Additional auxiliary switches	81	Common control terminal for the auxiliary switch, position I	Floating contacts 2 A AC1 / 250 V	1.5 - 2.5 mm ²
	82	Auxiliary switch position I - leading normally closed (NC) contact		
	84	Auxiliary switch position I - leading normally open (NO) contact		
	91	Common control terminal for the auxiliary switch, position II		
	92	Auxiliary switch position II - leading normally closed (NC) contact		
	94	Auxiliary switch position II - leading normally open (NO) contact		

7.2.3 Inputs and outputs of the electronic module (3KC8 only)

The 3KC8 transfer switching equipment contains inputs and outputs on the electronic module in addition to the two inputs and outputs of the motor operator.

7.2.3.1 Inputs for voltage measurement and power supply

The inputs for voltage measurement and power supply on the electronic module are located in the following positions on the electronic module:



- ① Power supply input I
- ② Voltage measurement supply source I
- ③ Voltage measurement supply source II
- ④ Power supply input II

Figure 7-11 Inputs and outputs of the electronic module

Inputs source I

The inputs for the power supply and voltage measurement of source I are listed in the table below:

Designation	Pin		Typical connection	Explanation	Properties	Recommended cable cross-section
Power supply input 1	101	-	L1	Power supply through source I	208 – 277 V AC ± 20 %; 45 ... 65 Hz	1.5 - 2.5 mm ²
	102	-	N	Power supply through source I		
Voltage measurement supply source I (see accessories)	103	./N	N	Input for voltage measurement of the neutral conductor or of a phase of source I	600 V AC (ph-ph) max. 332 V AC (ph-n) max.	1.5 - 2.5 mm ²
	104	./.	L3	Input for voltage measurement of a phase of source I		
	105	./.	L2	Input for voltage measurement of a phase of source I		

7.2 Functions of the inputs and outputs

Designation	Pin		Typical connection	Explanation	Properties	Recommended cable cross-section
	106	N/.	L1	Input for voltage measurement of a phase or of the neutral conductor of source I		

Inputs source II

The inputs for the power supply and voltage measurement of source II are listed in the table below:

Designation	Pin		Typical connection	Explanation	Properties	Recommended cable cross-section
Power supply input 2	201	-	N	Power supply through source II	208 – 277 V AC ± 20 %: 45 ... 65 Hz	1.5 - 2.5 mm ²
	202	-	L1	Power supply through source II		
Voltage measurement supply source II (see accessories)	203	.N	L1	Input for voltage measurement of the neutral conductor or of a phase of source II	600 V AC (ph-ph) max. 332 V AC (ph-n) max.	1.5 - 2.5 mm ²
	204	./.	L2	Input for voltage measurement of a phase of source II		
	205	./.	L3	Input for voltage measurement of a phase of source II		
	206	N/.	N	Input for voltage measurement of a phase or of the neutral conductor of source II		

Functions of the inputs for the power supply and voltage measurement of the motor operator

Inputs 101-102 and 201-202

Inputs 101-102 and 201-202 are used for supplying power to the electronic module and the transfer switching equipment. This must be between the following ranges:

- 208 – 277 V AC ± 20 % (166 – 332 V AC)
- 45 – 65 Hz

Current input:

- 100 mA (standby mode)
- 15 A max. (transfer mode)

Oversvoltage protection:

- 4.8 kV - 1.2 / 50 μs

Inputs 103-106 and 203-206

Inputs 103-106 and 203-206 are used for voltage and frequency measurements. The voltage and frequency measurements are implemented using additional accessories. For more

information, see the section titled Connecting the inputs and outputs of the electronic module (3KC8 only) (Page 82).

Using these accessories, the electronic module can monitor both sources. The corresponding default must be selected on the DIP switches for this purpose. For more information, see the section titled Automatic mode - programming of the electronic module (3KC8 only) (Page 125). The results of the voltage measurement have a direct effect on the display of source availability and on automatic mode of the transfer switching equipment.

The following parameters can be monitored:

- **Phase rotation:** To determine the phase rotation, both sources I and II must be available.
- **Frequency within defined limits:** Compliance with the frequency limits refers either to the nominal frequency (default "Auto Conf" on potentiometer 1) or the default via potentiometer 1 in conjunction with the limits of potentiometer 2.
- **Loss of the neutral conductor:** In three-phase 4-wire networks with neutral (default of DIP switch 1 at position A and DIP switch 2 at position C), the loss of the neutral conductor is detected for most loads. The loss is only established under load.
- **Loss of the main or alternative source supply:** Loss of the main or alternative source depends on the rated voltage and the frequency in conjunction with the limits set by potentiometer 2. The source supply is regarded as not available when the timer for the delay on loss of the supply has expired (potentiometer 3).
- **Return of the main or alternative source supply:** The return of the main or alternative source depends on the line voltage and the frequency in conjunction with the limits set by potentiometer 2. The source supply is regarded as available when the timer for the delay on return of the supply has expired (potentiometer 4).

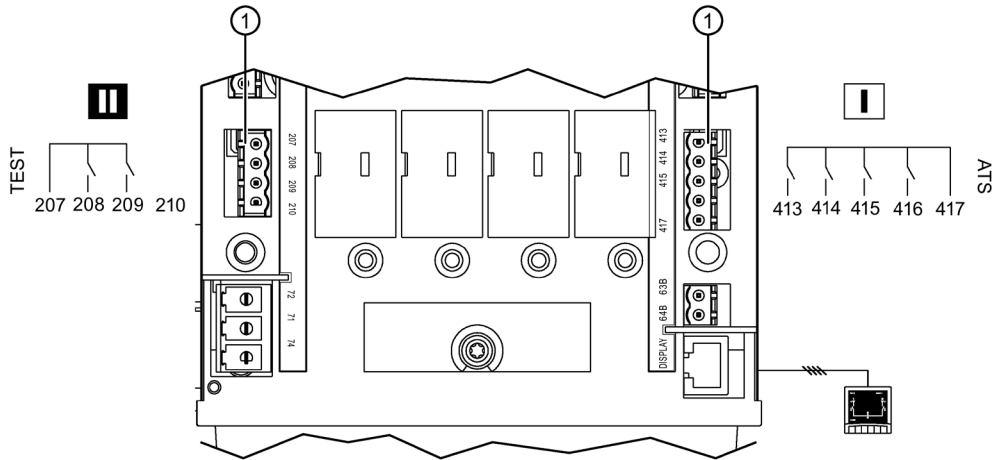
Functions of the inputs depending on the network

Monitoring of the parameters on inputs 103-106 and 203-206 depends on the network. The table below contains a list of the functions depending on the network.

Network	Detection of the network availability	Detection of whether sources are within defined limits:	Detection of the phase rotation	Detection of the neutral conductor
Single-phase network with neutral (1PH + N)	✓	✓		
Three-phase 3-wire network without neutral (3PH)	✓	✓	✓	
Three-phase 4-wire network with neutral (3PH + N)	✓	✓	✓	✓

7.2.3.2 Control inputs of the electronic module

The following control inputs are located on the electronic module:



① Control inputs of the electronic module

Figure 7-12 Control inputs of the electronic module

The functions of control inputs 413 – 417 and inputs 207-209 differ according to network type. For network / network applications, these have other functions than for network / generator applications.

Technical specifications for the control inputs of the electronic module

The table below contains the technical specifications for the control inputs of the electronic module. These are valid both with network / network applications and with network / generator applications.

	Electronic module
Number of inputs	6
Direct current I_{in}	1 - 2.5 mA
Line resistance	1 kΩ
Length of cable	100 m, cable cross-section min.: 1.5 mm ² ≙ 16AWG
Pulse duration	at least 60 ms
Power per input	0.03 VA
Overvoltage protection	2.4 kV (1.2/50 μs overvoltage)
ESD proof voltage (touch / air)	2/4 kV
Impulse voltage resistance U_{imp} between inputs and other current-carrying parts	4.8 kV (1.2 μs / 50 μs), increased insulation
Permissible cable cross-section	min. 1.5 mm ² / max. 2.5 mm ²

7.2.3.3 Functions of the control inputs for network / generator application

Designation	Pin	Explanation	Properties	Recommended cable cross-section
Control inputs of the electronic module	207	Common control terminal for inputs 208-209	Use only with floating contacts and supply via pin 207	1.5 - 2.5 mm ²
	208	Input for test off load		
	209	Input for test on load		
	210	Inactive		
	413	Input: Priority for test on load	Use only with floating contacts and supply via pin 417	1.5 - 2.5 mm ²
	414	Input: Deactivating the delay for stabilizing source II		
	415	Input: Manual return transfer		
	416	Input: Inhibition of automatic mode		
417	Common control terminal for inputs 413-417			

NOTICE

Damage to the device

Do not connect inputs 207 to 209 to the power supply.

Do not connect inputs 413 to 417 to the power supply.

Pin 207: Common control terminal for inputs 208-209

Pin 207 is used as the common control terminal for inputs 208-209.

Pin 208: Input for test off load

This command enables a generator test without initiation of a transfer. The generator is started via outputs 72-71-74.

The test can be carried out both in manual operation and in automatic mode. If the main power supply is lost, this test is not possible (loss of the main power supply results in termination of the test). The test is carried out when contacts 208 and 207 are closed.

Pin 209: Input for test on load

This command enables execution of a generator start and a complete transfer on load for generator test purposes.

The test on load can only be carried out in automatic mode. The test is carried out when contacts 207 and 209 are closed.

Pin 210: Inactive

Pin 413: Priority for test on load

During a test on load (pin 209), pin 413 causes the transfer switching equipment to remain in position II (generator) while pin 209 is active. Transfer in source I is therefore not possible during the test on load.

Note

The transfer switching equipment also remains in position II when the generator is not active.

Pin 414: Deactivating the delay for stabilizing source II

In network/generator applications, a fixed delay of 5 seconds is set for stabilization of the generator (source II) when switching from I to II. By short-circuiting pin 414 with pin 417, this delay can be deactivated regardless of the status of source II.

Pin 415: Manual return transfer

This command prevents automatic return transfer of source II to source I. In other words, even if source I is available again, the 3KC8 transfer switching equipment remains in switch position II and must be switched back manually. The command becomes active when contacts 415 and 417 are closed.

If the contact is opened, the transfer switching equipment changes to switch position I after expiry of the set delay times (higher priority due to network/generator application) when source I is available again.

Pin 416: Inhibition of automatic mode

This command inhibits the automatic mode of the electronic module without activating another operating mode. In this way, the 3KC8 transfer switching equipment can be operated only in manual operation (using the handle) or in remote mode (using inputs 313-317 on the motor operator).

Pin 417: Common control terminal of inputs 413-416

Pin 417 is used as the common control terminal for inputs 413-416.

7.2.3.4 Functions of the control inputs for network / network application

Designation	Pin	Explanation	Properties	Recommended cable cross-section
Control inputs of the electronic module	207	Common control terminal for inputs 208-209	Use only with floating contacts and supply via pin 207	1.5 - 2.5 mm ²
	208	Inactive		
	209	Selection of the prioritized source (if 413 and 417 are open)		
	210	Inactive		
	413	Priority of a source	Use only with floating contacts and supply via	1.5 - 2.5 mm ²
	414	Inactive		

Designation	Pin	Explanation	Properties	Recommended cable cross-section
	415	Manual return transfer	pin 417	
	416	Inhibition of automatic mode		
	417	Common control terminal for inputs 413-417		

NOTICE**Damage to the device**

Do not connect inputs 207 to 209 to the power supply.

Do not connect inputs 413 to 417 to the power supply.

Pin 207: Common control terminal of inputs 208-209

Pin 207 is used as the common control terminal for inputs 208-209.

Pin 208: Inactive**Pin 209: Selection of the prioritized source**

This command enables the selection of a prioritized source (if contacts 413 and 417 are open):

- If contacts 207 and 209 are open, source I is prioritized.
- If contacts 207 and 209 are closed, source II is prioritized.

Pin 210: Inactive**Pin 413: Priority of a source**

This command enables adjustment for prioritization of a source:

- If contacts 413 and 417 are open, a prioritization is active.
- If contacts 413 and 417 are closed, no source can be prioritized.

Pin 414: Inactive**Pin 415: Manual return transfer**

This command prevents automatic return transfer to the prioritized source supply. In other words, even if the prioritized source is available again, the 3KC8 transfer switching equipment remains in the current switch position and it must be switched back manually. The command becomes active when contacts 415 and 417 are closed.

If the contact is opened, the transfer switching equipment changes back immediately to the prioritized switch position as soon as the prioritized source is available again.

Pin 416: Inhibition of automatic mode

This command prevents automatic mode of the electronic module without activating another operating mode. In this way, the 3KC8 transfer switching equipment can be operated only in

7.2 Functions of the inputs and outputs

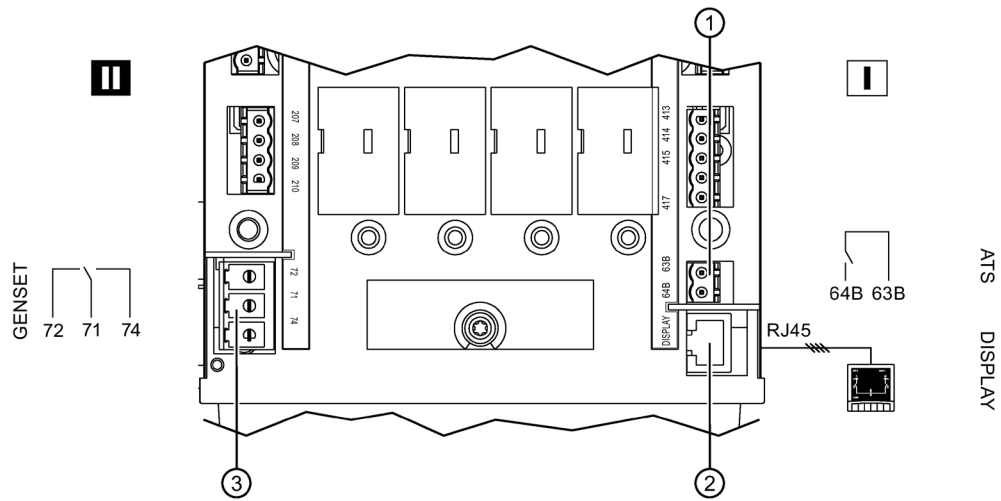
manual operation (using the handle) or in remote mode (using inputs 313-317 on the motor operator).

Pin 417: Common control terminal of inputs 413-416

Pin 417 is used as the common control terminal for inputs 413-416.

7.2.3.5 Outputs of the electronic module

The following outputs are located on the electronic module:



- ① Output – relay of the operational readiness of the device
- ② Output – 3KC9823-0 display (optional)
- ③ Output – switching the generator on/off

Figure 7-13 Outputs of the electronic module

Designation	Pin	Explanation	Properties	Recommended cable cross-section
Relay of operational readiness	63B	Availability of the electronic module and of the motor operator: <ul style="list-style-type: none"> • Open if the electronic module and/or motor operator of the transfer switching equipment are not available. • Closed if the switch on the motor operator is at the "Auto" position and the electronic module and the motor operator are ready for operation. 	Floating contacts 2 A AC1 / 250 V	1.5 - 2.5 mm ²
	64B			

Designation	Pin	Explanation	Properties	Recommended cable cross-section
Switching the generator on/off	71	Common control terminal for pins 72 and 74	Floating contacts 2 A AC1 / 250 V	1.5 - 2.5 mm ²
	72	Signal for starting / stopping the generator: NC contact (normally closed contact)		
	74	Signal for starting / stopping the generator: NO contact (normally open contact)		
Display connection	To display	Output for the optional 3KC9823-0 display	Cable length up to 3 m	RJ45

Functions of the outputs

Outputs 63B and 64B

These outputs provide permanent feedback about the functional capability of the electronic module and about the product availability of the motor operator

Outputs 63B-64B are closed when the transfer switching equipment is in automatic mode and ready (not a fault state).

The table below provides an overview of fault states that result in opening of the 63B-64B outputs. To guarantee high safety standards, these outputs are used for information purposes only; they do not prevent switching. When requested, the transfer switching equipment will always attempt to switch.

States in which the motor operator is not available	Remarks	Relay 63 B - 64 B open	LED fault indicator lights up
Fault on the motor operator	Refer to the table "States in which the motor operator is not available" in chapter Outputs of the motor operator (Page 105)		
Fault: internal clock		Yes	Yes
Motor operator has not been recognized	Wiring problem (connection between electronic module and motor operator)	Yes	Yes
Fault: Outputs signal for starting / stopping the generator	At least one of the outputs signal for starting / stopping the generator does not change its state (pin 72, 74)	Yes	Yes
Fault – during autoconfiguration	Detection of voltage, frequency, phase rotation, position of the neutral conductor failed.	Yes	Yes
Transfer switching equipment is in "manual operation" mode	The user has intentionally turned the switch on the motor operator from the "Auto" position to the "Manual" position. As the transfer switching equipment is not available for remote control, this state is indicated with the opening of the relay. If the switch is turned to the "Auto" position, the state resets itself.	Yes	No
Position of neutral conductor incorrect	The position of the neutral conductor is different between source I and source II	Yes	Yes

States in which the motor operator is not available	Remarks	Relay 63 B - 64 B open	LED fault indicator lights up
Phase rotation faulty	The phase rotation is different between source I and source II	Yes	Yes
Supply voltage outside the limit		Yes	No

The user can evaluate outputs 63A-64A of the motor operator as well as outputs 63B-64B of the electronic module so that it is easy to localize the fault in the electronic module or motor operator: outputs 63A-64A only show the state of the motor operator, whereby outputs 63B-64B show the state of both the electronic module and the motor operator.

A high level of operational readiness can be ensured in the event of a fault:

- If outputs 63B-64B of the electronic module are closed and outputs 63A-64A of the motor operator are open, the user can bypass the electronic module and actuate remote control for transfer switching via inputs 312 to 317 on the motor operator.
- If outputs 63A-64A of the motor operator are closed, manual transfer switching with the supplied handle is possible in the event of an emergency.

Outputs 71, 72, 74 (only relevant for the network / generator application)

These outputs enable starting and stopping of the generator:

- If source I is not available, contact 71 is closed with 72, and at the same time 74 is open.
- If source I is available, contact 71 is closed with 74, and 72 remains open.

Output RJ45

This output is used for connecting the additionally available 3KC9823-0 display. This is described in more detail in the section titled Display (3KC8 only) (Page 158).

7.3 Remote mode

Remote mode of the 3KC4 and 3KC8 transfer switching equipment is enabled by inputs 312 - 317 on the motor operator.

- With both the 3KC4 transfer switching equipment and the 3KC8 transfer switching equipment, you start remote mode by turning the switch from the "Manual" position to the "Auto" position and closing inputs 312 and 317.
- On the 3KC8 transfer switching equipment, automatic mode of the electronic module is prevented by closing the inputs.

Depending on the connection of the 3KC4 and 3KC8 transfer switching equipment, there are two control logics of the inputs:

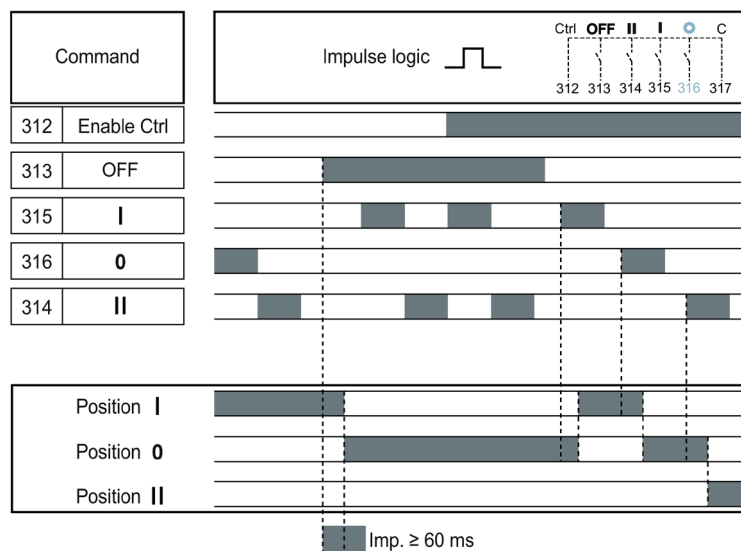
- Impulse logic
- Continuous operation logic

Note

In remote mode, the commands for changing to position I and II are prioritized over command O. In this way, the continuous operation logic can be set by connecting inputs 316 and 317.

7.3.1 Impulse logic

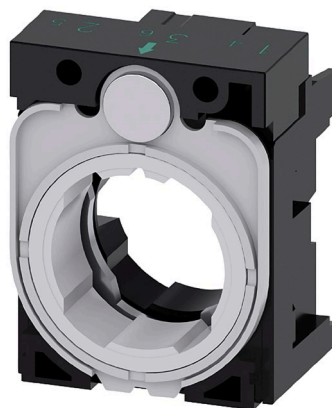
The figure below shows an example for the control logic of the 3KC4 and 3KC8 transfer switching equipment in the case of impulse logic:



The 3KC4 and 3KC8 transfer switching equipment is switched over by a pulse to a position and remains in this position until a new pulse occurs:

- Contact 312 must be short-circuited using contact 317 and the corresponding pin (I or II or O) so that a transfer can occur. Contacts 312 and 317 can be short-circuited using the 3SU1002-2BF60-0AA0 toggle switch and 3SU1500-0AA10-0AA0 holder in conjunction with a contact block with a 3SU1400-1AA10-1LA0 contact element.
- To initiate a transfer for the switch positions (0, I, II), a pulse command with a duration of at least 60 ms is required. Each command can be executed with a 3SU1000-0AB10-0AA0 pushbutton and 3SU1500-0AA10-0AA0 holder in conjunction with a contact block with a 3SU1400-1AA10-1LA0 contact element.
- Commands I and II take priority over command O.
- The OFF position has priority over all commands and also functions when contact 312 (activate remote mode) is not connected. This causes the switch to change to position O. The OFF command can be executed using the 3SU1002-2BF60-0AA0 toggle switch and 3SU1500-0AA10-0AA0 holder in conjunction with a contact block with a 3SU1400-1AA10-1LA0 contact element.

The following accessories can be used to activate the impulse logic:



2 x toggle switches (with 2 switch positions 0- 5 x holders, 3SU1500-0AA10-0AA0 I), 3SU1002-2BF60-0AA0



5 x contact blocks with one contact element, 3 x pushbuttons, 3SU1000-0AB10-0AA0 3SU1400-1AA10-1LA0

Note

Contact blocks with gold-plated internal contacts must be used.

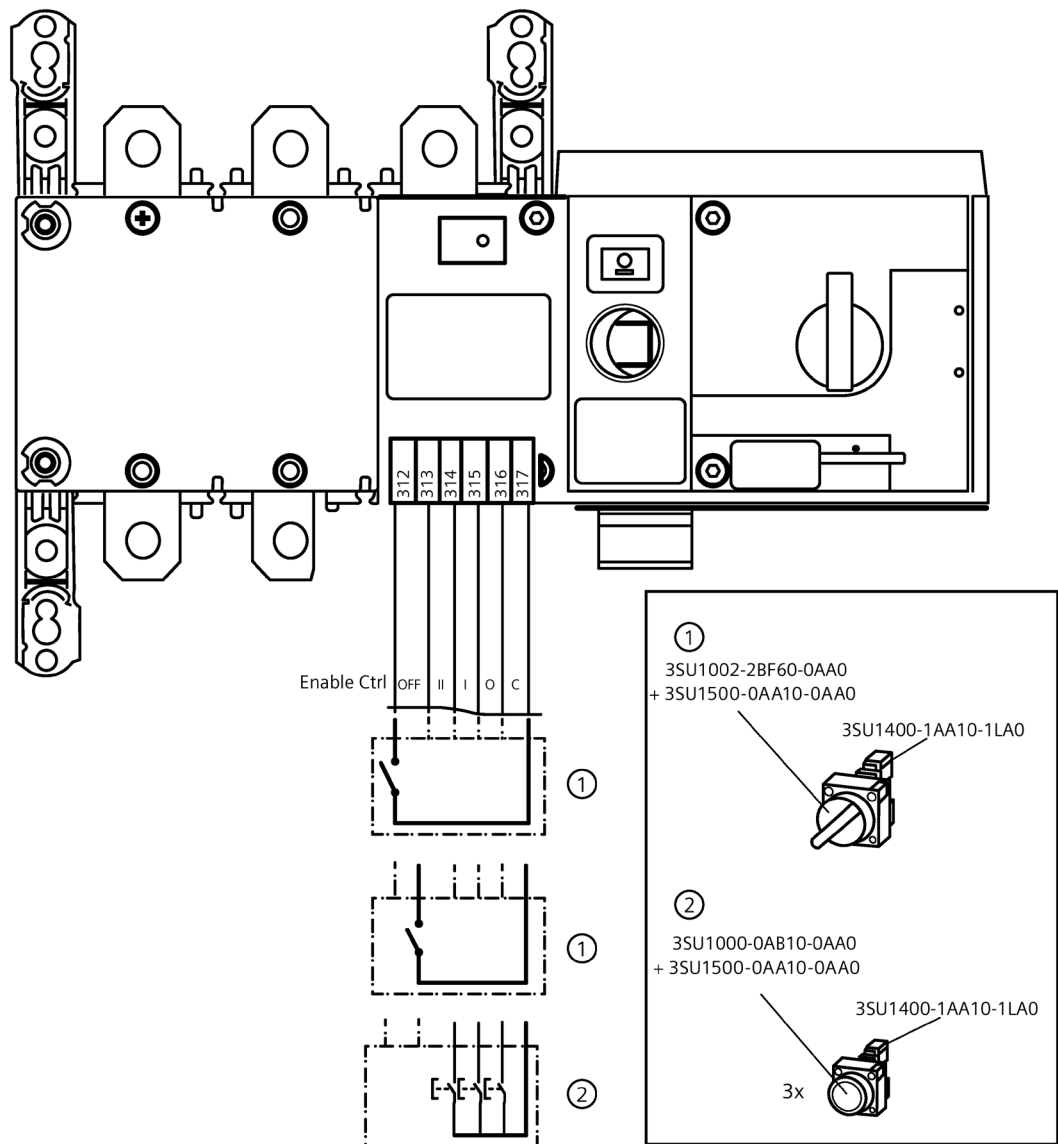
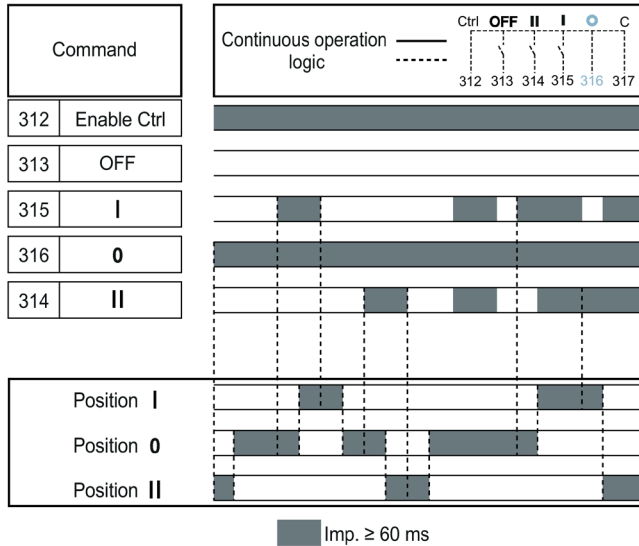


Figure 7-14 Control logic of the 3KC4 / 3KC8 transfer switching equipment in the case of impulse logic

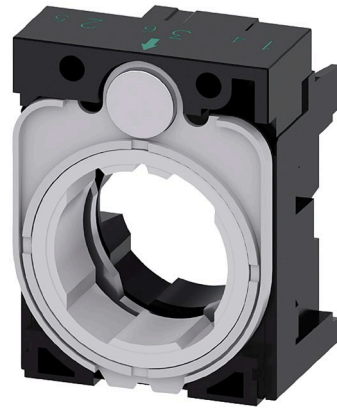
7.3.2 Continuous operation logic

The figure below shows an example of the control logic of the 3KC4 and 3KC8 transfer switching equipment in the case of continuous operation logic:



The 3KC4 and 3KC8 transfer switching equipment is switched over to a specific position (I or II) and remains there while the signal is active:

- Contact 312 must be short-circuited using contact 317 and the corresponding pin (I or O) for a transfer to occur. Contacts 312 and 317 can be short-circuited using the 3SU1002-2BF60-0AA0 toggle switch and 3SU1500-0AA10-0AA0 holder in conjunction with a contact block with a 3SU1400-1AA10-1LA0 contact element.
- Commands I and II take priority over O and they can be set using the 3SU1002-2BL60-0AA0 toggle switch and 3SU1500-0AA10-0AA0 holder in conjunction with two contact blocks with a 3SU1400-1AA10-1LA0 contact element (for I and II).
- The O command must always be active for continuous operation logic. This command (316) can be maintained using the 3SU1002-2BF60-0AA0 toggle switch and 3SU1500-0AA10-0AA0 holder in conjunction with a contact block with 3SU1400-1AA10-1LA0 contact element.
- Commands I and II have the same priority, in other words, the active command (I or II) remains active until it is interrupted.
- If commands I and II occur simultaneously, no change takes place. If then a command expires, no change is made.
- The OFF position has priority over all commands and also functions when contact 312 (activate remote mode) is not connected. This causes the switch to change to position O. The OFF command can be executed using the 3SU1002-2BF60-0AA0 toggle switch and 3SU1500-0AA10-0AA0 holder in conjunction with a contact block with a 3SU1400-1AA10-1LA0 contact element.



3 x toggle switches (with 2 switch positions 0- I), 3SU1500-0AA10-0AA0
I), 3SU1002-2BF60-0AA0



5 x contact blocks with one contact element, 3SU1400-1AA10-1LA0
1 x toggle switch (with 3 switch positions 0-I-II), 3SU1002-2BL60-0AA0

Note

Contact blocks with gold-plated internal contacts must be used.

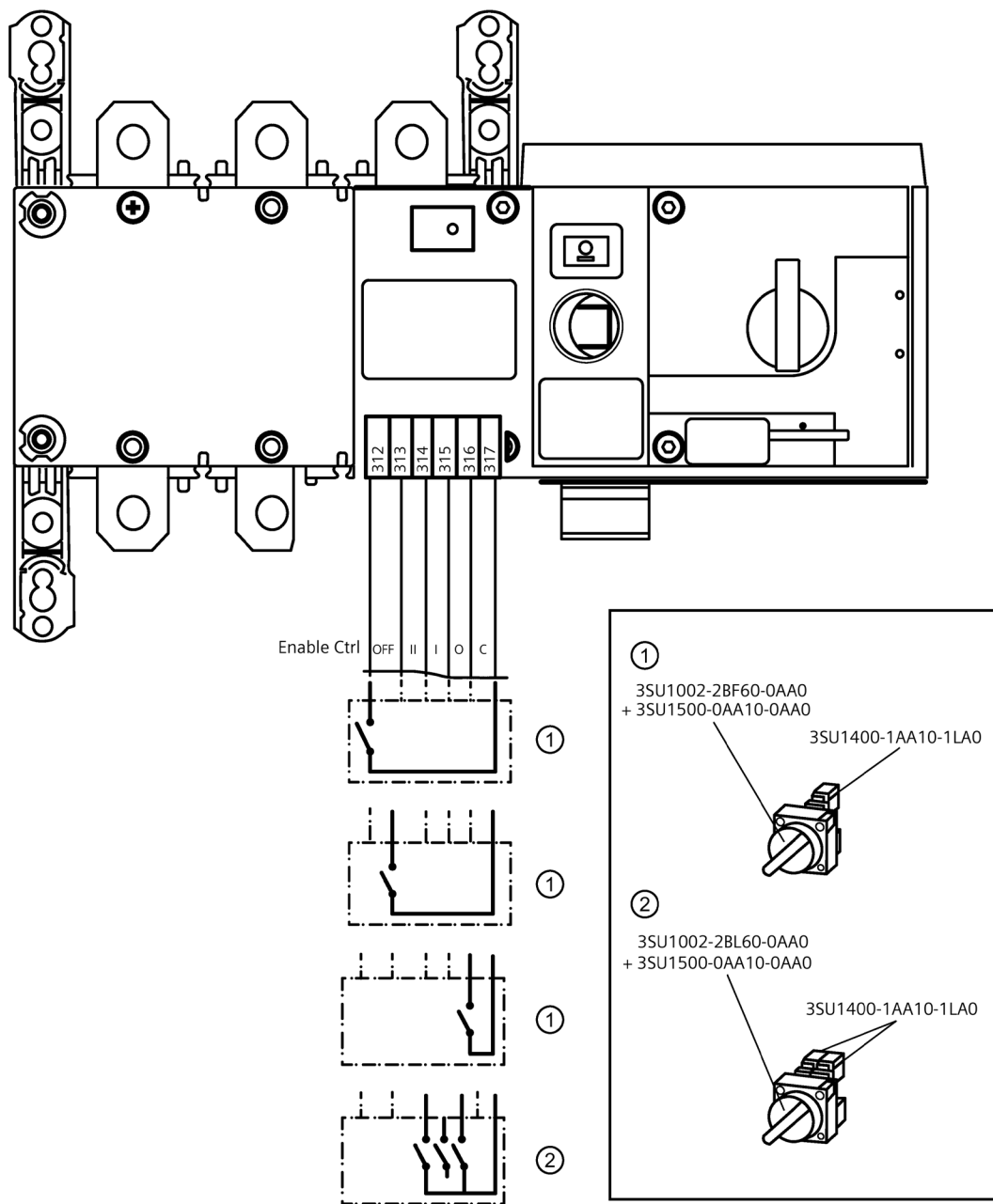


Figure 7-15 Control logic of the 3KC4 / 3KC8 transfer switching equipment in the case of continuous operation logic

7.4 Automatic mode - programming of the electronic module (3KC8 only)

The electronic module of the 3KC8 of the transfer switching equipment can be programmed directly on the module in five steps. Programming is described below.

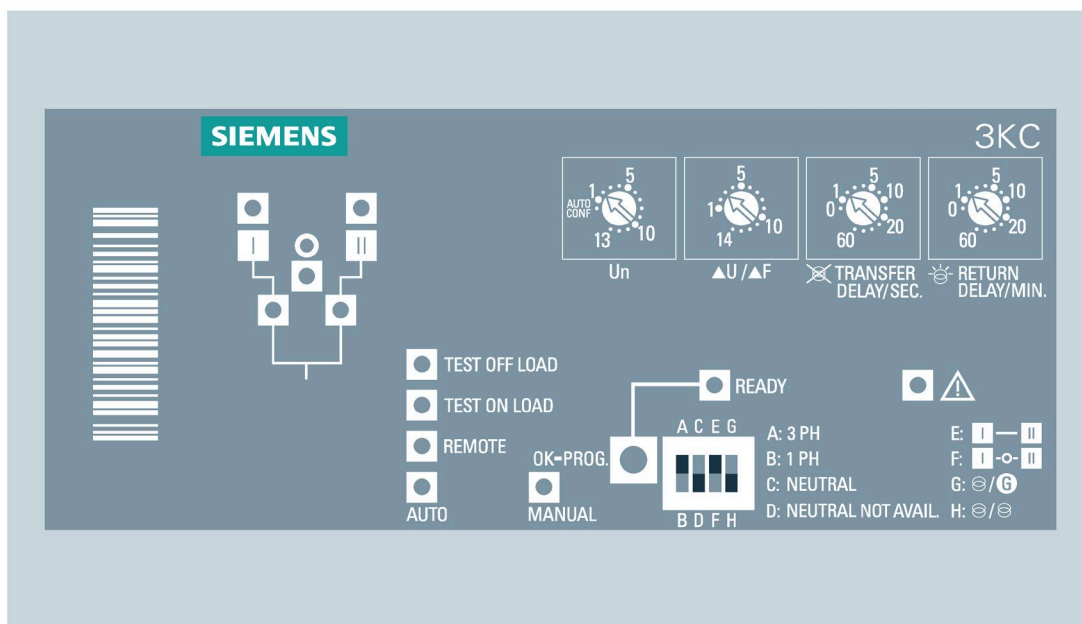


Figure 7-16 Electronic module

7.4.1 Step 1: Preset network conditions

You set the defaults of the network conditions on the DIP switches. A screwdriver is required for this. First, make sure the transfer switching equipment is in manual operation.

1. Check whether the transfer switching equipment is in the "Manual" position. Set the transfer switching equipment to the "Manual" position if applicable.

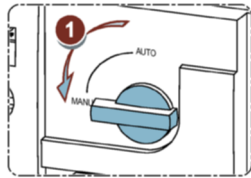
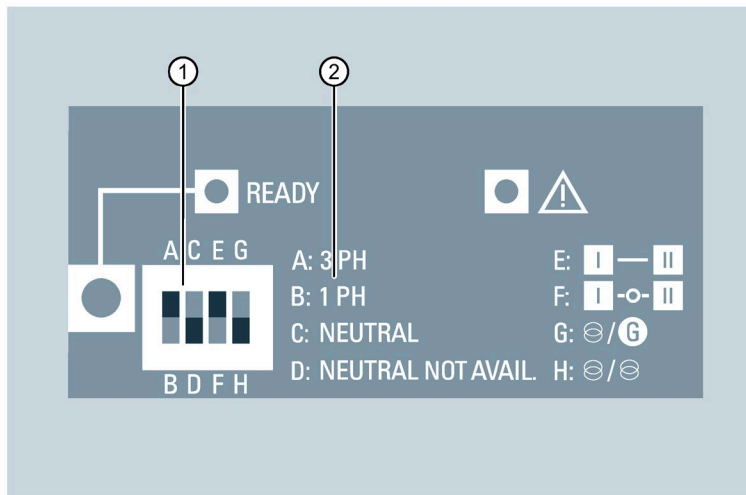


Figure 7-17 Set the switch to the "Manual" position

2. Set the position of the DIP switch manually with the screwdriver.

The different default options are explained, as well as the DIP switch.



- ① DIP switch
- ② Explanation of the defaults

Figure 7-18 DIP switch default

DIP switch	Explanation
A-B	<ul style="list-style-type: none"> • A: Three-phase network • B: Single-phase network (with this setting, the DIP switch C-D is inactive)
C-D	<ul style="list-style-type: none"> • C: Three-phase 4-wire network with neutral: Enables recognition of failure of the neutral conductor in the case of unbalanced loads • D: Three-phase 3-wire network without neutral
E-F	<ul style="list-style-type: none"> • E: No additional delay in position O • F: Additional delay of 2 s in position O

7.4 Automatic mode - programming of the electronic module (3KC8 only)

DIP switch	Explanation
G-H	<ul style="list-style-type: none">• G: Network / generator applications• H: Network / network applications

Note

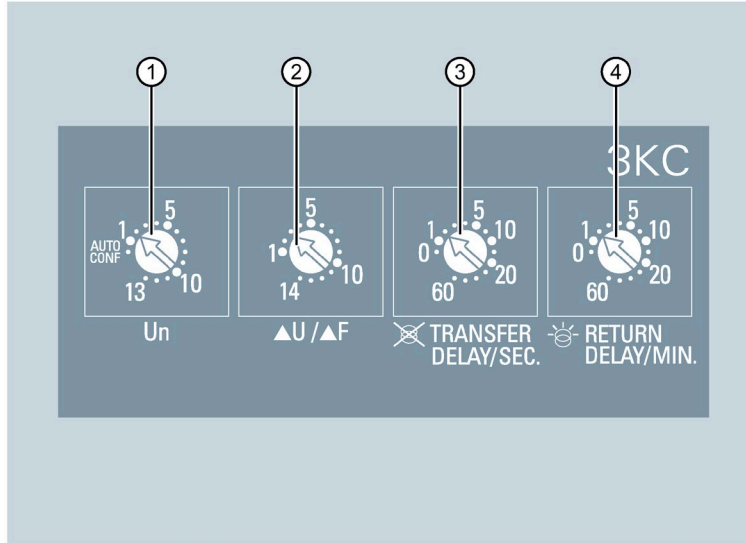
The "Ready" LED starts to flash green as soon as settings are made on the DIP switches. The "Ready" LED does not go out until the settings are saved.

7.4.2 Step 2: Setting the potentiometer

In this step, the potentiometer settings must be defined. In doing so, you can choose between 14 different settings respectively. A screwdriver is required for this.

1. Set the position of the potentiometer manually with the screwdriver.

You can find an explanation of the defaults on the transfer switching equipment.



- ① Potentiometer "Un"
- ② Potentiometer "ΔU / ΔF"
- ③ Potentiometer "Transfer delay/sec."
- ④ Potentiometer "Return/delay/min."

Figure 7-19 Setting the potentiometer

Potentiometer	Explanation
Un	<ul style="list-style-type: none"> • Position 0 = Autoconfiguration • Position 1-13 = Pre-configuration of voltage and frequency (see table below)
ΔU / ΔF	Setting the limits: <ul style="list-style-type: none"> • ΔU: Adjustable from 5 to 20 % • ΔF: Adjustable from 3 to 10 %
Transfer delay / sec.	Timer for setting the delay for system loss (0 - 60 sec): If system loss is detected, the timer is started. If the source is available again before expiry of the timer, transfer is not carried out.

7.4 Automatic mode - programming of the electronic module (3KC8 only)

Potentiometer	Explanation
Return delay / min.	Timer for setting the delay for restoring the prioritized source (0 - 60 min): When the prioritized source is available again, the timer is started. The power supply is switched over after expiry of the timer. If the prioritized source fails before expiry of the timer, the transfer is not carried out.

Note**Defined timer settings for network / generator applications**

When switching from the main source to the generator, an additional delay of 5 s is set after the generator has become available. This can be disabled with pin 414.

After return transfer to the main source, a generator cooling time is fixed at 3 mins (command to generator remains active).

The table contains a summary of the possible potentiometer settings:

Item no.	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Un	Auto Conf	220 / 127 V	380 / 220 V	400 / 230 V	415 / 240 V	480 / 277 V	208 / 120 V	220 / 127 V	230 / 132 V	240 / 138 V	380 / 220 V	400 / 230 V	415 / 240 V	480 / 277 V	-
Freq.		50 Hz					60 Hz								
$\Delta U / \Delta F$	-	5 / 3 %	6 / 3 %	7 / 4 %	8 / 4 %	9 / 5 %	10 / 5 %	11 / 6 %	12 / 6 %	13 / 7 %	14 / 7 %	15 / 8 %	16 / 8 %	18 / 9 %	20 / 10 %
Transfer Delay/ Sec.	-	0	1	2	3	4	5	8	10	15	20	30	40	50	60
Return Delay/ Min.	-	0	1	2	3	4	5	8	10	15	20	30	40	50	60

Note

The "Ready" LED starts to flash green as soon as settings are made on the potentiometers.

7.4.3 Step 3: Automatic configuration of the transfer switching equipment (only with potentiometer Un = 0)

Note

You only have to carry out this step if you set the potentiometer Un to the "0" position in Step 2: Setting the potentiometer (Page 128).

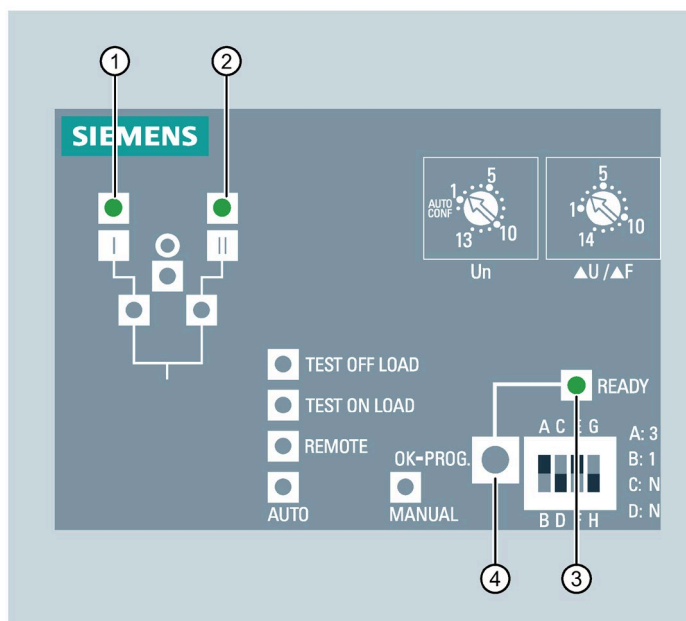
The 3KC8 transfer switching equipment has an auto-configuration function for detecting and configuring the rated values for voltage and frequency, the phase sequence, and the position of the neutral conductor.

Requirements

- The connections have been checked.
- The product is ready for commissioning
- Availability of the main source is required, optimally both sources are available

Procedure

1. Press the "OK-Prog" button ④ for at least 2 s to measure the rated values for voltage, frequency, the phase sequence and the position of the neutral conductor.



- ① LED availability of source I
- ② LED availability of source II
- ③ "Ready" LED
- ④ "OK-Prog" pushbutton

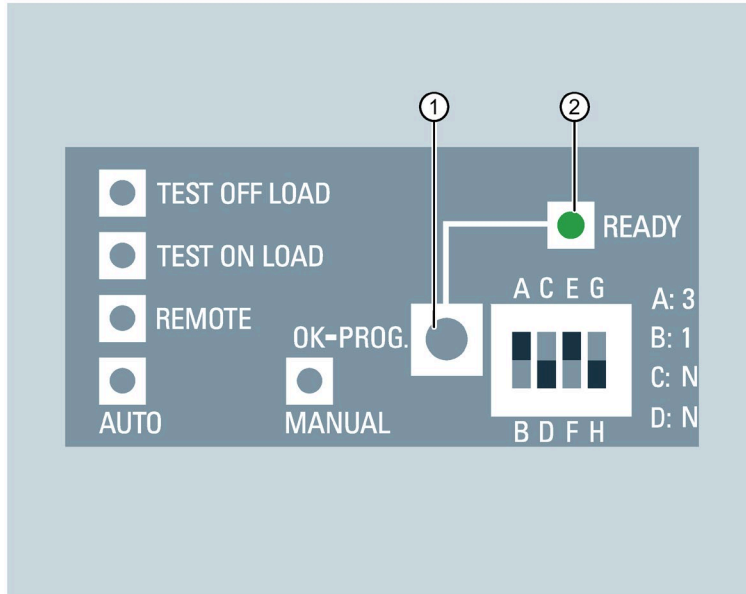
Figure 7-20 Automatic configuration

LED ① or ② for source availability flashes during measurement of the rated values.

The "Ready" LED ③ flashes green if the parameters have been changed but not yet saved.

7.4.4 Step 4: Saving the configuration

1. Press the "OK-Prog" button ① for approximately 60 ms to save the configured parameters.



- ① "OK-Prog" pushbutton
- ② "Ready" LED

Figure 7-21 Saving the configuration

The "Ready" LED ② stops flashing and shows a continuous green light when the parameters have been successfully saved.

7.4.5 Step 5: Switching the 3KC8 transfer switching equipment to automatic mode

After programming steps 1 to 4 have been successfully carried out, the 3KC8 transfer switching equipment can be switched to automatic mode.

1. Turn the switch from the "Manual" position to the "Auto" position.

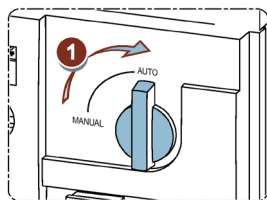


Figure 7-22 Turning the switch to the "Auto" position

When the product has been successfully connected and programmed, the "Power" and "Ready" LEDs and the two "Auto" LEDs show a continuous green light.

Commissioning

The following content is described in this chapter:

- Commissioning the 3KC4 transfer switching equipment
- Commissioning the 3KC8 transfer switching equipment

8.1 Commissioning the 3KC4 transfer switching equipment

After the 3KC4 transfer switching equipment has been connected to the main circuits, and the control circuits have been successfully connected according to type and source, you can commission the transfer switching equipment.

Requirements

- The transfer switching equipment is in the "Manual" position

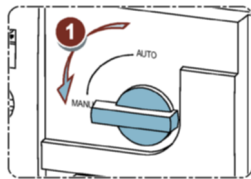


Figure 8-1 Switch in "Manual" position

- The handle is in the "O" position

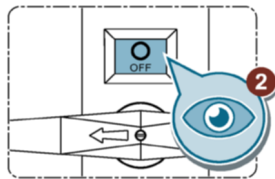


Figure 8-2 Handle in the "O" position

8.1 Commissioning the 3KC4 transfer switching equipment

- All cable lugs / busbars have been properly mounted

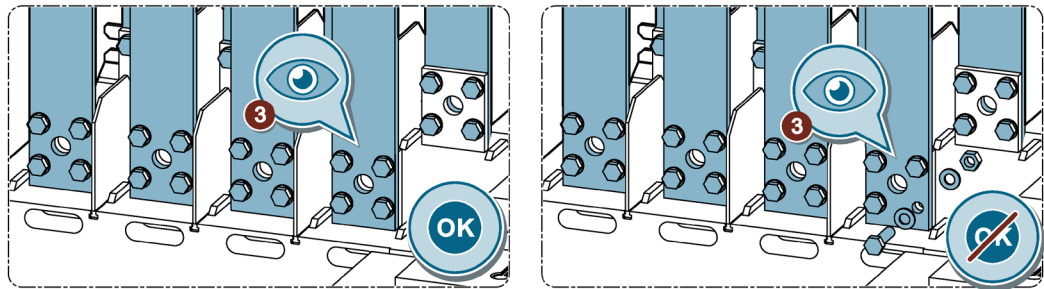


Figure 8-3 Fastening the cable lugs / busbars

- All connectors have been fastened properly

Procedure

1. Switch on the power supply.

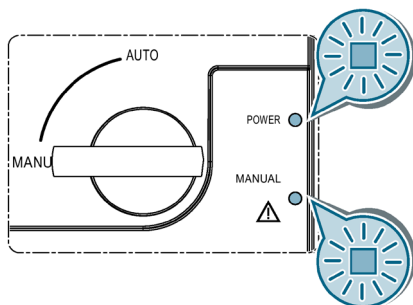


Figure 8-4 Switching on the power supply

"Power" LED and warning LED light up.

2. Turn the switch from the "Manual" position to the "Auto" position to switch the transfer switching equipment to remote mode.

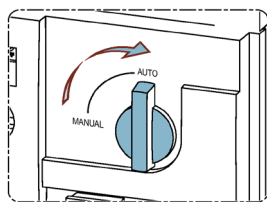


Figure 8-5 Turning the switch to the "Auto" position

8.2 Commissioning the 3KC8 transfer switching equipment

After the 3KC8 transfer switching equipment has been connected to the main circuits, and the control circuits have been successfully connected according to type and source, you can commission the transfer switching equipment.

Requirements

- The transfer switching equipment is in the "Manual" position

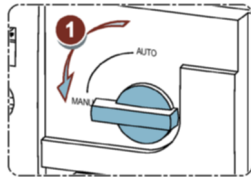


Figure 8-6 Switch in "Manual" position

- The handle is in the "O" position

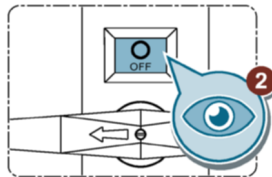


Figure 8-7 Handle in the "O" position

- All cable lugs / busbars have been properly mounted

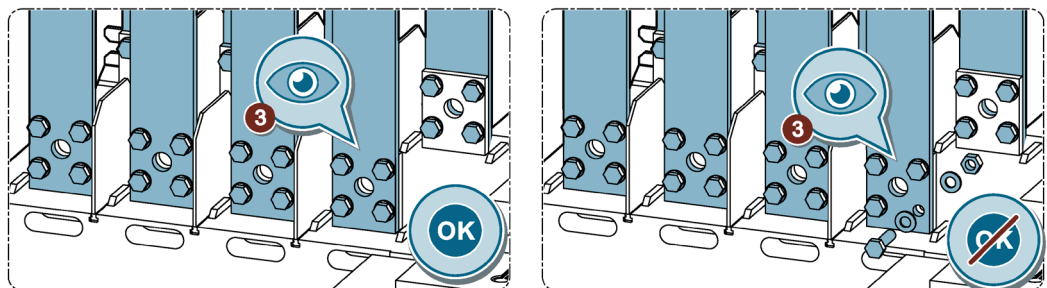


Figure 8-8 Fastening the cable lugs / busbars

8.2 Commissioning the 3KC8 transfer switching equipment

- All connectors have been fastened properly

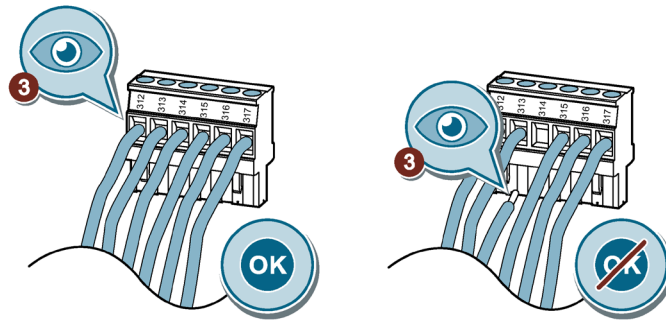


Figure 8-9 Securing the connectors

- The electronic module has been correctly connected

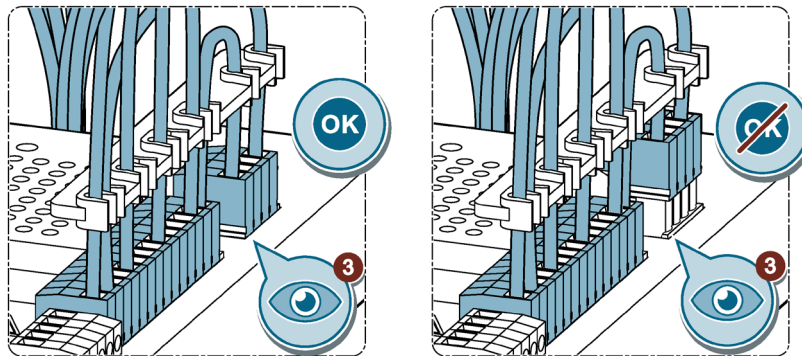


Figure 8-10 Electronic module connections

Procedure

1. Switch on the power supply.

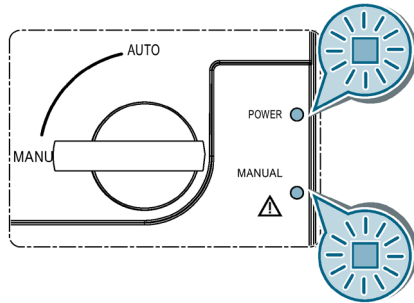


Figure 8-11 Switching on the power supply

The "Power" and warning LEDs on the motor operator and on the electronic module light up.

The LEDs for indicating source availability light up (depending on source availability).

2. Program the electronic module as described in the section titled Automatic mode - programming of the electronic module (3KC8 only) (Page 125).
3. Turn the switch from the "Manual" position to the "Auto" position to switch the transfer switching equipment to automatic mode.

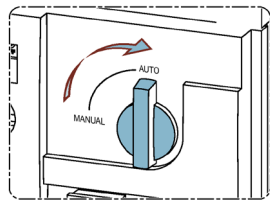


Figure 8-12 Turning the switch to the "Auto" position

Accessories

The following content is described in this chapter:

- Accessories for the 3KC4 and 3KC8 transfer switching equipment and their scope of supply
- Using and installing the accessories

Generally valid installation instructions

 WARNING
Hazardous voltage!
Ensure there is no live voltage before mounting an accessory.

Note

Some points in this chapter are relevant either for the 3KC4 transfer switching equipment or the 3KC8 transfer switching equipment. Note the relevant information in the chapter headings.

If you are using the 3KC8 transfer switching equipment, mount the corresponding accessories for the electronic module first. For information, see the section titled Connecting the inputs and outputs of the electronic module (3KC8 only) (Page 82).

9.1 Terminal covers

To ensure maximum safety standards, optional covers for the connecting terminals are available for current ratings 250 A to 630 A. These ensure IP2X protection against direct contact of the terminals or bridging bars.

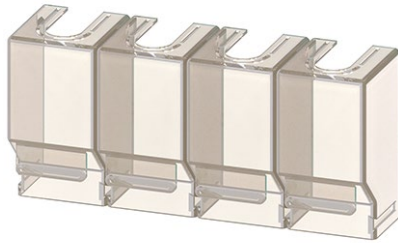


Figure 9-1 Terminal covers

The scope of supply includes 3 or 4 terminal covers depending on the number of poles. Front side protection of the terminals (top and bottom) requires two terminal covers to be ordered. Full protection, including touch protection on the rear, requires four sets to be ordered.

The optionally available terminal covers are listed in the table below.

Current rating	Number of poles	Position	Product number
250 A	3 poles	Top, bottom, front, rear	3KC9804-1
	4 poles		3KC9804-2
400 A	3 poles		3KC9804-1
	4 poles		3KC9804-2
630 A	3 poles		3KC9804-3
	4 poles		3KC9804-4

9.1.1 Mounting terminal covers

The following steps are necessary for fitting the terminal covers on the 3KC4 and 3KC8 transfer switching equipment of current ratings 250 A to 630 A.

Note

If bridging bars are used, mount them first.

Requirements

- Main circuit is disconnected
- Transfer switching equipment is in the "Manual" position
- Bridging bars are mounted (if used)
- Accessories for the electronic module installed (3KC8 only)

Procedure

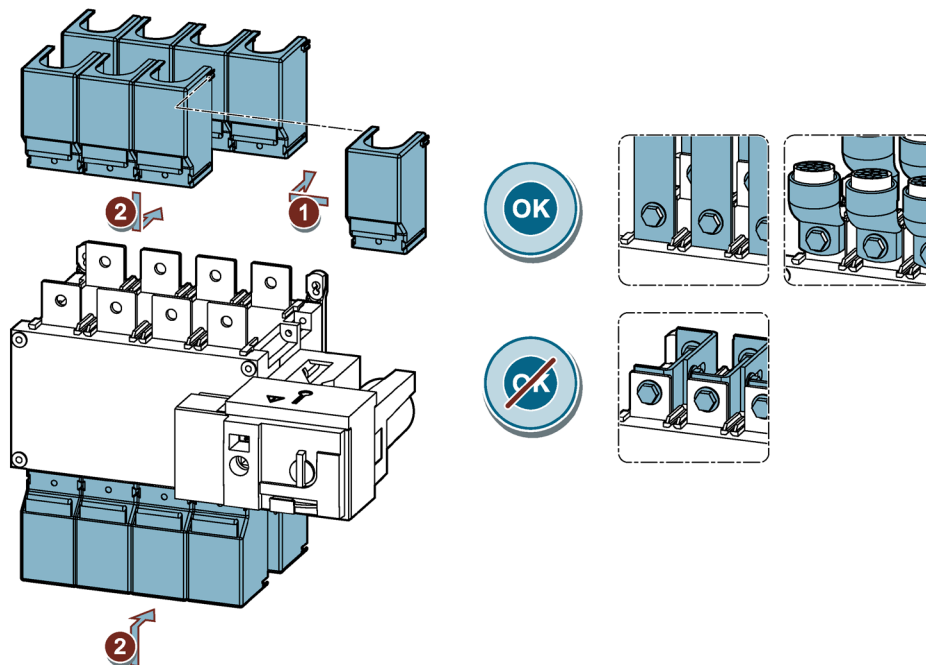


Figure 9-2 Mounting terminal covers

1. Connect the terminal covers with each other depending on the number of poles.
2. Place the connected terminal covers in the draw-out assembly of the transfer switching equipment.

Note

When using bridging bars, only the terminal cover for the front may be used.

9.2 Phase barriers

Phase barriers are used for safe insulation between the connecting terminals. They are available for current ratings 250 A to 630 A

For current ratings 800 A to 3200 A, the phase barriers are already included in the scope of supply.

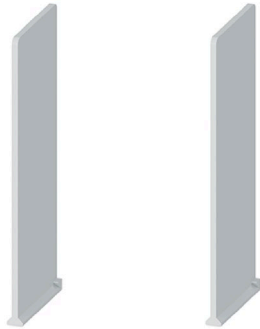


Figure 9-3 Phase barriers

The scope of supply includes 2 phase barriers (for 3-pole devices) or 3 phase barriers (for 4-pole devices) depending on the number of poles.

For full protection on the top and bottom of both installed switches, 4 packs must be ordered in each case.

The optionally available phase barriers are listed in the table below.

Current rating	Number of poles	Position	Product number
250 A	3 poles	Top, bottom	3KC9808-1
	4 poles		3KC9808-6
400 A	3 poles		3KC9808-1
	4 poles		3KC9808-6
630 A	3 poles	3KC9808-2	
	4 poles	3KC9808-7	

9.2.1 Mounting phase barriers

The following steps are necessary for fitting the phase barriers on the 3KC4 and 3KC8 transfer switching equipment of current ratings 250 A to 630 A.

Note

If bridging bars are used, mount them first.

Requirements

- Main circuit is disconnected
- Transfer switching equipment is in the "Manual" position

- Bridging bars are mounted (if used)
- Accessories for the electronic module installed (3KC8 only)

Procedure

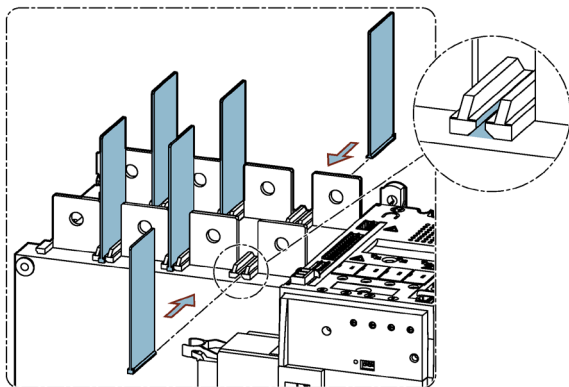


Figure 9-4 Mounting phase barriers

1. Insert the barrier into the mounting channels on the transfer switching equipment.
 - With 3-pole types, insert 4 phase barriers per side in each case.
 - With 4-pole types, insert 6 phase barriers per side in each case.

9.3 Terminal plates

As well as the terminal covers, terminal plates can also be used to protect the terminals against direct touch. The terminal plates are mounted on the front side to protect the upper and lower connecting terminals.



Figure 9-5 Terminal plate

For current ratings 250 A to 630 A, a terminal plate is required for the overall protection of the top and bottom. For current ratings from 800 A, the terminal plates consist of 2 parts and are included in the scope of supply.

9.3 Terminal plates

The optionally available terminal plates are listed in the table below.

Current rating	Number of poles	Position	Product number
250 A	3 poles	Top, bottom	3KC9827-1
	4 poles		3KC9828-1
400 A	3 poles		3KC9827-1
	4 poles		3KC9828-1
630 A	3 poles		3KC9827-2
	4 poles		3KC9828-2
800 A	3 poles		3KC9827-3
	4 poles		3KC9827-7
1000 A	3 poles		3KC9827-3
	4 poles		3KC9827-7
1250 A	3 poles		3KC9827-3
	4 poles		3KC9827-7
1600 A	3 poles		3KC9827-4
	4 poles		3KC9827-8
2000 A	3 poles		3KC9827-5
	4 poles		3KC9828-5
2500 A	3 poles		3KC9827-5
	4 poles		3KC9828-5
3200 A	3 poles		3KC9827-5
	4 poles		3KC9828-5

9.3.1 Mounting terminal plates

Current ratings 250 A to 630 A

The following steps are necessary for mounting the terminal plates on the 3KC4 and 3KC8 transfer switching equipment.

Requirements

- Main circuit is disconnected
- Transfer switching equipment is in the "Manual" position
- Accessories for the electronic module installed (3KC8 only)

Procedure

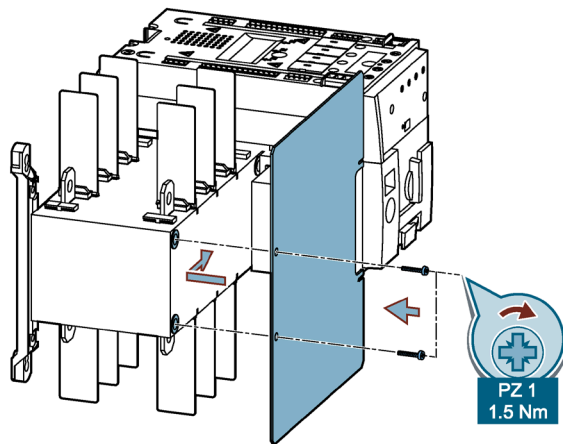


Figure 9-6 Mounting terminal plates for current ratings 250 A to 630 A

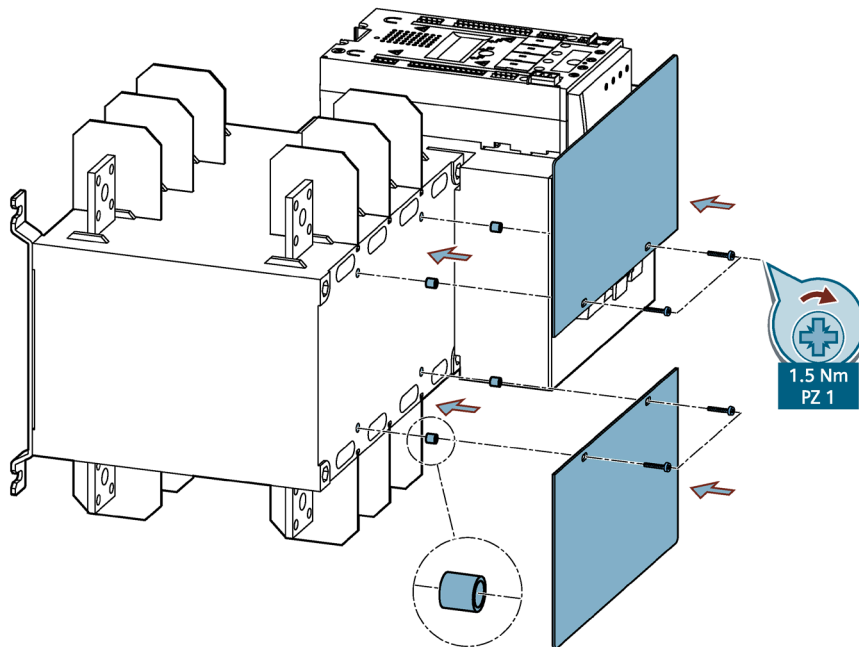


Figure 9-7 Mounting terminal plates for current ratings 800 A to 1600 A

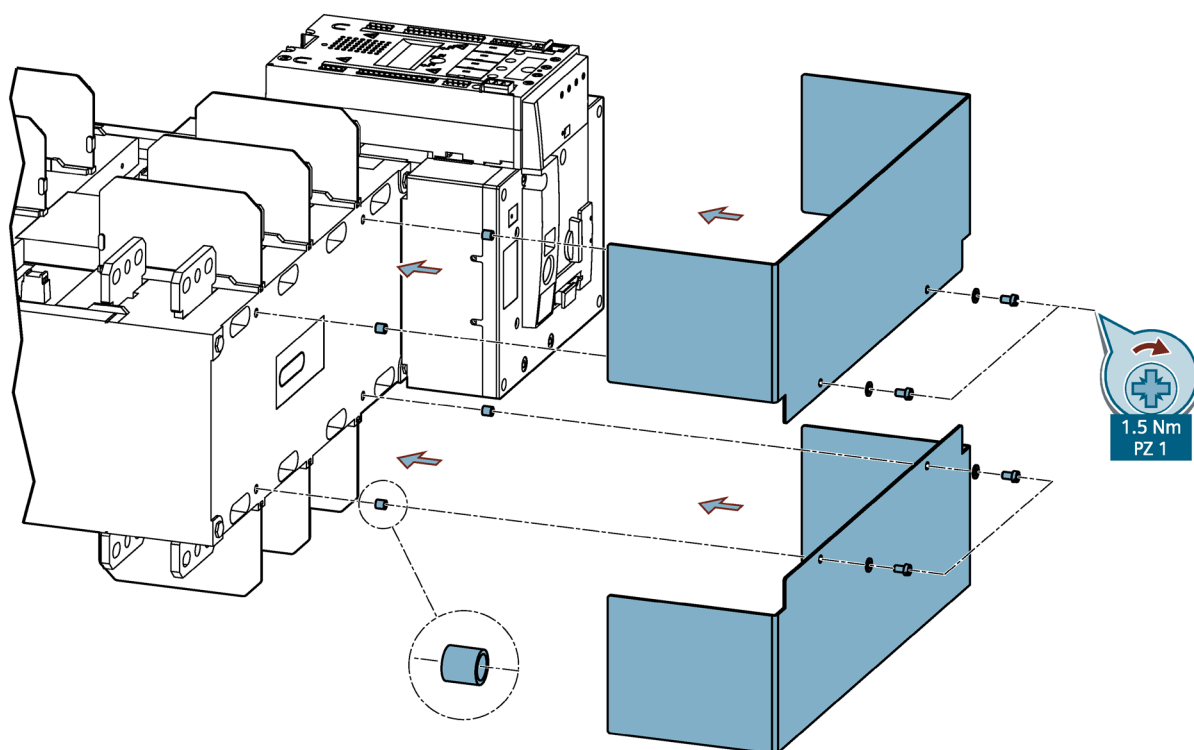


Figure 9-8 Mounting terminal plates for current ratings 2000 A to 3200 A

1. Attach the terminal plate or plates (800 A and higher) to the transfer switching equipment in accordance with the figure.
2. Fit the terminal plate(s) on the transfer switching equipment using the supplied bolts.

Note

If you have fitted the phase barrier accessories (you can find information on this in the section titled Phase barriers (Page 142)), they can no longer be removed after the terminal plate has been fitted.

9.4 Mounting set

Mounting sets are available as spare parts for current ratings 250 A to 630 A. The mounting set comprises two metal device holders and four plastic covers.



Figure 9-9 Mounting set

The scope of supply includes one set comprising 2 device holders and 4 plastic covers.

Current rating	Number of poles	Product number
250 A ... 630 A	3 or 4 poles	3KC9820-6

9.4.1 Replacing the mounting set

The following steps are necessary for replacing additional mounting sets.

Procedure

1. Remove the old mounting sets. Use a screwdriver to lift off the plastic covers and remove the fixing bolts.

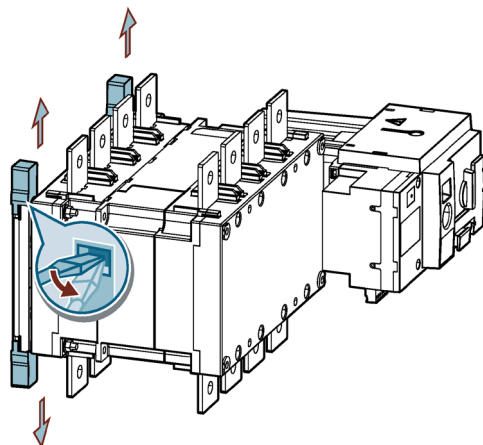


Figure 9-10 Removing the mounting sets

2. Fasten the new device holders with the bolts and fit all four plastic covers, as illustrated in the figures below. With the 630 A version, these must first be adapted by knocking out some elements using pliers.

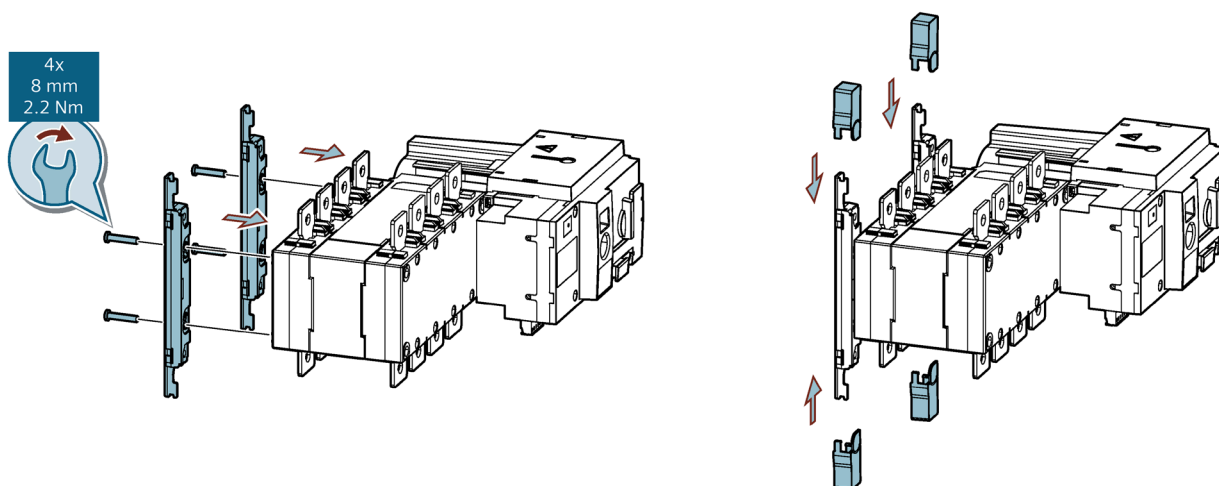


Figure 9-11 Mounting for 250 A ... 400 A

9.5 Bridging bars

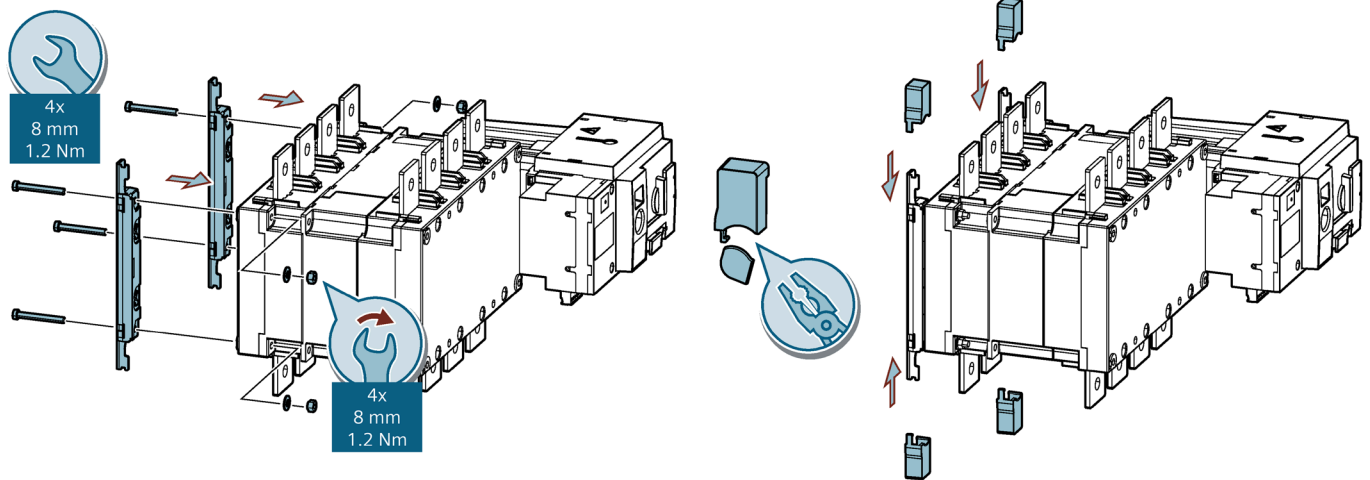


Figure 9-12 Mounting for 630 A

9.5 Bridging bars

For current ratings 250 A to 1600 A, bridging bars can be mounted for implementing an upstream or downstream connection point. They serve as a bridge for the load-side connection and they can be attached either on the top or bottom of the transfer switching equipment.

The bridging bars for current ratings 250 A to 630 A and 800 A to 1600 A comprise one bridging bar as well as the bolts, nuts and washers for mounting.

These must be ordered separately for connecting to the connecting terminals. Please note here the section titled Connecting bridging bars on the load side (Page 38)

To install the device, 3 or 4 bridging bars must be mounted depending on the number of poles.



Figure 9-13 Bridging bar 250 A to 630 A



Figure 9-14 Bridging bar 800 A to 1600 A

There is only 1 bridging bar per product number pack so 3 or 4 packs must be ordered.

The bridging bars are listed in the table below.

Current rating	Number of poles	Position	Product number
250 A	3 poles	Top, bottom	3KC9818-2
	4 poles		3KC9818-2
400 A	3 poles		3KC9818-3
	4 poles		3KC9818-3
630 A	3 poles		3KC9818-4
	4 poles		3KC9818-4
800 A	3 poles		3KC9818-5
	4 poles		3KC9818-5
1000 A	3 poles		3KC9818-5
	4 poles		3KC9818-5
1250 A	3 poles		3KC9818-6
	4 poles		3KC9818-6
1600 A	3 poles		3KC9818-7
	4 poles		3KC9818-7

9.6 Copper bar connection kit

The copper bar connection kit is described in the section titled Copper bar connection kit (Page 44). All the components in the connection kit are listed below.



Figure 9-15 Connection, part A (3KC9811-0, included in the scope of supply for current rating 3200 A)

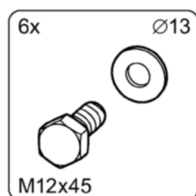


Figure 9-16 Bolt set, part B, 45 mm (3KC9811-1)

9.6 Copper bar connection kit

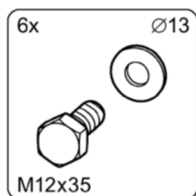


Figure 9-17 Bolt set, part B, 35 mm short length (3KC9811-2)

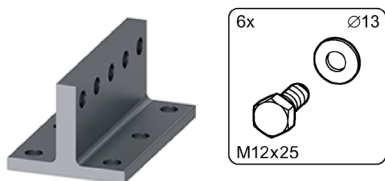


Figure 9-18 T piece, part C (3KC9811-3)

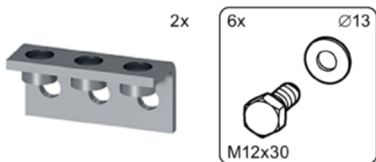


Figure 9-19 Bracket, part D (3KC9811-4)

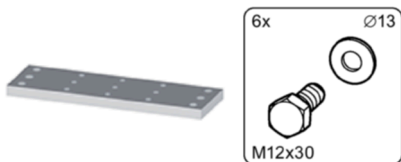


Figure 9-20 Bridging bar, part E (3KC9818-8)

Different connection variants can be created from these components. These are described in the section titled Copper bar connection kit (Page 44).

9.7 Autotransformer

With the autotransformer, the necessary rated voltage of 230 V AC can be generated in a three-phase 3-wire network without neutral. The method of mounting and connecting the autotransformer can be seen in the section titled Installing and connecting an autotransformer (400 V / 230 V) (Page 73).

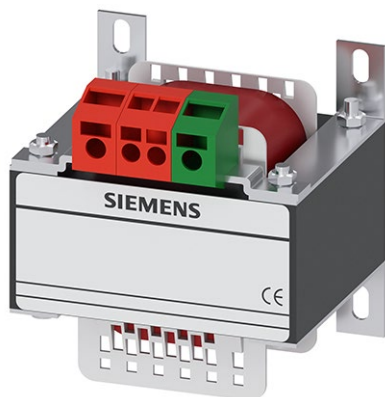


Figure 9-21 Autotransformer (400 V / 230 V) 3KC9824-1

Use of a dual power supply is recommended for the 3KC4 transfer switching equipment. In this case, 2 autotransformers are required both for the 3KC4 transfer switching equipment and for the 3KC8 transfer switching equipment respectively.

Current rating	Number of poles	Position	Product number
250 A ... 3200 A	3	-	3KC9824-1

9.8 Dual power supply (DPS, 3KC4 only)

With the dual power supply, the power supply on the 3KC4 remotely operated transfer switching equipment is implemented by means of 2 x 230 V AC sources. The section Mounting and connecting the dual power supply (DPS) (Page 71) describes the design and installation of the dual power supply.

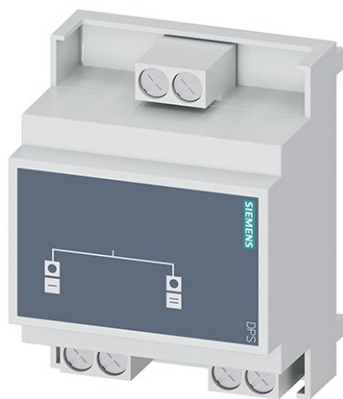


Figure 9-22 Dual power supply (DPS) 3KC9625-1

9.9 Power supply kit 3KC9830-, 3KC9831- (4-pole, 3KC8 only)

Current rating	Number of poles	Position	Product number
250 A ... 3200 A	3 or 4 poles	-	3KC9625-1

9.9 Power supply kit 3KC9830-, 3KC9831- (4-pole, 3KC8 only)

The power supply kit for a three-phase 4-wire network with neutral consists of 3 phases and a neutral conductor. This enables monitoring of the phases and the neutral conductor as well as the power supply of the 3KC8 transfer switching equipment.

The power supply kit is described in the section titled Connecting power supply kit 3KC9830-, 3KC9831- (4-pole) (Page 85).

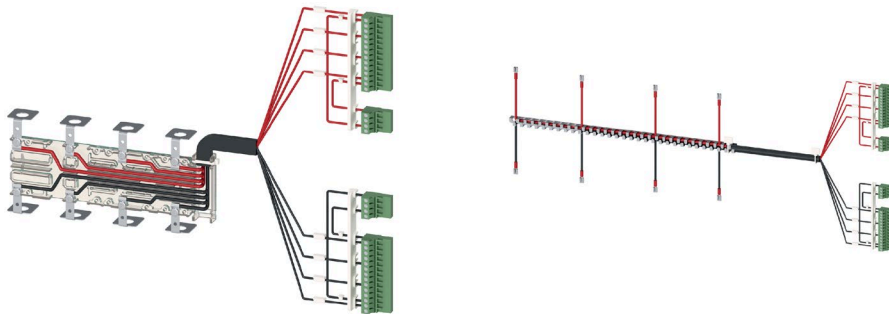


Figure 9-23 Power supply kit 3KC9830-, 3KC9831-

The table below lists the possible variants depending on the arrangement of the load (on the top or bottom) and the current rating.

Current rating	Number of poles	Position	Product number
250 A	4 poles	Bottom	3KC9830-1
400 A	4 poles		3KC9830-2
630 A	4 poles		3KC9830-3
800 A ... 1000 A	4 poles		3KC9830-4
1250 A	4 poles		3KC9830-5
1600 A	4 poles		3KC9830-6
2000 A ... 3200 A	4 poles		3KC9830-7
250 A	4 poles	Top	3KC9831-1
400 A	4 poles		3KC9831-2
630 A	4 poles		3KC9831-3
800 A ... 1000 A	4 poles		3KC9831-4
1250 A	4 poles		3KC9831-5
1600 A	4 poles		3KC9831-6
2000 A ... 3200 A	4 poles		3KC9831-7

9.10 Auxiliary conductor terminal 3KC9822-, 3KC9832- (3-pole, 3KC8 only)

The auxiliary conductor terminal kit for a three-phase 3-wire network without neutral consists of 3 phases without neutral. This is used to implement the monitoring of the three phases.

The auxiliary conductor terminal kit is described in the section titled Connecting the auxiliary conductor terminal 3KC9822-, 3KC9832- for a three-phase 3-wire network (3-pole) (Page 89).

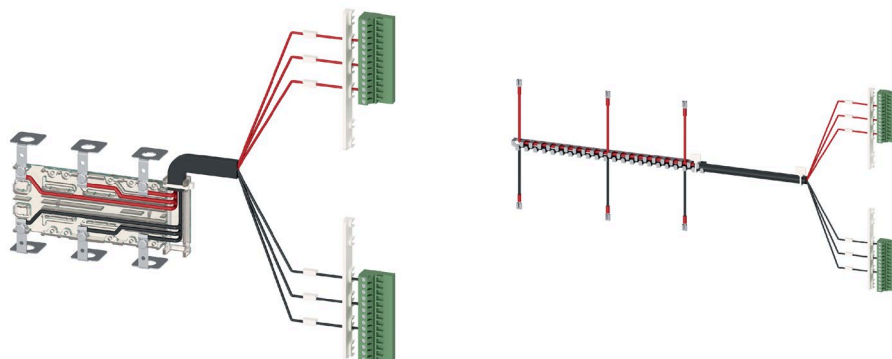


Figure 9-24 Auxiliary conductor terminal kit 3KC9822-, 3KC9832-

The table below lists the possible variants depending on the arrangement of the load (on the top or bottom) and the current rating.

Current rating	Number of poles	Position	Product number
250 A	3 poles	Bottom	3KC9822-1
400 A	3 poles		3KC9822-2
630 A	3 poles		3KC9822-3
800 A ... 1000 A	3 poles		3KC9822-4
1250 A	3 poles		3KC9822-5
1600 A	3 poles		3KC9822-6
2000 A ... 3200 A	3 poles		3KC9822-7
250 A	3 poles	Top	3KC9832-1
400 A	3 poles		3KC9832-2
630 A	3 poles		3KC9832-3
800 A ... 1000 A	3 poles		3KC9832-4
1250 A	3 poles		3KC9832-5
1600 A	3 poles		3KC9832-6
2000 A ... 3200 A	3 poles		3KC9832-7

9.11 Power supply kit 3KC9833-, 3KC9834- (2-pole, 3KC8 only)

The power supply kit for a single-phase network with neutral consists of one phase and a neutral conductor. This enables monitoring of the phase and the neutral conductor as well as the power supply of the 3KC8 transfer switching equipment.

The power supply kit is described in the section titled Connecting power supply kit 3KC9833-, 3KC9834- for single-phase network (Page 92).

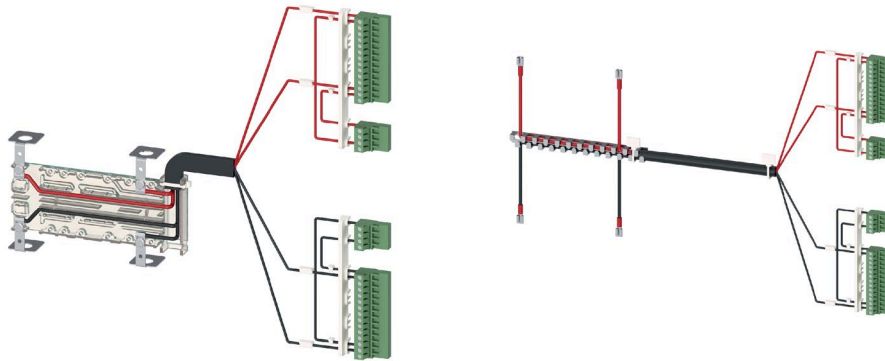


Figure 9-25 Power supply kit 3KC9833-, 3KC9834-

The table below lists the possible variants depending on the arrangement of the load (on the top or bottom) and the current rating.

Current rating	Number of poles	Position	Product number
250 A	3 poles	Bottom	3KC9833-1
400 A	3 poles		3KC9833-2
630 A	3 poles		3KC9833-3
800 A ... 1000 A	3 poles		3KC9833-4
1250 A	3 poles		3KC9833-5
1600 A	3 poles		3KC9833-6
2000 A ... 3200 A	3 poles		3KC9833-7
250 A	3 poles	Top	3KC9834-1
400 A	3 poles		3KC9834-2
630 A	3 poles		3KC9834-3
800 A ... 1000 A	3 poles		3KC9834-4
1250 A	3 poles		3KC9834-5
1600 A	3 poles		3KC9834-6
2000 A ... 3200 A	3 poles		3KC9834-7

9.12 Cover frame (3KC8 only)

The cover frame helps to implement a clean and safe door cut-out to enable access to the front of the 3KC8 transfer switching equipment (electronic module and operation of the motor operator).

You can find the dimensions of the cover frame in the section titled Dimensions of the cover frame for door cut-out (Page 26).



Figure 9-26 Cover frame

Current rating	Product number
250 A ... 630 A	3KC9820-4
800 A ... 3200 A	3KC9820-5

9.13 Auxiliary switches

The auxiliary switches are optionally available for current ratings 250 A to 1600 A. Only 2 auxiliary switches can be installed per transfer switching equipment.

For current ratings from 2000 A to 3200 A, the auxiliary switches are already included and mounted on the transfer switching equipment.

One leading CO contact per auxiliary switch is included for position I and II.

The section titled Auxiliary switch of the transfer switching equipment (Page 75) describes the auxiliary switches and their installation in more detail.



Figure 9-27 Auxiliary switches 3KC9803-1 (left) and 3KC9803-2 (right)

9.14 Display (3KC8 only)

Current rating	Product number
250 A ... 630 A	3KC9803-1
800 A ... 3200 A	3KC9803-2

9.14 Display (3KC8 only)

The display is intended for applications where the switch indicator and source availability also have to be visible outside the control cabinet, e.g. on the control cabinet door. The maximum distance of the connection is 3 m.

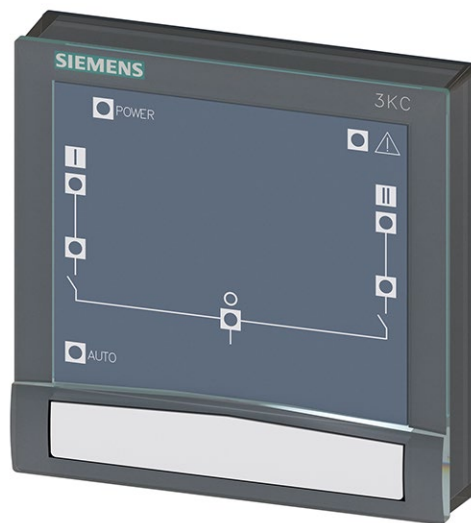


Figure 9-28 Display 3KC9823-0

The 3KC9823-0 display shows the following states:

- Display of source availability
- Indication of the switch position
- Indication of the selected mode ("Auto")
- Fault indicator

Current rating	Product number
250 A ... 3200 A	3KC9823-0

Mounting the display

The door thickness must not exceed 20 mm to allow the display to be mounted on a cabinet door.

1. Release and remove the nut from the bolt thread on the rear of the display.

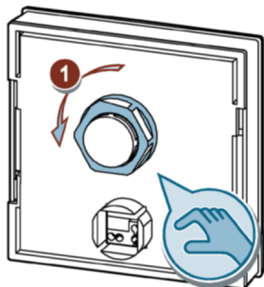


Figure 9-29 Display - removing the nut

2. Drill two holes with a diameter of 22.5 mm at the point in the door where you would like to mount the display. Note the dimensions in the figure:

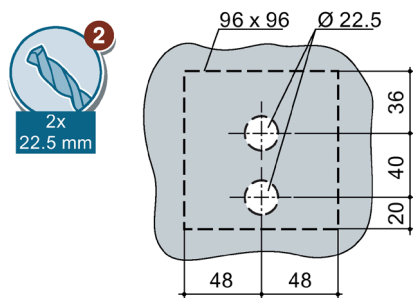


Figure 9-30 Cabinet door drill holes

3. Insert the bolt thread and the connection socket of the display through the two drill holes.

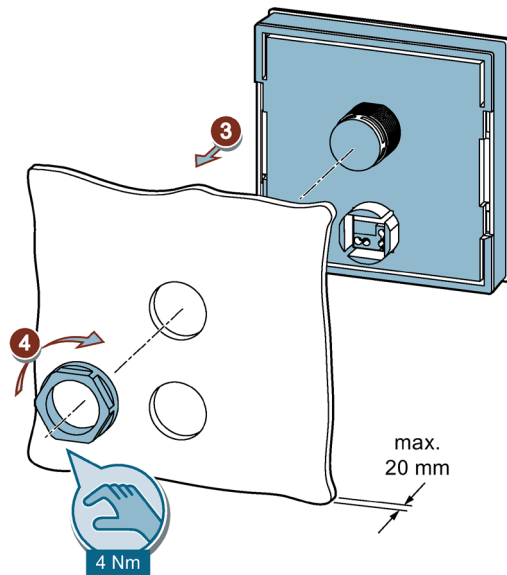


Figure 9-31 Mounting the display

4. Place the nut on the bolt thread and tighten it with the specified torque.

Connecting the display

The 3KC9823-2 connection cable is required for connecting the display to the transfer switching equipment (see also the section titled Connection cable (3KC8 only) (Page 161)).

1. Connect one end of the 3KC9823-2 connection cable with the connection socket on the rear of the display.

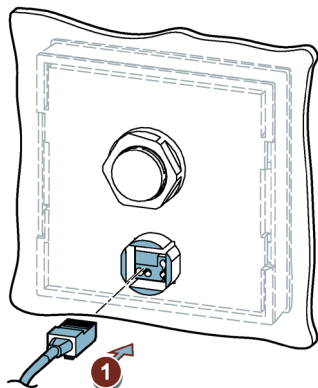


Figure 9-32 Connecting the 3KC9823-2 connection cable on the display

2. Connect one end of the connection cable 3KC9823-2 with the connection socket on the rear of the display.

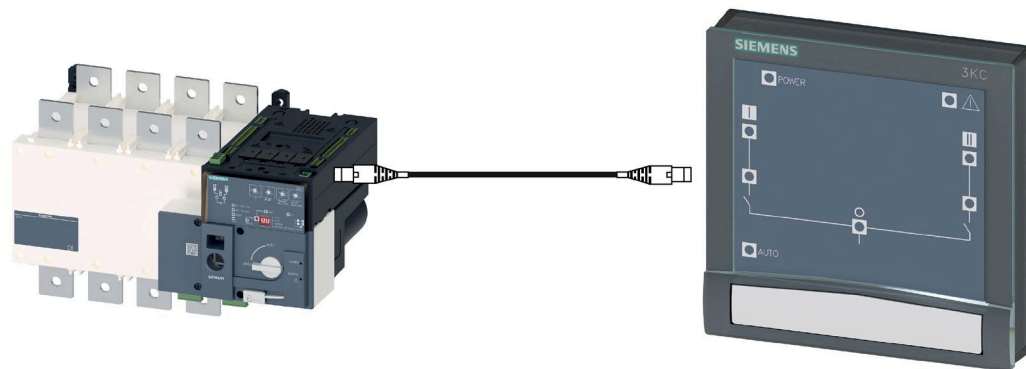


Figure 9-33 Connecting the display on the transfer switching equipment

9.15 Connection cable (3KC8 only)

With the connection cable, a simple connection can be established between the 3KC8 transfer switching equipment and the external display.

Technical specifications

- Type RJ45 8-core
- Straight wires, not shielded and not crossed
- Length: 3 m

9.16 Sealable cover (3KC8 only)

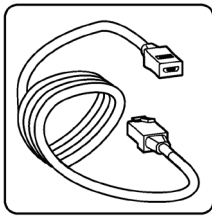


Figure 9-34 3KC9823-2 connection cable

Current rating	Product number
250 A ... 3200 A	3KC9823-2

9.16 Sealable cover (3KC8 only)

The sealable cover for the electronic module of the 3KC8 transfer switching equipment prevents unauthorized access to the electronic module.

The sealing ribbons and the bolt set are included in the delivery content.



Figure 9-35 Sealable cover

Current rating	Product number
250 A ... 3200 A	3KC9821-0

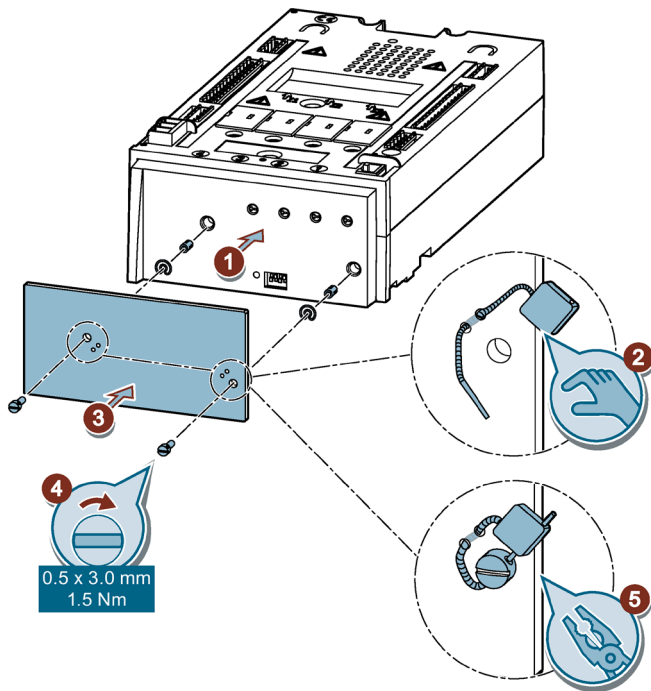
Mounting the sealable cover

Requirement

- The electronic module of the transfer switching equipment is already programmed.

Procedure

1. Press the threaded sockets into their intended positions.
2. Remove the sealable cover's protective film and mount the two sealing ribbons as shown in the diagram.
3. Mount the sealable cover onto the electronic module.
4. Tighten the sealable cover with the bolt set provided and remember to use the washers.
5. Close the sealing ribbons using pliers.

**Note**

The sealing ribbons are also available separately as spare parts in a packet of 10 (3KC9621-2).

Current rating	Product number
250 A ... 3200 A	3KC9621-2

9.17 Motor operator

The motor operator of the 3KC4 and 3KC8 transfer switching equipment can be replaced with a new motor operator in the event of a defect. It is possible to replace the motor operator without disassembling the transfer switching equipment.



Figure 9-36 Motor operator

The required motor operator depends on the current rating. The table below lists the motor operators according to current rating.

Current rating	Product number
250 A ... 400 A	3KC9826-1
630 A	3KC9826-2
800 A ... 1250 A	3KC9826-3
1600 A	3KC9826-4
2000 A 3200 A	3KC9826-5

Replacing the motor operator of the 3KC4 transfer switching equipment

WARNING

Danger! High voltage

Turn off and lock out all power supplying this device before working on this device. Installation and maintenance work on this device must be carried out by authorized persons with the appropriate electrical training only.

The following steps describe the replacement of the motor operator on the 3KC4 transfer switching equipment.

1. Switch the transfer switching equipment from "Auto" mode to "Manual" mode.

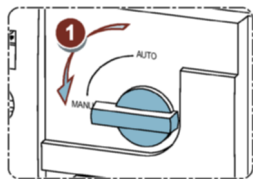


Figure 9-37 Set the switch to the "Manual" position

2. Switch the transfer switching equipment to position 0 (OFF).
3. Press the button on the cover cap.

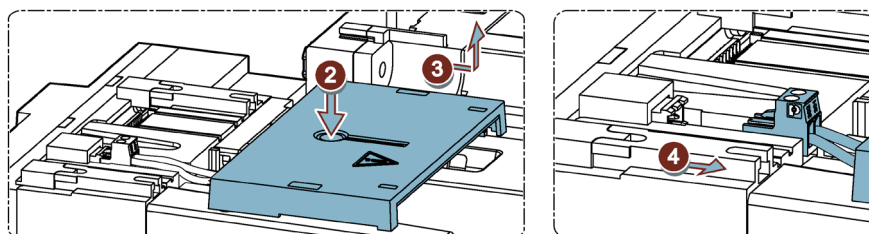


Figure 9-38 Disassembling the cover cap and the power supply kit

4. Slide the cover cap carefully backwards and remove it.
5. Remove the power supply of the transfer switching equipment (pin 301 and 302).
6. Remove the control inputs (pins 312-317).

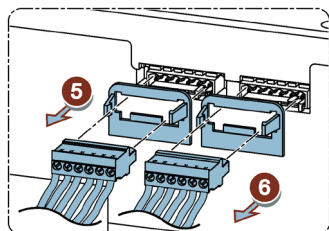


Figure 9-39 Removing control inputs

7. Remove the outputs (pins 63, 64, 24, 14, 04, 13).

- Remove the bolts in accordance with the figure.

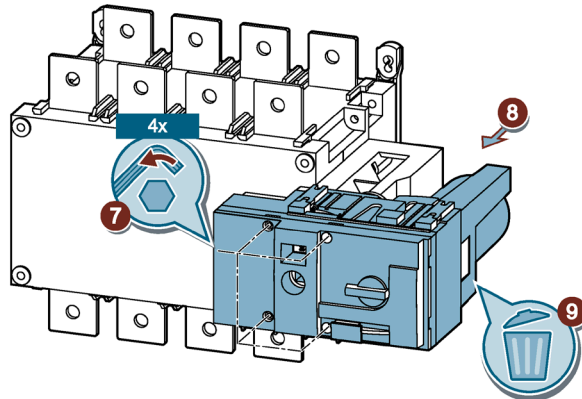


Figure 9-40 Disassembling and disposing of the motor operator of the 3KC4 transfer switching equipment

- Remove the motor operator from the transfer switching equipment.
- Dispose of the motor operator in an environmentally friendly way.
- To mount a new motor operator, follow steps 1 to 8 in the reverse order.

Replacing the motor operator of the 3KC8 transfer switching equipment

The following steps describe the replacement of the motor operator on the 3KC8 transfer switching equipment.

- Switch the transfer switching equipment from "Auto" mode to "Manual" mode.

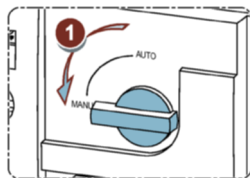


Figure 9-41 Set the switch to the "Manual" position

- Remove the inputs of the electronic module.

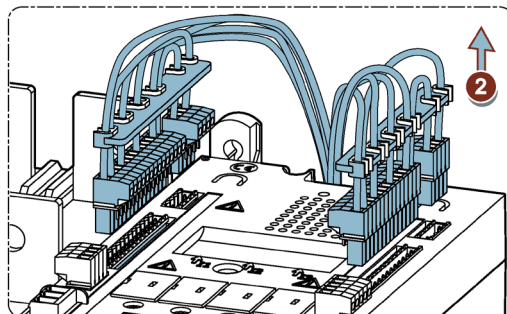


Figure 9-42 Removing the inputs of the electronic module

- Remove the control inputs (pins 312-317).

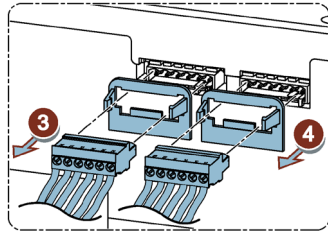


Figure 9-43 Removing control inputs and outputs

- Remove the outputs (pins 63, 64, 24, 14, 04, 13).
- Remove the bolts in accordance with the figure.

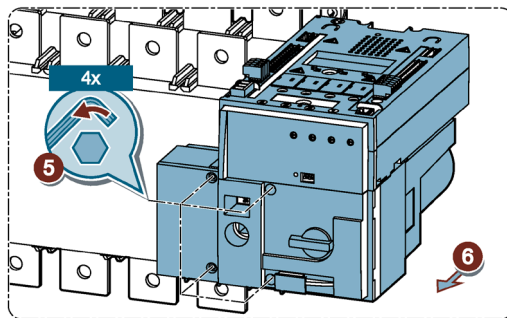


Figure 9-44 Disassembling the motor operator of the 3KC8 transfer switching equipment

- Remove the motor operator from the transfer switching equipment.
- Remove the bolts of the electronic module in accordance with the figure.

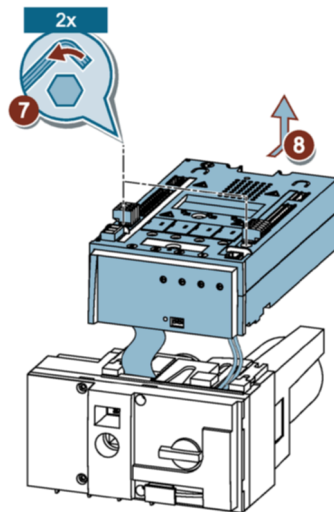


Figure 9-45 Disassembling the electronic module

- Pull the electronic module to the rear to release the bolts.

9. Lift the electronic module to reach the connections.

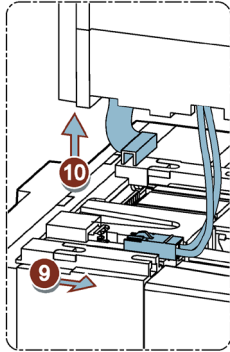


Figure 9-46 Disconnecting the power supply

10. Disconnect the power supply of the transfer switching equipment (pin 301 and 302).
11. Release the clip assembly to remove the electronic module from the motor operator.
12. Dispose of the motor operator in an environmentally friendly way.

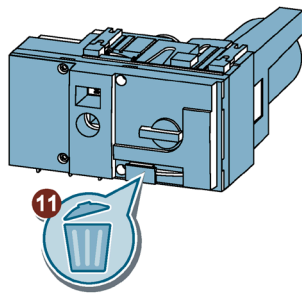


Figure 9-47 Disposing of the motor operator

13. To mount a new motor operator, follow steps 1 to 11 in the reverse order. Before mounting the new electronic module (step 7), also refer to the figure "Adapter selection" in chapter Electronic module (3KC8 only) (Page 169) to decide about the use of the enclosed adapter.

9.18 Electronic module (3KC8 only)

The electronic module of the 3KC8 transfer switching equipment can be replaced with a new electronic module in the event of a defect.



Figure 9-48 Electronic module 3KC9826-0

Current rating	Product number
250 A ... 3200 A	3KC9826-0

Replacing the electronic module

1. To disassemble the electronic module, follow the corresponding steps 1 to 11 in the section titled Motor operator (Page 164).
2. Dispose of the electronic module in an environmentally friendly way.

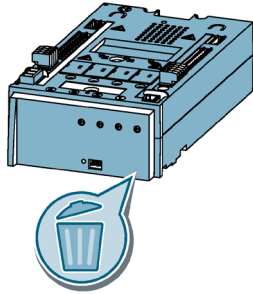


Figure 9-49 Disposing of the electronic module

3. To mount a new electronic module, follow steps 1 to 11 in the section titled Motor operator (Page 164) in reverse order. Refer to the figure below for fitting the adapter:

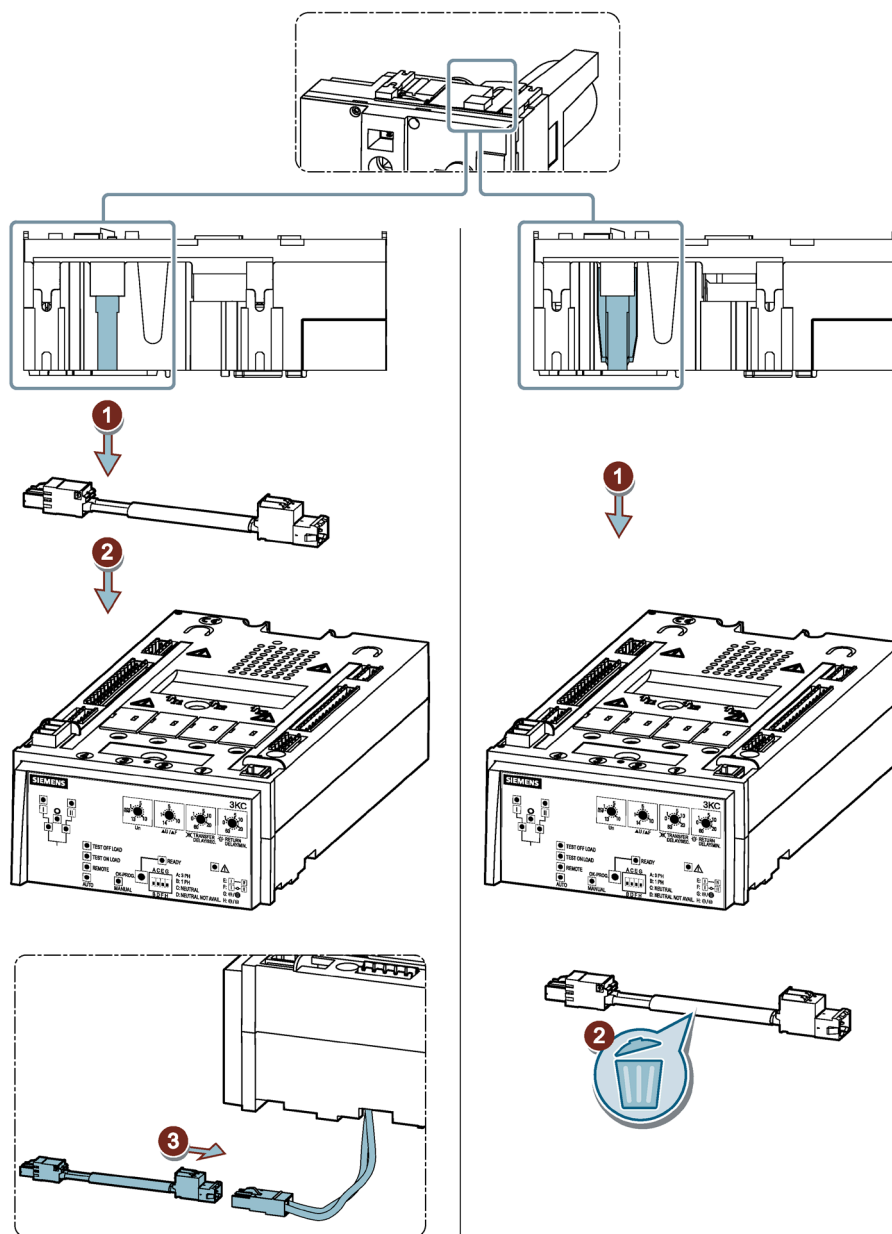


Figure 9-50 Adapter selection

9.18 Electronic module (3KC8 only)

Service and maintenance

10.1 Fault rectification

The following content is described in this chapter:

- Fault states and fault detection on the 3KC4 transfer switching equipment
- Fault states and fault detection on the 3KC8 transfer switching equipment

10.1.1 Fault states and fault detection on the 3KC4 transfer switching equipment

Fault state	Procedure for fault rectification
The transfer switching equipment does not transfer automatically.	<ul style="list-style-type: none"> • Check whether the power supply inputs of terminals 301 and 302 (208 to 277 V AC \pm 20 %) are connected. • Check whether the switch is in the "Auto" position. • Check whether contacts 313 and 317 are opened. • Check whether contacts 312 and 317 are closed. • Check whether the "Power" LED shows a green light and the warning LED has gone out. • Check product availability via the closed contacts 63A and 64A.
The transfer switching equipment cannot be operated with the handle.	<ul style="list-style-type: none"> • Check whether the switch is in the "Manual" position. • Check whether the product is not padlocked. • Check the direction of movement of the handle. • Try to turn the handle in the direction described on the handle with appropriate force.
The electrical commands I (ON) – O (OFF) – II (ON) are not followed.	<ul style="list-style-type: none"> • Check the selected control logic (impulse / continuous operation logic). • Check the cabling of the plug-in connections. • Check whether contacts 312 and 317 are closed. • Check whether contacts 313 and 317 are opened.

10.1 Fault rectification

Fault state	Procedure for fault rectification
<p>The warning LED on the motor operator lights up.</p>	<ul style="list-style-type: none"> • In the case of the 3KC4 transfer switching equipment, the warning LED on the motor operator lights up when the transfer switching equipment is in manual operation. If the LED lights up even though the transfer switching equipment is in automatic mode, an internal fault is active. To reset the state, switch the transfer switching equipment from automatic mode to manual operation and back again to automatic mode. Alternatively, the transfer switching equipment can be reset on the hardware by switching off the power supply to the transfer switching equipment for more than 3 minutes. If the LED continues to light up, you must locate and correct the fault. • The warning LED lights up if contacts 313 (priority command for the OFF position) and 317 are closed. This is a normal state. • If the LED lights up for other reasons, contact Technical Support (http://www.siemens.com/lowvoltage/technical-support).
<p>The transfer switching equipment cannot be locked.</p>	<ul style="list-style-type: none"> • Check whether the transfer switching equipment is in the "Manual" position. • Ensure the handle for manual transfer has been removed and is not secured in the assembly. • Check whether the switch on the transfer switching equipment is in the O position (padlocking mode is only possible in the O position).

10.1.2 Fault states and fault detection on the 3KC8 transfer switching equipment

Fault state	Procedure for fault rectification
<p>The transfer switching equipment does not transfer automatically (automatic or remote transfer switching).</p>	<ul style="list-style-type: none"> • Check whether the power supply inputs of terminals 101 and 102 as well as 201 and 202 (208 to 277 V AC \pm 20 %) are connected. • Check whether the switch is in the "Auto" position. • Check whether contacts 313 and 317 are opened. • Check whether the "Power" LED shows a green light and the warning LED has gone out. • Check whether the "Ready" LED on the electronic module shows a continuous green light • Check whether at least one of the two LEDs for source availability shows a continuous green light. • Check product availability via the closed contacts 63A and 64A as well as 63B and 64B. • Check whether the problem relates to the electronic module and the motor operator, or only to the electronic module. <p>Note: The electronic module can be bypassed to localize the problem to the electronic module or motor operator. Contacts 312 and 317 must be closed and contact 313 must remain open. In this way, the motor operator can execute transfer commands through inputs 314-317 without involvement of the electronic module. The transfer switching equipment is in remote mode.</p>
<p>The transfer switching equipment cannot be operated with the handle.</p>	<ul style="list-style-type: none"> • Check whether the switch is in the "Manual" position. • Check whether the product is not padlocked. • Check the direction of movement of the handle. • Try to turn the handle in the direction described on the handle with appropriate force.
<p>The electrical commands I (ON) – O (OFF) – II (ON) are not followed.</p>	<ul style="list-style-type: none"> • Check the selected control logic (impulse / continuous operation logic). • Check the cabling of the plug-in connections. • Check whether contacts 312 and 317 are closed. • Check whether contacts 313 and 317 are opened.
<p>The transfer switching equipment cannot be locked.</p>	<ul style="list-style-type: none"> • Check whether the switch is in the "Manual" position. • Ensure the handle for manual transfer has been removed and is not secured in the assembly. • Check whether the switch on the transfer switching equipment is in the O position (padlocking mode is only possible in the O position).

Fault state	Procedure for fault rectification
The "Ready" LED flashes.	<p>The "Ready" LED flashes if the saved settings are not identical to those displayed on the electronic module. Possible reasons for this</p> <ul style="list-style-type: none"> • The settings are not saved. • The potentiometer settings have been changed without saving. <p>To correct this fault, either reset the 3KC8 to the changed settings or save the new settings. For this purpose, switch the transfer switching equipment to the "Manual" position and briefly press the "OK-Prog" pushbutton. The transfer switching equipment can then be switched back to the "Auto" position.</p>
The "Auto" LED flashes.	<p>The "Auto" LED lights up green continuously when the 3KC8 transfer switching equipment is in automatic mode. The "Auto" LED flashes green when the timer is running.</p>
The warning LED on the motor operator lights up.	<p>In the case of the 3KC8 transfer switching equipment, the warning LED on the motor operator lights up when the transfer switching equipment is in manual operation. If the LED lights up even though the transfer switching equipment is in automatic mode, an internal fault is active. To reset the state, switch the transfer switching equipment from automatic mode to manual operation and back again to automatic mode. Alternatively, the transfer switching equipment can be reset on the hardware by switching off the power supply to the transfer switching equipment for more than 3 minutes. If the LED continues to light up, you must locate and correct the fault:</p> <ul style="list-style-type: none"> • The warning LED lights up if contacts 313 (priority command for the OFF position) and 317 are closed. This is a normal state. • Check whether the power supply for the transfer switching equipment is within the limits. • If the LED lights up for other reasons, contact Technical Support (http://www.siemens.com/lowvoltage/technical-support).
The fault indicator on the electronic module lights up	<p>To reset the state, switch the transfer switching equipment from automatic mode to manual operation. Then switch back again to automatic mode.</p> <p>If the fault persists, contact Technical Support (http://www.siemens.com/lowvoltage/technical-support).</p>


10.2 Regular service and maintenance

This chapter describes the procedure and intervals for service and maintenance.

Qualified personnel

The product/system associated with this documentation may be handled only by personnel qualified for the respective assignment, while observing the appropriate documentation for the associated task, in particular the safety and warning notices provided in the documentation. Because of their training and experience, qualified personnel are able to recognize any risks involved when handling these products/systems and to avoid any possible hazards.

Procedure

 WARNING
Hazardous voltage!
Ensure there is no live voltage before carrying out service or maintenance work on the transfer switching equipment.

We recommend actuating the 3KC4 and 3KC8 transfer switching equipment at least once a year in the following sequence:

I - 0 - II - 0 - I.

This should be done both in manual operation and in automatic mode with the 3KC8 transfer switching equipment and in remote mode with the 3KC4 transfer switching equipment.

In addition, all connections should be tested at least once a year to make sure they are tight. The procedure is as follows:

- Check the tightening torque of the connecting screws
- Visual inspection of all cables
- Visual inspection of accessories and their connections

Technical specifications

The technical specifications of the 3KC4 and 3KC8 transfer switching equipment in accordance with IEC 60947-3 and IEC 60947-6-1 are described in this chapter:

11.1 Technical specifications 3KC4 and 3KC8 from 250 A to 1000 A

		3KC4.38	3KC4.42	3KC4.46	3KC4.48	3KC4.50
		3KC8.38	3KC8.42	3KC8.46	3KC8.48	3KC8.50
Uninterrupted current	A	250	400	630	800	1000
Operating voltage at 50/60 Hz AC in compliance with IEC 60947-6-1	V			415		
Operating voltage at 50/60 Hz AC in compliance with IEC 60947-3	V			690		
Insulation voltage	V			1000 AC; 1000 DC		
Impulse withstand voltage (U_{imp}) of the main circuit	kV	12	12	12	12	12
Impulse withstand voltage (U_{imp}) of the control circuit	kV	4	4	4	4	4
Overvoltage category with pollution degree 3				RTSE: IV; ATSE: III		
Operational current in compliance with IEC 60947-6-1						
• AC-31 B 415 V	A	250	400	630	800	1000
• AC-32 B 415 V	A	200	400	500	800	1000
• AC-33 B 415 V	A	200	200	400	800	1000
Operational current in compliance with IEC 60947-3						
• AC-21 A/B 415 V	A	250	400	630	800	1000
• AC-21 A/B 690 V	A	200	200	500	800	1000
• AC-22 A/B 415 V	A	250	400	630	800	1000
• AC-22 A/B 690 V	A	160	160	400	630	800
• AC-23 A/B 415 V	A	200	400	500/630	800	1000
• AC-23 A/B 690 V	A	125	125	400	630	630
• DC-21/-22 A 220 V	A	250	250	630	800	1000
• DC-21/-22/-23 A 440 V; DC-23 220 V	A	200	200	630	800	1000
Operational power in compliance with IEC 60947-3						
• AC-23 A/B 415 V	kW	110	220	335	450	700

Technical specifications

11.1 Technical specifications 3KC4 and 3KC8 from 250 A to 1000 A

		3KC4.38	3KC4.42	3KC4.46	3KC4.48	3KC4.50
		3KC8.38	3KC8.42	3KC8.46	3KC8.48	3KC8.50
• AC-23 A/B 690 V	kW	110	110	400	400	630
Short-circuit behavior						
Short-circuit current ratings in compliance with IEC 60947-6-1						
• Short-time withstand current (I_{cw} , 60 ms, 415 V)	kA	10 at 30 ms	10 at 30 ms	12.6	20	20
• Short-circuit current making capacity (I_{cm} , 415 V)	kA	17	17	25.2	40	40
Short-circuit current ratings in compliance with IEC 60947-3						
• Short-time withstand current (I_{cw} , 60 ms, 415 V)	kA	8 at 690 V	8 at 690 V	10 at 690 V	35	35
• Short-circuit current making capacity (I_{cm} , 415 V)	kA	22 at 690 V	30 at 690 V	17 at 690 V	73.5	73.5
Conditional short-circuit current with fuse						
• Continuous current of upstream fuse	A	250	400	630	800	1000
• Conditional short-circuit current with fuse (690 V) IEC 60947-3	kA	50	50	50	50	50
• Conditional short-circuit current with fuse (415 V) IEC 60947-6-1	kA	50	50	50	50	50
Let-through current of gG fuse at 415 V; max. permissible	kA	22	30	42	51	60
I^2t value of the gG fuse at 400/500 V; max. permissible	kA ² s	200	600	3000	6000	6300
Transfer switching properties						
Switching time I-0 & II-0	s	0.5	0.5	0.6	1.4	1.4
Switch-off time I-0-II & II-0-I IEC 60947-6-1	s	0.4	0.4	0.4	1.4	1.4
Transfer time I-0-II & II-0-I IEC 60947-6-1	s	0.9	0.9	1	2.8	2.8
Transfer time I-0-II & II-0-I IEC 60947-6-1 with source monitoring	s	1	1	1.1	3.1	3.1
Motor operator rated apparent power at 230 V AC	VA	115	115	150	184	184
Motor operator peak inrush current at 230 V AC	A	1.2	1.2	1.2	2	2
Main conductor connections						
• Cu conductor, solid	mm ²	1 x (95 ... 150)	1 x (185 ... 240)	2 x (150 ... 300)	2 x (185 ... 300)	2 x 240 ... 4 x 185
• Cu conductor, stranded	mm ²	1 x (95 ... 150)	1 x (185 ... 240)	2 x (150 ... 300)	2 x (185 ... 300)	2 x 240 ... 4 x 185
• With cable lug (DIN 46234)	mm ²	1 x 150	1 x 240	2 x 300	2 x 300	4 x 185

11.2 Technical specifications 3KC4 and 3KC8 from 1250 A to 3200 A

		3KC4.38	3KC4.42	3KC4.46	3KC4.48	3KC4.50
		3KC8.38	3KC8.42	3KC8.46	3KC8.48	3KC8.50
• Cu busbar	mm ²	1 x 32 x 5	1 x 32 x 8	2 x 40 x 5	2 x 50 x 5	2 x 60 x 5
• Tightening torque for main contacts	Nm	20 ... 26	20 ... 26	40 ... 45	8.3 ... 13	8.3 ... 13
Other properties						
Power loss; per pole	W	5.9	15.1	32.4	41.7	46.9
Mechanical endurance		7000	4000	4000	2500	2500
Electrical endurance (AC-23 B at 415 V)		1000	1000	1000	500	500
IP protection class / with cover		IP00 / IP20				
Ambient temperature during operation	°C	-20 ... +70				
Ambient temperature during storage	°C	-40 ... +70				
Width x height x depth (3-pole switch)	mm	328 x 160 x 292	328 x 170 x 292	377 x 260 x 369	504 x 370 x 440	504 x 370 x 440
Width x height x depth (4-pole switch)	mm	378 x 160 x 292	378 x 170 x 292	437 x 260 x 369	584 x 370 x 440	584 x 370 x 440

11.2 Technical specifications 3KC4 and 3KC8 from 1250 A to 3200 A

		3KC4.52	3KC4.54	3KC4.56	3KC4.58	3KC4.60
		3KC8.52	3KC8.54	3KC8.56	3KC8.58	3KC8.60
Uninterrupted current	A	1250	1600	2000	2500	3200
Operating voltage at 50/60 Hz AC in compliance with IEC 60947-6-1	V	415				
Operating voltage at 50/60 Hz AC in compliance with IEC 60947-3	V	690				
Insulation voltage	V	1000 AC; 1000 DC				
Impulse withstand voltage (U _{imp}) of the main circuit	kV	12	12	12	12	12
Impulse withstand voltage (U _{imp}) of the control circuit	kV	4	4	4	4	4
Overvoltage category with pollution degree 3		RTSE: IV; ATSE: III				
Operational current in compliance with IEC 60947-6-1						
• AC-31 B 415 V	A	1250	1600	2000	2500	3200
• AC-32 B 415 V	A	1250	1250	2000	2000	2000
• AC-33 B 415 V	A	1000	1000	1250	1250	1250
Operational current in compliance with IEC 60947-3						
• AC-21 A/B 415 V	A	1250	1600	-/2000	-/2500	-/3200

Technical specifications

11.2 Technical specifications 3KC4 and 3KC8 from 1250 A to 3200 A

		3KC4.52	3KC4.54	3KC4.56	3KC4.58	3KC4.60
		3KC8.52	3KC8.54	3KC8.56	3KC8.58	3KC8.60
• AC-21 A/B 690 V	A	1250	1600	-/2000	-/2000	-/2000
• AC-22 A/B 415 V	A	1250	1600	-/2000	-/2500	-/3200
• AC-22 A/B 690 V	A	1000	1000	-	-	-
• AC-23 A/B 415 V	A	1250	1250	-/1600	-/1600	-/1600
• AC-23 A/B 690 V	A	800	800	-	-	-
• DC-21/-22 A 220 V	A	1250	1250	-	-	-
• DC-21/-22/-23 A 440 V; DC-23 220 V	A	1250	1250			
Operational power in compliance with IEC 60947-3						
• AC-23 A/B 415 V	kW	800	900	-	-	-
• AC-23 A/B 690 V	kW	800	800	-	-	-
Short-circuit behavior						
Short-circuit current ratings in compliance with IEC 60947-6-1						
• Short-time withstand current (I_{cw} , 60 ms, 415 V)	kA	25	32	50	50	50
• Short-circuit current making capacity (I_{cm} , 415 V)	kA	52.5	67.2	105	105	105
Short-circuit current ratings in compliance with IEC 60947-3						
• Short-time withstand current (I_{cw} , 60 ms, 415 V)	kA	35	50	50	50	50
• Short-circuit current making capacity (I_{cm} , 415 V)	kA	73.5	105	105	105	105
Conditional short-circuit current with fuse						
• Continuous current of upstream fuse	A	1250	2 x 800	--	--	--
• Conditional short-circuit current with fuse (690 V) IEC 60947-3	kA	100	100	--	--	--
• Conditional short-circuit current with fuse (415 V) IEC 60947-6-1	kA	100	100	--	--	--
• Let-through current of gG fuse at 415 V; max. permissible	kA	100	100	--	--	--
• I^2t value of the gG fuse at 400/500 V; max. permissible	kA ² s	--	--	--	--	--
Transfer switching properties						
Switching time I-O & II-O RTSE / ATSE	s	1.4	1.4	1.6	1.6	1.6

11.2 Technical specifications 3KC4 and 3KC8 from 1250 A to 3200 A

		3KC4.52	3KC4.54	3KC4.56	3KC4.58	3KC4.60
		3KC8.52	3KC8.54	3KC8.56	3KC8.58	3KC8.60
Switch-off time I-0-II & II-0-I IEC 60947-6-1	s	1.4	1.5	1.2	1.2	1.2
Transfer time I-0-II & II-0-I IEC 60947-6-1	s	2.8	2.9	2.8	2.8	2.8
Transfer time I-0-II & II-0-I IEC 60947-6-1 with source monitoring	s	3.1	3.3	2.8	2.8	2.8
Motor operator rated apparent power at 230 V AC	VA	184	230	322	322	322
Motor operator peak inrush current at 230 V AC	A	2	2	3.5	3.5	3.5
Main conductor connections						
• Cu conductor, solid	mm ₂	4 x 185	6 x 185	--	--	--
• Cu conductor, stranded	mm ₂	4 x 185	6 x 185	--	--	--
• With cable lug (DIN 46234)	mm ₂	4 x 185	6 x 185	--	--	--
• Cu busbar	mm ₂	2 x 60 x 7	2 x 100 x 5	3 x 100 x 5	2 x 100 x 10	3 x 100 x 10
• Tightening torque for main contacts	Nm	20 ... 26	40 ... 45	40 ... 45	40 ... 45	40 ... 45
Other properties						
Power loss; per pole	W	93.3	122	178	255	330
Mechanical endurance		2500	2500	1500	1500	1500
Electrical endurance (AC-23 B at 415 V)		500	500	500	500	500
IP protection class / with cover		IP00 / IP20				
Ambient temperature during operation	°C	-20 ... +70				
Ambient temperature during storage	°C	-40 ... +70				
Width x height x depth (3-pole switch)	mm	504 x 370 x 440	596 x 380 x 440	596 x 380 x 569	596 x 380 x 569	596 x 380 x 569
Width x height x depth (4-pole switch)	mm	584 x 370 x 440	716 x 380 x 440	716 x 380 x 569	716 x 380 x 569	716 x 380 x 569

11.3 Technical specifications of the electronic module

Electronic module for the 3KC8 transfer switching equipment up to 3200 A

	Unit	3KC8 (250 to 3200 A)
ATS settings		
• Network variants		1 + N; 3; 3 + N
• Transfer delay	s	0 ... 60
• Return transfer delay	min	0 ... 60
• Frequency deviation	%	±3 ... 10
• Voltage	%	±5 ... 20
Measuring inputs		
Maximum rated voltage (U_n)		
• Phase-phase	V AC	480
• Phase-neutral	V AC	277
Metering range (L-N)	V	30 ... 332
Metering range (L-L)	V	30 ... 600
Measuring frequency	Hz	30 ... 70
Input impedance (L-L)	MΩ	12
Number of monitored phases		1 or 3
Measuring method		True RMS
Relative error of measurement method	%	0.5
Auxiliary supply		
Connection type		Integrated dual power supply
Rated voltage (AC)	V	230
Supply voltage range (AC)	V	166 ... 332
Frequency	Hz	45 ... 65
Power loss (230 V AC) ¹⁾	W	2.5
Impulse withstand voltage (U_{imp}) of the control circuit	kV	4
Overvoltage category of the control circuit		III
Digital inputs		
Number of inputs		Motor operator: 5 Electronic module: 6

11.3 Technical specifications of the electronic module

	Unit	3KC8 (250 to 3200 A)
Digital input ²⁾		<p>Motor operator: O position, I position, II position, O position with priority, release for remote control mode</p> <p>Electronic module: inhibition of automatic mode, inhibition of automatic return transfer, priority and selection of system, test off load, test on load, priority for test on load, deactivation of stabilization delay</p>
Input delay	ms	46
Number of relay outputs		<p>Motor unit: 4 NO Electronic module: 1 NO 1 CO: 2A/250 V AC / 2A/24 V DC</p>
Supplementary notes on relay outputs ²⁾		<p>Motor operator: availability of the motor operator, switch position I, O, II,</p> <p>Electronic module: availability of the device, generator start/stop signal</p>
Connections		
Connecting terminals		removable / plug-in
Connectable conductor cross-section / stranded, solid	mm ²	1.5 ... 2.5
Connectable conductor cross-section / solid	AWG	16 ... 14
Connectable conductor cross-section / stranded	AWG	16 ... 14
Tightening torque	Nm	0.5 ... 0.6

1) In addition to the power loss of the motor operator

2) You can find more information in the chapter on the functions of the inputs and outputs.

Dimension drawings

The following content is described in this chapter:

- Dimensions of the 3KC4 transfer switching equipment 250 A to 3200 A
- Dimensions of the 3KC8 transfer switching equipment 250 A to 3200 A

12.1 Dimension drawings of the 3KC4 transfer switching equipment

The dimension drawings of the 3KC4 transfer switching equipment are shown below. The dimension drawings are arranged according to current rating.

Current rating 250 A to 630 A

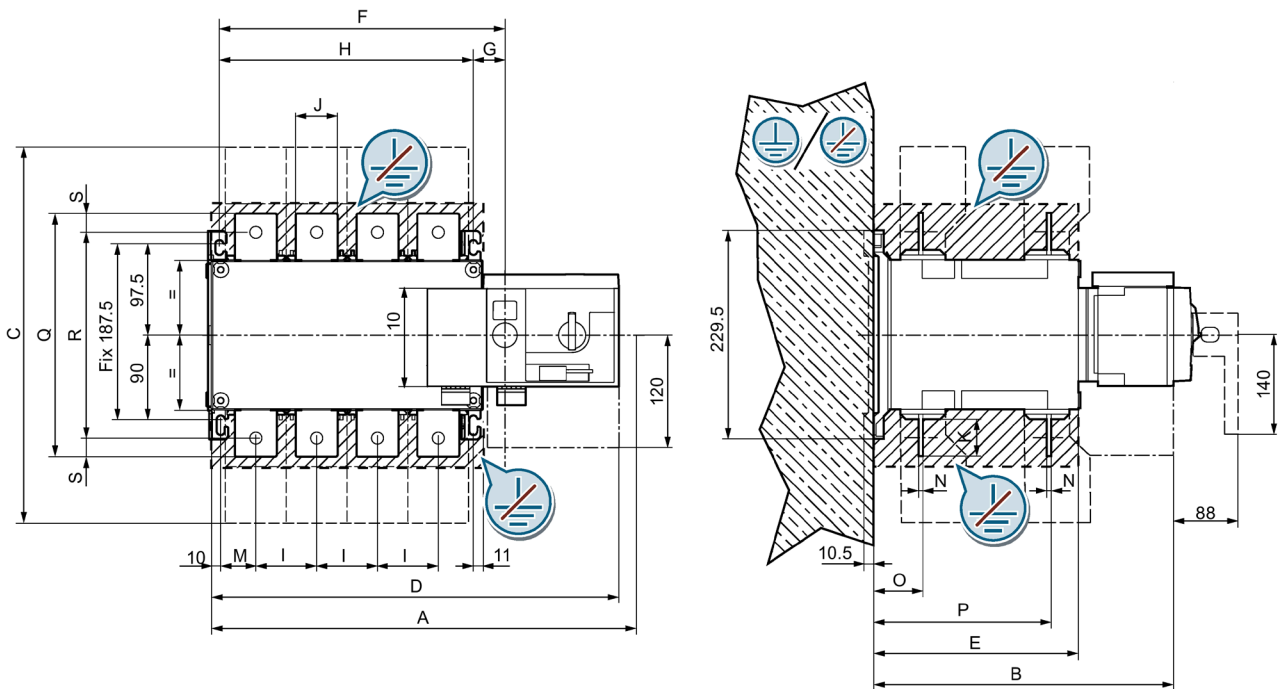


Figure 12-1 Dimension drawing current rating 250 A to 630 A

mm	250 A		400 A		630 A	
	3P	4P	3P	4P	3P	4P
A	345	395	345	395	394	454
B	244	244	244	244	321	321
C	288	288	288	288	402	402

12.1 Dimension drawings of the 3KC4 transfer switching equipment

mm	250 A		400 A		630 A	
	3P	4P	3P	4P	3P	4P
D	328	378	328	378	377	437
E	152	152	152	152	221	221
F	195	245	195	245	244	304
G	35	35	35	35	34	34
H	160	210	160	210	210	270
I	50	50	50	50	65	65
J	25	25	35	35	45	45
K	30	30	35	35	50	50
L	11	11	11	11	13	13
M	33	33	33	33	42.5	37.5
N	3.5	3.5	3.5	3.5	5	5
O	39.5	39.5	39.5	39.5	53	53
P	133.5	133.5	133.5	133.5	190	190
Q	160	160	170	170	260	260
R	130	130	140	140	220	220
S	15	15	15	15	20	20

Current rating 800 A to 1600 A

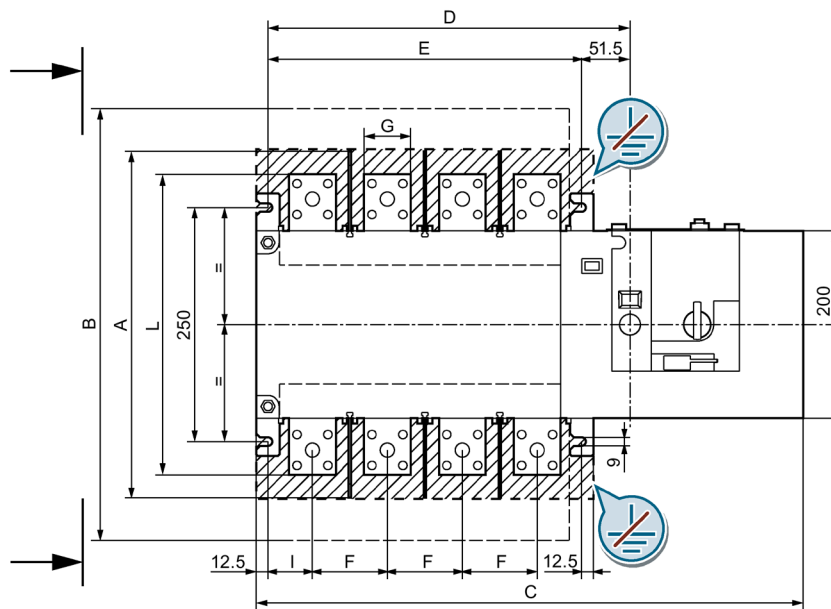


Figure 12-2 Dimension drawing current rating 800 A to 1600 A, front view

12.1 Dimension drawings of the 3KC4 transfer switching equipment

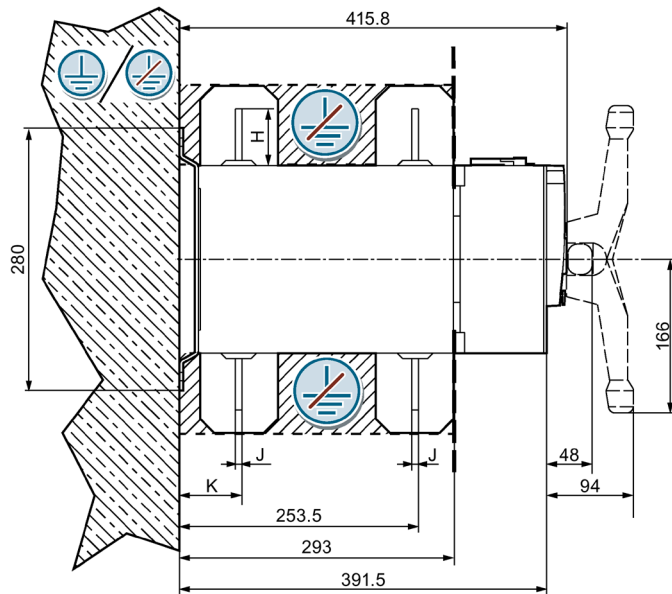


Figure 12-3 Dimension drawing current rating 800 A to 1600 A, side view

mm	800 A		1000 A		1250 A		1600 A	
	3P	4P	3P	4P	3P	4P	3P	4P
A	370	370	370	370	370	370	380	380
B	461	461	461	461	461	461	531	531
C	504	584	504	584	504	584	596	716
D	307	387	307	387	307	387	399	519
E	255	335	255	335	255	335	347	467
F	80	80	80	80	80	80	120	120
G	50	50	50	50	60	60	90	90
H	60.5	60.5	60.5	60.5	65	65	44	44
I	47.5	47.5	47.5	47.5	47.5	47.5	53	53
J	7	7	7	7	7	7	8	8
K	66.5	66.5	66.5	66.5	66.5	66.5	67.5	67.5
L	321	321	321	321	330	330	288	288

Current rating 2000 A to 3200 A

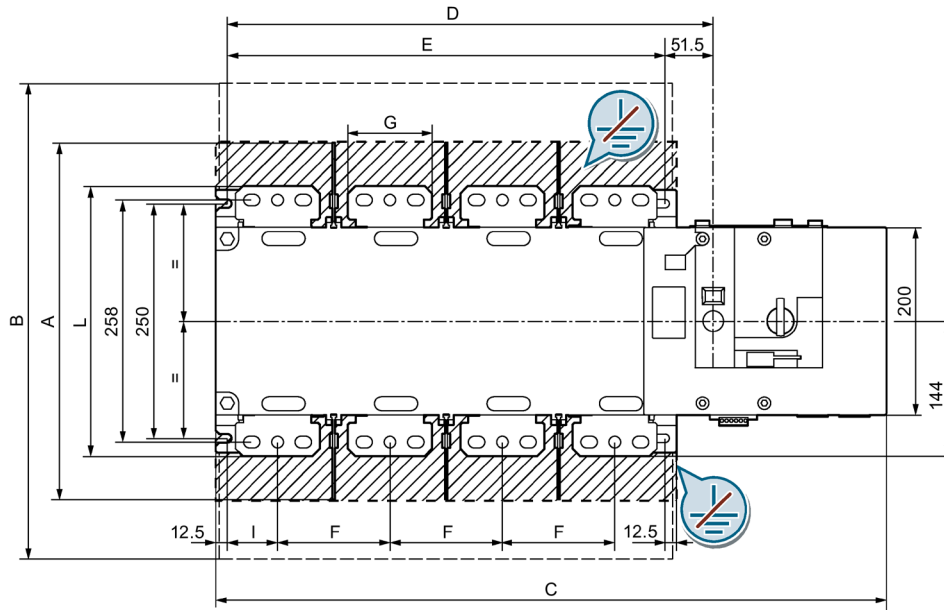


Figure 12-4 Dimension drawing current rating 2000 A to 3200 A, front view

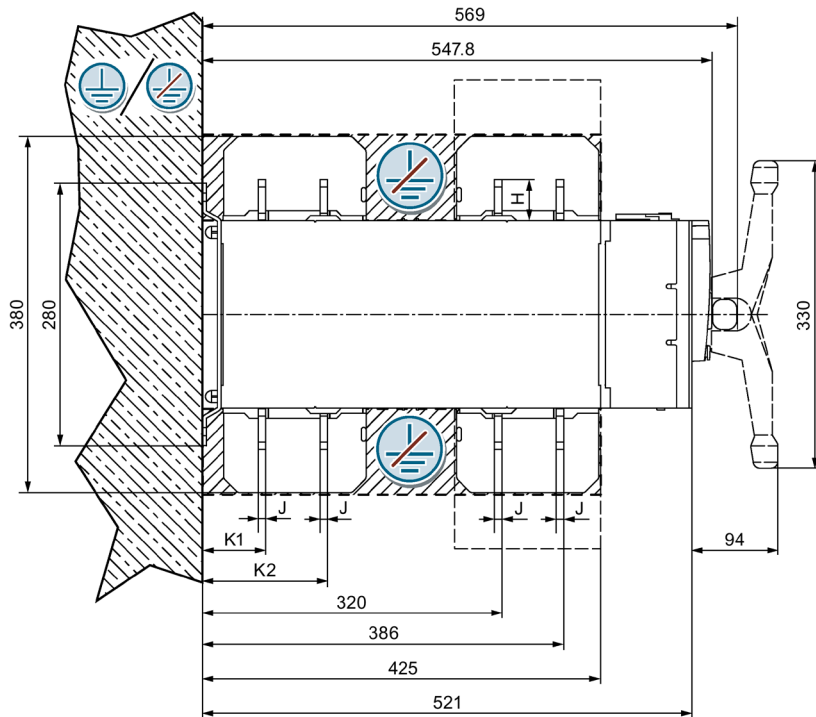


Figure 12-5 Dimension drawing current rating 2000 A to 3200 A, side view

12.2 Dimension drawings of the 3KC8 transfer switching equipment

mm	250 A		400 A		630 A	
	3P	4P	3P	4P	3P	4P
A	345	395	345	395	394	454
B	244	244	244	244	321	321
C	288	288	288	288	402	402
D	328	378	328	378	377	437
E	152	152	152	152	221	221
F	195	245	195	245	244	304
G	35	35	35	35	34	34
H	160	210	160	210	210	270
I	50	50	50	50	65	65
J	25	25	35	35	45	45
K	30	30	35	35	50	50
L	11	11	11	11	13	13
M	33	33	33	33	42.5	37.5
N	3.5	3.5	3.5	3.5	5	5
O	39.5	39.5	39.5	39.5	53	53
P	133.5	133.5	133.5	133.5	190	190
Q	160	160	170	170	260	260
R	130	130	140	140	220	220
S	15	15	15	15	20	20

Current rating 800 A to 1600 A

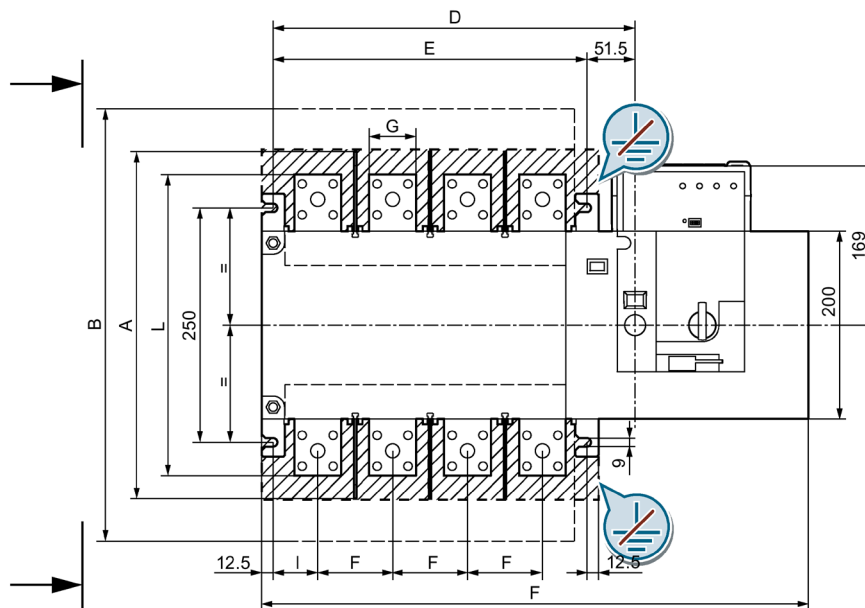


Figure 12-7 Dimension drawing current rating 800 A to 1600 A, front view

12.2 Dimension drawings of the 3KC8 transfer switching equipment

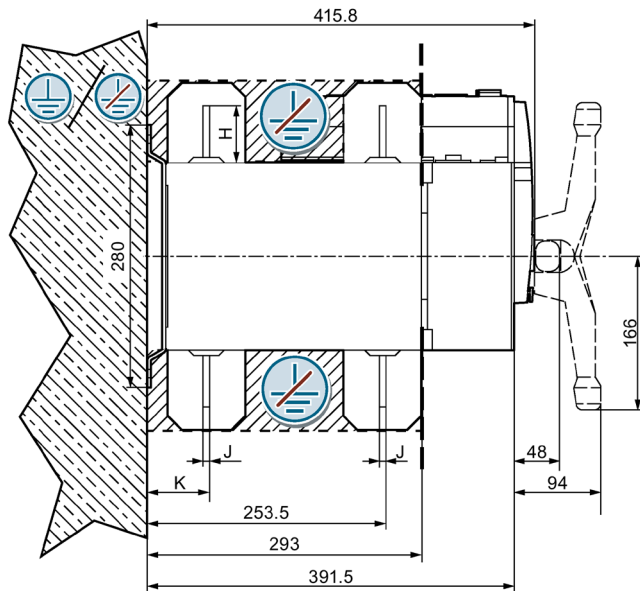


Figure 12-8 Dimension drawing current rating 800 A to 1600 A, side view

mm	800 A		1000 A		1250 A		1600 A	
	3P	4P	3P	4P	3P	4P	3P	4P
A	370	370	370	370	370	370	380	380
B	461	461	461	461	461	461	531	531
C	504	584	504	584	504	584	596	716
D	307	387	307	387	307	387	399	519
E	255	335	255	335	255	335	347	467
F	80	80	80	80	80	80	120	120
G	50	50	50	50	60	60	90	90
H	60.5	60.5	60.5	60.5	65	65	44	44
I	47.5	47.5	47.5	47.5	47.5	47.5	53	53
J	7	7	7	7	7	7	8	8
K	66.5	66.5	66.5	66.5	66.5	66.5	67.5	67.5
L	321	321	321	321	330	330	288	288

Current rating 2000 A to 3200 A

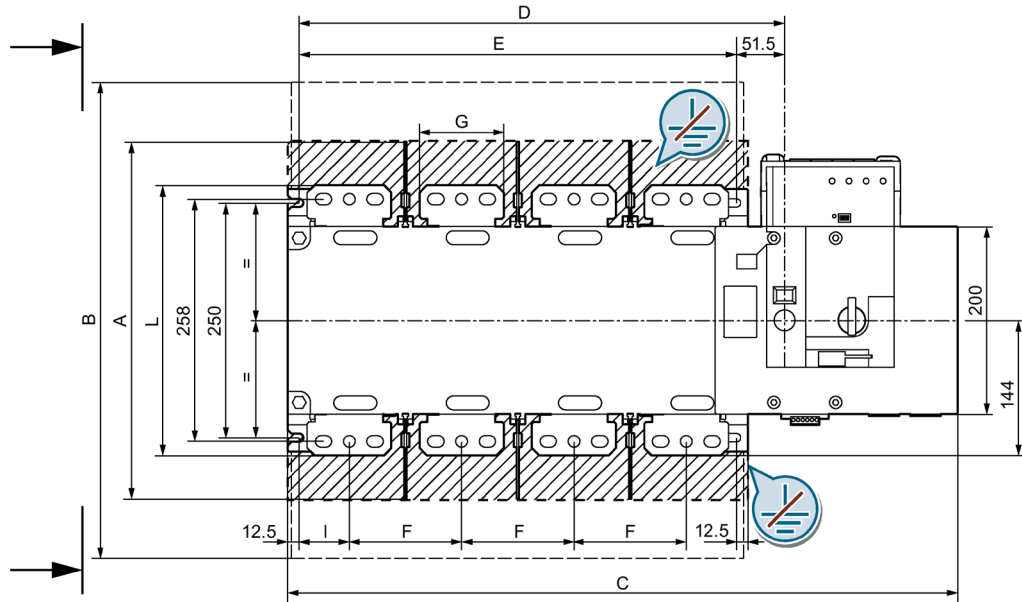


Figure 12-9 Dimension drawing current rating 2000 A to 3200 A, front view

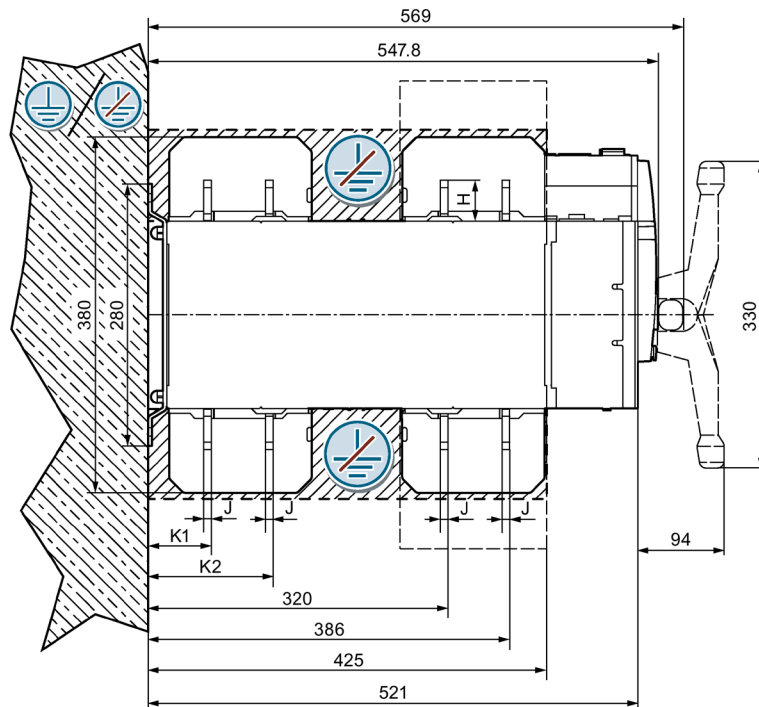


Figure 12-10 Dimension drawing current rating 2000 A to 3200 A, side view




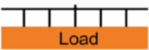


12.2 Dimension drawings of the 3KC8 transfer switching equipment

mm	2000 A		2500 A		3200 A	
	3P	4P	3P	4P	3P	4P
A	380	380	380	380	380	380
B	461	461	461	461	461	461
C	596	716	596	716	596	716
D	399	519	399	519	399	519
E	347	467	347	467	347	467
F	120	120	120	120	120	120
G	90	90	90	90	90	90
H	44	44	44	44	44	44
I	53	53	53	53	53	53
J	8	8	8	8	8	8
K1	67.5	67.5	67.5	67.5	67.5	67.5
K2	134	134	134	134	134	134
L	288	288	288	288	288	288

Applications

The application areas for the 3KC4 and 3KC8 transfer switching equipment are described in this chapter. The innovative solutions offered by the transfer switching equipment for complex source requirements are described here. An appropriate, separate transfer switching controller must be used with the 3KC4 transfer switching equipment for the purpose of source monitoring and control.

The symbols shown in the circuit diagrams have the following meaning:

Symbol	Explanation
	Transformer (1)
	Generator
	Transfer switching equipment with the switches P1 and P2
	Load
	CL = critical load
	NCL = non-critical load

The following tables show the behavior of the transfer switching equipment. The availability of the sources (transformers or generators) is described by the following numbers:

- 1 = source available
- 0 = source not available
- x = source availability not defined as it is insignificant.

The switching states of the transfer switching equipment are described as follows:

- P1 = P1 switch closed
- P2 = P2 switch closed
- P3 = P3 switch closed, etc.
- x = insignificant (transfer switching equipment can be in any one of the three switching states I, 0 or II).

13.1 Transfer between two sources with one outgoing load

Advantages of the 3KC8 series

- Plug and play solutions
- Compactness of the transfer switching equipment
- Reduced number of products through all-In-one solutions
- Installed mechanical and electrical locks

The sequence tables below apply for transfer switching equipment with electronic module (3KC8) and 3KC4 transfer switching equipment with an appropriate, separate transfer switching controller.

13.1 Transfer between two sources with one outgoing load

Transfer with T1 (kVA) = T2 (kVA)

The transfer switching equipment can be used for transfer between 2 sources with equal power (T1 (kVA) = T2 (kVA)) and with an outgoing load. The 3KC8 series offers the ideal solution both for network / network applications as well as for network / generator applications.

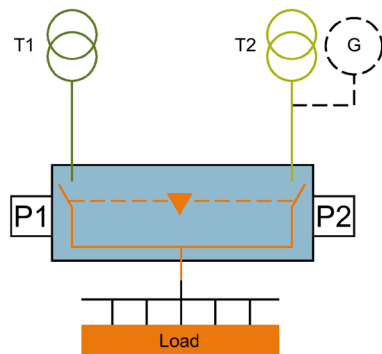


Figure 13-1 Transfer T1 (kVA) > T2/G (kVA)

T1	T2/G	Switching state of the transfer switching equipment	Load
0	0	x	OFF
1	0	P1	ON
0	1	P2	ON
1	1	P1 or P2 *	ON

* Dependent on the priority setting on the transfer switching equipment

13.2 Transfer between two sources with two outgoing loads

Transfer with $T1 \text{ (kVA)} > T2/G \text{ (kVA)}$

With this application, the power of source I is greater than that of source II ($T1 \text{ (kVA)} > T2/G \text{ (kVA)}$). One generator and one transformer are usually used for this. However, with this application, the 3KC8 transfer switching equipment can also switch between two transformers. The load is divided into a critical and non-critical load here.

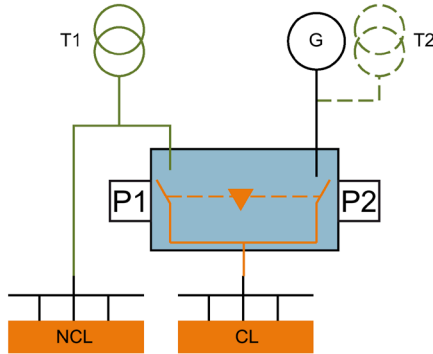


Figure 13-2 Transfer $T1 \text{ (kVA)} > T2/G \text{ (kVA)}$

T1	T2/G	Switching state of the transfer switching equipment	Non-critical load	Critical load
0	0	x	OFF	OFF
1	0	P1	ON	ON
0	1	P2	OFF	ON
1	1	P1	ON	ON

Transfer with $T1 \text{ (kVA)} = T2 \text{ (kVA)}$

The transfer switching equipment also offers innovative approaches for connection to two non-differentiated transformers with equal power ($T1 \text{ (kVA)} = T2 \text{ (kVA)}$).

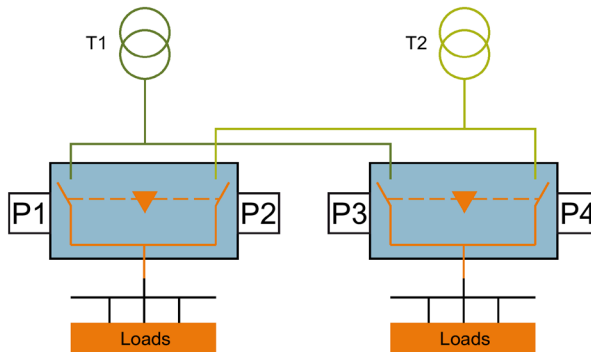


Figure 13-3 Transfer $T1 \text{ (kVA)} = T2 \text{ (kVA)}$

13.3 Transfer between three sources with one outgoing load

T1	T2	Switching state of the transfer switching equipment	Loads
0	0	x	OFF
1	0	P1 + P3	ON
0	1	P2 + P4	ON
1	1	P1 + P3	ON

13.3 Transfer between three sources with one outgoing load

Transfer with T1 (kVA) = T2 (kVA) = G

The transfer switching equipment can be used for transfer between 3 sources comprising two transformers T1 and T2 as well as one generator G with an outgoing load. By using two transfer switches, this complex application in which the power of the 3 sources is equal (T1 (kVA) = T2 (kVA) = G) can be realized, thus enabling the power supply to be maintained.

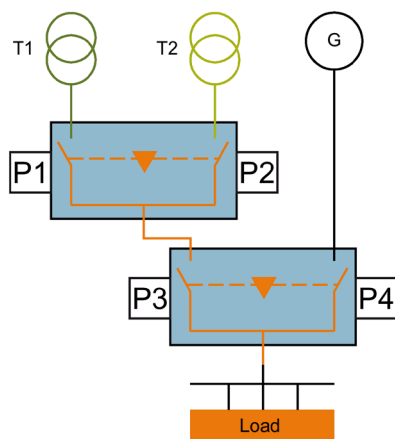


Figure 13-4 Transfer T1 (kVA) = T2 (kVA) = G

T1	T2	G	Switching state of the transfer switching equipment	Load
0	0	0	x	OFF
1	0	x	P1 + P3	ON
0	1	x	P2 + P3	ON
0	0	1	P4	ON
1	1	x	(P1 or P2)* + P3	ON

* Dependent on the priority setting on the transfer switching equipment

13.4 Transfer between three sources with two outgoing loads

Transfer with $T1 \text{ (kVA)} = T2 \text{ (kVA)} > TG$ - variant 1

Applications with one generator (G) and two transformers (T1 and T2) are described below for the case where the power of the two transformers is greater than that of the generator ($T1 \text{ (kVA)} = T2 \text{ (kVA)} > G$). By using two transfer switches, this complex application can be realized, thus enabling the power supply to be maintained. The load is divided into a critical and non-critical load here.

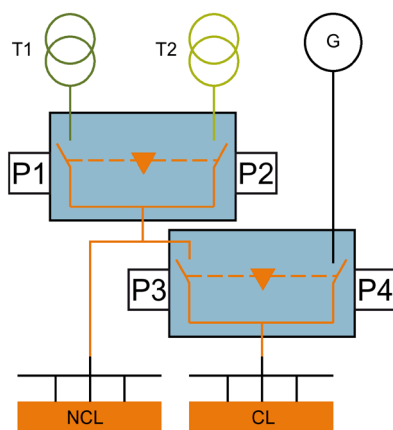


Figure 13-5 Transfer $T1 \text{ (kVA)} = T2 \text{ (kVA)} > G$

T1	T2	G	Switching state of the transfer switching equipment	Non-critical load	Critical load
0	0	0	x	OFF	OFF
1	0	x	P1 + P3	ON	ON
0	1	x	P2 + P3	ON	ON
0	0	1	P4	OFF	ON
1	1	x	(P1 or P2)* + P3	ON	ON

* Dependent on the priority setting on the transfer switching equipment

Transfer with $T1 (kVA) = T2 (kVA) > G$ - variant 2

The application can also be implemented for the following configuration. Three transfer switches are required for this application. This configuration ensures high source reliability and thus minimum fault susceptibility.

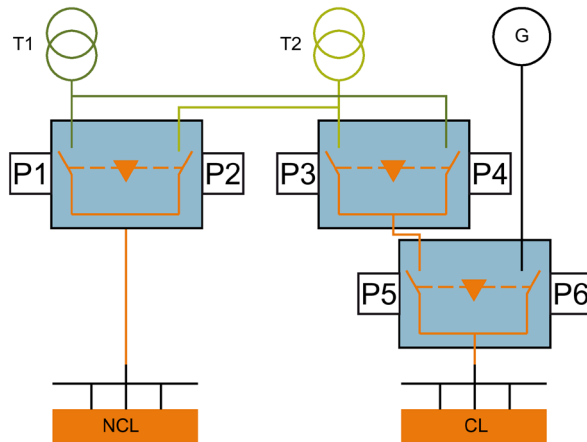


Figure 13-6 Transfer $T1 (kVA) = T2 (kVA) > G$

T1	T2	G	Switching state of the transfer switching equipment	Non-critical load	Critical load
0	0	0	x	OFF	OFF
1	0	x	P1 + P4 + P5	ON	ON
0	1	x	P2 + P3 + P5	ON	ON
0	0	1	P6	OFF	ON
1	1	x	(P1 or P2)* + (P3 or P4)* + P5	ON	ON

* Dependent on the priority setting on the transfer switching equipment

Transfer with T1 (kVA) < T2 (kVA) and T2 (kVA) > T3 (kVA)

As well as the previously described applications, applications comprising 3 transformers (T1, T2, T3) where the power of the transformer T2 is greater than that of the other two (T1 (kVA) < T2 (kVA) and T2 (kVA) > T3 (kVA)) can also be implemented with the transfer switching equipment. By using two transfer switches, this complex application can be realized, thus enabling the power supply to be maintained.

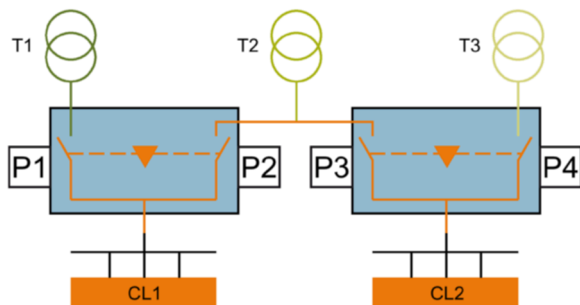


Figure 13-7 Transfer T1 (kVA) < T2 (kVA) and T2 (kVA) > T3 (kVA)

T1	T2	T3	Switching state of the transfer switching equipment	Non-critical load 1	Critical load 2
0	0	0	x	OFF	OFF
1	0	0	P1	ON	OFF
0	1	0	P2 + P3	ON	ON
0	0	1	P4	OFF	ON
1	0	1	P1 + P4	ON	ON
0	1	1	P2 + (P3 or P4)*	ON	ON
1	1	0	(P1 or P2)* + P3	ON	ON
1	1	1	(P1 or P2)* + (P3 or P4)*	ON	ON

* Dependent on the priority setting on the transfer switching equipment

13.5 Transfer between two loads with one incoming source (with 3KC4 transfer switching equipment only)

The 3KC4 transfer switching equipment can be used for transfer between 2 loads with 1 incoming source.

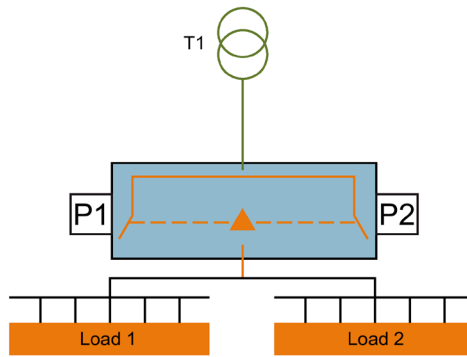


Figure 13-8 Transfer between 2 loads with 1 incoming source

T1	Switching state of the transfer switching equipment	Load 1	Load 2
0	x	OFF	OFF
1	0	OFF	OFF
1	P1	ON	OFF
1	P2	OFF	ON

Appendix

The following content is described in this chapter:

- Environmental conditions
- Operating conditions
- Storage conditions

A.1 Environmental conditions

IP degree of protection

- IP20 protection against direct contact of the motor operator
- IP20 protection against direct contact of the interfaces when the terminal covers are mounted correctly and according to regulations
- IP00 protection without mounted terminal covers

A.2 Operating conditions

A.2.1 Temperature

- At a temperature of -20 °C to +40 °C without derating
- At temperatures from - 20 °C to +70 °C, the derating correction factor K_t must be factored in

<i>K_t – correction factor</i>	Temperature
0.9	40 °C to 50 °C
0.8	50 °C to 60 °C
0.7	60 °C to 70 °C

The simplified method of calculating the derating is used here:

$$I_{thu} \leq I_{th} \times K_f$$

In a few cases, specific requirements demand precise derating calculations. Contact Siemens for this.

A.2.2 Humidity

- At 80 % air humidity and 55 °C, condensation does not take place
- At 95 % air humidity and 40 °C, condensation does not take place

A.2.3 Altitude conditions

- Up to 2000 m no derating
- For higher altitudes, the following derating correction factor must be factored in

K _a – correction factor	2000 m < A ≤ 3000 m	3000 m < A ≤ 4000 m
U _e	0.95	0.8
I _e	0.85	0.85

A.3 Storage conditions**A.3.1 Temperature**

The transfer switching equipment must be stored between -40 °C and +70 °C.

A.3.2 Storage conditions

- Maximum storage time up to 12 months
- Storage in a dry, non-corrosive, salt-free environment is recommended

A.3.3 Storage position

At current rating ≤ 630 A, a maximum of 3 packages may be stored on top of each other.

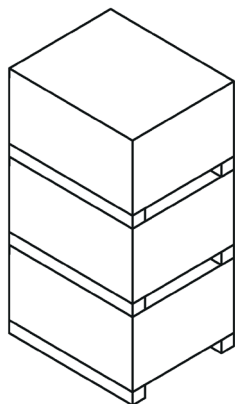


Figure A-1 Storage position ≤ 630 A

At current rating ≥ 800 A, no more than 1 package may be stored. Stacking several packages on top of each other is not permissible.

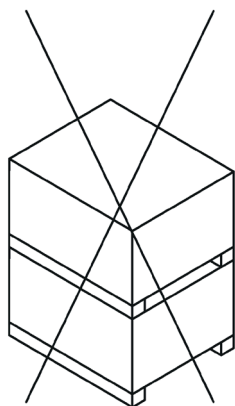


Figure A-2 Storage position ≥ 800 A

Dimensions and weight of the packed 3KC4 transfer switching equipment

Current rating	Number of poles	Weight		Volume (cm) including packaging
		Net	Gross	
250 A	3-pole	6.9	10.2	585 x 385 x 310
	4-pole	7.7	11.0	585 x 385 x 310
400 A	3-pole	7	10.3	585 x 385 x 310
	4-pole	8.1	11.4	585 x 385 x 310
630 A	3-pole	12.2	15.5	585 x 385 x 385
	4-pole	14.3	17.6	585 x 385 x 385
800 A	3-pole	27.9	43.9	730 x 800 x 600
	4-pole	32.2	48.2	730 x 800 x 600

Current rating	Number of poles	Weight		Volume (cm) including packaging
		Net	Gross	
1000 A	3-pole	28.4	44.4	730 x 800 x 600
	4-pole	32.9	48.9	730 x 800 x 600
1250 A	3-pole	28.9	44.9	730 x 800 x 600
	4-pole	33.6	49.6	730 x 800 x 600
1600 A	3-pole	33.1	49.1	730 x 800 x 600
	4-pole	39.4	55.4	730 x 800 x 600
2000 A	3-pole	50.7	66.7	730 x 800 x 600
	4-pole	61.6	77.6	730 x 800 x 600
2500 A	3-pole	50.7	66.7	730 x 800 x 600
	4-pole	61.6	77.6	730 x 800 x 600
3200 A	3-pole	61.0	77.0	730 x 800 x 600
	4-pole	75.3	91.3	730 x 800 x 600

Dimensions and weight of the packed 3KC8 transfer switching equipment

Current rating	Number of poles	Weight		Volume (cm) including packaging
		Net	Gross	
250 A	3-pole	8.0	11.3	585 x 385 x 310
	4-pole	8.8	12.1	585 x 385 x 310
400 A	3-pole	8.1	11.4	585 x 385 x 310
	4-pole	9.1	12.5	585 x 385 x 310
630 A	3-pole	13.3	16.6	585 x 385 x 385
	4-pole	15.4	18.7	585 x 385 x 385
800 A	3-pole	29.0	45.0	730 x 800 x 600
	4-pole	33.3	49.3	730 x 800 x 600
1000 A	3-pole	29.5	45.5	730 x 800 x 600
	4-pole	34.0	50.0	730 x 800 x 600
1250 A	3-pole	30.0	46.0	730 x 800 x 600
	4-pole	34.7	50.7	730 x 800 x 600
1600 A	3-pole	34.2	50.2	730 x 800 x 600
	4-pole	40.5	56.5	730 x 800 x 600
2000 A	3-pole	51.8	67.8	730 x 800 x 600
	4-pole	62.7	78.7	730 x 800 x 600
2500 A	3-pole	51.8	67.8	730 x 800 x 600
	4-pole	62.7	78.7	730 x 800 x 600
3200 A	3-pole	62.1	78.1	730 x 800 x 600
	4-pole	76.4	92.4	730 x 800 x 600

ESD guidelines

In this chapter, you will find the ESD guidelines that must be observed when handling the 3KC4 and 3KC8 transfer switching equipment.

B.1 Electrostatic sensitive devices (ESD)

ESD components are destroyed by voltage and energy far below the limits of human perception. Voltages of this kind occur as soon as a device or an assembly is touched by a person who is not electrostatically discharged. ESD components which have been subject to such voltage are usually not recognized immediately as being defective, because the malfunction does not occur until after a longer period of operation.

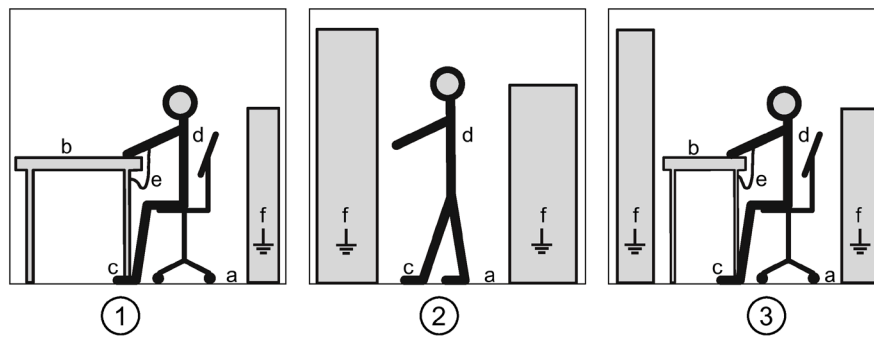
ESD Guidelines

NOTICE
Electrostatic sensitive devices Electronic modules contain components that can be destroyed by electrostatic discharge. These modules can be easily destroyed or damaged by improper handling. <ul style="list-style-type: none">• You must discharge your body electrostatically immediately before touching an electronic component. To do this, touch a conductive, grounded object, e.g., a bare metal part of a switch cabinet or the water pipe.• Always hold the component by the plastic enclosure.• Electronic modules should not be brought into contact with electrically insulating materials such as plastic film, plastic parts, insulating table supports or clothing made of synthetic fibers.• Always place electrostatic sensitive devices on conductive bases.• Always store and transport electronic modules or components in ESD-safe conductive packaging, e.g. metallized plastic or metal containers. Leave the component in its packaging until installation.

NOTICE
Storage and transport If you have to store or transport the component in non-conductive packaging, you must first pack the component in ESD-safe, conductive material, e.g., conductive foam rubber, ESD bag.

The diagrams below illustrate the required ESD protective measures for electrostatic sensitive devices.

B.1 Electrostatic sensitive devices (ESD)



- (1) ESD seat
- (2) ESD standing position
- (3) ESD seat and ESD standing position

Protective measures

- a Conductive floor
- b ESD table
- c ESD footwear
- d ESD smock
- e ESD bracelet
- f Cubicle ground connection

Figure B-1 ESD work center

List of abbreviations

Table C- 1 Meaning of abbreviations used in this document

Abbreviation	Meaning
1PH + N	Single-phase network with 1 phase and neutral
3PH	Three-phase 3-wire network with 3 phases without neutral
3PH + N	Three-phase 4-wire network with 3 phases and with neutral
AC	Alternating voltage
ATS	Automatic transfer switch (electronic module)
ATSE	Automatic transfer switching equipment
Cu	Copper
DC	Direct voltage
DPS	Dual power supply
EN	European Standard
ESD	Electrostatic discharge
IEC	International Electrotechnical Commission
IP	International Protection
N	Neutral conductor
RJ	Registered jack
PH	Phase
RTSE	Remotely operated transfer switching equipment

Table C- 2 Meaning of symbols and abbreviations

Sym- bol/abbreviatio n	Meaning
ΔU	Voltage tolerance
ΔF	Frequency tolerance
I^2t	Let-through energy
I_{cm}	Short-circuit current making capacity
I_{cw}	Short-time withstand current
U_e	Rated operational voltage
V_{imp}	Impulse withstand voltage
U_n	Nominal voltage

Index

C

Conductive floor, 210
Cubicle ground connection, 210

D

Discharge, 209

E

Electrostatic sensitive devices, 209
ESD bracelet, 210
ESD footwear, 210
ESD protective measures, 209
ESD seat, 210
ESD smock, 210
ESD standing position, 210
ESD table, 210

S

Storage, 209

T

Transport, 209

Further Information

Always at your disposal: our extensive support
www.siemens.com/online-support

Siemens AG
Energy Management
Low Voltage & Products
Postfach 10 09 53
93009 REGENSBURG
Germany

Subject to change.
3ZW1012-3KC83-0AC1
© Siemens AG 2017

EM LP
Online

