

MANUAL

# SENTRON

## Switching Devices

3NJ63 Switch Disconnectors with Fuses



## SENTRON

### Switch Disconnectors with Fuses, In-Line Design 3NJ63

System Manual

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## 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

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#### **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.

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### 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.

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# Introduction

## Purpose of this manual

The SENTRON manual "3NJ63 In-Line Switch Plug-In Disconnectors with Fuses" describes the basic functions of the switchgear range. It contains information about selection, configuring, and commissioning.

In addition to the main devices, it also includes details of accessories.

Furthermore, to facilitate configuration, the manual contains dimension drawings, circuit diagrams, and technical specifications of the switching devices and accessories.



Usage in the manual	LV HRC versions
Size 00	3NJ630
Size 1	3NJ631
Size 2	3NJ632
Size 3	3NJ633

## Required basic knowledge

A general knowledge of low-voltage switchgear and control gear is required to understand this manual.

## Symbols used in the text

The following table explains the meaning of the various symbols used within this document:

Symbol	Meaning
	LED is illuminated
	LED not illuminated

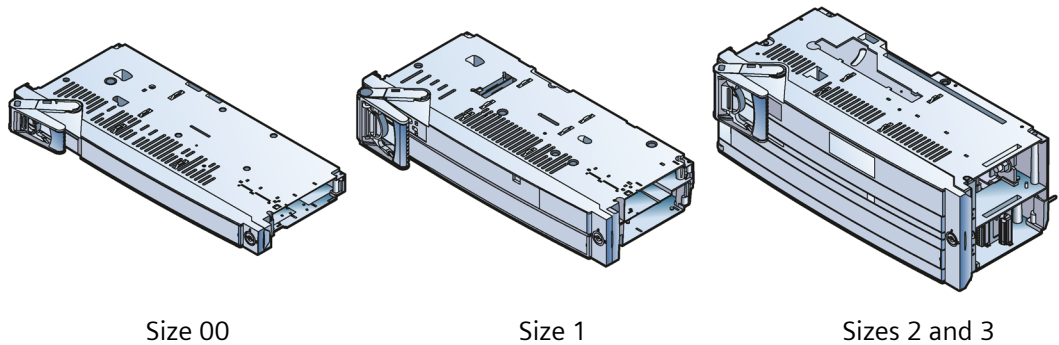


## Product description

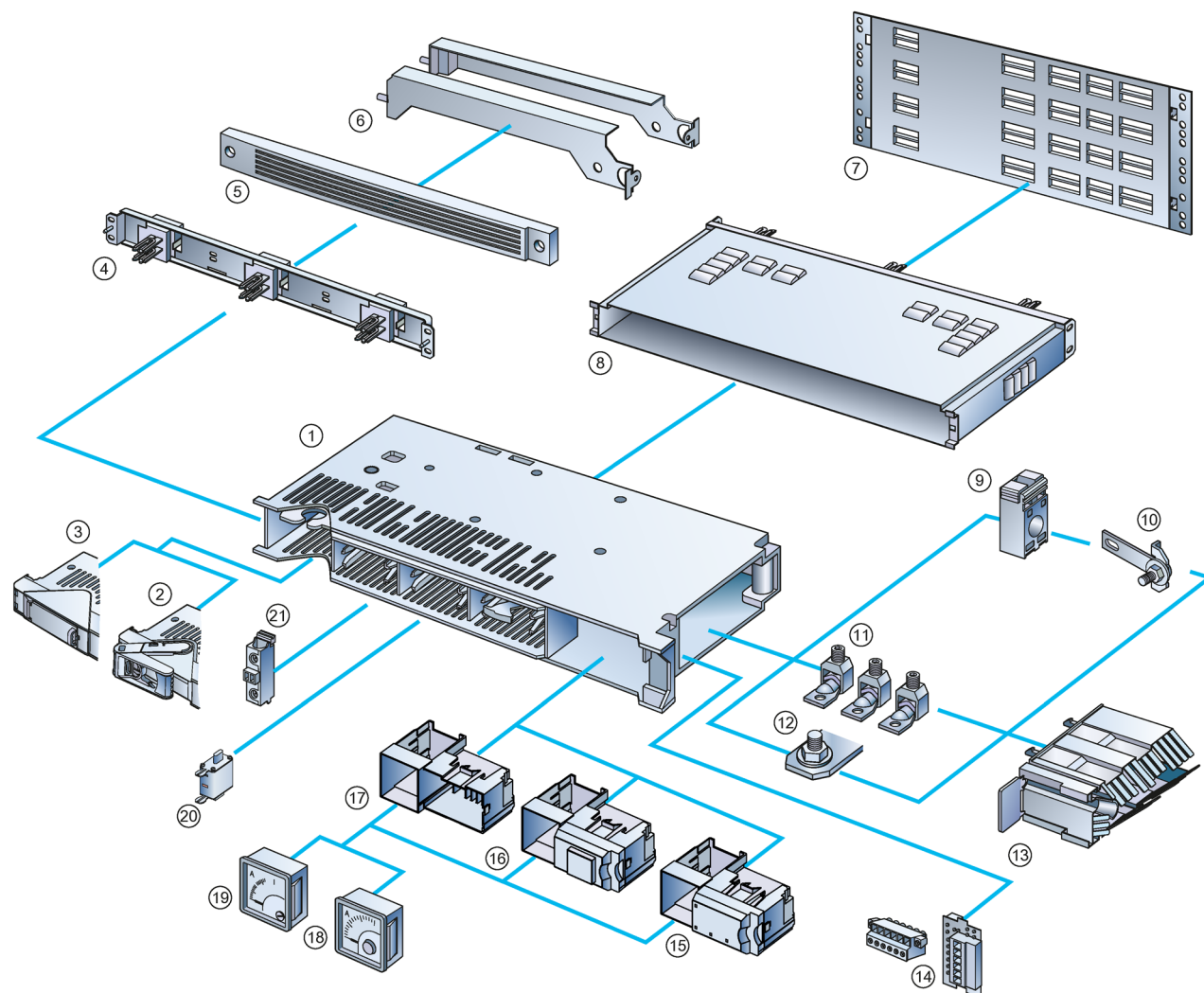
### 2.1 Overview

#### All key product features at a glance

- Type tested according to IEC EN 60947-3
- Voltage levels up to 690 V AC and 500 V DC
- 160 A to 630 A for LV HRC fuse links according to IEC 60269-1 / EN 60269-1
- 2-/3-/4-pole versions available
- 185 mm center-to-center clearance of plug-in contacts
- Developed for switchgears in plug-in design
- Horizontal or vertical mounting position
- Front panel locked in ON position
- Degree of protection IP41
- With electronic fuse monitoring devices (EFM)
- Manually operated or with motorized operating mechanism



## Overview of components and accessory parts



① 3NJ63 switch disconnector basic device, here in size 00, open, without front panel

② Manual operating mechanism

③ Motorized operating mechanism

④ Connection module

⑤ Blanking cover

⑥ Guide rails

⑦ Busbar cover

⑧ Contact extension

⑨ Current transformer

⑩ Current transformer busbar

⑪ Connecting terminals

⑫ Stud bolt connection

⑬ Terminal cover

⑭ Multifunction plug

⑮ Holder for measuring device with electronic fuse monitoring (EFM10)

⑯ Holder for measuring device with electronic fuse monitoring (EFM20/25)

⑰ Holder for measuring device without EFM

⑱ Bi-metal ammeter

⑲ Moving-iron ammeter

⑳ LV HRC fuse

㉑ Auxiliary switch

## 2.2 Benefits

### Advantages for switchgear manufacturers

- Compact, modular design
- Simple and efficient mounting due to incoming plug-in contact
- High packing density in the field
- Cable connection with clamps or lugs
- Can be mounted in different control cabinet depths
- Comprehensive range of accessories

### Advantages for users

- Conversion, retrofitting, and replacement without switching off the switchgear
- Dead-state fuse replacement
- Maintenance free
- High personnel safety
- Operating handle can be locked in OFF position
- Clear and unambiguous switch position indicator

## 2.3 Application

The plug-in 3NJ63 switch disconnectors with fuses are installed in low-voltage distribution boards where a minimum amount of space is available for a maximum number of cable feeders to the power distribution system. They can be easily fitted in all common control cabinets (minimum depth: 400 mm).

The plug-in 3NJ63 switch disconnectors with fuses are available for rated uninterrupted currents of 160 A to 630 A. LV HRC fuse links according to IEC 60269-1 / EN 60269-1 provide overload and short-circuit protection up to 690 V AC / 500 V DC.

The switch disconnectors can be retrofitted at any time with electronic fuse monitoring devices, auxiliary switches, an ammeter (48 mm x 48 mm), and up to four current transformers, with no extra space required. For installation in control cabinets with a depth > 400 mm, the mounting depth of the in-line disconnectors can be increased by 200 mm using a contact extension. Further installation accessories, such as guide rails and blanking covers for empty sections, complete the product range.

## 2.4 Basic versions

### Basic version types

The 3NJ63 product range comprises four sizes covering a current range up to 630 A. All types are designed as 2-/3-/4-pole switch disconnectors with fuses. The devices are suitable for applications up to 690 V AC / 500 V DC.

The basic versions are divided into the following types:

Switching capacity	Operation	Rated conditional short-circuit current $I_q$	LV HRC fuses		
			2-pole	3-pole	4-pole
DC23B, 230 V	Manual	66 kA	125 ... 630 A	-	-
DC21B, 500 V	Manual	66 kA	160 ... 630 A	-	-
AC22B, 500 V	Manual, motorized	55 kA	-	-	160 ... 630 A
AC23A, 500 V	Manual, motorized	120 kA	-	120 ... 630 A	-
AC23A, 690 V	Manual, motorized	100 kA	-	500 A	-
AC22B, 800 V	Manual, motorized	100 kA	-	250 A	-

## 2.5 Accessories

The following accessories are available in addition to the main devices:

- Electronic fuse monitoring devices
- Current transformers
- Ammeters
- Auxiliary switches
- Multi-function plugs
- Terminals
- Terminal covers
- Guide rails
- Blanking covers
- Busbar covers

## 2.6 Design

### Compact and modular design

All sizes fit busbar systems with a 185 mm center-to-center clearance, and have the same width and depth as well as a uniform 50 mm grid with regard to mounting height (50, 100, or 200 mm). This enables an in-line disconnect panel to be set up with any combinations of different sizes.

Subsequent replacement of in-line disconnectors of different sizes is easy. Furthermore, the user-friendly hinged handle is retractable in both the ON and the OFF state, so that the compact design is retained in both switch positions.

On device versions with a motorized operating mechanism the motor is integrated in the contour of the housing.

The electronic fuse monitoring device (EFM) can be upgraded as an accessory or it can be supplied ready mounted from the factory.



# Functions

## 3.1 Mode of operation

### Operation

The plug-in switch disconnectors are fitted with a snap-action mechanism and are switched by turning the handle approx. 45°. After it has been operated, the handle is folded away against the front panel in the ON or OFF position for safety reasons.

### Indication

A unique switch position indication is output by the indicator in the inspection window of the in-line disconnector (ON "I" = red, OFF "O" = green). The switch position indicator is mechanically linked to the moving switching contacts.

### Voltage test

In the event of a voltage test on the fuse links, the transparent insert in the front panel is opened.

### Personal safety

The switch disconnectors are type tested according to IEC 60947-3 and have degree of protection IP41 in the operating state.

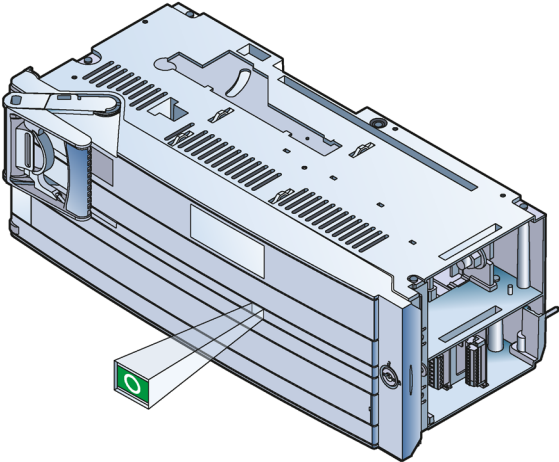
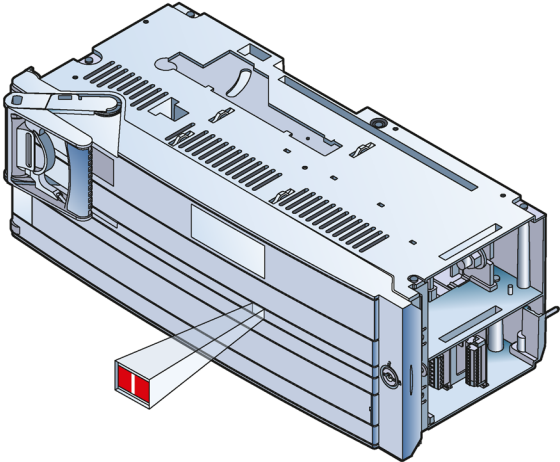
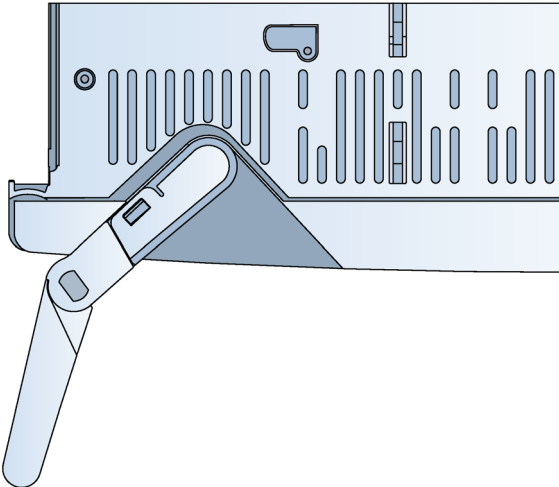
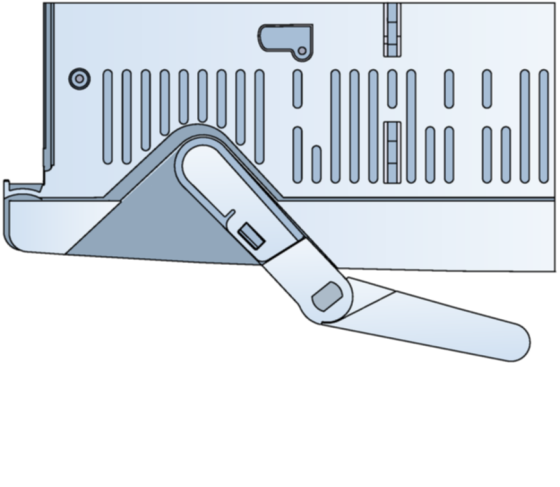
The special locking mechanism on the handle ensures that the in-line disconnector must be switched off before it is possible to open the front panel and remove the fuses. A switchgear key according to DIN 43668 is also required to open the cover.

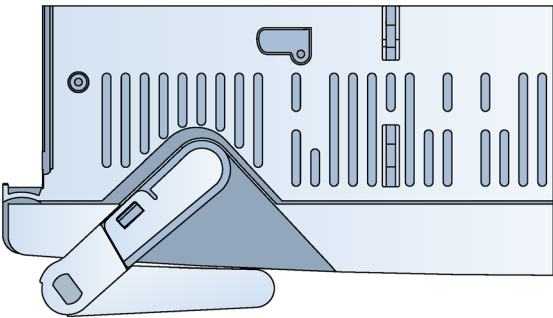
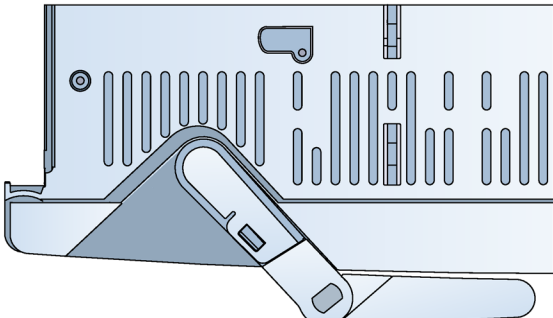
Disconnection during the switching operation (snap-action mechanism) is implemented before and after the fuse link. This ensures that, if power is supplied over the busbars or via the cable connecting side, the fuse links are in a dead state when switched off.

### Locking capability

In the OFF position, the handle can be padlocked (padlock Ø: 6 mm) to protect against unintentional restarting.

Switch position

"OFF" switch position	"ON" switch position
	
"OFF" switch position, display	"ON" switch position, display
	
"OFF" switch position, operating lever in changeover position	"ON" switch position, operating lever in changeover position

"OFF" switch position	"ON" switch position
	
"OFF" switch position, operating lever in end position	"ON" switch position, operating lever in end position

## 3.2 Electronic fuse monitoring

### Electronic fuse monitoring devices EFM - overview

The electronic fuse monitoring devices EFM 10 and EFM 20/25 can either be mounted in the 3NJ63 at the factory or installed by the customer as accessory 3NJ69. The EFM 10 and the EFM 20 for monitoring AC systems (up to  $U_{in} = 690\text{ V}$ ) work regardless of whether or not a load is present. They detect, signal, and indicate the states of the fuses. The EFM 25 is designed for monitoring DC systems (up to  $U_e = 440\text{ V}$ ).

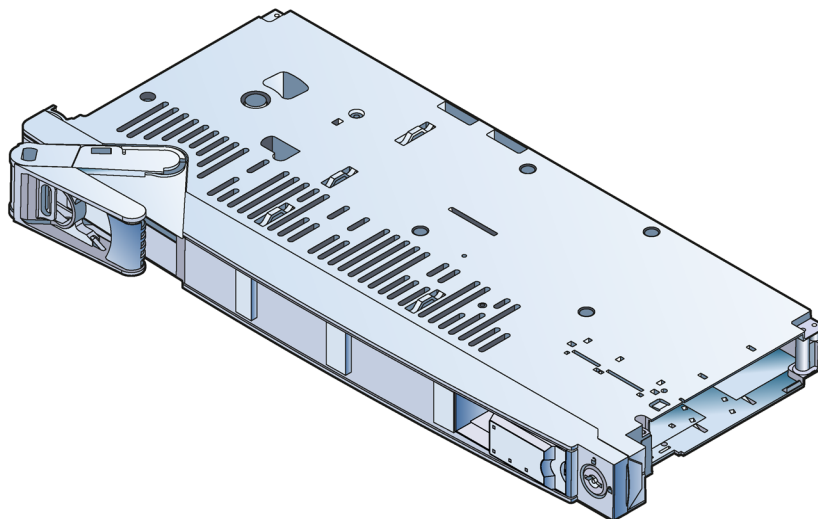


Figure 3-1 3NJ63 size LV HRC 1 with electronic fuse monitoring device (EFM 10)

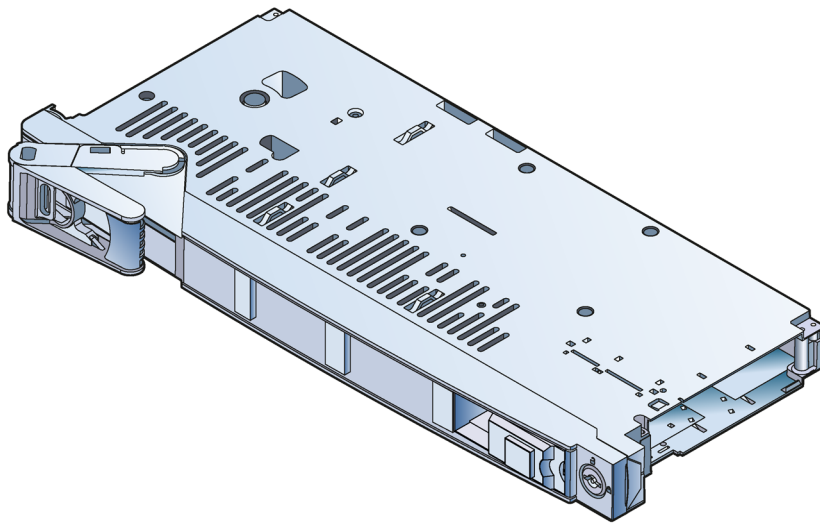


Figure 3-2 3NJ63 size LV HRC 1 with electronic fuse monitoring device (EFM 20/25)

### Typical applications of the EFM

- If a fuse fails, a "general fault" is signaled to a control room by means of integrated auxiliary switches (1 signaling relay with 1 changeover contact).
- If a fuse fails, a load is disconnected, e.g. via the optional integral motorized operating mechanism.

### Possible areas of application for the EFM

The 3NJ63 switch disconnecter with fuse may be used as follows to ensure safe isolation in conjunction with the EFM:

- EFM 10 and EFM 20: 3-phase, sine wave AC systems (50/60 Hz) up to 690 V
- EFM 25: DC systems up to 440 V

### Operating principle of the EFM 10

The electronic fuse monitoring device EFM 10 is supplied via the phases of the AC system. It works according to the closed-circuit principle: The signaling relay is normally energized (no fault). The electronic fuse monitoring device measures the voltages upstream and downstream of the three fuses. If the voltage drop at one of the three fuses exceeds  $13\text{ V} \pm 10\%$ , the following operating states occur:

- The electronic fuse monitoring device trips
- The signaling relay (changeover contact) drops out as the general alarm output
- The red LED on the fuse concerned lights up.

The red LED and the signaling relay always indicate the current states of the fuses. The states are not stored.

The green LED indicates that power is being supplied to the electronic fuse monitoring device.

### Circuit diagram of the EFM 10

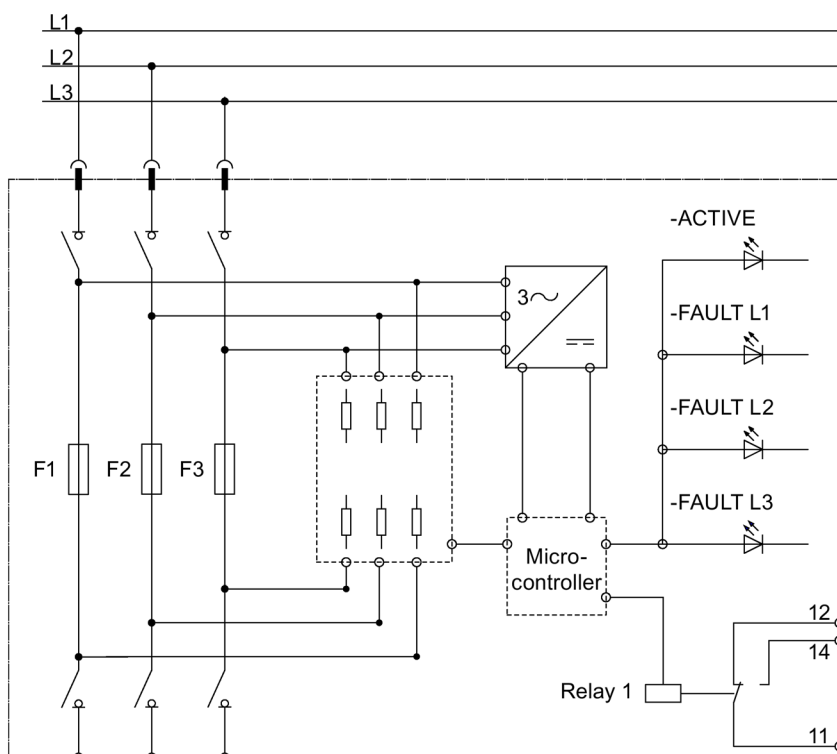


Figure 3-3 3NJ63 size LV HRC 00, internal wiring with EFM 10

#### Note

The green LED is not illuminated if the electronic fuse monitoring device has been connected in a way other than that described above when the infeed is live and more than one fuse is faulty! In this case, the internal power supply of the EFM can no longer be guaranteed (refer to "Voltage tap for the internal power supply and direction of the incoming supply" below)!

#### Note

If the EFM is built into the 3NJ63 and not all wires of the changeover contact are connected to the multi-function plug, the exposed cable ends must be electrically insulated.

### Operating principle of the EFM 20

The electronic fuse monitoring device EFM 20 is supplied via the three phases L1, L2, and L3 of the AC system. It works according to the closed-circuit principle (default setting): The signaling relay is normally energized (no fault). The electronic fuse monitoring device measures the voltages upstream and downstream of the three fuses. If the voltage drop at one of the three fuses exceeds  $13\text{ V} \pm 10\%$ , the following operating states occur:

- The electronic fuse monitoring device trips
- The signaling relay drops out
- The corresponding signal is indicated on the display

If line monitoring is active, the following signals may also be output:

- "Undervoltage" line function active
- "Overvoltage" line function active
- "Phase failure" line function active

The illuminated display indicates that power is being supplied to the electronic fuse monitoring device.

### Circuit diagram of the EFM 20

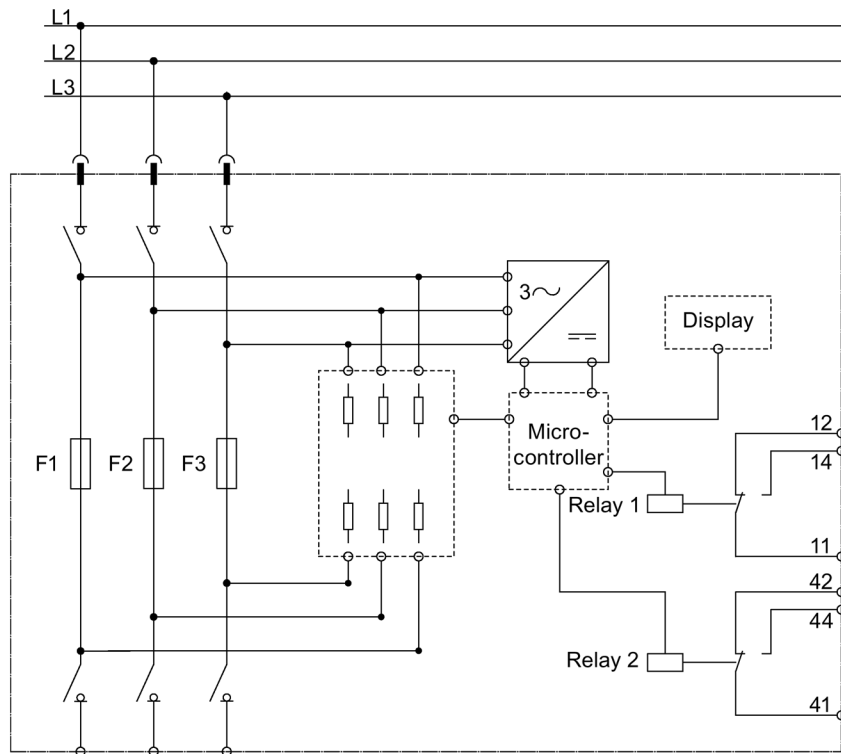


Figure 3-4 3NJ63 size LV HRC 00, internal wiring with EFM 20

**Note**

The display is not illuminated if the electronic fuse monitoring device is connected in a way other than that described above when the infeed is live and more than one fuse is faulty! In this case, the internal power supply of the EFM can no longer be guaranteed (refer to "Voltage tap for the internal power supply and direction of the incoming supply" below)!

**Note**

If the EFM is built into the 3NJ63 and not all wires of the changeover contact are connected to the multi-function plug, the exposed cable ends must be electrically insulated.

**Cable designation**

	Terminal designation	Cable color	Size		
			LV HRC 00	LV HRC 1	LV HRC 2, LV HRC 3
			Cable designation		
Pick-off at fuse holders with AC (infeed plug-in contacts)	X1 (L1)	Black	1	11	21
	X2 (L1)	Black	4	14	24
	X3 (L2)	Black	2	12	22
	X4 (L2)	Black	5	15	25
	X5 (L3)	Black	3	13	23
	X6 (L3)	Black	6	16	26
Pick-off at fuse holders with DC (infeed plug-in contacts)	X1 (+)	Black	1	11	21
	X2 (+)	Black	4	14	24
	X3	Black	-	-	-
	X4	Black	-	-	-
	X5 (-)	Black	3	13	23
	X6 (-)	Black	6	16	26
Relay 1	Base point	Gray	11	21	31
	NC contact	Gray	12	22	32
	NO contact	Gray	14	24	34
Relay 2	Base point	Gray	41	51	61
	NC contact	Gray	42	52	62
	NO contact	Gray	44	54	64

### Operating principle of the EFM 25

The electronic fuse monitoring device EFM 25 is supplied via the two poles L+ and L- of the DC system. It works according to the closed-circuit principle (default setting): The signaling relay is normally energized (no fault). The electronic fuse monitoring device measures the voltages upstream and downstream of the two fuses. If the voltage drop at one of the fuses exceeds  $20\text{ V} \pm 10\%$ , the following operating states occur:

- The electronic fuse monitoring device trips
- The signaling relay drops out
- The corresponding signal is indicated on the display.

If line monitoring is active, the following signals may also be output:

- "Undervoltage" line function active
- "Overvoltage" line function active

The illuminated display indicates that power is being supplied to the electronic fuse monitoring device.

### Circuit diagram of the EFM 25 for voltages up to 440 V DC

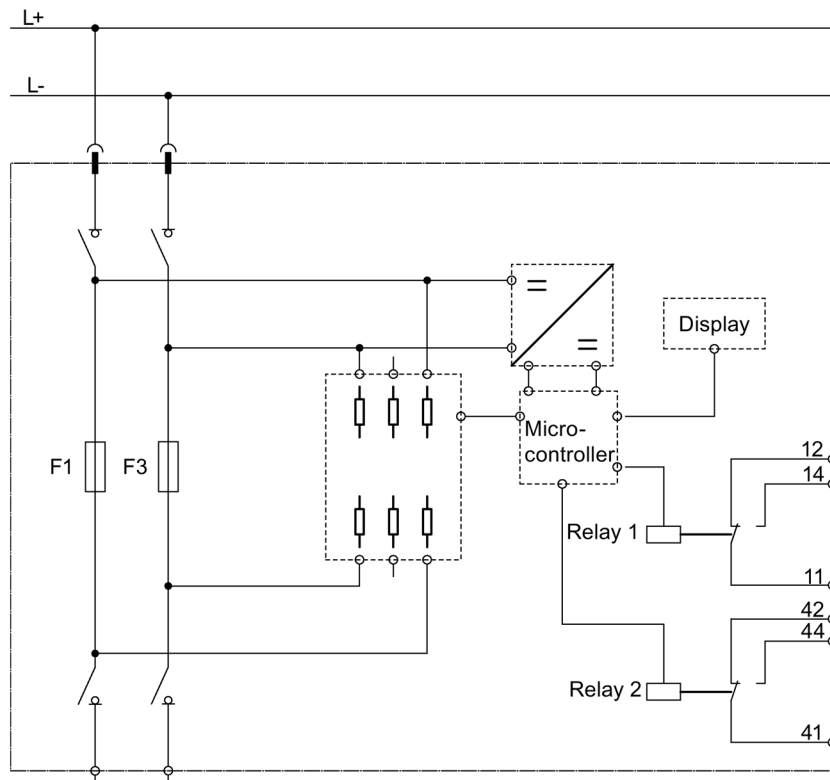


Figure 3-5 3NJ63 size LV HRC 00, internal wiring with EFM 25

**Note**

The display is not illuminated if the electronic fuse monitoring device is connected in a way other than that described above when the infeed is live and more than one fuse is faulty! In this case, the EFM's internal power supply can no longer be guaranteed!

---

**Note**

If the EFM is built into the 3NJ63 and not all wires of the changeover contact are connected to the multi-function plug, the exposed cable ends must be electrically insulated.

---

**Short-circuit protection of the EFM 25**

Max. protection: "DIAZED 2 A gLgG" fuse

**Operation of the EFM 20 and EFM 25**

To activate SETUP or RUN mode, press the "Enter" key for longer than 2 seconds. The memory function is activated by means of the setup functions.

2 pushbutton units for setting values



1 "Enter" pushbutton unit for selecting the mode and "branching" within the menu



---

**Note**

The fuse or the line is not monitored in SETUP mode. Monitoring is only assured in RUN mode.

---

If line monitoring is active, the voltage limits are monitored. If one of the voltages exceeds or falls below the limit, relay 2 drops out providing closed-circuit principle is selected (see below). The symbol for undervoltage or overvoltage appears on the display.

If a fault occurs, the relays respond according to the selected operating principle after the set error delay time (Del):

### 3.2 Electronic fuse monitoring

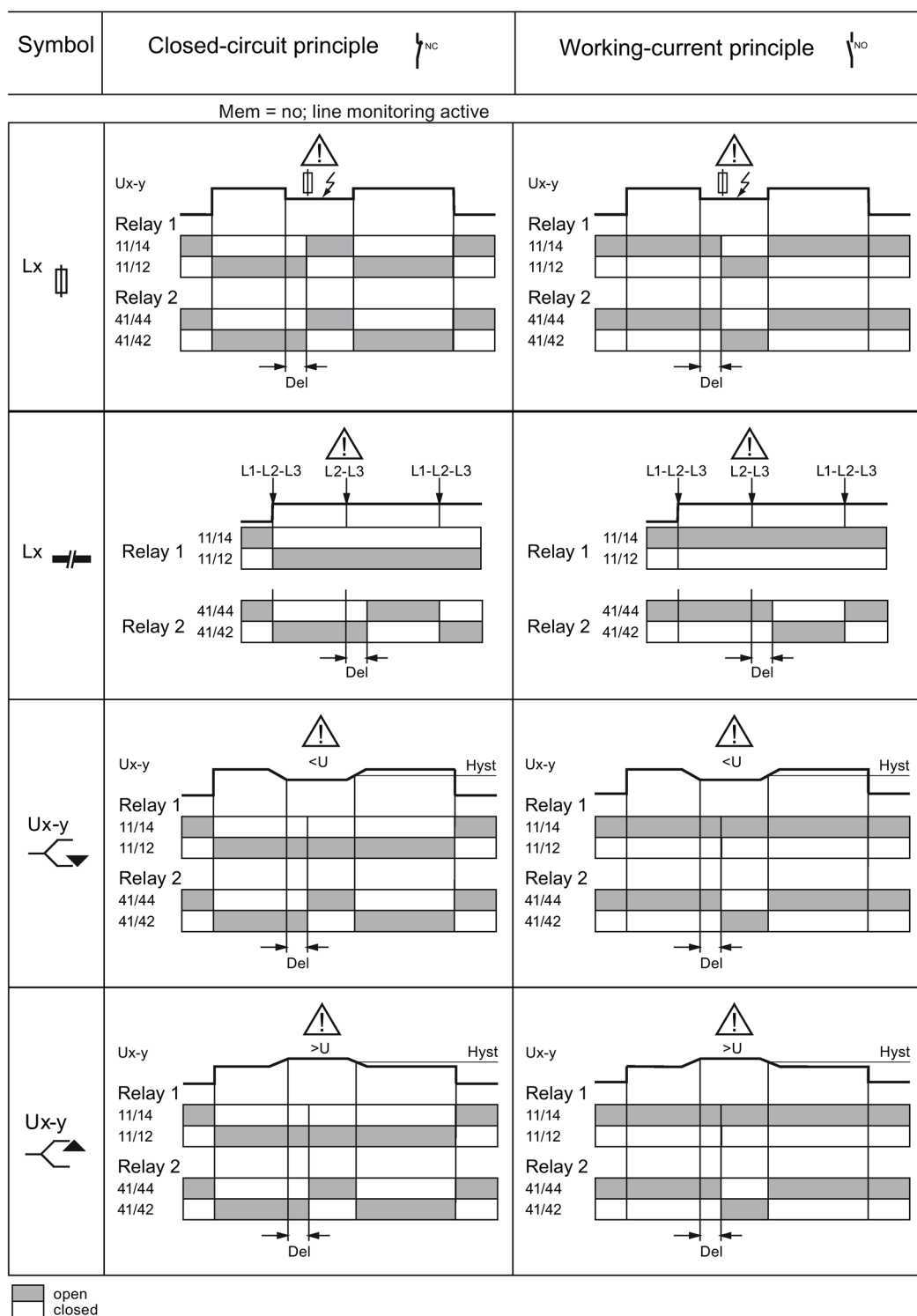


Figure 3-6 Closed-circuit / open-circuit principle, EFM 20 (AC)

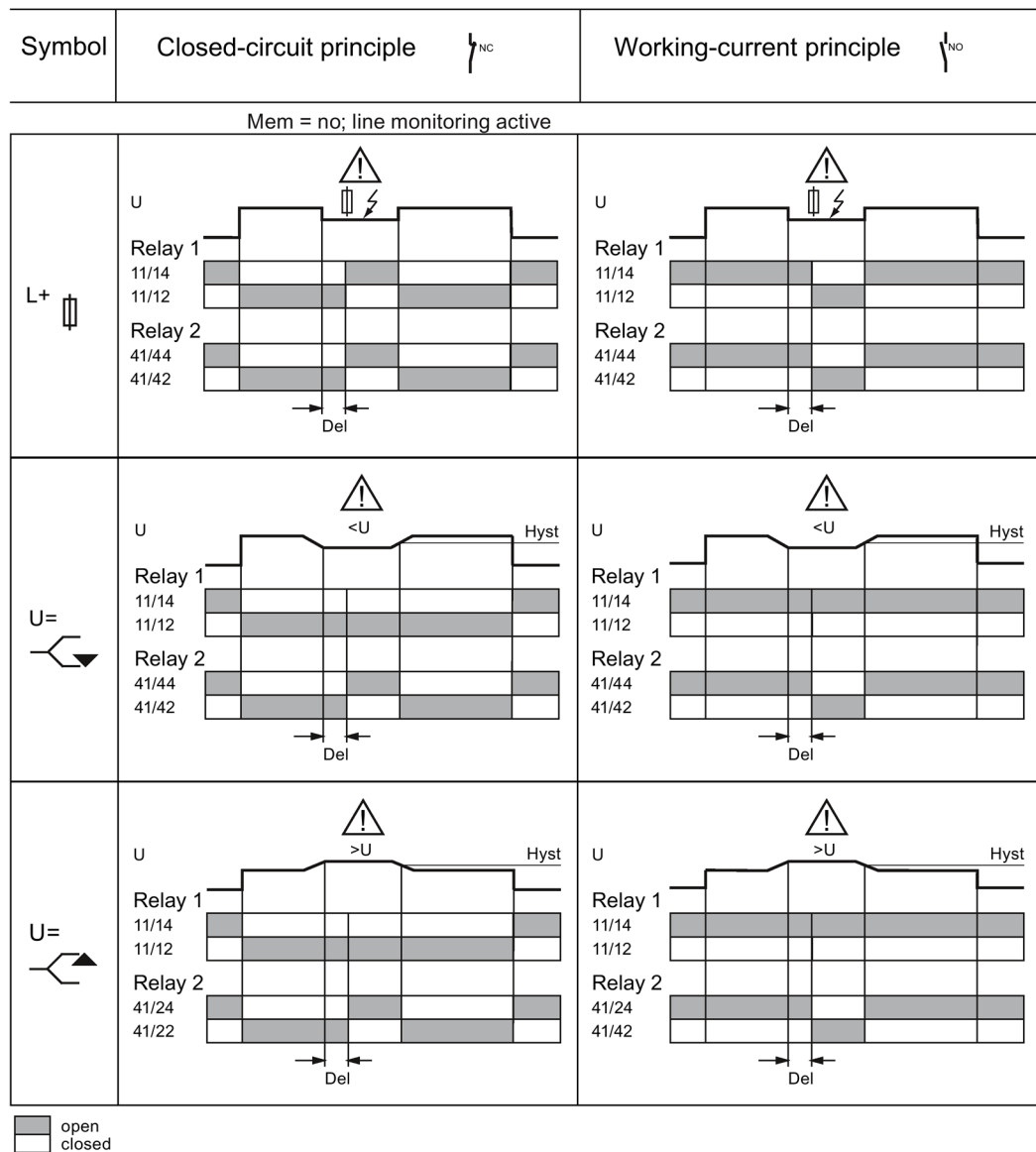


Figure 3-7 Closed-circuit / open-circuit principle, EFM 25 (DC)

You acknowledge an alarm by simultaneously pressing the Up and Down keys (only if the memory function is active).

### Note

All alarms should be acknowledged, even if they are no longer present!

If several alarms are present, only the alarm with the highest priority is actually displayed. An alarm for a faulty fuse takes priority over all others (refer to the alarm priorities below).

### Menu structure on the display of the EFM 20 (AC)

#### Legend:










- RUN: Operating mode

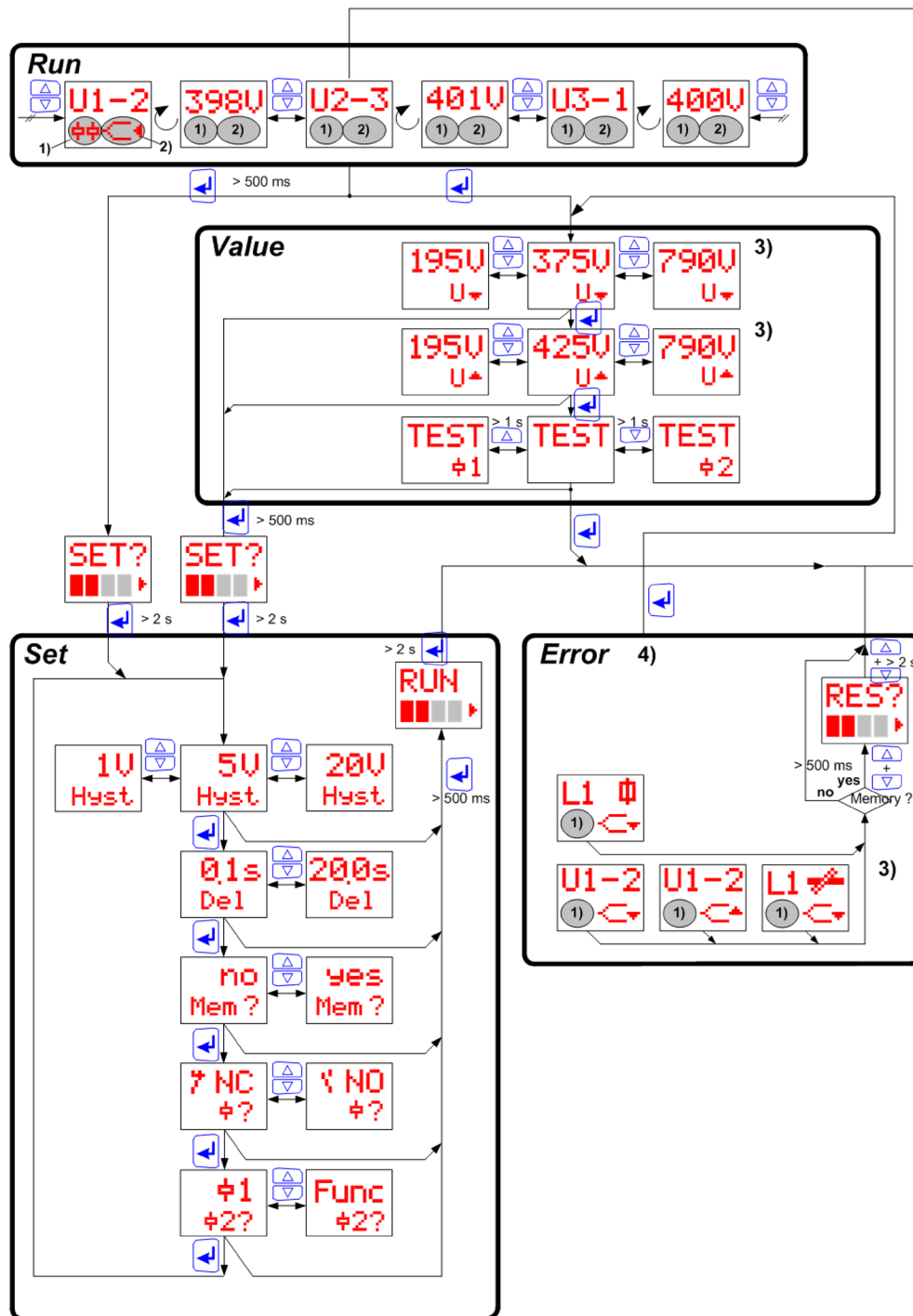
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#### Note

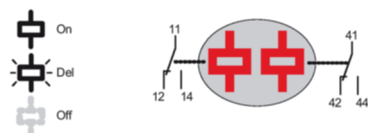
The fuse or the line is not monitored in SETUP mode. Monitoring is only assured in RUN mode.

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- U1-2, U2-3, U3-1: Phase-to-phase voltages
- Value: Value range (195 V to 790 V)
- TEST 1, TEST 2: Test on relay 1, test on relay 2
- SET?: Setup mode
- Hyst: Hysteresis (fluctuation range) in V (1 V - 20 V, default setting: 5 V)
- Del: Delay after which a fault is indicated (0.1 to 20 s), e.g. in a system with large voltage fluctuations or if the motor that is used draws a very high current on starting
- Mem?: Save yes / no
- NC: Normally Closed - closed-circuit principle, i.e. the relay is energized (default setting)
- NO: Normally Open - open-circuit principle
-  1  2?: Contactor 2 responds like contactor 1
- Func  2?: Contactor 2 responds to overvoltage/undervoltage/phase failure
- Error: Fault indication
- RES?: Reset fault indication
- Memory?: Save fault indication yes / no
- L1   : Voltage at the fuses: Lower threshold value undershot
- U1-2  : Phase-to-phase voltage: Lower threshold value undershot
- U1-2  : Phase-to-phase voltage: Upper threshold value exceeded
- L1   : Phase failure L1





1)



2)

Upper limit exceeded: 

No limit violation: 

Lower limit undershot: 

3) Functions or indication are only active if line monitoring is activated



4) If the memory function is active, the fault indication alternates with the following symbol:



### Menu structure on the display of the EFM 25 (DC)

#### Legend:










- RUN: Operating mode

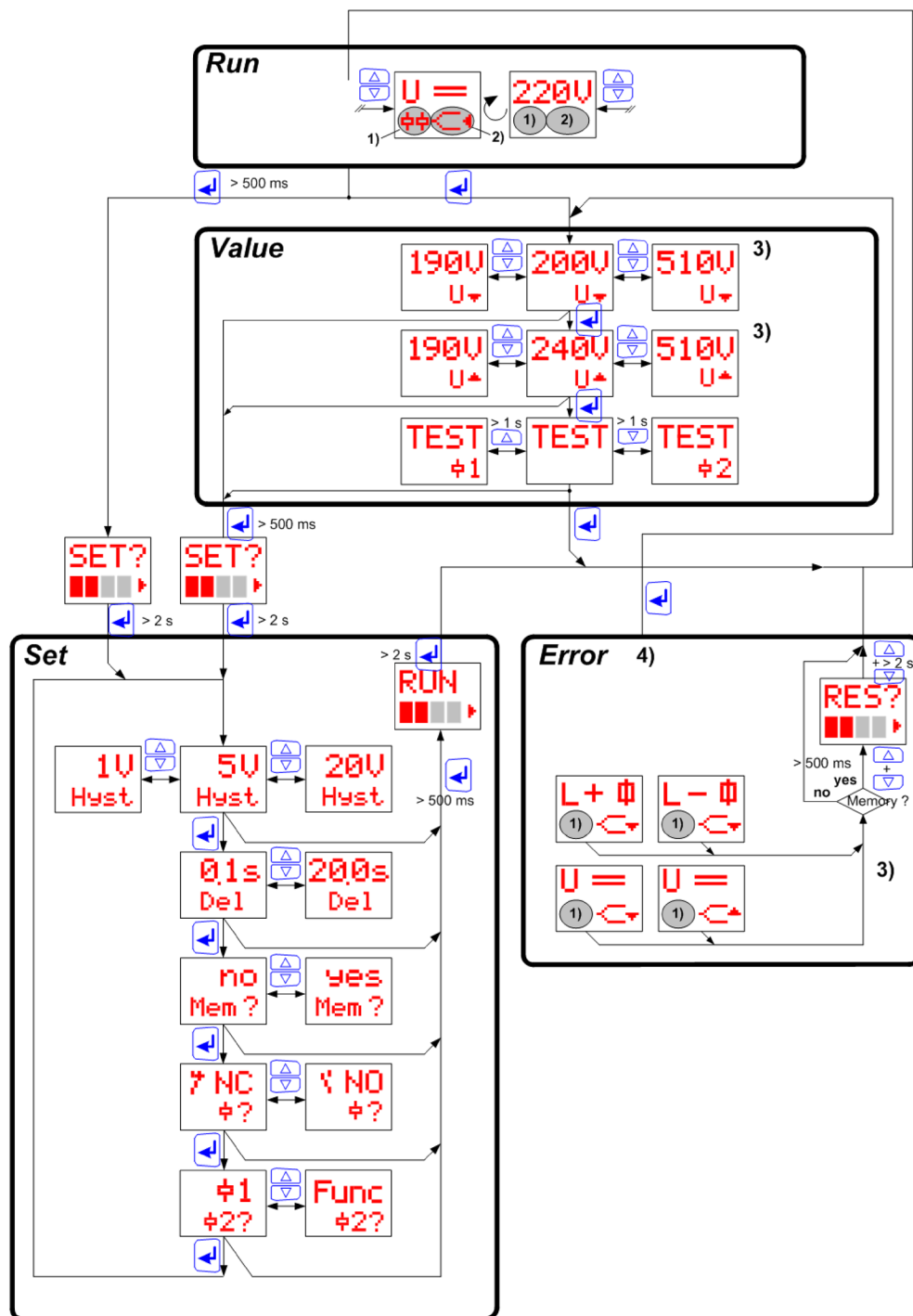
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#### Note

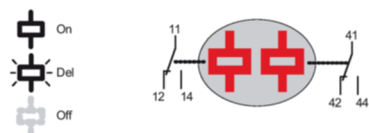
The fuse or the line is not monitored in SETUP mode. Monitoring is only assured in RUN mode.

---

- U =: Line-to-line voltage
- Value: Value range (190 V to 510 V)
- TEST 1, TEST 2: Test on relay 1, test on relay 2
- SET?: Setup mode
- Hyst: Hysteresis (fluctuation range) in V (1 V - 20 V, default setting: 5 V)
- Del: Delay after which a fault is indicated (0.1 to 20 s)
- Mem?: Save yes / no
- NC: Normally Closed - closed-circuit principle, i.e. the relay is energized (default setting)
- NO: Normally Open - open-circuit principle
-  1  2?: Contactor 2 responds like contactor 1
- Func  2?: Contactor 2 responds to overvoltage/undervoltage/phase failure
- Error: Fault indication
- RES?: Reset fault indication
- Memory?: Save fault indication yes / no
- L+   , L-   : Voltage at the fuse: Lower threshold value undershot
- U =  : Line-to-line voltage: Lower threshold value undershot
- U =  : Line-to-line voltage: Upper threshold value exceeded





1)



### 3.2 Electronic fuse monitoring

2)

Upper limit exceeded: 

No limit violation: 

Lower limit undershot: 

3) Functions or indication are only active if line monitoring is activated



4) If the memory function is active, the fault indication alternates with the following symbol:



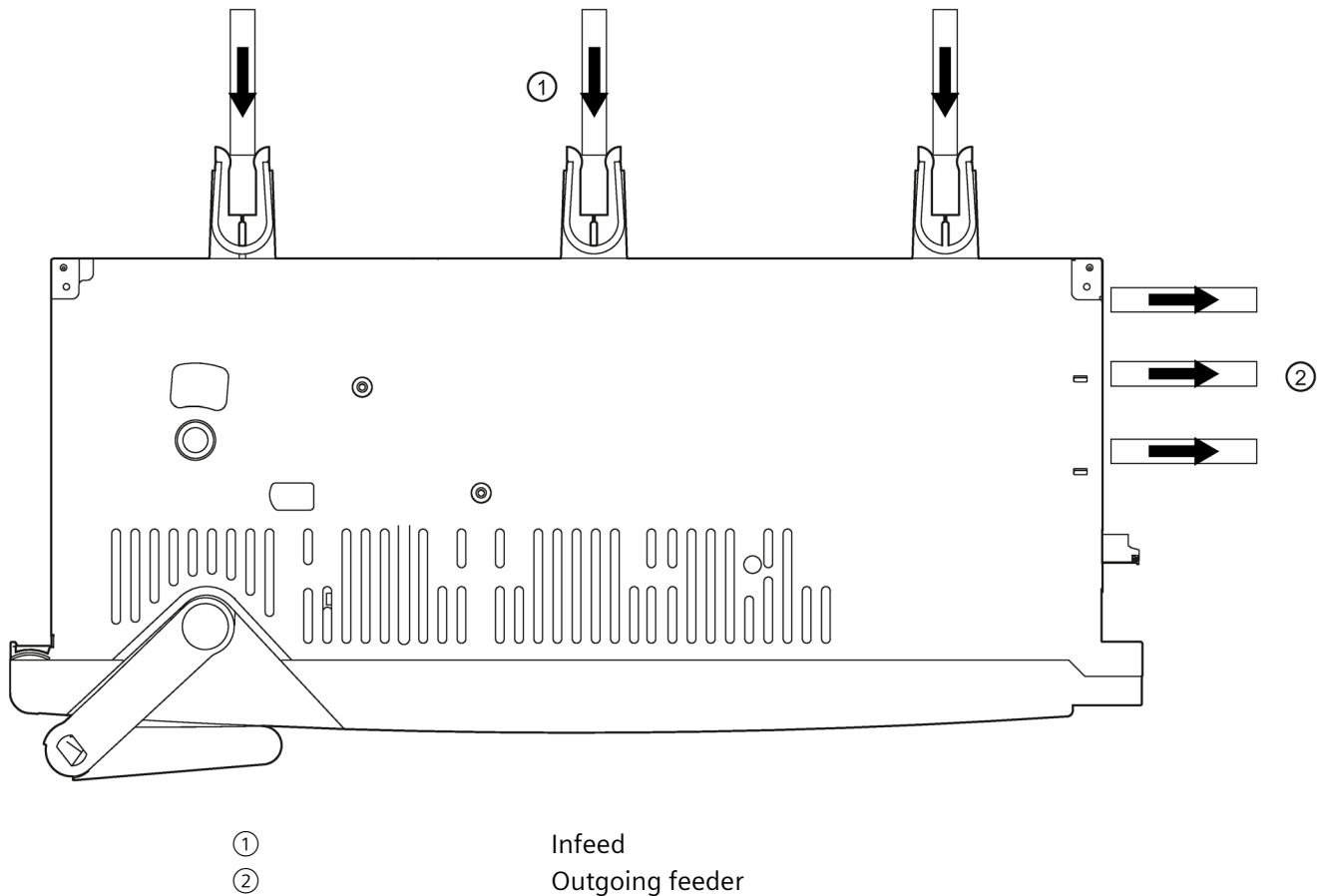
#### Alarm priorities on the EFM 20-25

Priority	Alarm	Function type	Remarks
1	Phase failure	Line monitoring	AC version only. The fault (phase or fuse failure) that was detected first in the monitoring sequence from L1 to L2 to L3 is indicated.
2	Fuse faulty	Fuse monitoring device	DC version: A faulty fuse can only be detected if a load is connected.
3	Undervoltage / over-voltage	Line monitoring	—

If several alarms are present, only the alarm with the highest priority is actually displayed.

### Voltage tap for the internal power supply and direction of the incoming supply on all EFMs, taking the EFM 10 as an example

The EFM electronics are supplied via the phases (L1, L2, L3 or L+, L-) of the main circuit. The voltage for the internal power supply is always tapped at the fuse holders on the side of the rear plug-in contacts. Owing to the internal power supply, the electronics are only fully functional if the 3NJ63 is switched on and at least two phases on the input side are supplied with power.



#### Note

The green LED on the EFM 10 does not light up, and the display of the EFM 20 or the EFM 25 is not illuminated, if the electronic fuse monitoring device is connected in a way other than that described above when the infeed is live and more than one fuse is faulty! In this case, the EFM's internal power supply can no longer be guaranteed!

### Note

If the green LED does not light up or the display is not illuminated when the infeed is live and the EFM is correctly connected, the EFM must be immediately replaced!

The table below shows:

- The number of tripped fuses
- Whether or not the electronics are active
- The "Fault" signal

as a function of the voltage tap (infeed side, outgoing side).

Table 3- 1 Number of tripped fuses, electronics active or not active and fault signal as a function of the voltage tap (infeed side, outgoing side) on the EFM 10/20

	Number of tripped fuses		Electronics active		Fault signal	
	AC <sup>1)</sup>	DC <sup>2)</sup>	AC	DC	AC	DC
Voltage tap for electronics = <b>infeed side</b> of the main conducting paths. Infeed correct: see pictures above	0	0	Yes	Yes	No	No
	1	1	Yes	Yes	Yes	Yes
	2	2	Yes	Yes	Yes	Yes
	3	—	Yes	—	Yes	—
Voltage tap for electronics = <b>outgoing side</b> of the main conducting paths	0	0	Yes	Yes	No	No
	1	1	Yes	No	Yes	Relay returns to the deenergized state (closed-circuit principle)
	2	2	No	No	Relay returns to the deenergized state (closed-circuit principle)	
	3	—	No	—	Relay returns to the deenergized state	

1) AC  $\triangleq$  EFM 10/20

2) DC  $\triangleq$  EFM 25

## 3.3 Motorized operation

### Motorized operation features

- The motor is installed in the factory.
- The motor is completely installed in the in-line disconnect without changing its dimensions.
- The operating buttons are protected by a transparent cover and can also be padlocked (padlock Ø: 6 mm)
- Emergency stop function if the motor voltage fails by operating with a size 3 Allen key

- Local or remote operation
- External connection by means of the 18-pole multi-function plug fitted in the factory

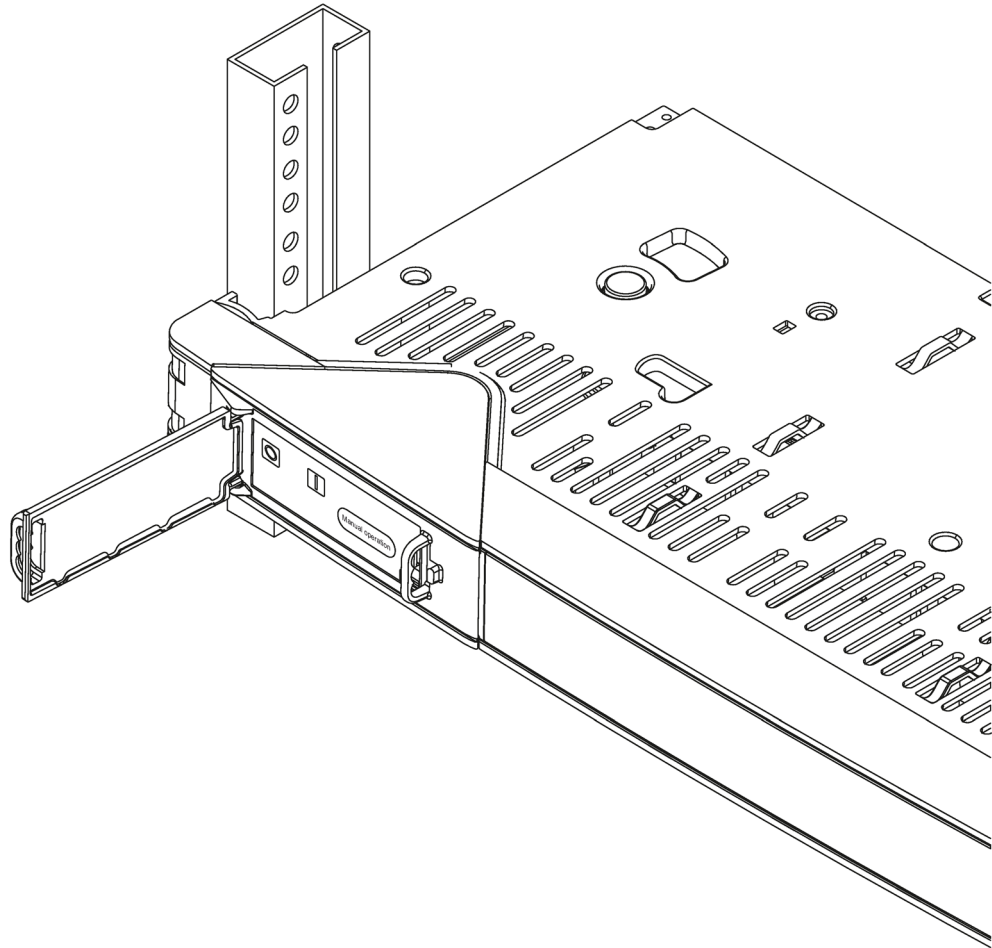


Figure 3-8 Motorized operation

## 3.4 Connection method

All plug-in switch disconnectors are supplied for connection with a cable lug as standard. Terminals are also available as optional accessories.

## 3.5 Current transformers and current transformer busbars

### Current transformers

Size	Primary current	Secondary current	Accuracy class	Feed-through opening
<b>Size 00</b>	50 A	1 A, 5 A	Class 1	Ø 21 mm
	100 A, 150 A	1 A, 5 A	Class 1, class 0.5	Ø 21 mm
			Class 0.5, calibrated	Ø 14 mm
<b>Size 1</b>	50 A	1 A, 5 A	Class 1	Ø 21 mm
	100 A, 150 A, 200 A, 250 A	1 A, 5 A	Class 1, class 0.5	Ø 21 mm
			Class 0.5, calibrated	Ø 15.2 mm
<b>Size 2 / size 3</b>	300 A, 400 A, 500 A, 600 A	1 A, 5 A	Class 1, class 0.5 Class 0.5, calibrated	Ø 32 mm

Current transformers are not allowed to be operated at no load because this could lead to hazardous voltages at the terminals.

If four current transformers are used, the fourth transformer is in phase L3 for size 00, phase L2 for size 1, or phase L1 for sizes 2 and 3.

If the fourth current transformer has size 00 or 1, the multi-function plug cannot be fitted because there is not enough space. A current transformer cannot be installed in the N conductor of 4-pole devices.

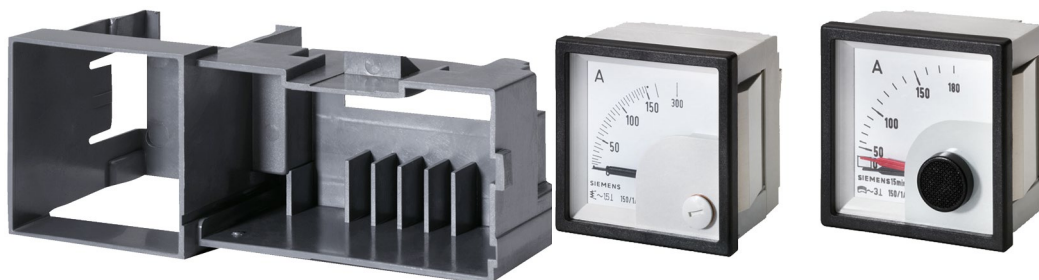
### Current transformer busbars

Size	Order no. of current transformer busbars for		
	1 current transformer	3 current transformers	4 current transformers
<b>Size 00</b>			
Current transformer with Ø 21 mm	3NJ69 20-3DB00	3NJ69 20-3DC00	3NJ69 20-3DD00
Current transformer with Ø 14 mm	3NJ69 20-3DE00	3NJ69 20-3DF00	3NJ69 20-3DG00
<b>Size 1</b>			
Current transformer with Ø 21 mm	3NJ69 30-3DB00	3NJ69 30-3DC00	3NJ69 30-3DD00
Current transformer with Ø 15.2 mm	3NJ6930-3DE00	3NJ6930-3DF00	3NJ6930-3DE00 3NJ6930-3DF00
<b>Size 2 / size 3</b>	No current transformer busbars required		

## 3.6 Ammeters

According to DIN 43718, an ammeter with dimensions 48 mm x 48 mm can be used to measure the current. It can be a moving-iron measuring instrument or a bi-metal measuring instrument.

A holder for ammeters can be ordered as a separate accessory.



Holder for ammeters

Ammeter: Moving-iron measuring instrument (left) and bi-metal measuring instrument (right)

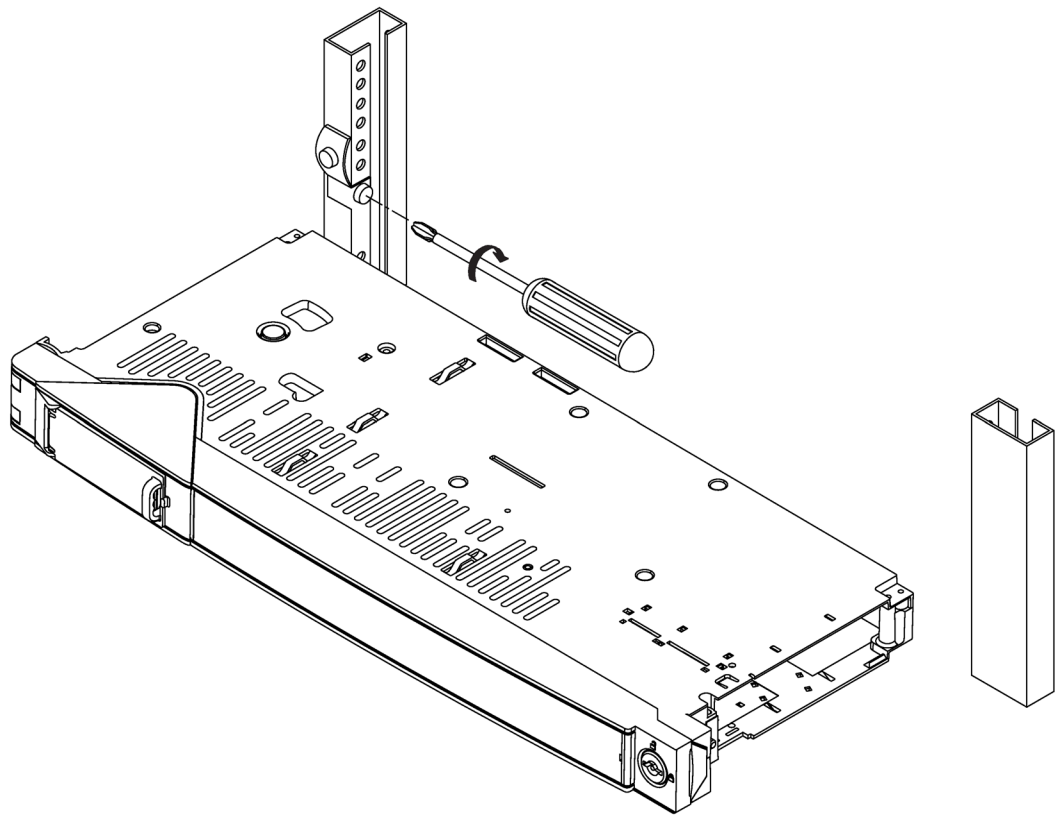
In the case of device versions with electronic fuse monitoring (EFM), the holder for one ammeter is already installed at the factory.



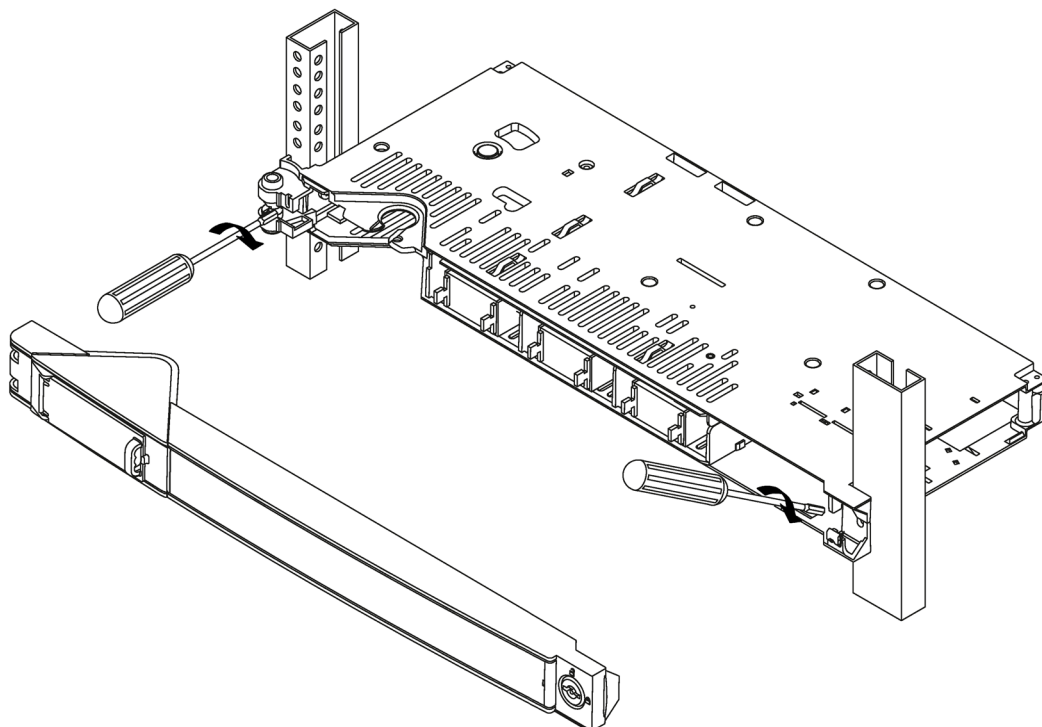
## Mounting

### 4.1 Mounting size 00

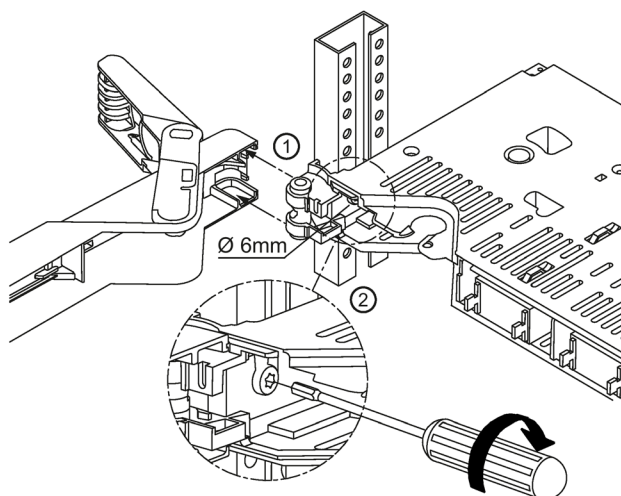
Installing the plates for device versions with a motorized operating mechanism in the control cabinet



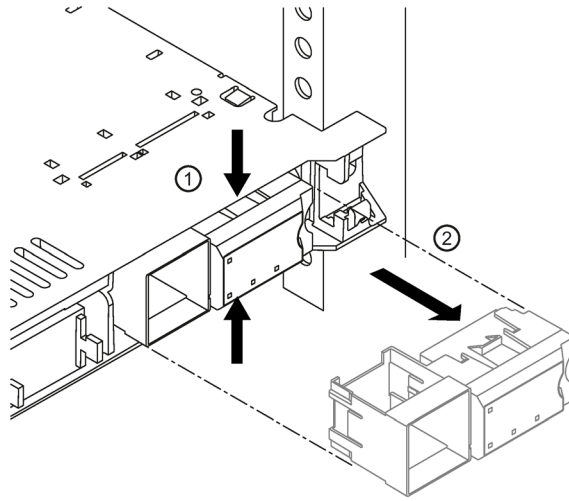
### Installing device versions with a motorized operating mechanism in the control cabinet



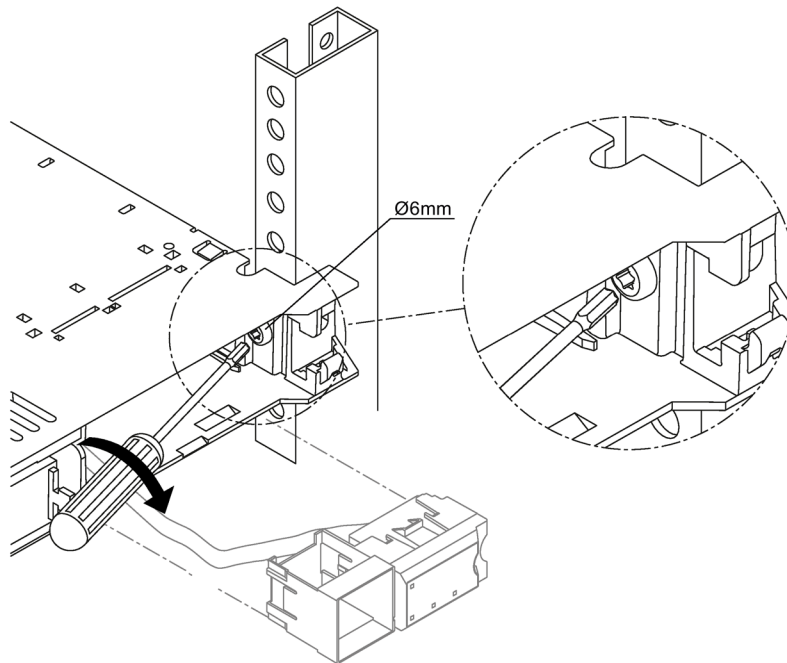
### Installation in the control cabinet



## Removing the EFM



## Installing / removing the EFM in / from the control cabinet

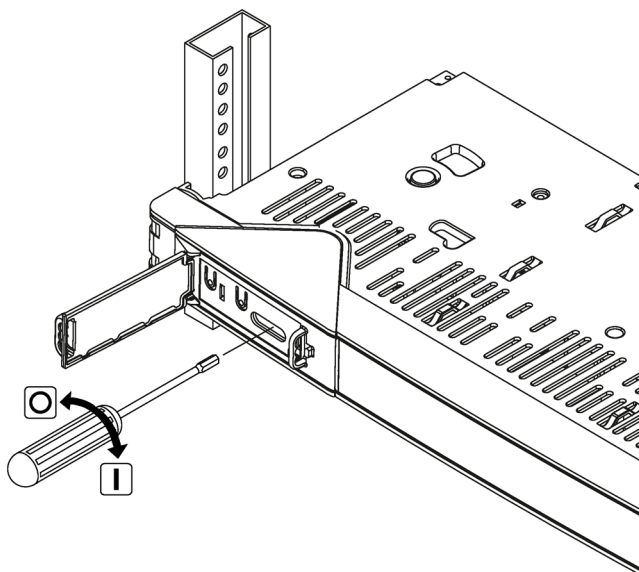


## Emergency operation

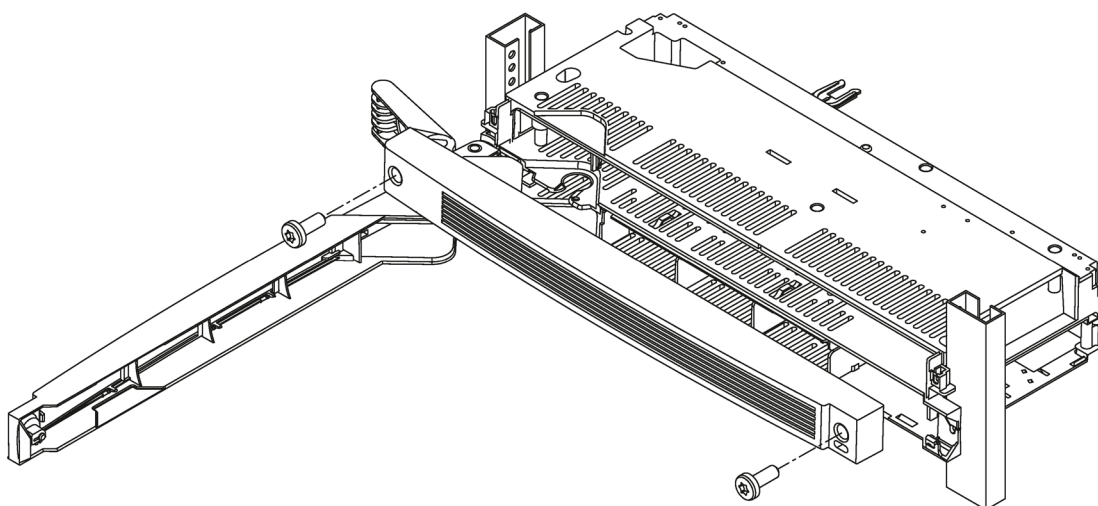
### NOTICE

#### Irreparable damage can be caused by motorized tools

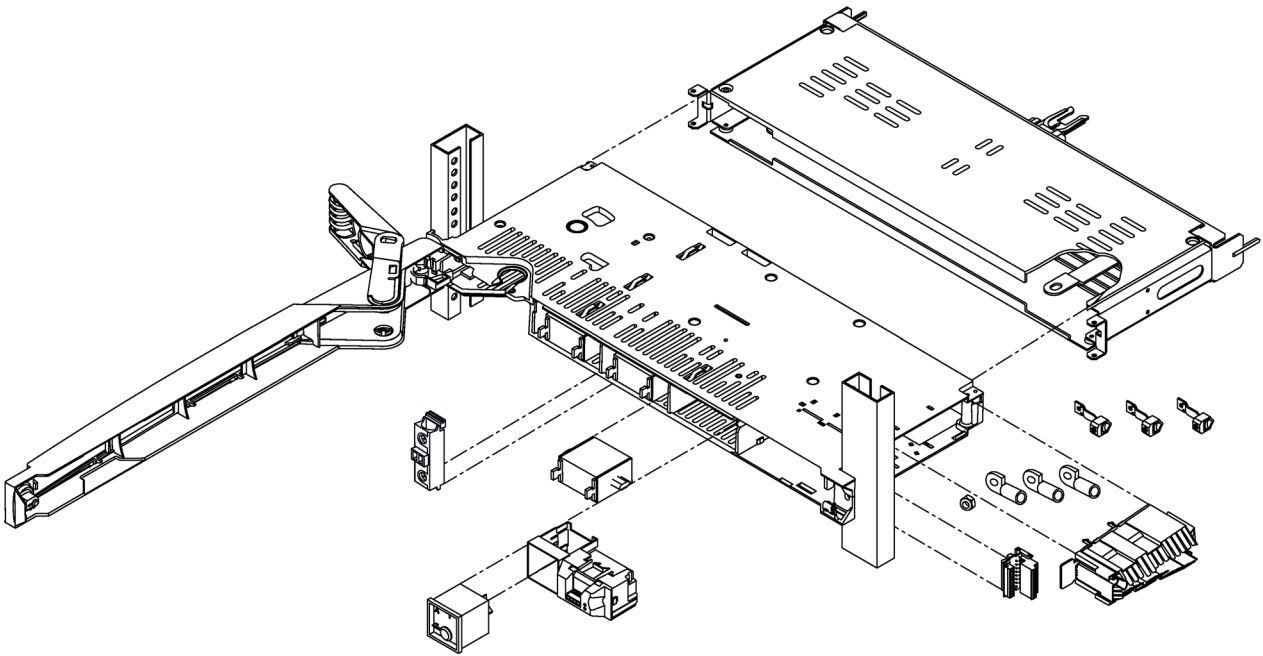
Emergency operation may only performed be using a manual tool. Operation using a motorized tool can cause irreparable damage to the switching mechanism.



## Installing 4-pole device versions with a motorized operating mechanism in the control cabinet



## Overview



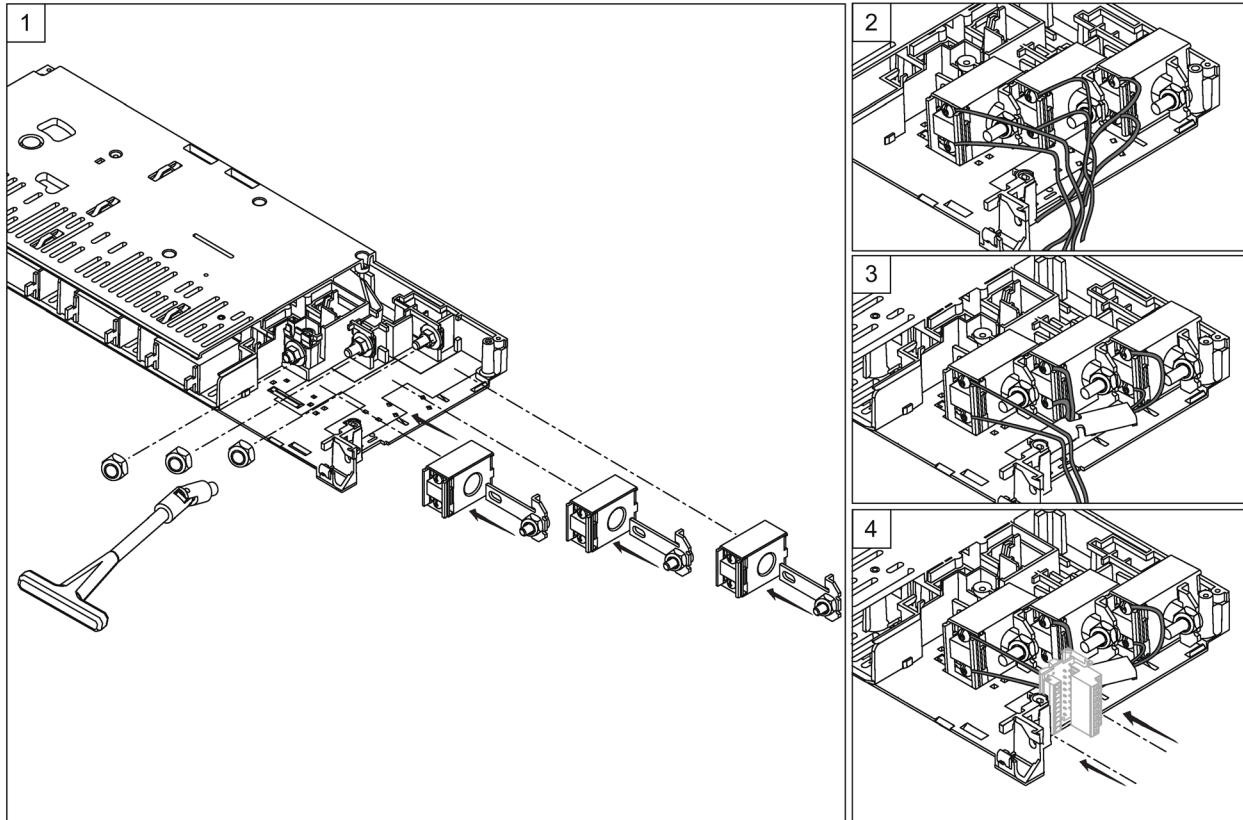
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### Note

The multi-function plug and the electronic fuse monitor (EFM) must be dismantled in order to install accessories.

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### Installing the current transformer and the multi-function plug



#### Note

The current transformers must not be operated with an open circuit.

## Wiring of the auxiliary switches

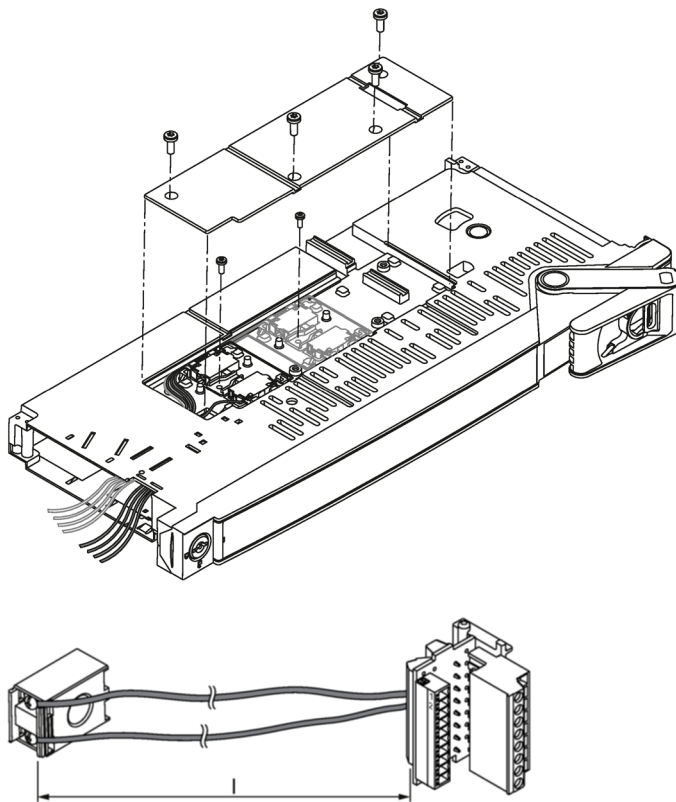
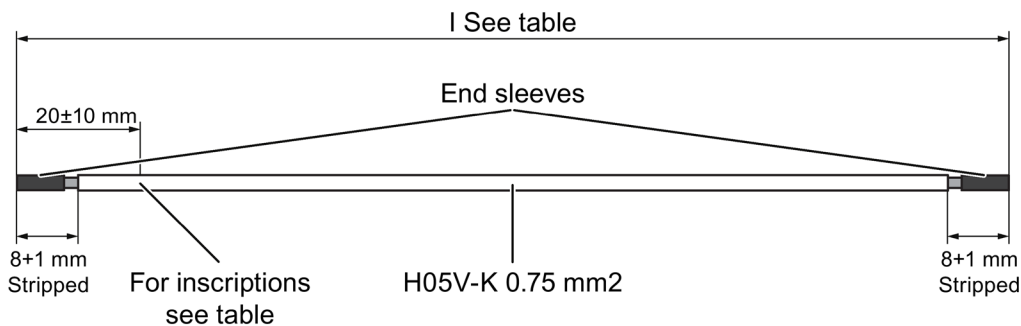


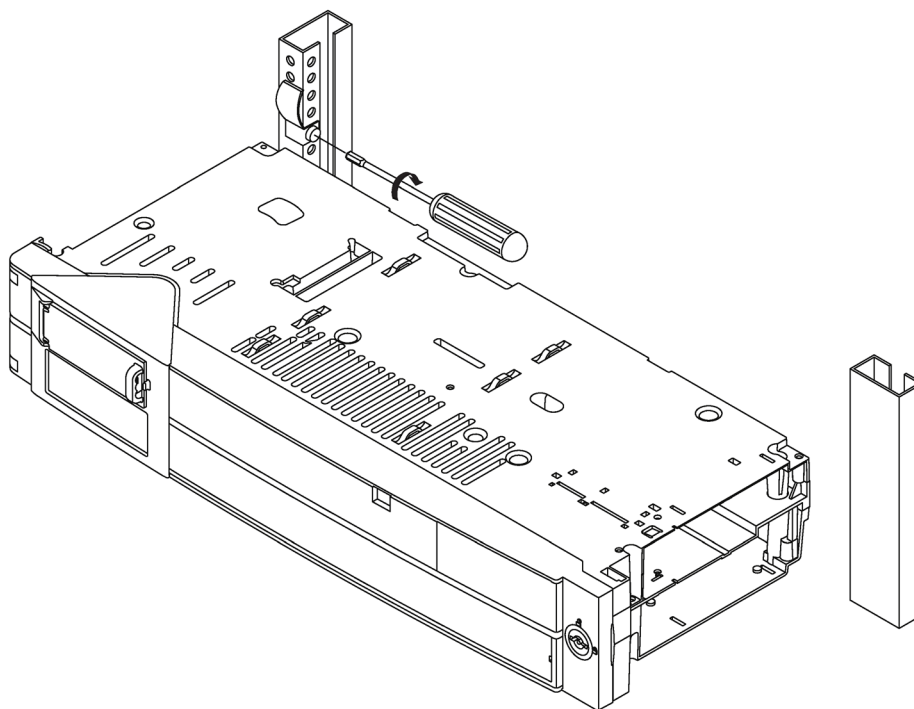
Figure 4-1 Cable lengths



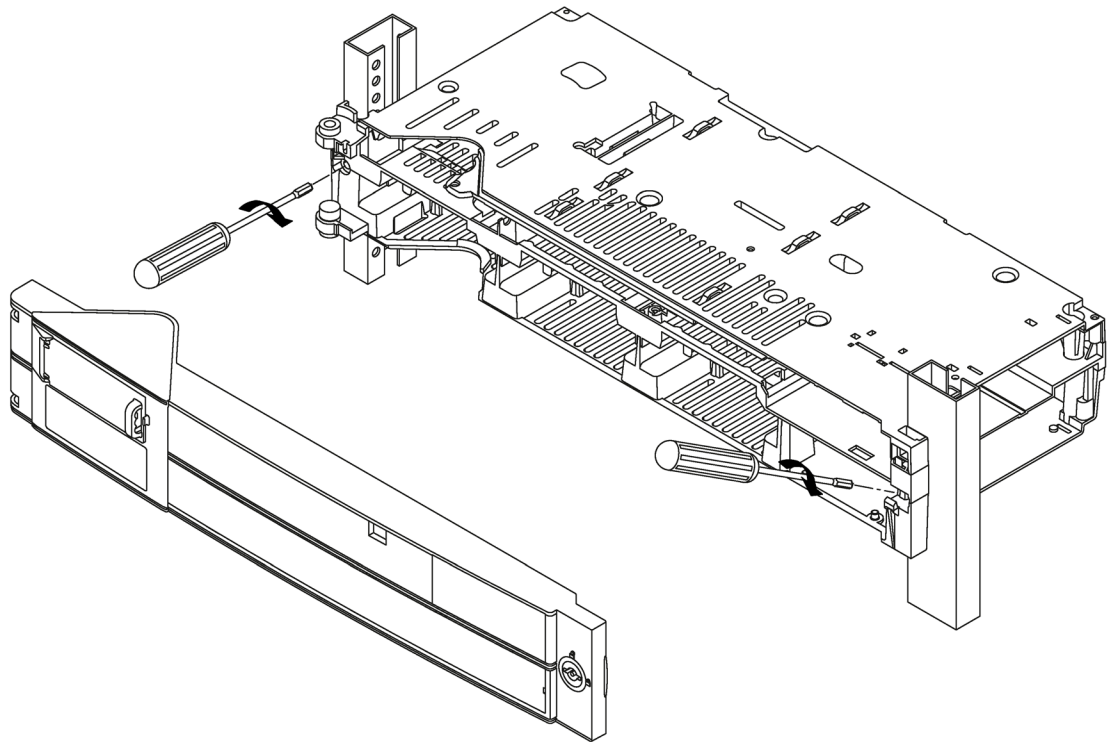
Size 00	Color: Black																	
Type	Current transformer												Auxiliary switch					
Inscription	L1K	1	L1L	2	L2K	3	L2L	4	L3K	5	L3L	6	-1	11	-2	12	-3	13
l [mm]	250		250		200		210		180		190		310		410		450	

## 4.2 Mounting size 1

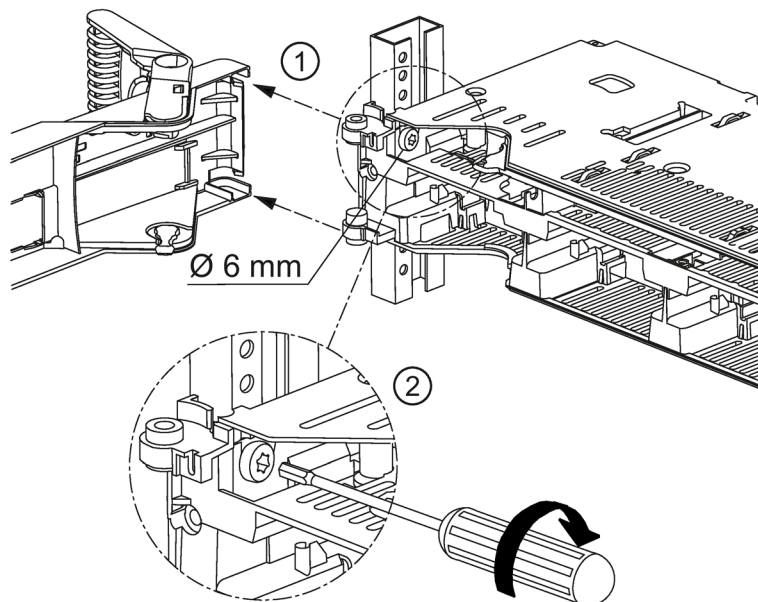
Installing the plates for device versions with a motorized operating mechanism in the control cabinet



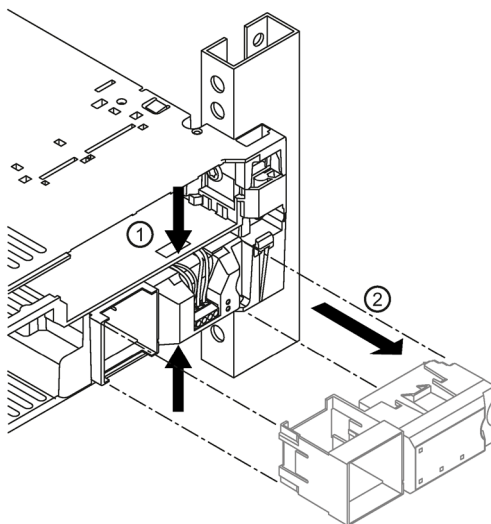
## Installing device versions with a motorized operating mechanism in the control cabinet



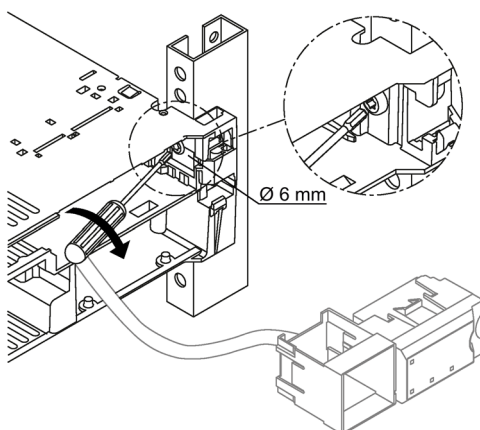
## Installation in the control cabinet



## Removing the EFM



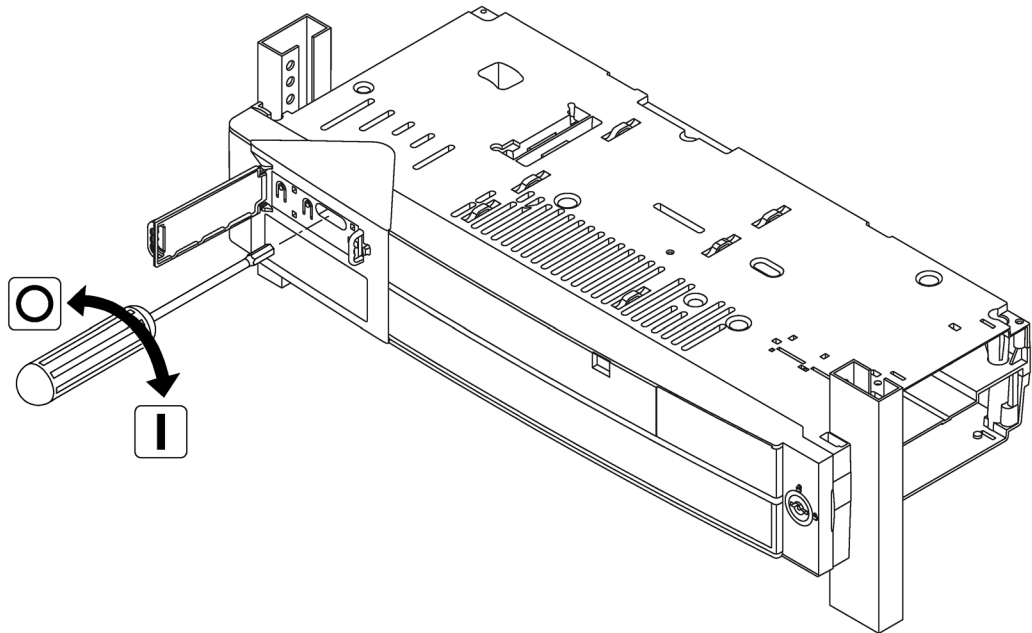
## Installing / removing the EFM in / from the control cabinet



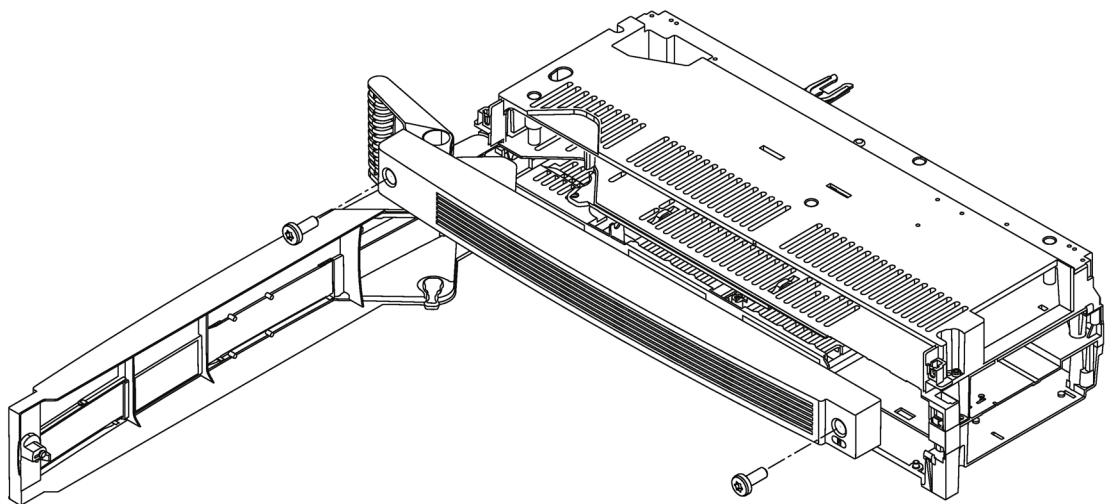
## Emergency operation

**NOTICE****Irreparable damage can be caused by motorized tools**

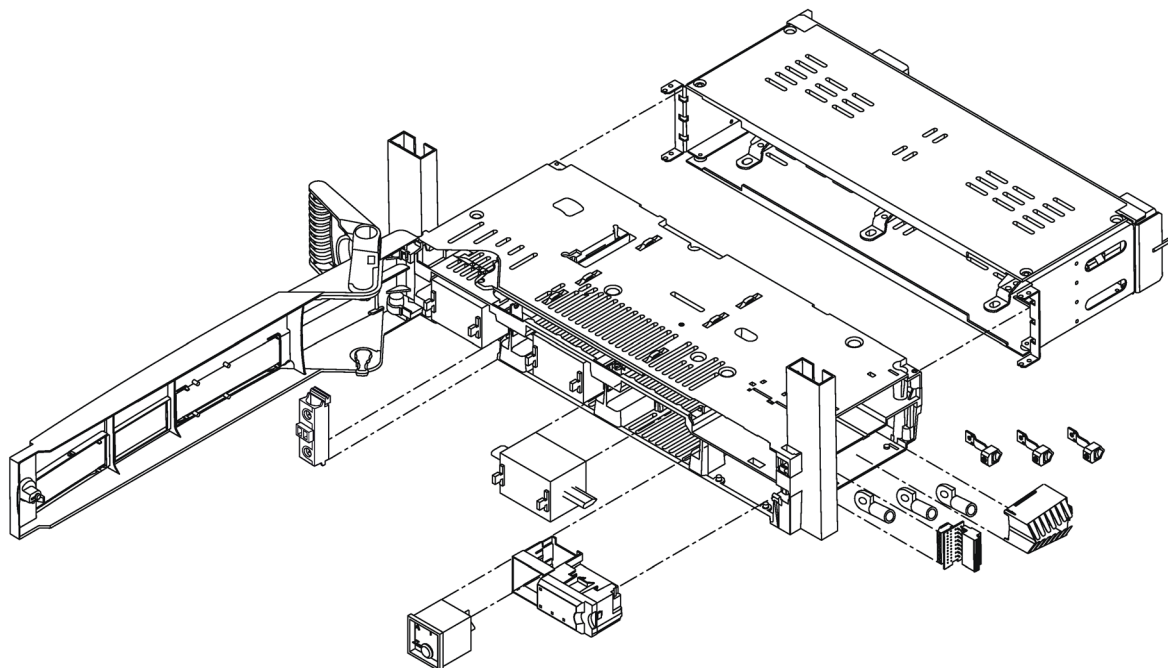
Emergency operation may only be performed by using a manual tool. Operation using a motorized tool can cause irreparable damage to the switching mechanism.



## Installing 4-pole device versions with a motorized operating mechanism in the control cabinet



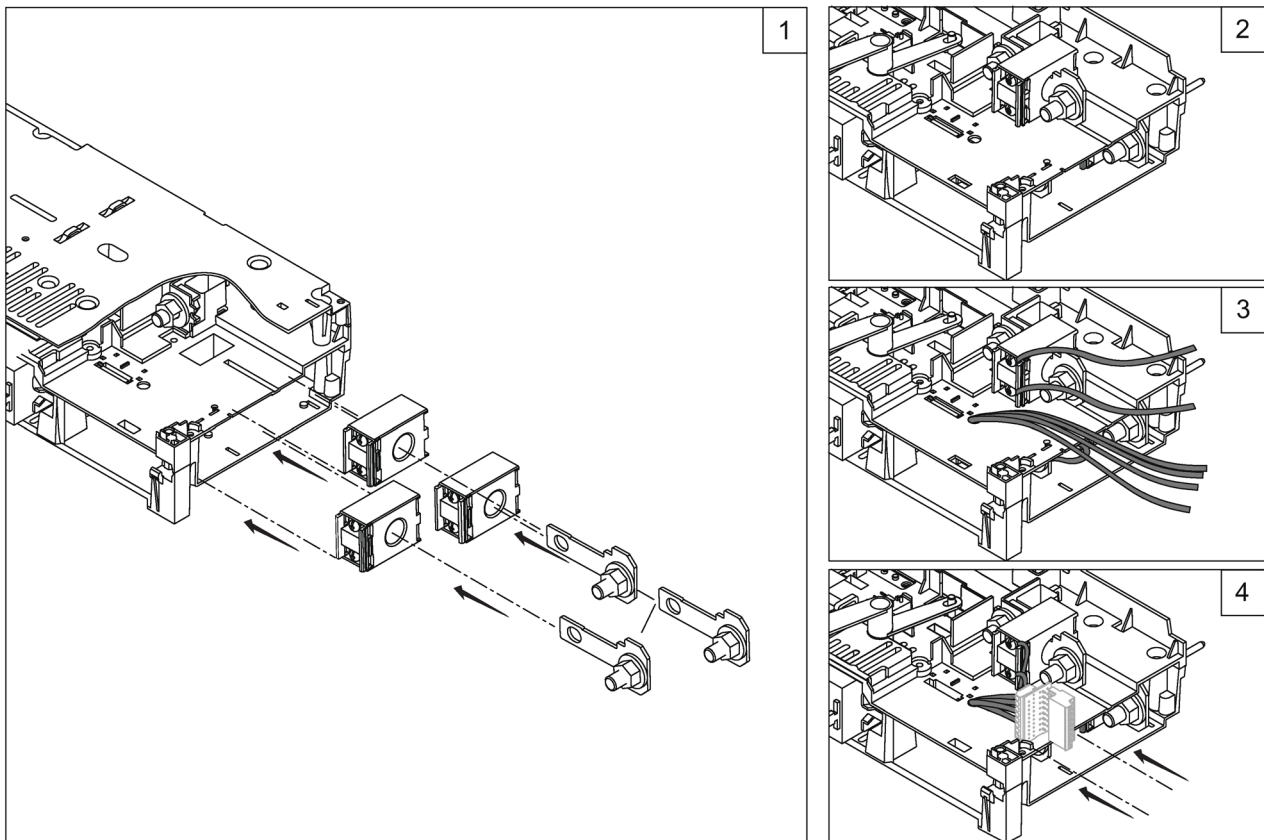
## Overview



### Note

The multi-function plug and the electronic fuse monitor (EFM) must be dismantled in order to install accessories.

## Installing the current transformer and the multi-function plug



### Note

The current transformers must not be operated with an open circuit.

Wiring of the auxiliary switches

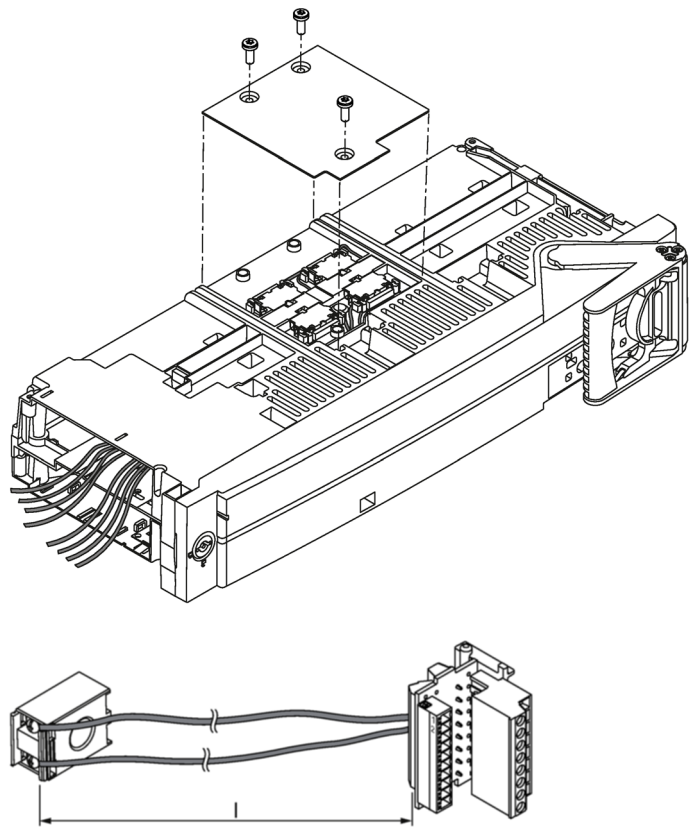
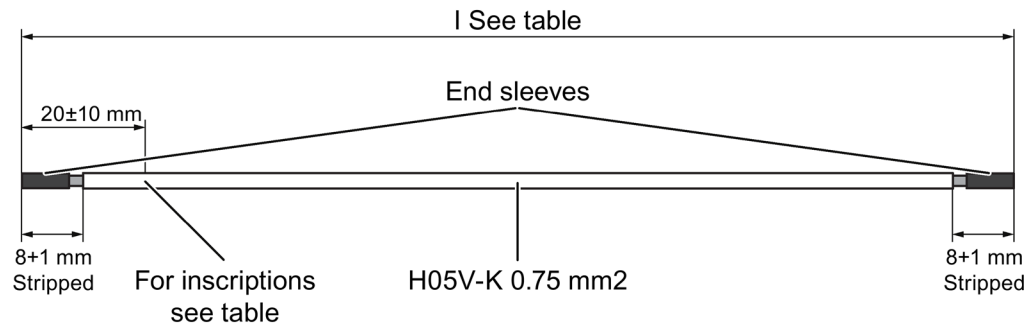


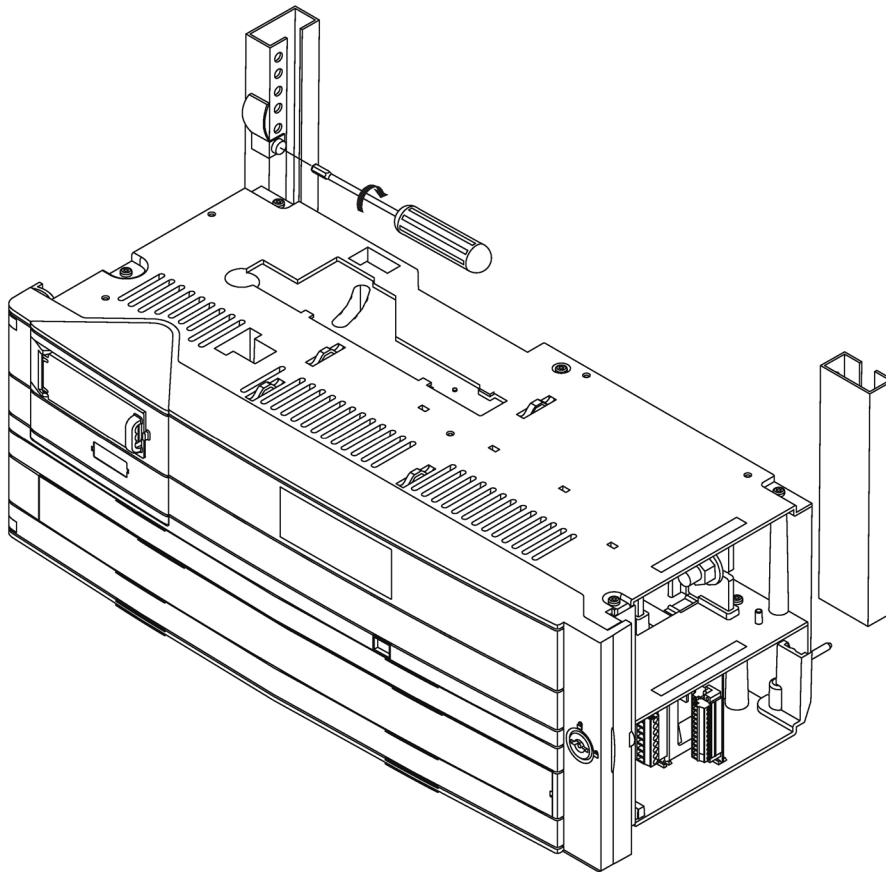
Figure 4-2 Cable lengths



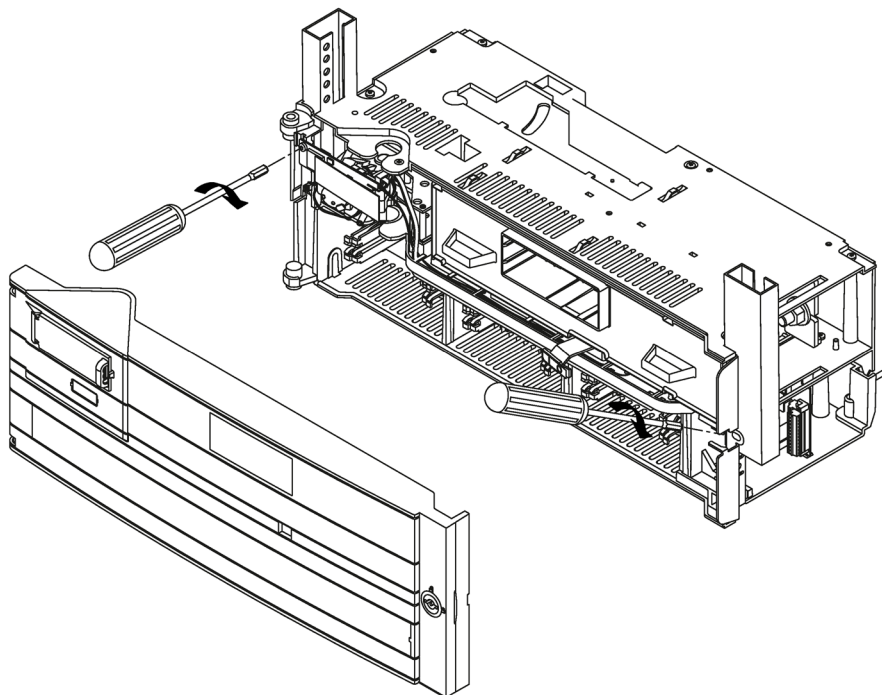
Size 1	Color: Brown																	
Type	Current transformer										Auxiliary switch							
Inscription	L1K	1	L1L	2	L2K	3	L2L	4	L3K	5	L3L	6	-1	11	-2	12	-3	13
l [mm]	290		300		170		170		220		240		450		450		460	500

## 4.3 Mounting sizes 2 and 3

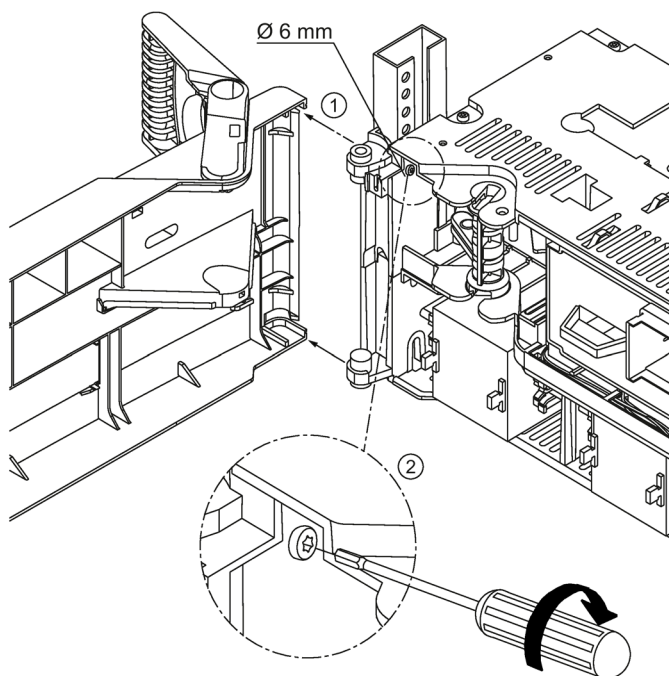
Installing the plates for device versions with a motorized operating mechanism in the control cabinet



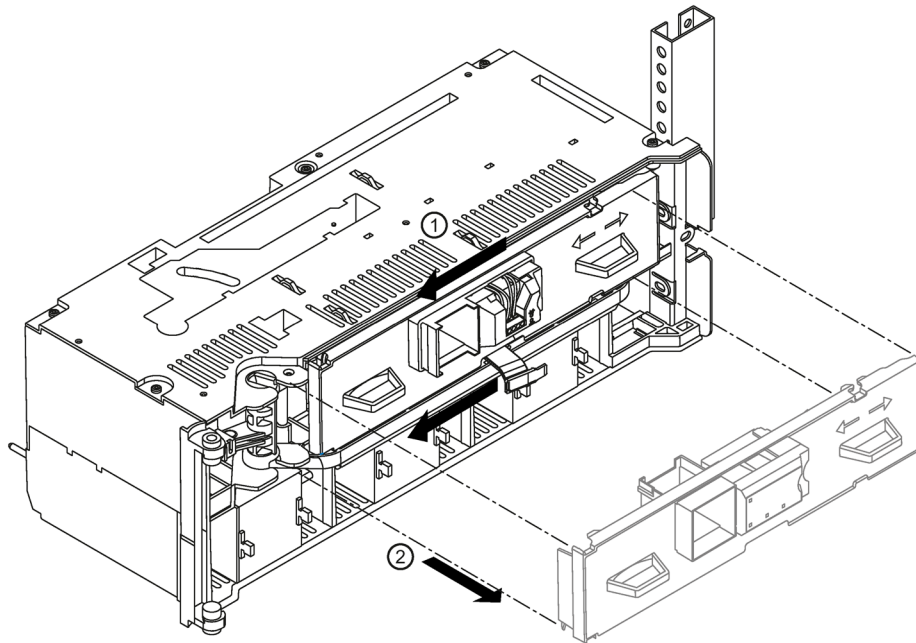
### Installing device versions with a motorized operating mechanism in the control cabinet



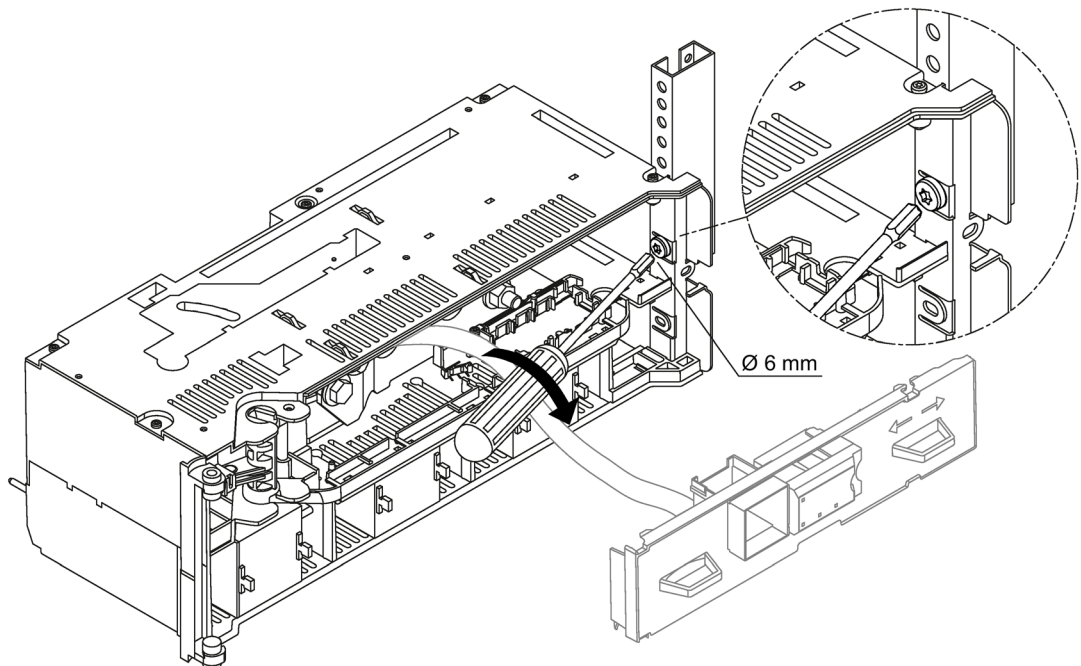
### Installation in the control cabinet



## Removing the EFM



## Installing / removing the EFM in / from the control cabinet

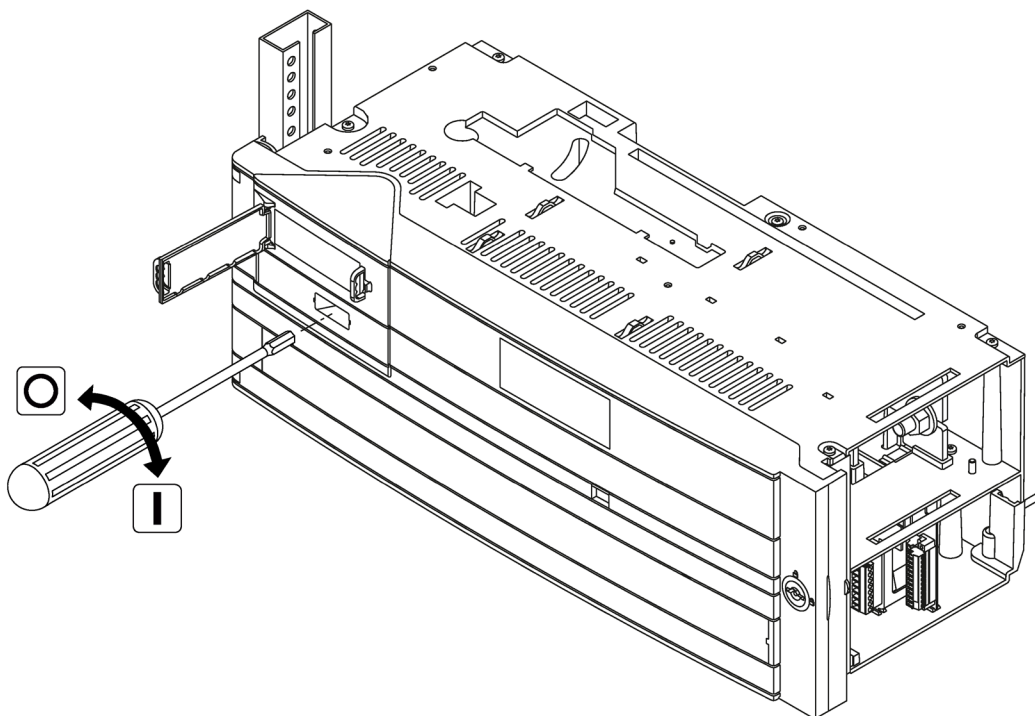


## Emergency operation

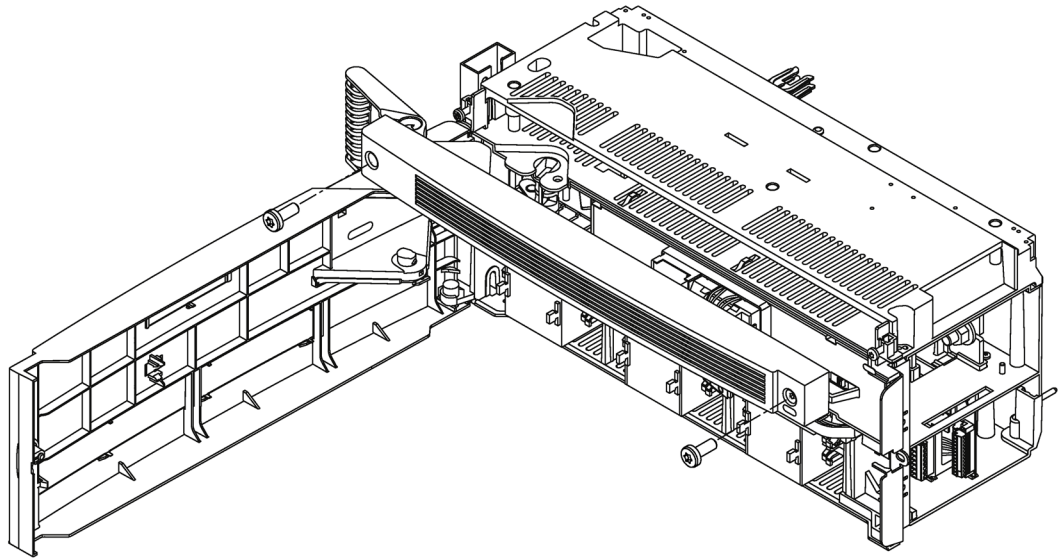
### NOTICE

#### **Irreparable damage can be caused by motorized tools**

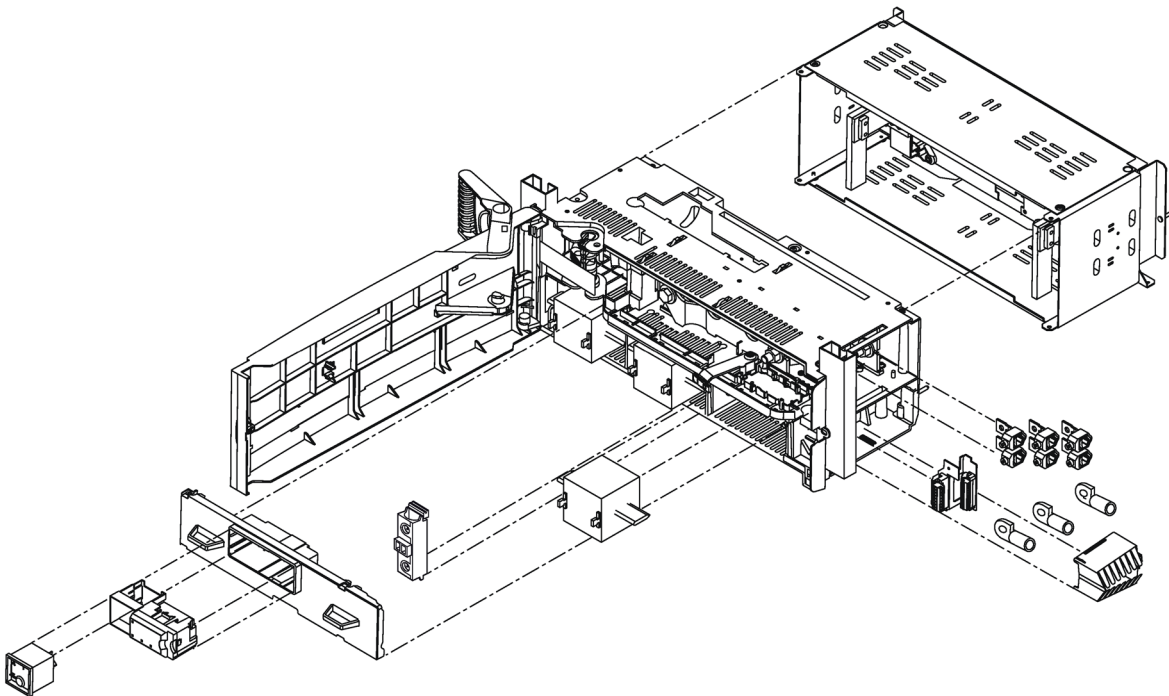
Emergency operation may only be performed by using a manual tool. Operation using a motorized tool can cause irreparable damage to the switching mechanism.



## Installing 4-pole device versions with a motorized operating mechanism in the control cabinet



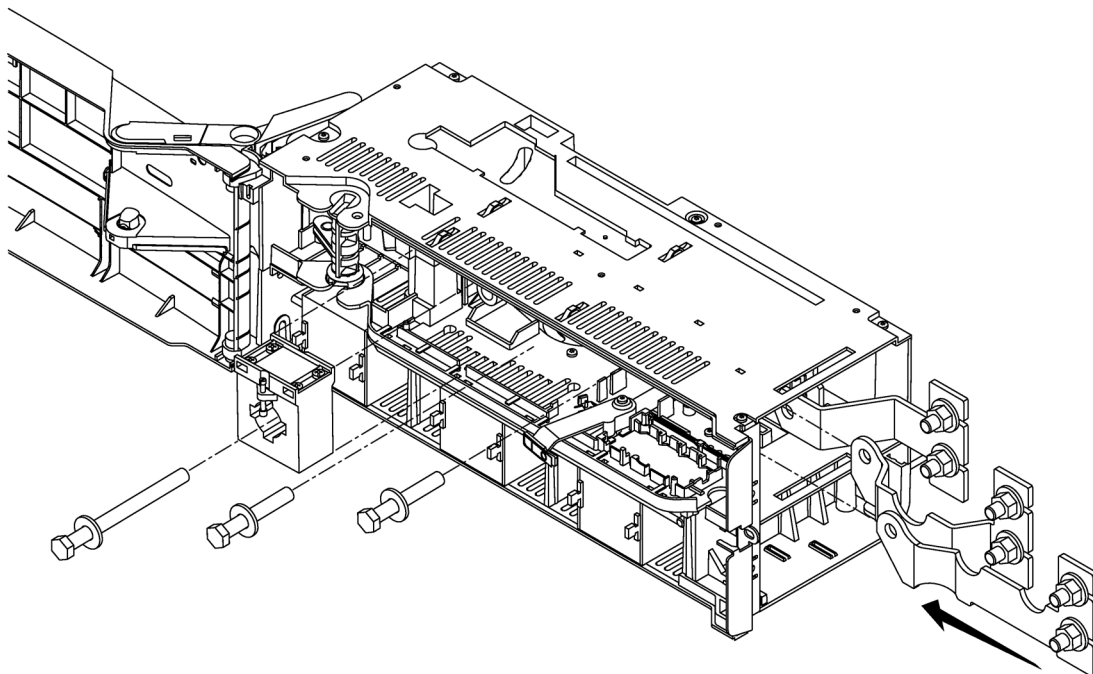
### Overview



#### Note

The multi-function plug and the electronic fuse monitor (EFM) must be dismantled in order to install accessories.

### Installing the current transformer and the multi-function plug



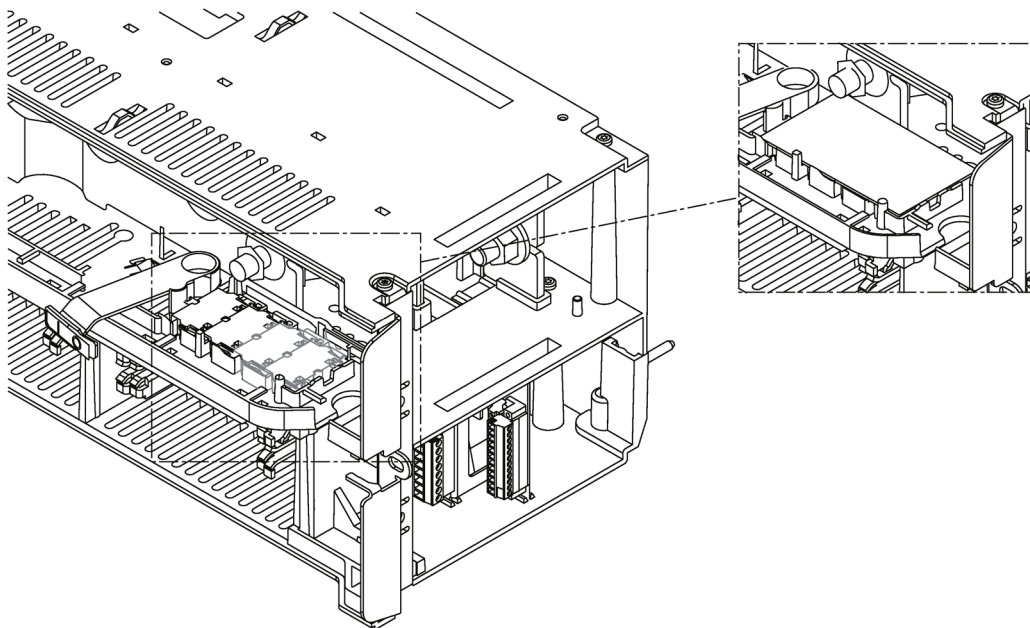
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#### Note

The current transformers must not be operated with an open circuit.

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### Wiring of the auxiliary switches



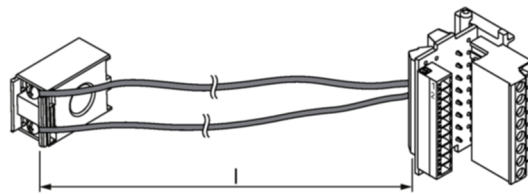
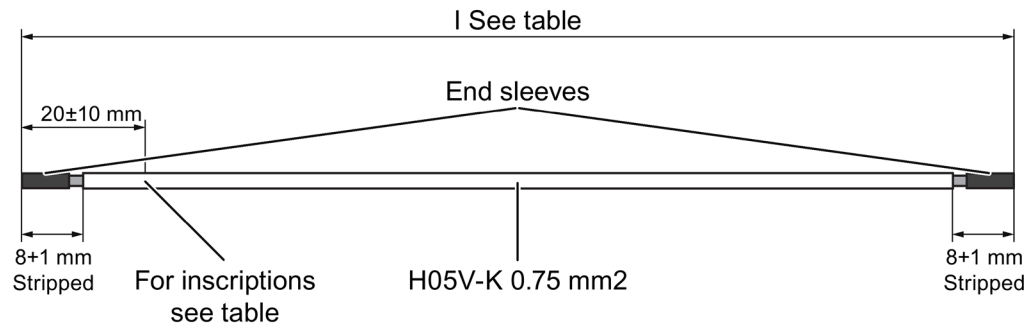


Figure 4-3 Cable lengths



Size 2 / size 3	Color: Blue																			
Type	Current transformer												Auxiliary switch							
Inscription	L1K	1	L1L	2	L2K	3	L2L	4	L3K	5	L3L	6	-1	11	-2	12	-3	13	-2	14
l [mm]	760		790		670		670		560		570		300		300		300		300	



## Configuration

### 5.1 Installation data

#### 3NJ63 switch disconnectors

Type of LV HRC version	Rated current [A]	Size	Height requirements of in-line disconnectors [mm]
3NJ6302	160	00	50
3NJ6312	250	1	100
3NJ6322	400	2	200
3NJ6332	630	3	200
3NJ6303	160	00	50
3NJ6313	250	1	100
3NJ6323	400	2	200
3NJ6333	630	3	200
3NJ6304	160	00	100
3NJ6314	250	1	150
3NJ6324	400	2	250
3NJ6334	630	3	250

#### Further built-in components

Type	Designation	Height requirements [mm]
3NJ69 00-4CB00	Blanking covers for empty compartments / connection module	50
3NJ69 15-3BA00	Connection module 400 A for device compartment (without front panel)	50

## 5.2 Rated currents

- Rated currents of device sizes =  $0.8 \times I_N$  of the biggest fuse link

Device size	Fuse $I_N$ [A]	Rated current = $0.8 \times I_N$ [A]
00	160	125
	125	100
	80	64
1	250	200
	224	180
	125	100
2	400	320
	355	284
	315	252
3	630	504
	500	400
	400	320

## 5.3 Configuration rules

Configuration rules must be observed by the plant manufacturer in accordance with the applicable standards (IEC 61439 series of standards). More technical information can be found in Chapter 5 of the TIP Planning Manual (<https://support.industry.siemens.com/cs/de/de/view/107113936/en>).

### Rated diversity factor according to IEC 61439 series of standards

Number of main circuits	Rated diversity factor
2 and 3	0.9
4 and 5	0.8
6 to 9 inclusive	0.7
10 or more	0.6

# Technical specifications

Table 6- 1 3NJ63 2-pole

Standards	3NJ6302.../LV HRC 00		3NJ6312.../LV HRC 1		3NJ6322.../LV HRC 2		3NJ6323.../LV HRC 3	
Rated operational voltage $U_e$ (V)	230	500	230	500	230	500	230	500
Rated operational current $I_e$ (A)	160	125	250	250	400	315	630	500
Rated insulation voltage $U_i$ (V)	1000	1000	1000	1000	1000	1000	1000	1000
Rated impulse voltage $U_{imp}$ (V)	8000	8000	8000	8000	8000	8000	8000	8000
Rated conditional short-circuit current *) $I_q$	66	66	66	66	66	66	66	66
Rated conditional short-circuit current (kA) rms value	100	100	100	100	100	100	100	100
Utilization category	DC23B	DC21B	DC23B	DC21B	DC23B	DC21B	DC23B	DC21B
Rated frequency DC	50/60 DC	50/60 DC	50/60 DC	50/60 DC	50/60 DC	50/60 DC	50/60 DC	50/60 DC
Endurance: total/electrical operating cycles	1600/200	1600/200	1600/200	1600/200	1000/200	1000/200	1000/200	1000/200
Degree of protection (in operating state) according to IEC/EN 60529	IP41	IP41	IP41	IP42	IP41	IP41	IP41	IP41
Power loss (W) (without fuse links)	22	14	47	70	67	42	164	104
Permissible ambient temperature (°C)	- 5 ... + 70							
Permissible mounting positions	Horizontal and vertical							

\*) in the switched-on state

Table 6- 2 3NJ63 3-pole

Standards	3NJ6303.../LV HRC 00		3NJ6313.../LV HRC 1			3NJ6323.../LV HRC 2		3NJ6333.../LV HRC 3	
Rated operational voltage $U_e$ (V)	500	690	500	690	800	500	690	500	690
Rated operational current $I_e$ (A)	160	125	250	250	250	400	400	630	500
Rated insulation voltage $U_i$ (V)	1000	1000	1000	1000	1000	1000	1000	1000	1000
Rated impulse voltage $U_{imp}$ (V)	8000	8000	8000	8000	8000	8000	8000	8000	8000
Rated conditional short-circuit current *) $I_q$	120	100	120	100	100	120	100	120	100
Rated conditional short-circuit current (kA) rms value	120	100	120	100	100	120	100	120	100
Utilization category	AC23A	AC23A	AC23A	AC23A	AC22B	AC23A	AC23A	AC23A	AC23A
Rated frequency (Hz) at DC	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60
Endurance: total/electrical operating cycles	8000/1000	8000/1000	8000/1000	8000/1000	1600/200	5000/1000	5000/1000	5000/1000	5000/1000
Degree of protection (in operating state) according to IEC/EN 60529	IP41	IP41	IP41	IP41	IP41	IP41	IP41	IP41	IP41
Power loss (W) (without fuse links)	33	21	70	70	70	100	100	245	129
Permissible ambient temperature (°C)	- 5 ... + 70								
Permissible mounting positions	Horizontal and vertical								

\*) in the switched-on state

Table 6- 3 3NJ63 4-pole

Standards	3NJ6303.../LV HRC 00	3NJ6313.../LV HRC 1	3NJ6323.../LV HRC 2	3NJ6333.../LV HRC 3
Rated operational voltage $U_e$ (V)	500	500	500	500
Rated operational current $I_e$ (A)	160	250	400	630
Rated insulation voltage $U_i$ (V)	1000	1000	1000	1000
Rated impulse voltage $U_{imp}$ (V)	8000	8000	8000	8000
Rated conditional short-circuit current *) $I_q$	55	55	55	55
Rated conditional short-circuit current (kA) rms value	100	100	100	100
Utilization category	AC22B	AC22B	AC22B	AC22B
Rated frequency (Hz) at DC	50/60	50/60	50/60	50/60
Endurance: total/electrical operating cycles	1600/200	1600/200	1000/200	1000/200
Degree of protection (in operating state) according to IEC/EN 60529	IP41	IP41	IP41	IP41
Power loss (W) (without fuse links)	33	70	100	245
Permissible ambient temperature (°C)	- 5 ... + 70			
Permissible mounting positions	Horizontal and vertical			

\*) in the switched-on state

## Conductor cross-sections

		3NJ630.../LV HRC 00	3NJ631.../LV HRC 1	3NJ632.../LV HRC 2	3NJ632.../LV HRC 3
<b>Conductor cross-section of cable lug connection</b> (Al/Cu, solid or stranded) according to DIN 46235 (Cu) and DIN 46239 (Al)	mm <sup>2</sup>	1x 10-95 2x 16-70	1x 25-240 2x 25-70	1x 25-300 2x 25-240	1x 25-300 2x 25-240
<b>Screw size</b>		M8	M12	2 x M12	2 x M12
<b>Torque</b>	Nm	15	30	30	30
<b>Conductor cross-section of terminal connection</b>	(Al/Cu), rm (Al/Cu), re (Al/Cu), sm (Al/Cu), se	mm <sup>2</sup>	1x 10-50 1x 10-50 1x 16-95 1x 16-95	1x 16-185 1x 16-150 1x 35-240 1x 35-300	2x 16-185 2x 16-150 2x 35-240 2x 35-300
<b>Torque</b>	Nm	15	25	25	25

## Derating factors according to ambient temperature -25 ... 70 °C

Table 6- 4 Derating factors according to ambient temperature -25 ... 70 °C

Ambient temperature -25...70°C		
Ambient temperature in °C	I <sub>the</sub> of current	I <sub>the</sub> 5% of current with EFM
-25~40 <sup>1)</sup>	100%	100%
45	95%	92%
50	90%	84%
55	85%	75%
60	80%	66%
65	75%	56%
70	69%	44%

<sup>1)</sup> The ambient air temperature must not exceed 40 °C and must not exceed an average of 35 °C in a 24-hour period.

## Auxiliary switches according to IEC 60947-5-1

<b>Rated insulation voltage U<sub>i</sub></b>	V	690
<b>Rated impulse voltage U<sub>imp</sub></b>	V	8000
<b>Rated operational current I<sub>e</sub></b> at AC 15, U <sub>e</sub> = 120 V at AC 15, U <sub>e</sub> = 230 V at AC 15, U <sub>e</sub> = 400 V at AC 15, U <sub>e</sub> = 690 V	A A A A	8 6 4 2

## Electronic fuse monitoring device (EFM 10)

Apparent power consumption	VA	S approx. 2.5 s		
Internal resistance of the measuring circuit	MOhm	$R_{in} > 6$		
Storage temperature	°C	- 20 ... + 80		
Operating temperature	°C	- 5 ... + 55		
Operating temperature (from 500 V or 500 A)	°C	- 5 ... + 35		
Degree of protection in closed in-line disconnecter		IP40		
Rated operational voltage of the main switching devices		230 ... 690 V AC, 50 / 60 Hz		
Voltage limits	%	$\pm 15$		
Signaling relay in accordance with IEC 60947-5-1	A kV V	$I_{th} = 1.5$ $U_{imp} = 4$ $U_i = 250$		
Loadability of the signaling relay				
Ue	V	24	125	240
DC - 13; Ie	A	1	0.2	0.1
AC - 15; Ie	A	1.5	1.5	1.5
Short-circuit protection		max. fuse Diazed 2 A gLgG		

## Electronic fuse monitoring device, AC version (EFM 20)

Apparent power consumption	VA	S approx. 2.5 s		
Internal resistance of the measuring circuit	MOhm	$R_{in} > 6$		
Storage temperature	°C	- 20 ... + 80		
Operating temperature	°C	- 5 ... + 55		
Operating temperature (from 500 V or 500 A)	°C	- 5 ... + 35		
Degree of protection in closed in-line disconnecter		IP40		
Rated operational voltage of the main switching devices		230 ... 690 V AC, 50 / 60 Hz		
Voltage limits	%	$\pm 15$		
Undervoltage	V	375		
Overvoltage	V	425		
Voltage drop for faulty fuses	V	> 13		
Delay time	s	0.1		
Relay 2		as relay 1 (fuse monitoring)		
Memory function		off		
Open-circuit / closed-circuit		Closed-circuit		
Mode		RUN mode		
Menu option		Show voltage values / alarms		
Signaling relay in accordance with IEC 60947-5-1	A kV V	$I_{th} = 1.5$ $U_{imp} = 4$ $U_i = 250$		
Signaling relay 1		1 changeover contact for fuse monitoring only		
Signaling relay 2		1 changeover contact as general alarm output OR like signaling relay 1 (default setting)		

<b>Loadability of the signaling relay</b>				
Ue	V	24	125	240
DC - 13; Ie	A	1	0.2	0.1
AC - 15; Ie	A	1.5	1.5	1.5
<b>Short-circuit protection</b>		max. fuse Diazed 2 A gLgG		

## Electronic fuse monitoring device, DC version (EFM 25)

<b>Apparent power consumption</b>	VA	S approx. 2.5 s		
<b>Internal resistance of the measuring circuit</b>	MOhm	$R_{in} > 6$		
<b>Storage temperature</b>	°C	- 20 ... + 80		
<b>Operating temperature</b>	°C	- 5 ... + 55		
<b>Operating temperature (from 500 V or 500 A)</b>	°C	- 5 ... + 35		
<b>Degree of protection</b> in closed in-line disconnectors		IP40		
<b>Rated operational voltage of the main switching devices</b>		220 ... 440 V DC		
<b>Voltage limits</b>	%	$\pm 15$		
<b>Undervoltage</b>	V	200		
<b>Overvoltage</b>	V	240		
<b>Voltage drop</b> for faulty fuses	V	> 20		
<b>Delay time</b>	s	0.1		
<b>Relay 2</b>		as relay 1 (fuse monitoring)		
<b>Memory function</b>		off		
<b>Open-circuit / closed-circuit</b>		Closed-circuit		
<b>Mode</b>		RUN mode		
<b>Menu option</b>		Show voltage values / alarms		
<b>Signaling relay</b> in accordance with IEC 60947-5-1	A kV V	$I_{th} = 1.5$ $U_{imp} = 4$ $U_i = 250$		
<b>Signaling relay 1</b>		1 changeover contact for fuse monitoring only		
<b>Signaling relay 2</b>		1 changeover contact as general alarm output OR like signaling relay 1 (default setting)		
<b>Loadability of the signaling relay</b>				
Ue	V	24	125	240
DC - 13; Ie	A	1	0.2	0.1
AC - 15; Ie	A	1.5	1.5	1.5
<b>Short-circuit protection</b>		max. fuse Diazed 2 A gLgG		

## Ammeters

<b>Input</b>		x /1 A or x /5 A
<b>Overload</b> Moving-iron measuring instrument Bi-metal measuring instrument		1.2 times 2 times
<b>Min/max pointer</b> Moving-iron measuring instrument Bi-metal measuring instrument	min min	- 15
<b>Intrinsic consumption</b> Moving-iron measuring instrument Bi-metal measuring instrument	VA VA	0.6 1

## Motorized operating mechanism

Size		Size 00	Size 1	Size 2 / size 3
<b>Supply voltage</b>	V	DC 24 ± 2		
<b>Current consumption</b>	A	1.1	1.3	2.8
<b>Endurance</b> (without any constraints on the switch dis-connectors according to IEC 60947-3) Operating cycles, total Operating cycles under load		1600 200	1600 200	1000 200
<b>Signal duration</b>	s	Min. 0.5 or permanent signal		



## Dimensional drawings

### 7.1 Size 00

3NJ6302... / 3NJ6303... / 3NJ6304...

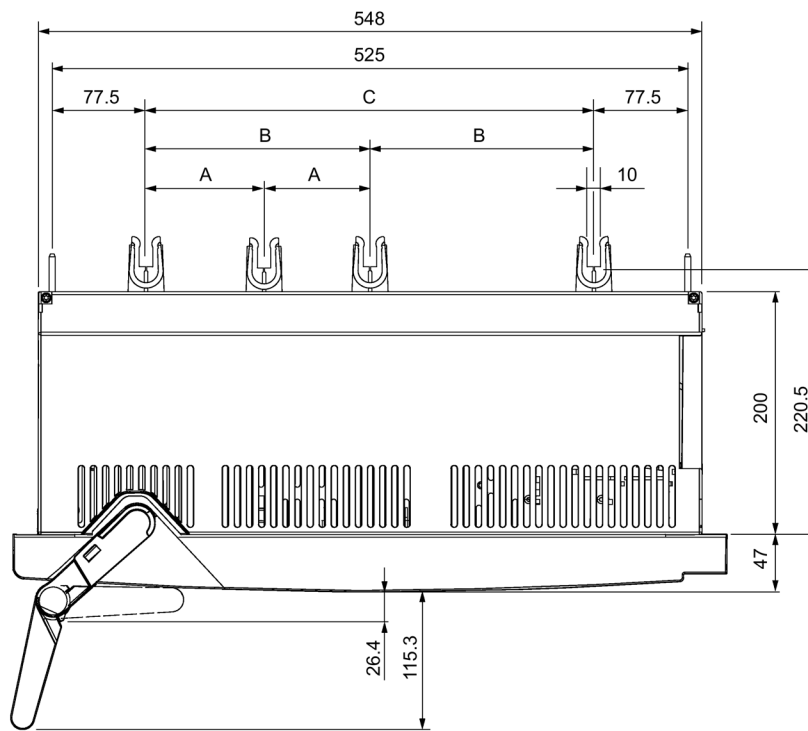
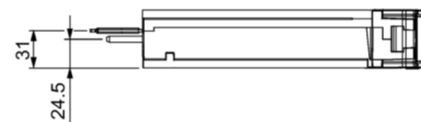


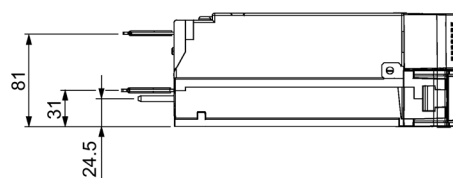
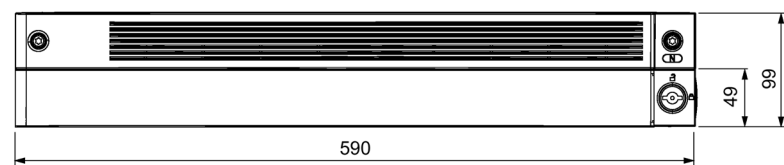
Figure 7-1 3NJ63 switch disconnectors size 00 with manual operation

#### Clearances between phases

	A	B	C
3NJ6302... (2-pole)	-	-	370
3NJ6303... (3-pole)	-	185	370
3NJ6304... (4-pole)	92.5	185	370



3NJ6304...



## 7.2 Size 1

Technical drawing showing the bottom view of a rectangular box. The overall width is 548 mm and the overall height is 220.5 mm. The internal width is 525 mm. The distance from the left edge to the first U-shaped feature is 77.5 mm, and from the last U-shaped feature to the right edge is 77.5 mm. The distance between the two central U-shaped features is labeled B. The distance between the two outer U-shaped features is labeled A. The distance from the left edge to the first U-shaped feature is 11.5 mm, and from the last U-shaped feature to the right edge is 11.2 mm. The distance from the bottom edge to the top edge of the box is 200 mm. The distance from the bottom edge to the bottom edge of the box is 47 mm. The distance from the bottom edge to the bottom edge of the box is 26.4 mm. The distance from the bottom edge to the bottom edge of the box is 115.3 mm.

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## Clearances between phases

	A	B	C
3NJ6312... (2-pole)	-	-	370
3NJ6313... (3-pole)	-	185	370
3NJ6314... (4-pole)	92.5	185	370

## 3NJ6312... / 3NJ6313...

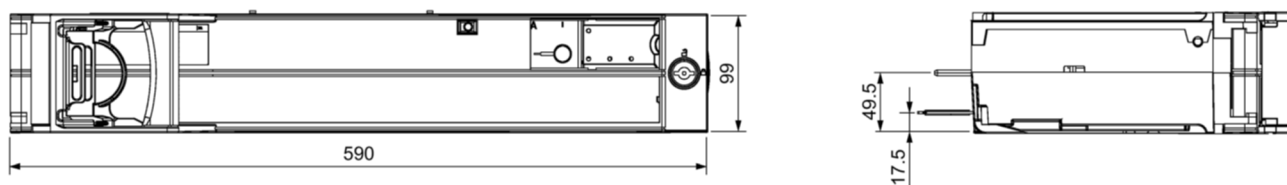


Figure 7-5 3NJ63 switch disconnector size 1, 2-/3-pole, with motorized operating mechanism

## 3NJ6314...

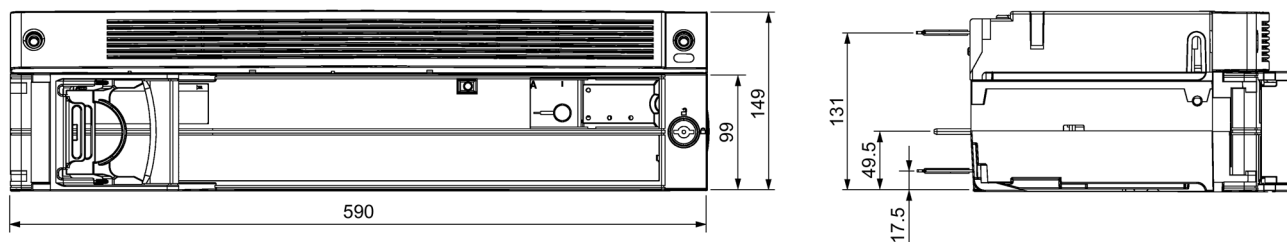


Figure 7-6 3NJ63 switch disconnector size 1, 4-pole, with motorized operating mechanism

## 7.3 Size 2

3NJ6322... / 3NJ6332... / 3NJ6323... / 3NJ6333... / 3NJ6324... / 3NJ6334...

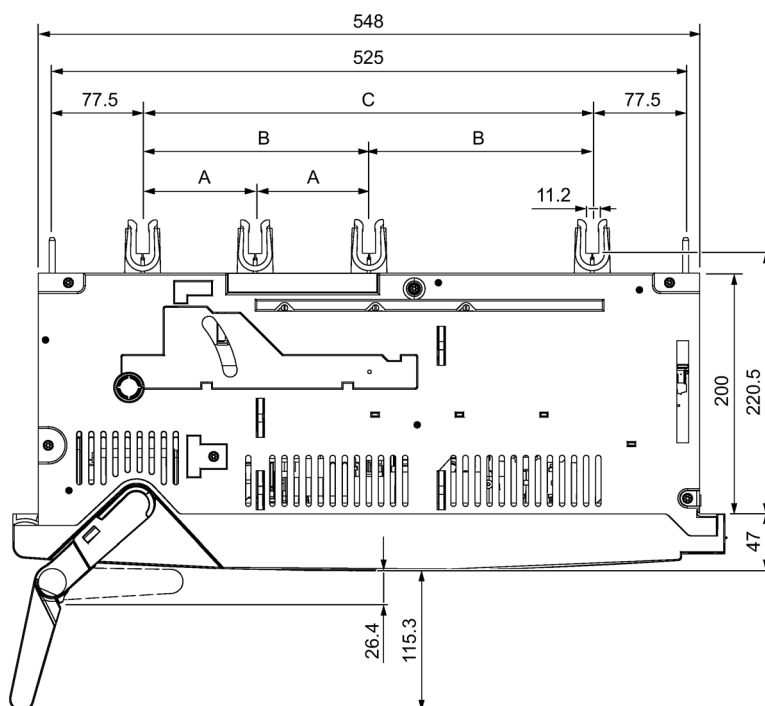


Figure 7-7 3NJ63 switch disconnectors size 2 with manual operation

### Clearances between phases

	A	B	C
3NJ6322... (2-pole)	-	-	370
3NJ6332... (2-pole)	-	-	370
3NJ6323... (3-pole)	-	185	370
3NJ6333... (3-pole)	-	185	370
3NJ6324... (4-pole)	92.5	185	370
3NJ6334... (4-pole)	92.5	185	370

3NJ6322... / 3NJ6332... / 3NJ6323... / 3NJ6333...

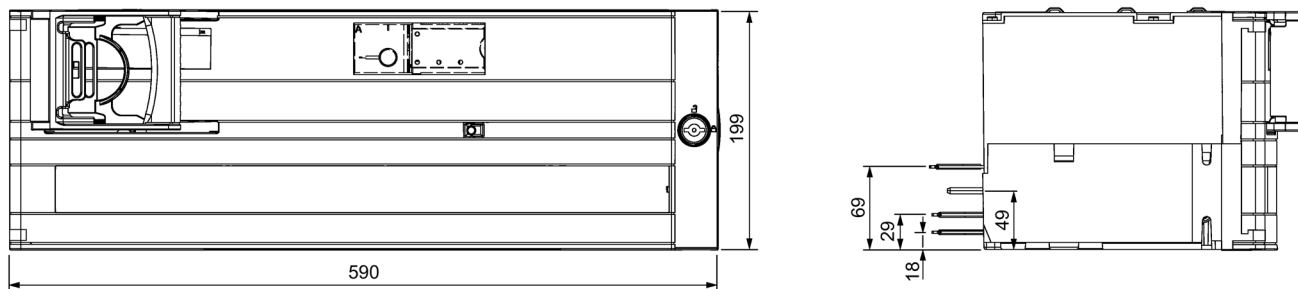


Figure 7-8 3NJ63 switch disconnecter size 2, 2-/3-pole, with motorized operating mechanism

3NJ6324... / 3NJ6334...

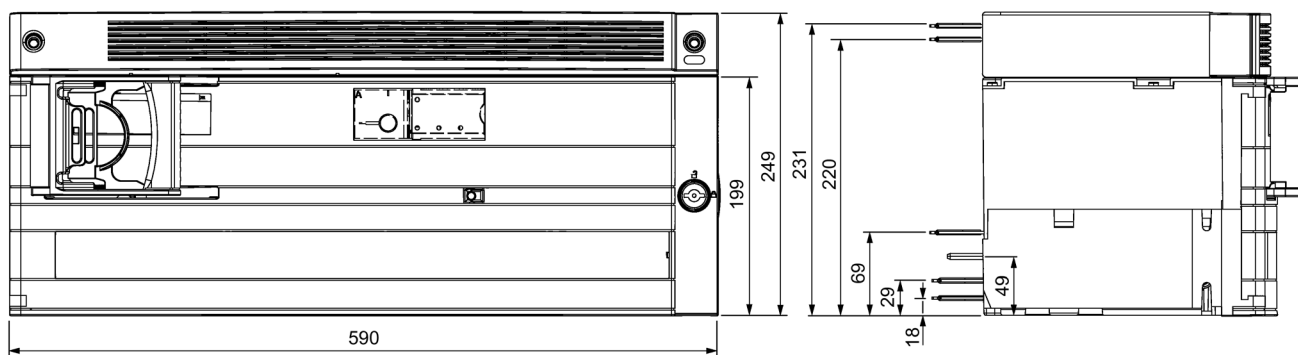


Figure 7-9 3NJ63 switch disconnecter size 2, 4-pole, with motorized operating mechanism

## 7.4 Position of the phases, terminal bolts, and current transformers

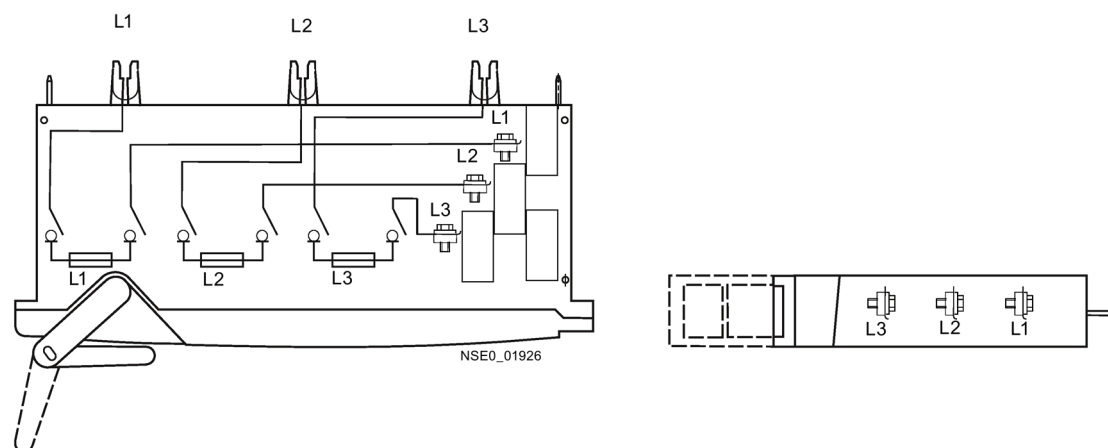


Figure 7-10 Size 00

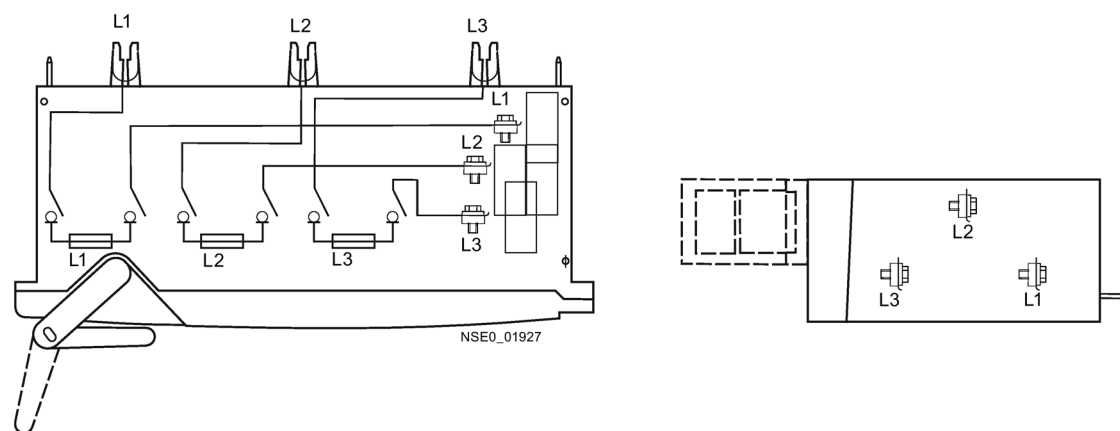


Figure 7-11 Size 1

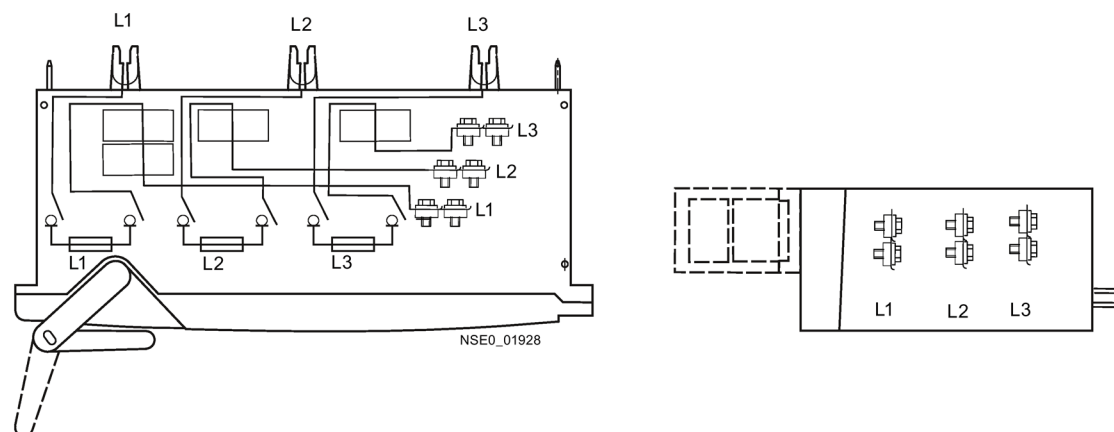


Figure 7-12 Size 2 / size 3

## 7.5 Current transformers

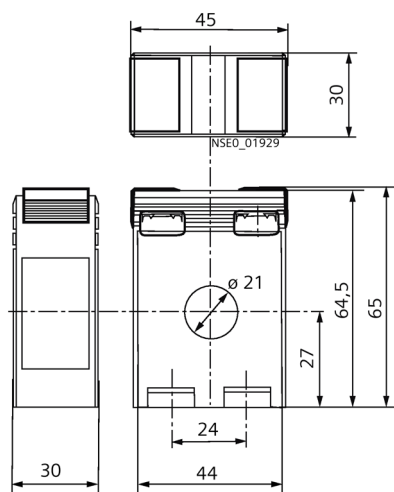


Figure 7-13 Current transformers for 3NJ63 switch disconnectors, size 00 and size 1, with feed-through opening Ø 21 mm

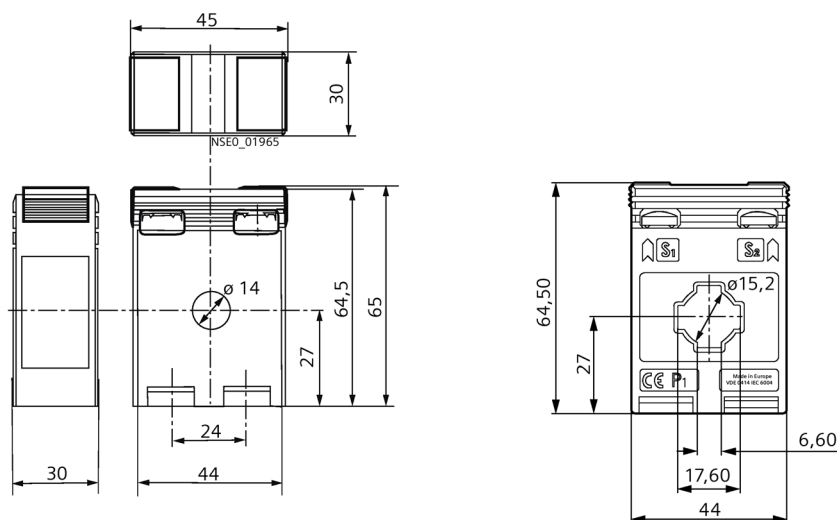


Figure 7-14 Current transformers for 3NJ63 switch disconnectors, size 00, calibrated, with feed-through opening Ø 14 mm and for 3NJ63, size 1, calibrated, with feed-through opening Ø 15.2 mm and 17 x 6 mm penetration.

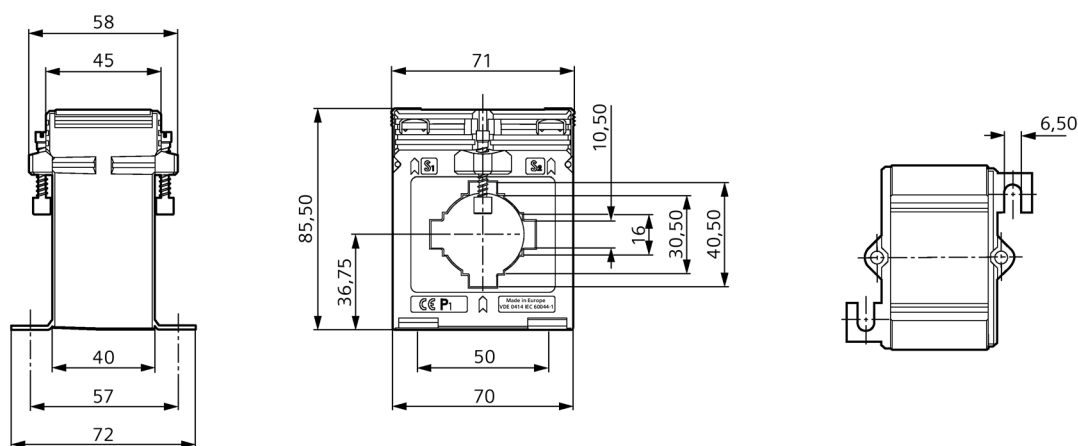


Figure 7-15 Current transformers for 3NJ63 switch disconnectors, size 2 and size 3

## 7.6 Ammeters

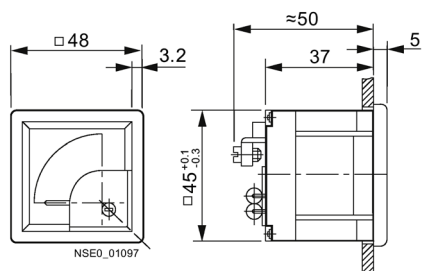


Figure 7-16 Moving-iron measuring instrument

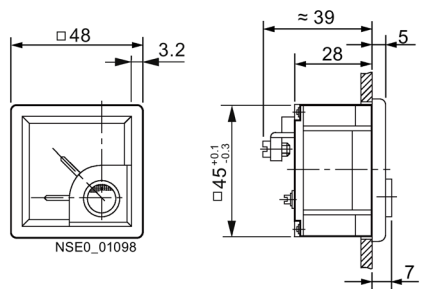


Figure 7-17 Bi-metal measuring instrument

# Schematics

## 8.1 Switching examples

### Typical circuit diagrams

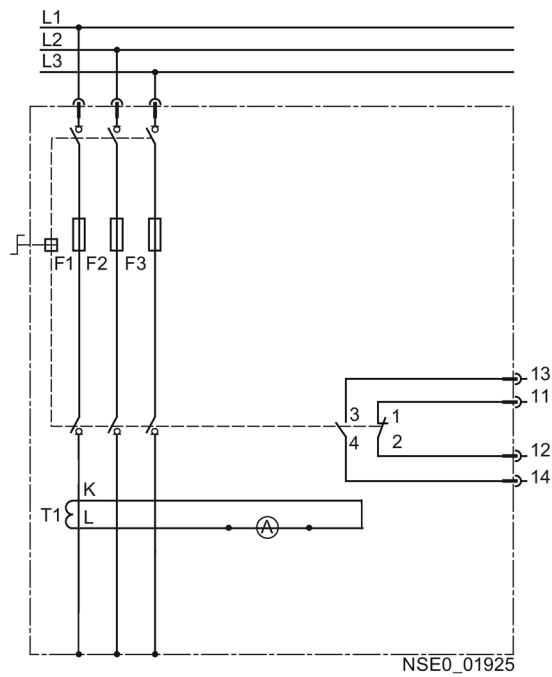


Figure 8-1 Typical circuit diagram with 1 current transformer wired to 1 ammeter, with 1 NO contact and 1 NC contact

## 8.1 Switching examples

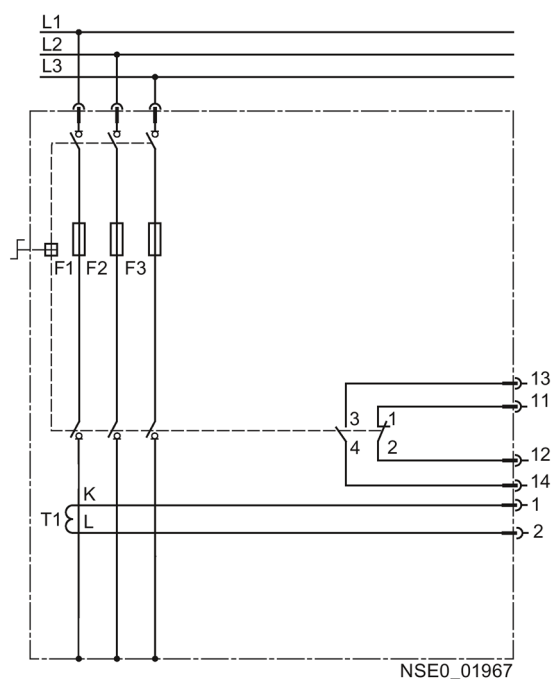


Figure 8-2 Typical circuit diagram with 1 current transformer wired to multi-function plug, with 1 NO contact and 1 NC contact

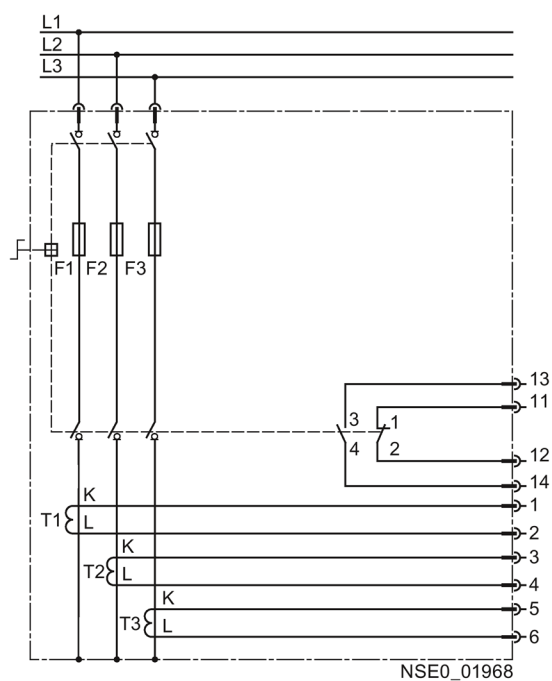


Figure 8-3 Typical circuit diagram with 3 current transformers wired to multi-function plug, with 1 NO contact and 1 NC contact

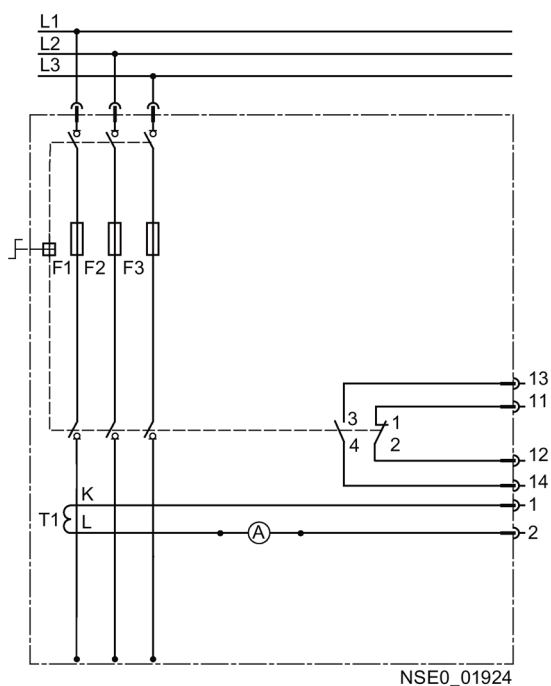


Figure 8-4 Typical circuit diagram with 1 current transformer wired to 1 ammeter and multi-function plug, with 1 NO contact and 1 NC contact

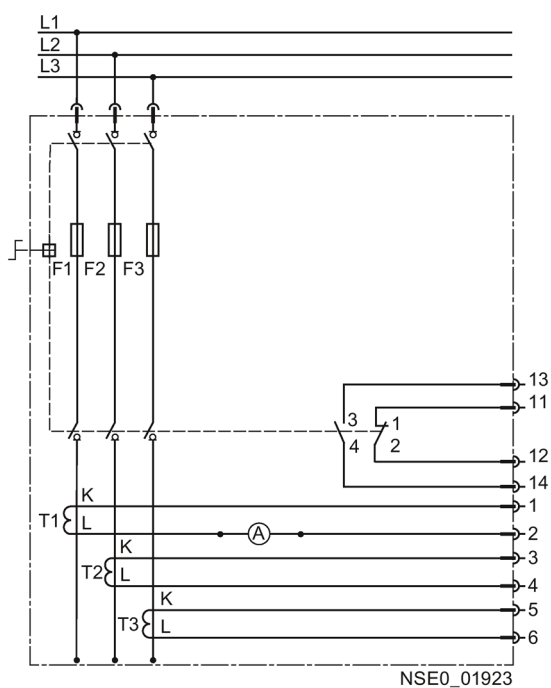


Figure 8-5 Typical circuit diagram with 3 current transformers wired to 1 ammeter and multi-function plug, with 1 NO contact and 1 NC contact

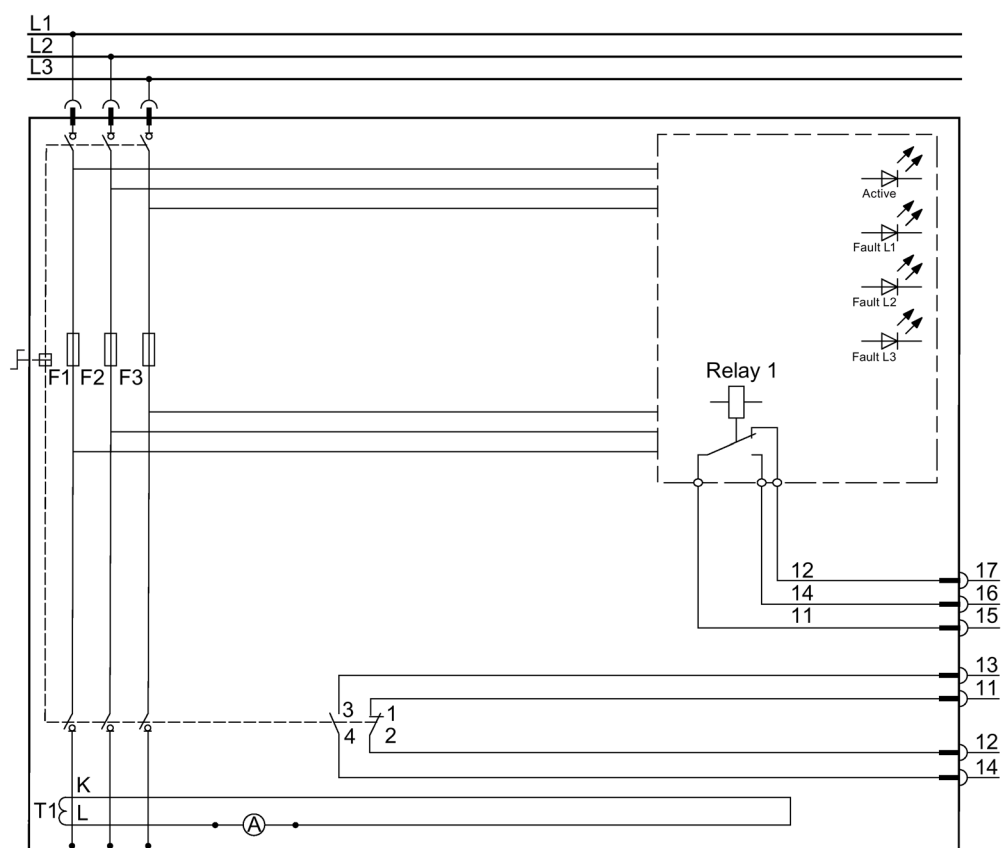


Figure 8-6 Typical circuit diagram 3NJ63 manually operated, with 1 current transformer wired to 1 ammeter, with 1 NO contact and 1 NC contact, with electronic fuse monitoring device (EFM10)

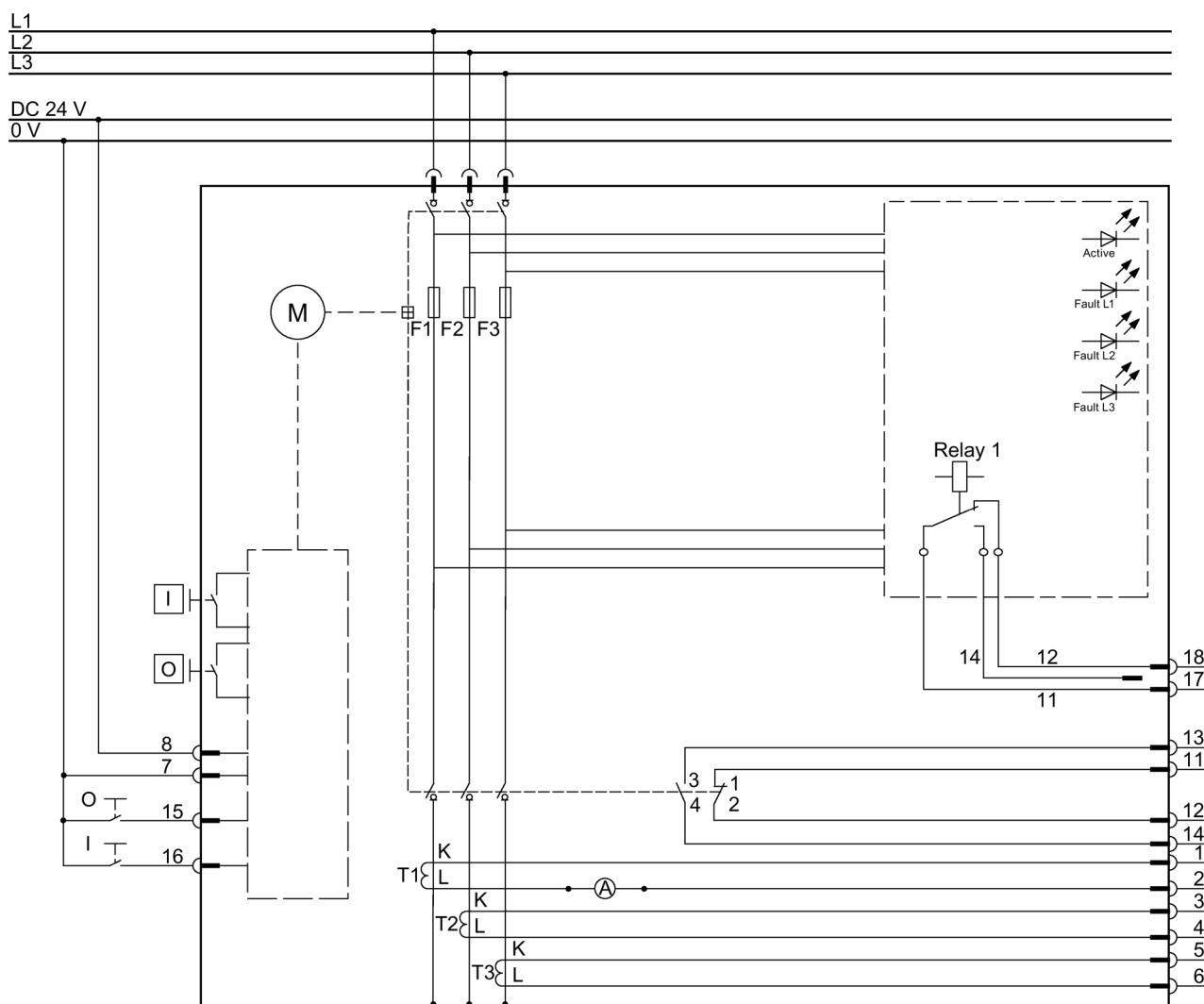


Figure 8-7 Typical circuit diagram 3NJ63 with motorized operating mechanism, with 3 current transformers wired to 1 ammeter and multi-function plug, with 1 NO contact and 1 NC contact, with electronic fuse monitoring device (EFM10)

## 8.1 Switching examples

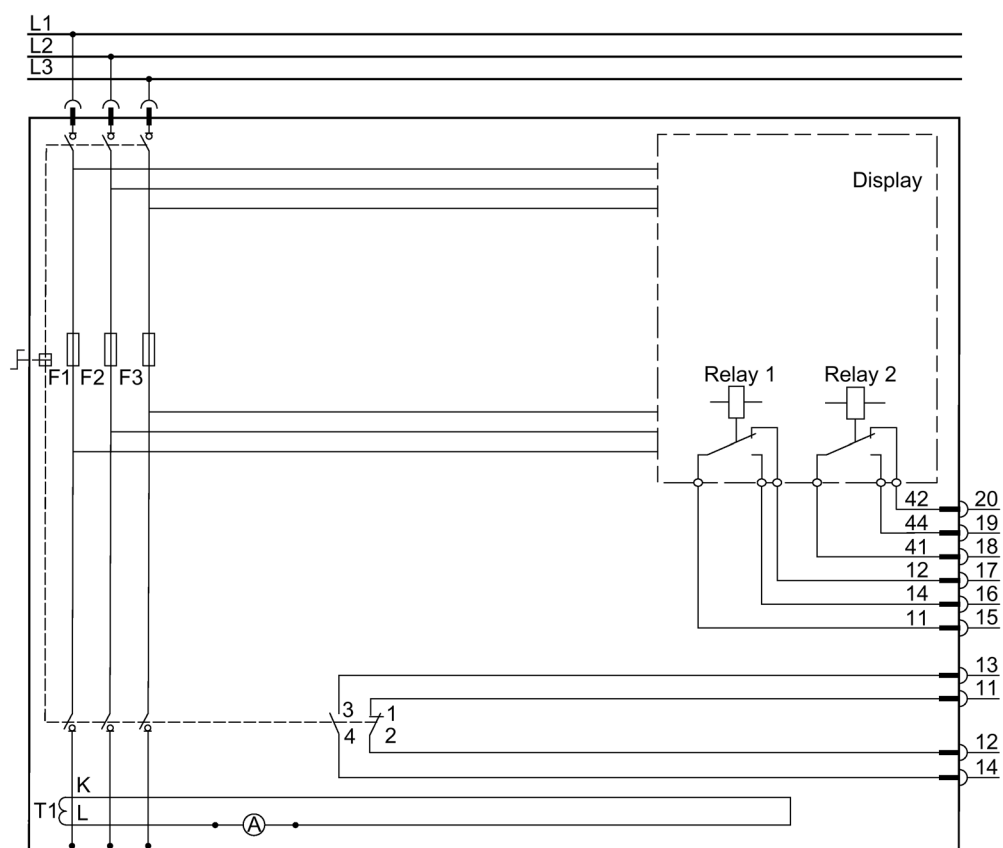


Figure 8-8 Typical circuit diagram 3NJ63 manually operated, with 1 current transformer wired to 1 ammeter, with 1 NO contact and 1 NC contact, with electronic fuse monitoring device (EFM20)

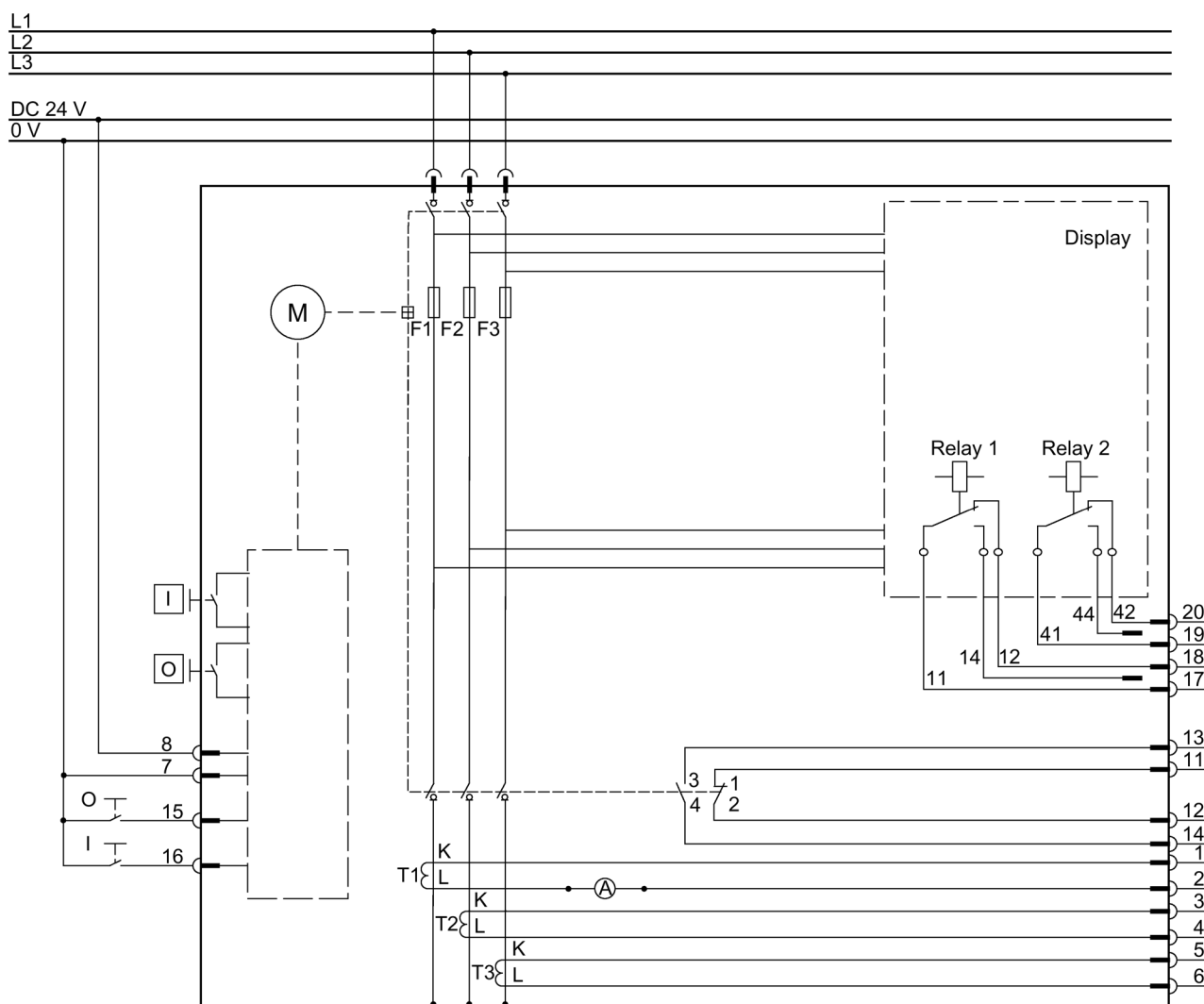


Figure 8-9 Typical circuit diagram 3NJ63 with motorized operating mechanism, with 3 current transformers wired to 1 ammeter and multi-function plug, with 1 NO contact and 1 NC contact, with electronic fuse monitoring device (EFM20)

## 8.2 Terminal connection diagram of the multi-function plugs

### 8.2.1 Manually operated switch disconnectors

Table 8- 1 Manually operated switch disconnectors

Current transformer L1, k	1	11	Auxiliary switch, NC contact, 1
Current transformer L1, l	2	12	Auxiliary switch, NC contact, 2
Current transformer L2, k	3	13	Auxiliary switch, NO contact, 3
Current transformer L2, l	4	14	Auxiliary switch, NO contact, 4
Current transformer L3, k	5	15	EFM 10/20/25, relay 1, 11/21/31
Current transformer L3, l	6	16	EFM 10/20/25, relay 1, 14/24/34
	7	17	EFM 10/20/25, relay 1, 12/22/32
	8	18	EFM 20/25, relay 2, 41/51/61
		19	EFM 20/25, relay 2, 44/54/64
		20	EFM 20/25, relay 2, 42/52/62

### 8.2.2 Switch disconnectors with motorized operating mechanism

Table 8- 2 Switch disconnectors with motorized operating mechanism

Current transformer L1, k	1	11	Auxiliary switch, NC contact, 1
Current transformer L1, l	2	12	Auxiliary switch, NC contact, 2
Current transformer L2, k	3	13	Auxiliary switch, NO contact, 3
Current transformer L2, l	4	14	Auxiliary switch, NO contact, 4
Current transformer L3, k	5	15	"Open" section
Current transformer L3, l	6	16	"Close" section
Neutral	7	17	EFM 10/20/25, relay 1, 11/21/31
+ 24 V DC	8	18	EFM 10/20/25, relay 1, 12/22/32
		19	EFM 20/25, relay 2, 41/51/61
		20	EFM 20/25, relay 2, 42/52/62

#### T

Typical applications of the EFM, 16

#### V

Voltage tap for the internal power supply and direction of the incoming supply on all EFMs, taking the EFM 10 as an example, 29



## Further Information

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