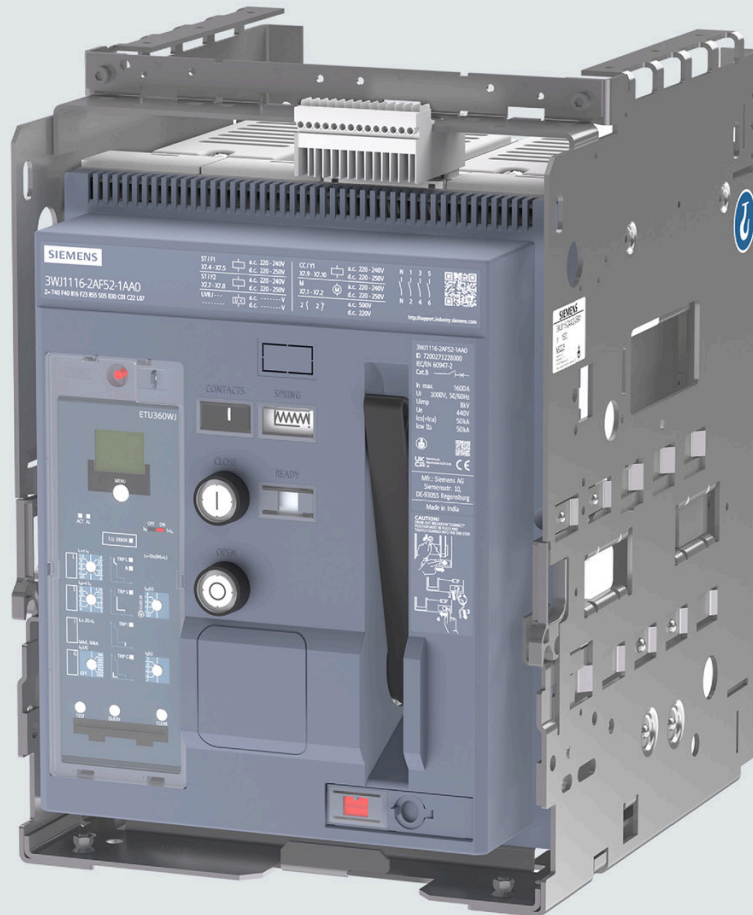


SIEMENS



Manual

SINOVA

Protection devices

3WJ Air circuit breakers

Edition

12/2022

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Circuit Breakers 3WJ Air Circuit breakers




Operating Instructions

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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

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.

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Introduction

Scope of validity of this manual

This equipment manual is a reference manual for technical information that users will need to configure, connect and operate the 3WJ Circuit Breakers and their accessories.

Target readers of this document

The information contained in this manual is provided for the benefit of:

- Planners
- Power distribution equipment manufacturers/builders
- Commissioning engineers
- Users
- Maintenance personnel

Ambient conditions

The Circuit Breakers are designed to be operated in enclosed rooms in which the operating conditions are not affected by dust or corrosive vapors/gases. Suitable enclosures must be used in dusty or damp conditions.

1.1 Technical support

You can find further support on the Internet (<https://www.siemens.com/support-request>).

1.2 Safety instructions



! DANGER

Hazardous voltage

Will cause death, serious personal injury, or equipment damage.

During operation, parts of the device or system are carrying hazardous electrical voltage. Improper handling of the device or system can result in death or serious injury, as well as significant material damage.

- Inspection and maintenance may only be performed by qualified personnel.
- Pay attention to all the notices provided on the product and in this manual.
- Before commencing maintenance work, ensure that no voltage is present on the power distribution equipment and make sure that this condition is maintained while work is being performed (according to EN 50110-1, DIN VDE 0105-100 and BGV A2).

Proceed in accordance with the Five Safety Rules:

- Turn off all power supplying the equipment.
- Lock out all power supplying the equipment to secure against reconnection.
- Verify that no voltage is present on the device.
- Ground and short the circuit.
- Provide protection against adjacent live parts.

Qualified personnel

Inspection and maintenance may only be performed by qualified personnel.

In the context of these operating instructions and the warning notices on the product, qualified personnel refers to persons who are familiar with the erection, installation, commissioning and operation of the product and who possess the qualifications appropriate for their activities, e.g.:

- Training or instruction/authorization to close and open, ground, and tag circuits and devices and systems in accordance with established safety procedures.
- Training or instruction in the proper care and use of protective equipment in accordance with established safety procedures.
- Training in first aid.

Spare parts

Only spare parts approved by the manufacturer may be used.

1.3 Standards

The 3WJ Circuit Breakers comply with the following standards:

- IEC 60947-2
- EN 60947-2

See also

<https://support.industry.siemens.com/> (<https://support.industry.siemens.com/>)

1.4 Transport

Long-term storage


- Seal the plastic film.
- Check the packaging regularly.

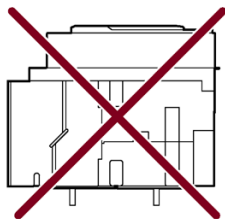
Unpacking and storing the Circuit Breaker

Unpack the Circuit Breaker and make sure that it was not damaged during transportation. If the Circuit Breaker or guide frame is not to be installed immediately, it must be stored and shipped in its original packaging only.

For withdrawable Circuit Breaker:

- Racking the Circuit Breaker in or out (Page 18)
- Removing the Circuit Breaker from the guide frame (Page 22)
- Inserting the Circuit Breaker into the guide frame (Page 23)

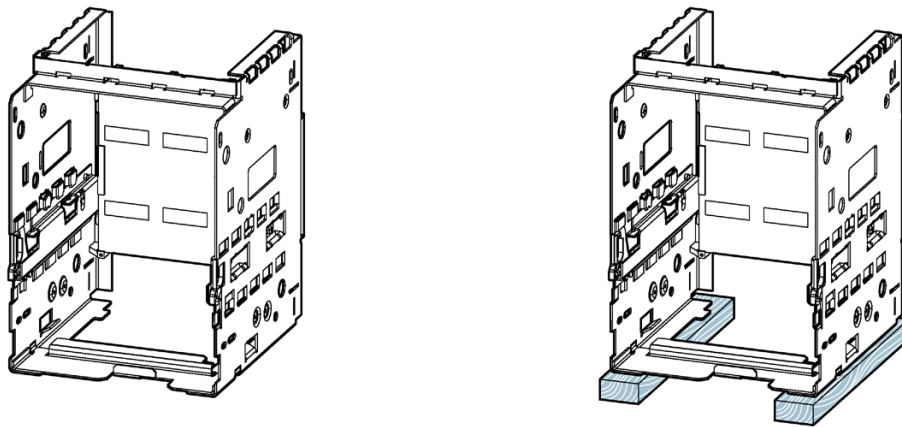
 CAUTION
Equipment damage Do not place the Circuit Breaker on its rear side.



Transportation with crane

	Circuit Breaker fixed	Circuit Breaker withdrawable	Guide frame
Breakers / No. of poles	Weight for reference		
3WJ11 / 3	≤35 kg	≤38 kg	≤23 kg
3WJ11 / 4	≤48 kg	≤51 kg	≤28 kg
3WJ12 / 3	≤60 kg	≤63 kg	≤37 kg
3WJ12 / 4	≤73 kg	≤76 kg	≤48 kg

Setting down the guide frame



Note

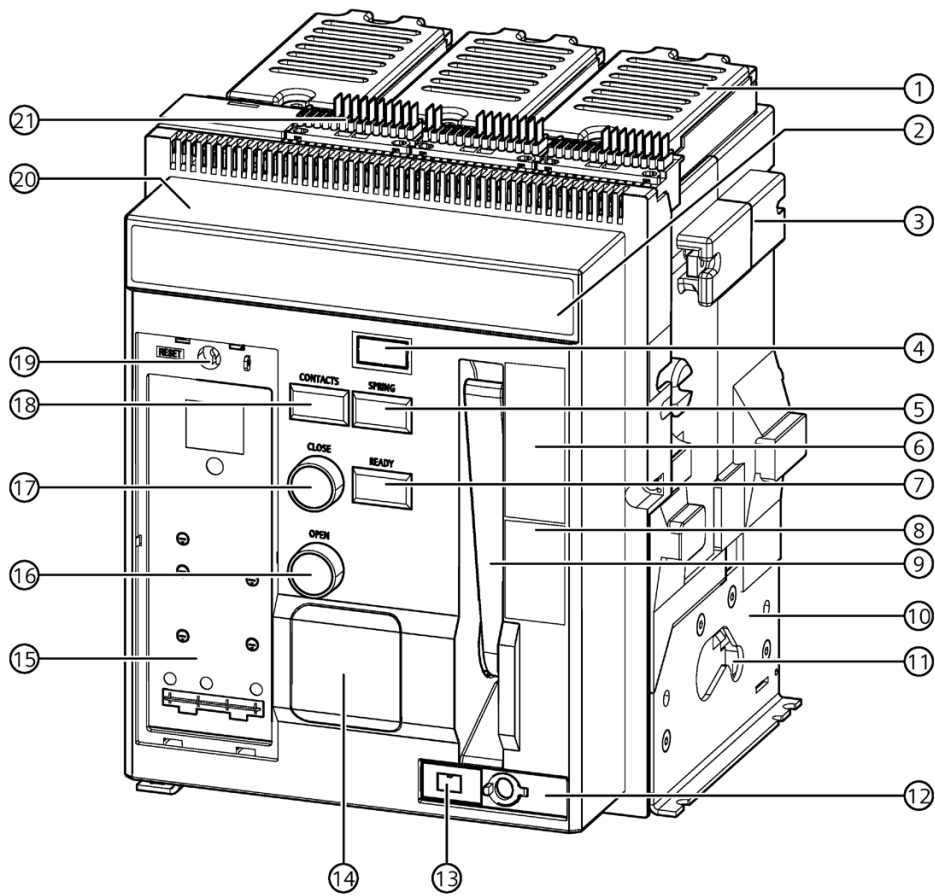
Only set the guide frame down on its base plate.
If the surface is uneven, support with an evenly leveled base.

Description

2.1 Mechanical components

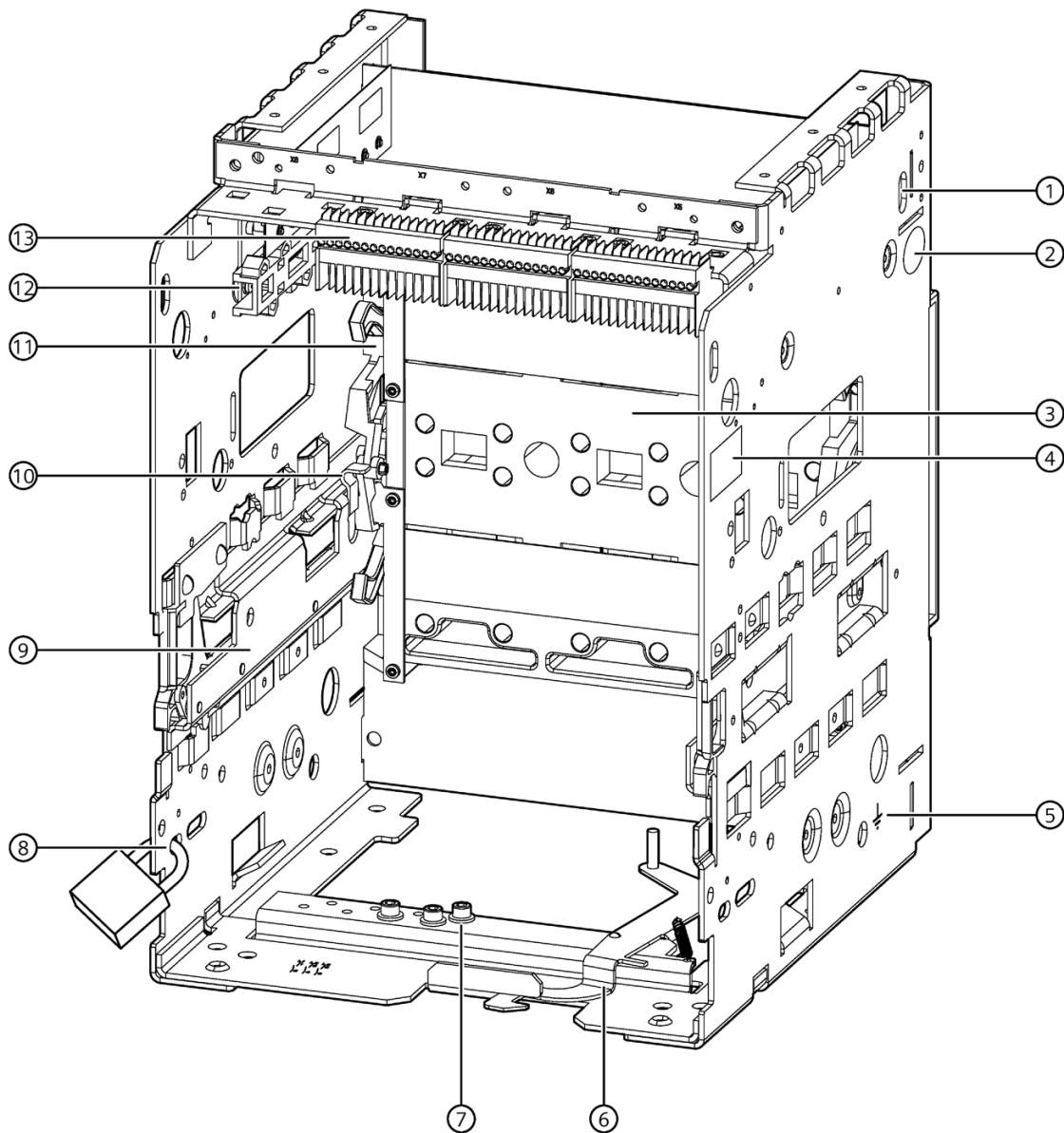
2.1.1 Design

2.1.1.1 Circuit Breaker



-
- | | |
|--|-------------------------------------|
| (1) Arc chute | (12) Draw-out window |
| (2) Accessory label | (13) Position indicator |
| (3) Carrying handle | (14) Position for CASTELL lock |
| (4) Counting indicator | (15) Electronic trip unit (ETU) |
| (5) Store-energy spring indicator | (16) Mechanical OPEN button |
| (6) Type label | (17) Mechanical CLOSED button |
| (7) Ready-to-close indicator | (18) Breaker OPEN/CLOSED indicator |
| (8) Racking pictogram | (19) Reset button |
| (9) Spring charging lever | (20) Operator panel |
| (10) Breaker foot | (21) Secondary disconnect terminals |
| (11) Retractable shaft (only withdrawable version) | |

2.1.1.2 Guide frame

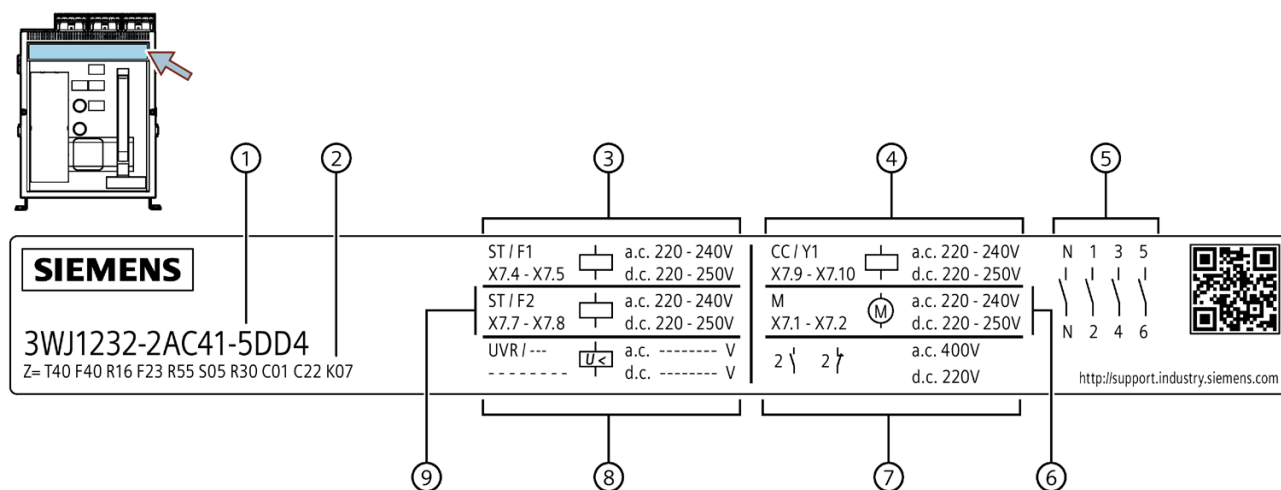


- | | |
|-----------------------------------|--|
| ① Opening for crane hook | ⑧ Locking device for racking rail |
| ② Crane hook label | ⑨ Racking rail |
| ③ Shutter (option) | ⑩ Locking device shutter (option) |
| ④ Type label | ⑪ Shutter lever (option) |
| ⑤ Ground connection | ⑫ Position signaling switch (option) |
| ⑥ Door locking provision (option) | ⑬ Sliding contact modules for secondary connection |
| ⑦ Rated-current coding at factory | |

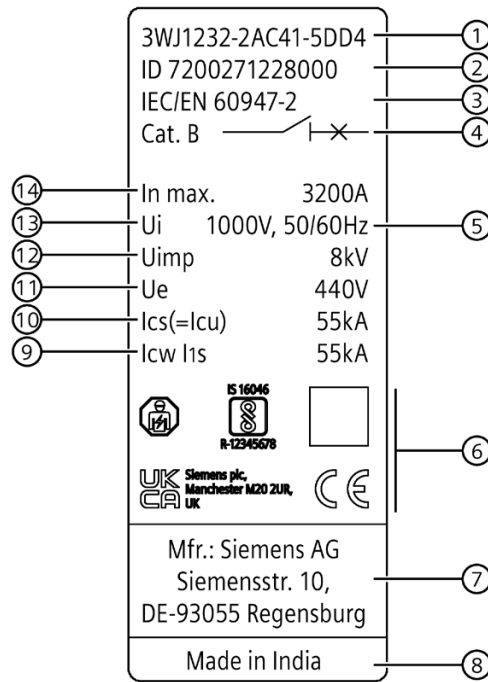
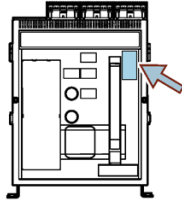
2.1.2 Circuit Breaker identification

2.1.2.1 Accessory and rating label

Circuit Breaker accessory label (with terminal assignments)

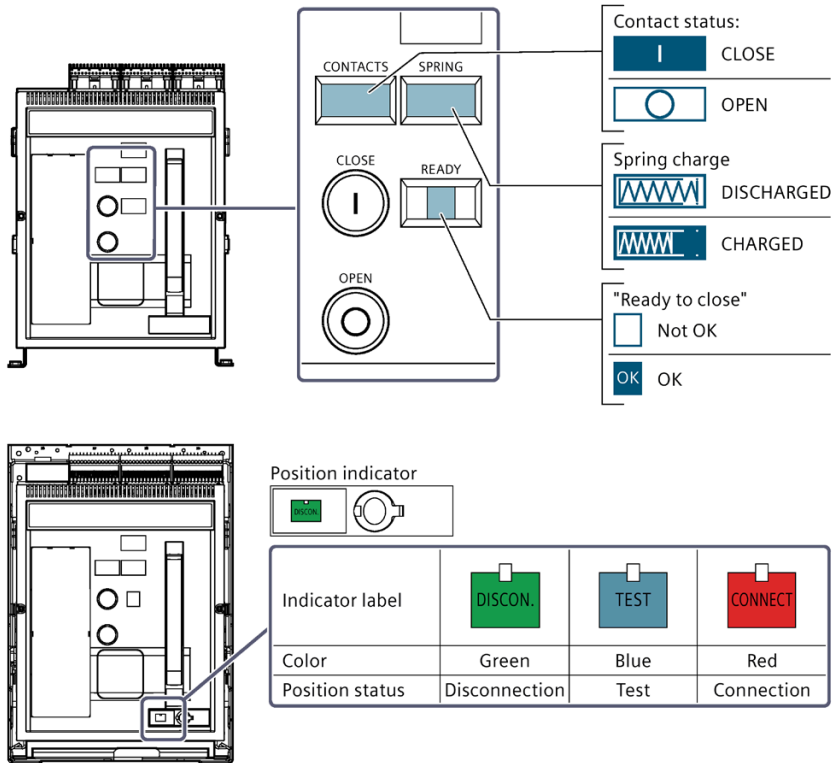


Circuit Breaker rating label



- | | |
|------------------------------------|---|
| ① Order no. of the Circuit breaker | ⑧ Country of production |
| ② ID of the Circuit breaker | ⑨ Rated short-time withstand current |
| ③ Standards | ⑩ Rated short-circuit breaking capacity |
| ④ Utilization category | ⑪ Rated operational voltage |
| ⑤ Range of the rated frequency | ⑫ Rated impulse withstand voltage |
| ⑥ Approvals | ⑬ Rated insulation voltage |
| ⑦ Manufacturer | ⑭ Circuit breaker max. rated current |

2.1.3 Indicators of the Circuit Breaker



2.1 Mechanical components

2.1.4 Operation

2.1.4.1 Installation

! WARNING

Risk of equipment damage and/or personal injury

Before installing the Circuit breaker, make sure that the minimum distances from insulated, grounded, and live components in the switchgear are observed.

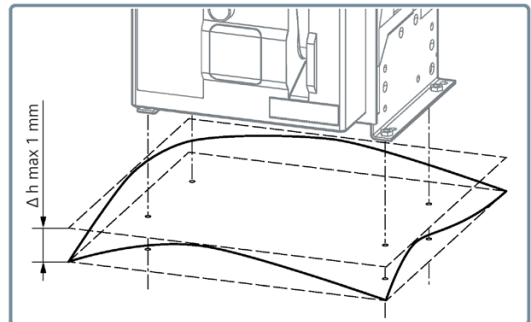
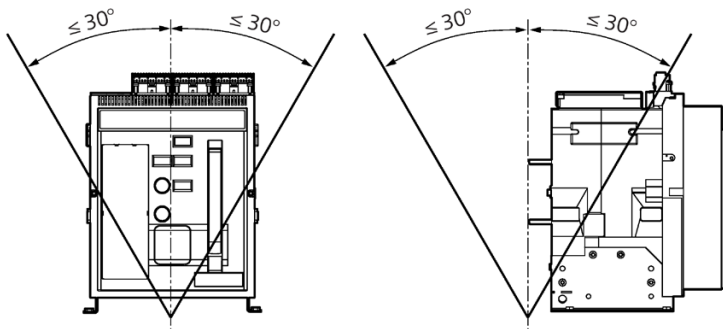
Details can be found in the chapter Technical specifications (Page 196).

Installation position

! WARNING

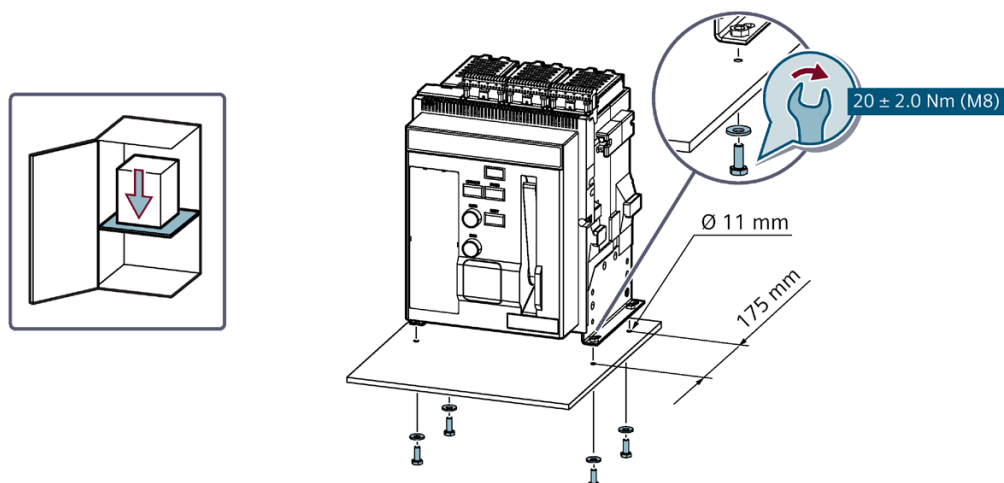
Risk of equipment damage and/or personal injury

You must not install the withdrawable Circuit breaker tilted towards the frontside: The Circuit breaker may slide out on the guiding rails, when racked in the disconnected position.



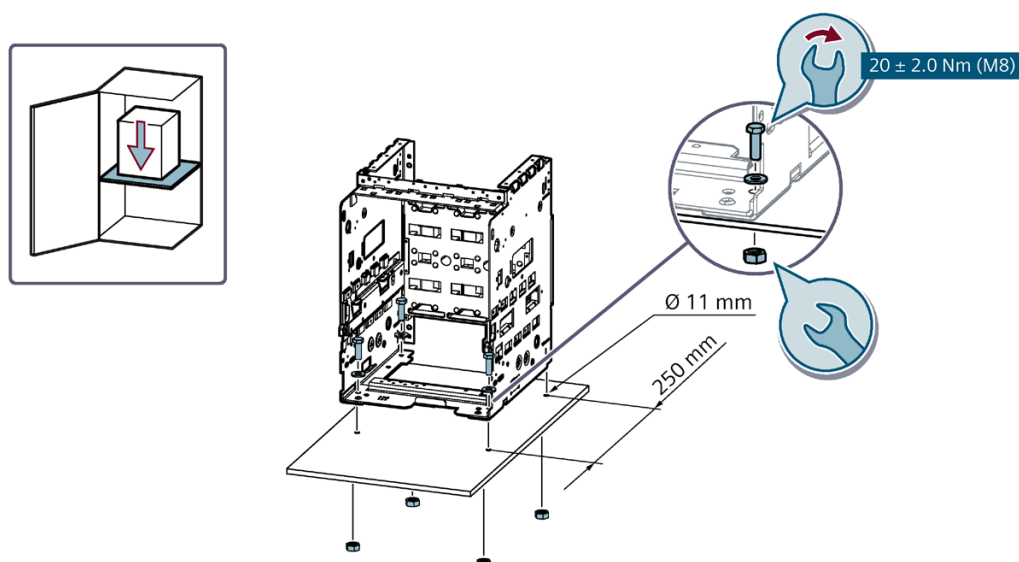
Installation on a horizontal surface

For fixed-mounted Circuit Breakers:



Supplied by customer: 4 x M8-8.8 bolts + strain washers

For withdrawable Circuit Breakers:



Supplied by customer: 4 x M8-8.8 bolts + nuts + washers

Arc chute cover

If several withdrawable Circuit Breakers are arranged one above the other in cubicles without compartment bases, we recommend to use arc chute covers.

See chapter Arc chute cover (Page 144)

2.1.4.2 Racking the Circuit Breaker in or out

NOTICE

Material damage due to over-rotation of the racking handle

The withdrawable Circuit Breaker must only be racked once the operator panel has been mounted and secured.

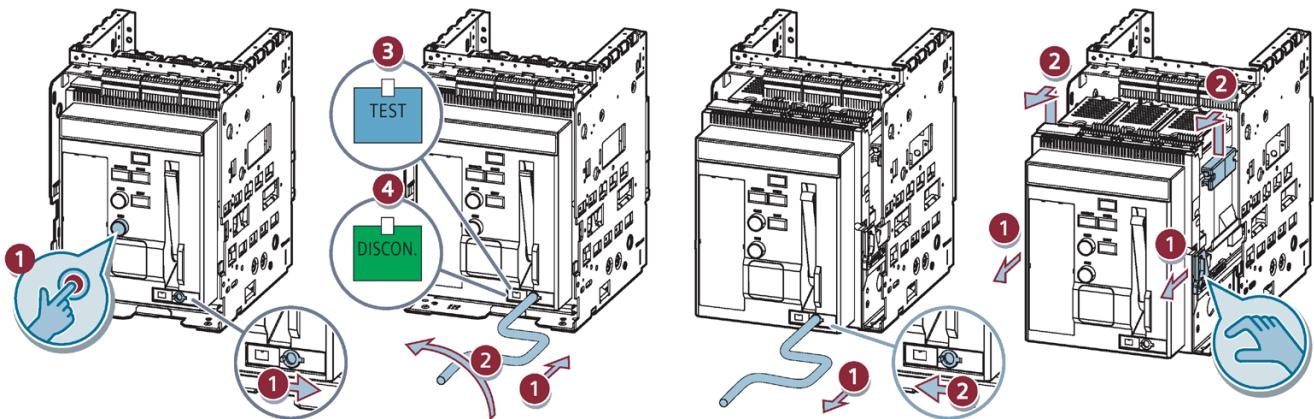
If a shutter is installed, a change of direction is not permitted while the Circuit Breaker is being racked until a defined position has been reached (disconnected/test/connected position).

Note

The indicator on the Circuit Breaker - position latching is not provided.

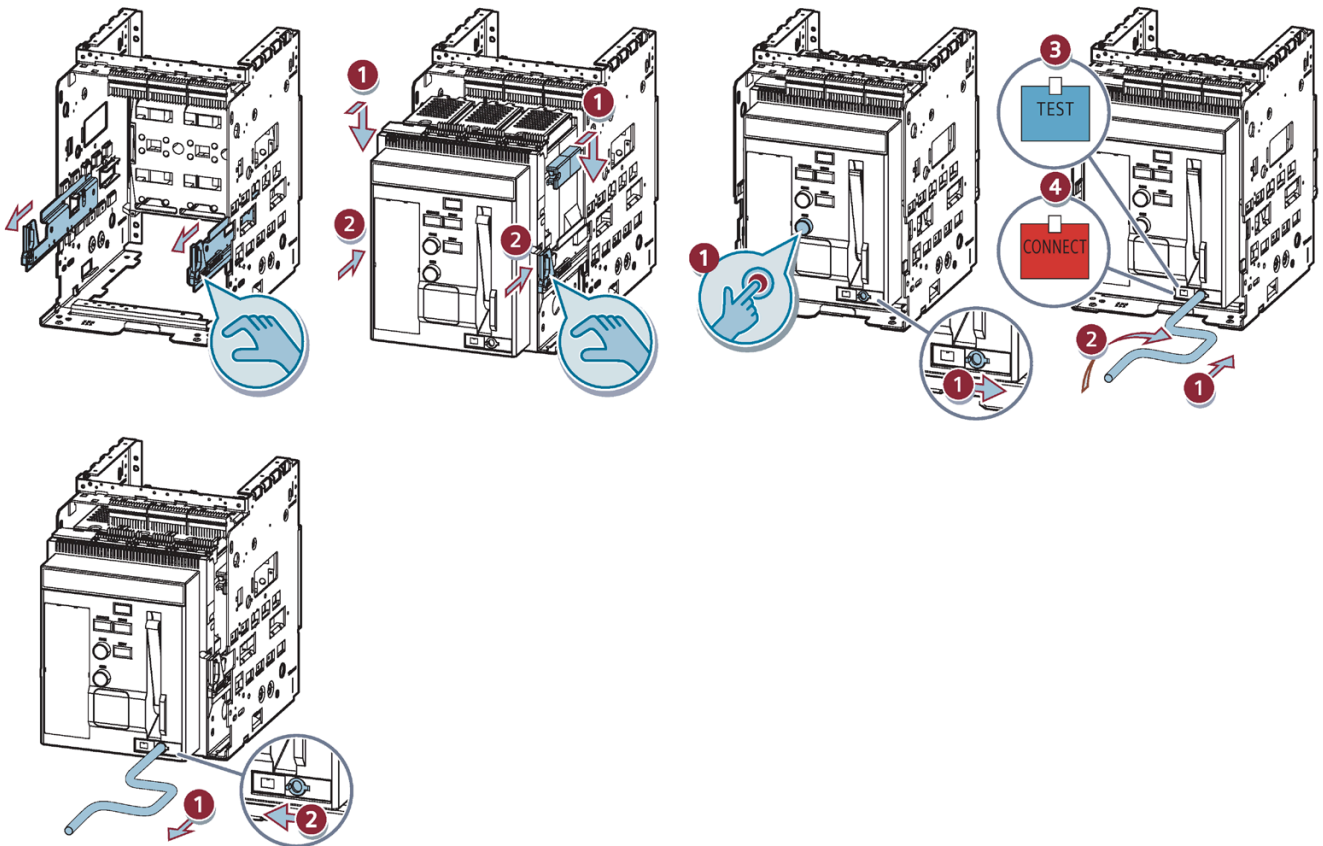
The position can only be checked via the indicator on the Circuit Breaker.

Racking out



- Press the OPEN button and open the slide switch simultaneously.
- Insert crank handle and turn it to rack the Circuit breaker out.
- Rack into test position.
- Rack further into disconnected position.
- Remove crank handle and close the slide switch.
- Slide the guide rails out completely. Move the Circuit Breaker out of the guide frame.

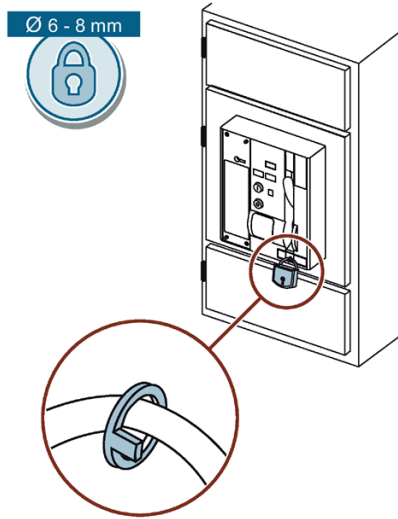
Racking in



- Slide the guide rails out completely.
- Move the Circuit Breaker back into the guide frame.
- Press the OPEN button and open the slide switch simultaneously.
- Insert crank handle and turn it to rack the Circuit breaker in. Rack into test position. Rack further into connect position.

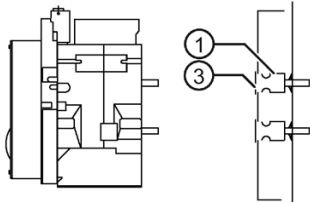

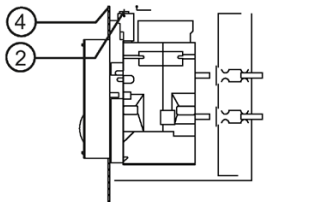
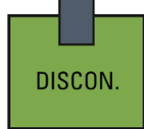
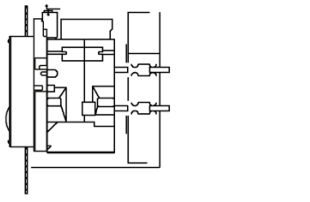
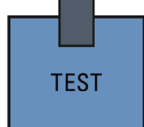
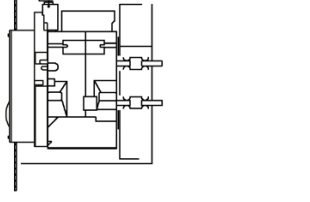
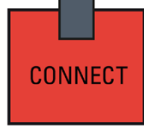
2.1 Mechanical components

- Remove crank handle and close the slide switch.



The slide switch for racking on the front of the Circuit Breaker is lockable by a padlock with diameter 6 to 8 mm.

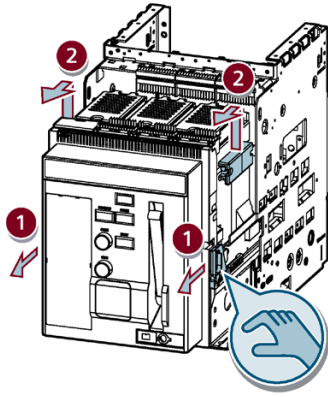
2.1.4.3 Position of the Circuit Breaker in the guide frame

Diagram	Position and display	Main and auxiliary circuit	Cubicle door	Shutter
	Maintenance position  Green	The auxiliary terminals of the breaker are outside of the auxiliary connector blocks of the guide frame.	Open	Closed
	Disconnect position  Green	The auxiliary terminals of the breaker are inside the auxiliary connector blocks of the guide frame. The guide rails are back in their initial position.	Closed	Closed
	Test position  Blue	Main circuits disconnected Auxiliary circuits connected	Closed	Closed
	Connected position  Red	Main circuits connected Auxiliary circuits connected	Closed	Open

- ① Main circuit
- ② Auxiliary circuit
- ③ Shutter
- ④ Cubicle door

2.1.4.4 Removing the Circuit Breaker from the guide frame

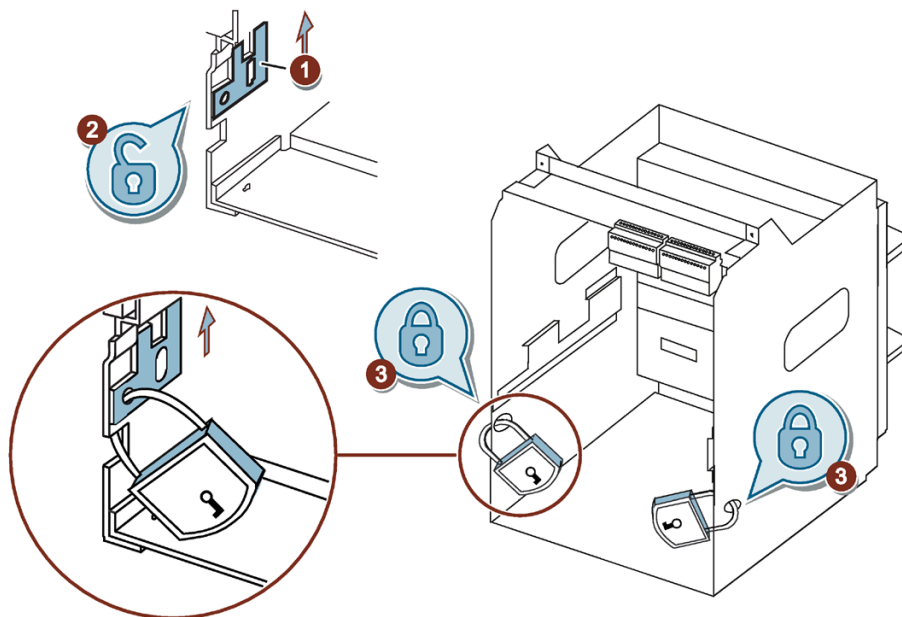
Removing the Circuit Breaker



To remove the Circuit Breaker from the guide frame you have to:

1. Slide out the guide rails
2. Lift the Circuit Breaker up and then remove it forward.

Interlocking device



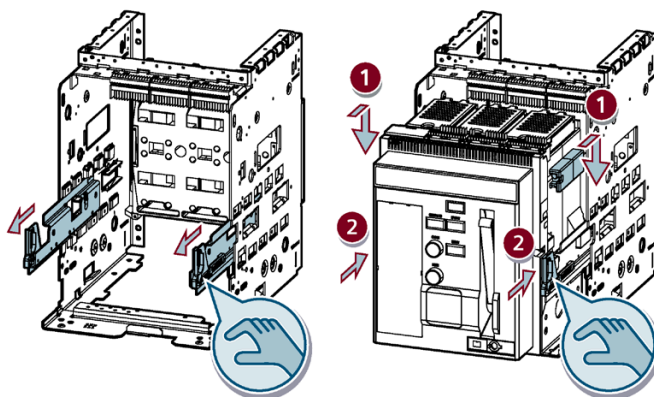
Block the shutter before installing the interlocking device.

The guide rails can be blocked by means of two padlocks to prevent installation of a Circuit Breaker into the guide frame.

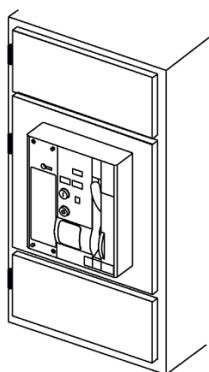
2.1.4.5 Inserting the Circuit Breaker into the guide frame

Note

If present, remove locking devices before inserting the Circuit Breaker into the guide frame.



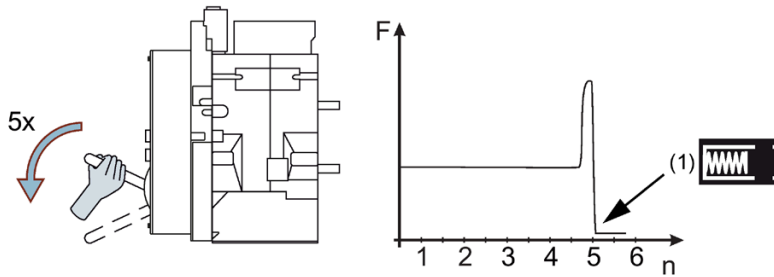
- Pull out the guide rails
- Insert the Circuit breaker by moving it forward and then down onto the guide rails.
- Push it to the end stop of the disconnected position. The correct position can be identified as the guiding rails must be back in their initial position and the secondary disconnect terminals must be hidden.



Close the door of the control cabinet.

To be able to close the circuit breaker, the stored-energy spring must be charged.

Manually charging the stored-energy spring



F Actuating force

n Number of strokes

(1) Stored-energy spring is charged

1. Fully grasp the charging handle.
2. Execute five strokes evenly and completely to the stop.
Execute the fifth stroke just as far and evenly as the first four strokes, although the actuating force will increase (see graphic above).

Once the stored-energy spring has been fully charged, the charging handle can be moved without resistance.

Automatically charging the stored-energy spring

As an option, the stored-energy spring can also be charged automatically with the spring charging motor.

2.1.4.6 Closing and opening

Note

The minimum time difference between ON and OFF command should be at least 100 ms.

Conditions for ready-to-close status

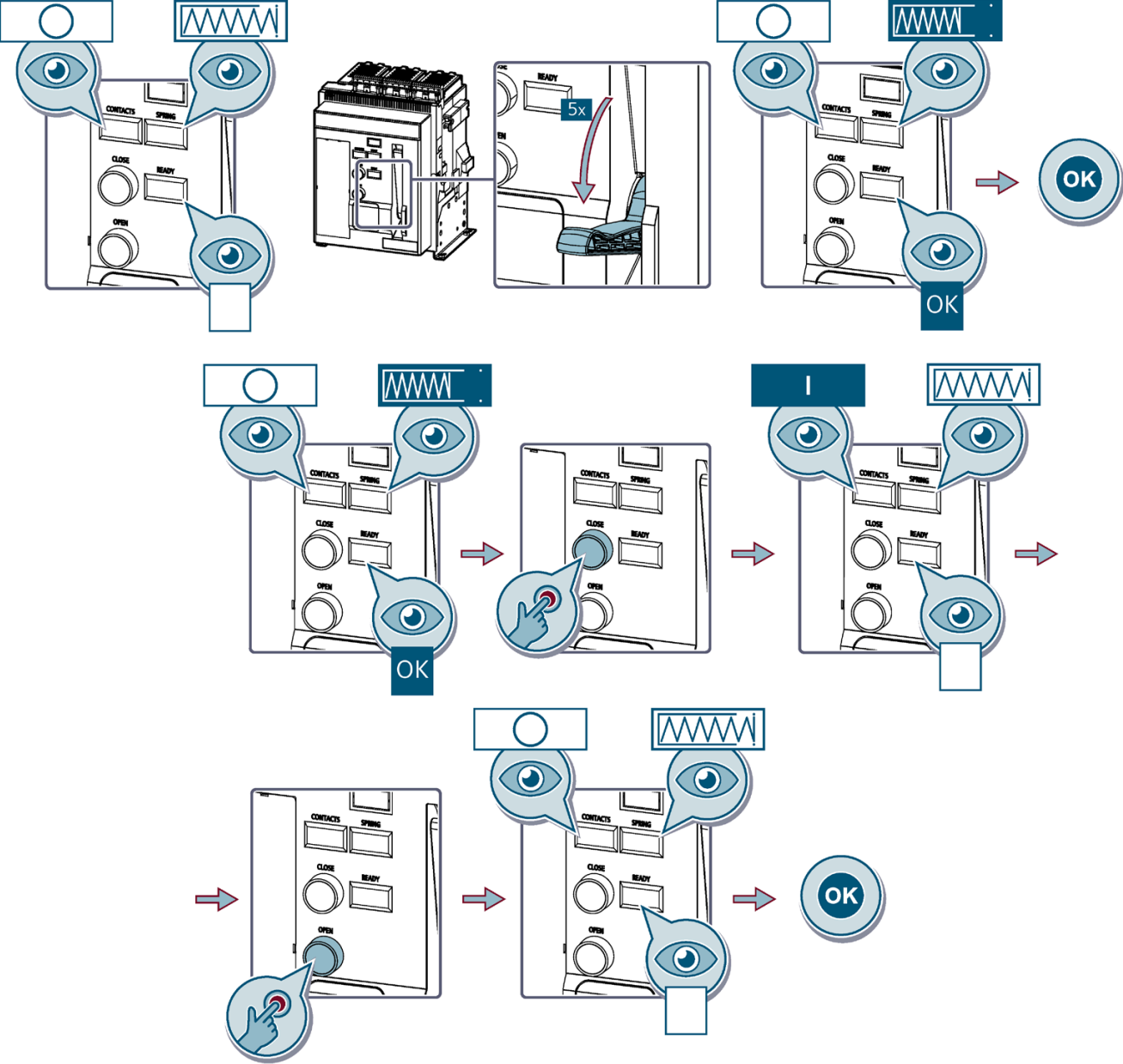
The conditions for the breaker's ready-to-close status can be found in Chapter Commissioning checklist (Page 28).

The circuit breaker is ready for closing when the READY window displays OK.

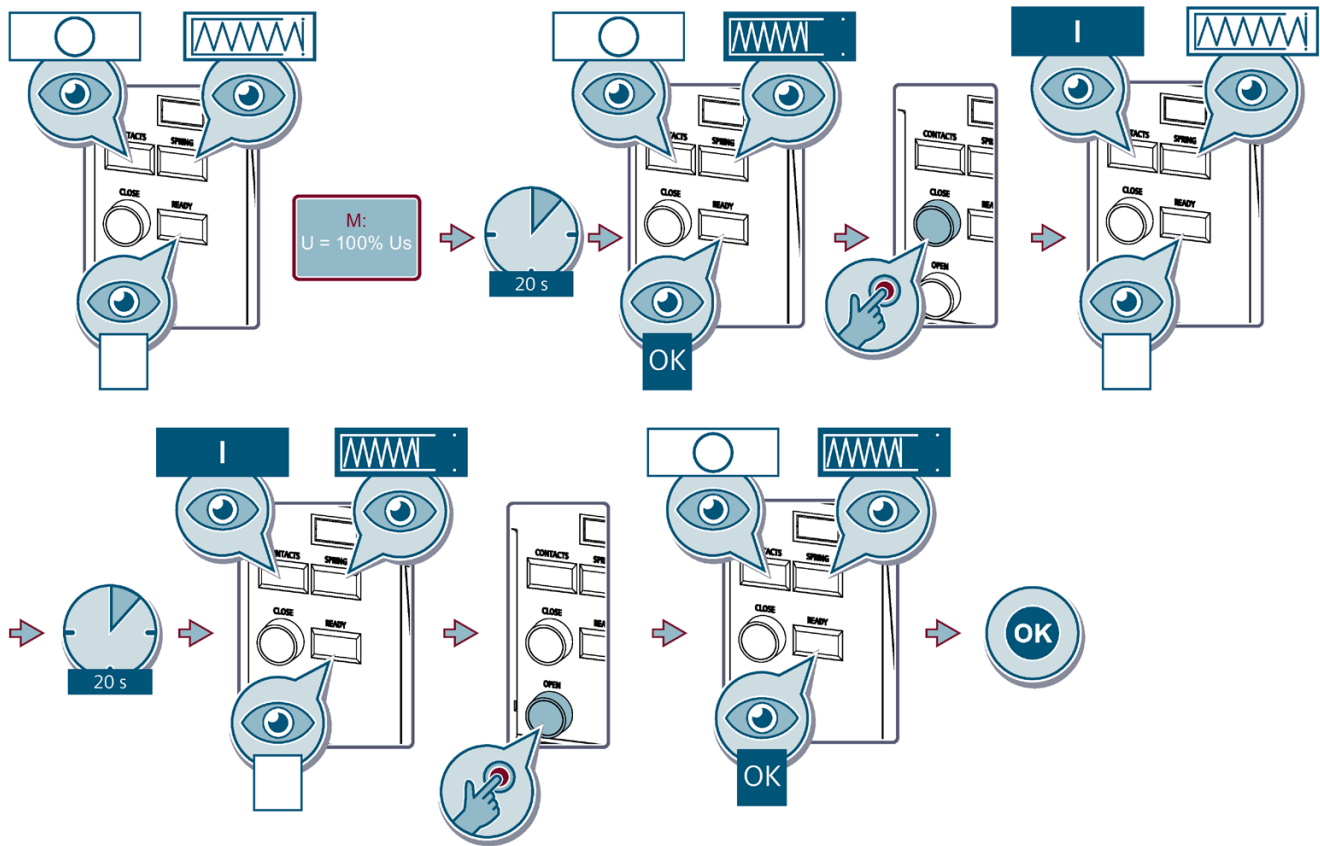
Automatically charging the stored-energy spring

If a spring charging motor is integrated, immediately after switching on, the stored-energy spring is charged again by the spring charging motor.

Closing and opening without motor



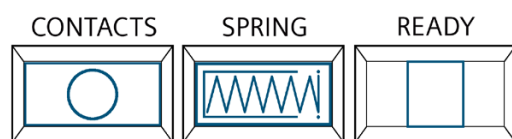
Closing and opening with motor



Indicator status

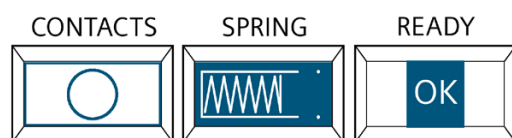
Without motor operating mechanism:

Open, Discharged



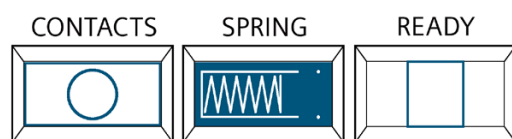
With motor operating mechanism:

Open, Charged



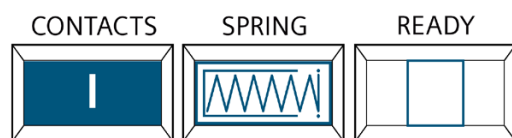
With motor operating mechanism, tripping by ETU:

Open, Charged, "Ready to Close" is not OK



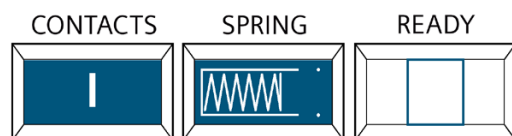
Without motor operating mechanism:

Closed, Discharged



With motor operating mechanism after approx. 20s:

Closed, Charged



2.1.4.7 Commissioning checklist

Checks and work to be carried out

Before commencing work on the device, observe the instructions in Chapter Safety instructions (Page 7).

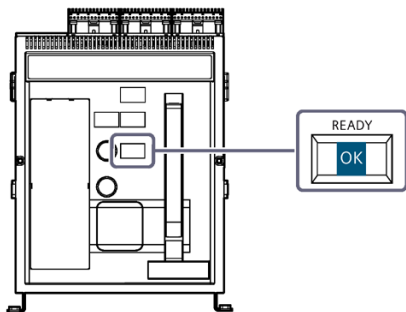
1. Open the circuit breaker and discharge the stored-energy spring.
2. Insert the crank handle (for withdrawable circuit breakers).
3. Move the circuit breaker to the test position (for withdrawable circuit breakers).
4. Press the red reset button to reset the mechanical reclosing lockout.
5. Connect the auxiliary voltages.
6. Set the parameters on the electronic trip unit.
7. Test the auxiliary functions.
8. Close the control cabinet door.
9. Move the circuit breaker to the connected position (for withdrawable circuit breaker).
10. Remove the crank handle (for withdrawable circuit breakers).
11. Charge the stored-energy spring.

Conditions for ready-to-close status (depending on equipment with accessories)

Undervoltage release	energized (auxiliary voltage present)
Shunt trip	not energized
Closing coil	not energized
Mechanical reclosing lockout	Set to RESET
Mechanical circuit breaker interlocking	not effective
Locking provisions	not activated

Observing status displays

The circuit breaker is ready for closing when the READY window displays OK. It can then be closed manually or by means of a control command.



2.1.5 Connection

2.1.5.1 Main connections

! DANGER

**Hazardous voltage.
Will cause death, serious personak injury or equipment damage**

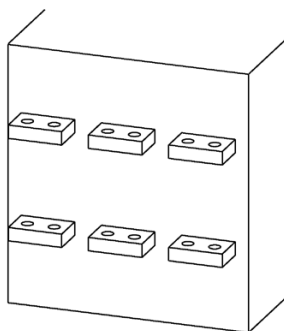
The fastening screws above and below the connection bars on the back of the guide frame are voltage-carrying.

Before commencing maintenance work, ensure that no voltage is present on the power distribution equipment and make sure that this condition is maintained while work is being performed (according to EN 50110-1, DIN VDE 0105-100 and BGV A2). For further information see chapter Safety instructions (Page 7).

For more information on the dimensions refer to chapter Dimension drawings (Page 199)

Horizontal connection

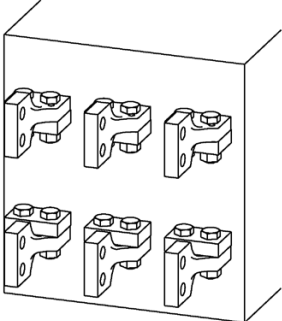
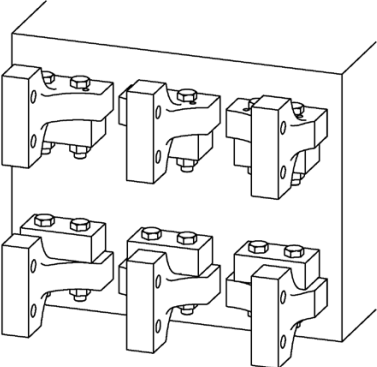
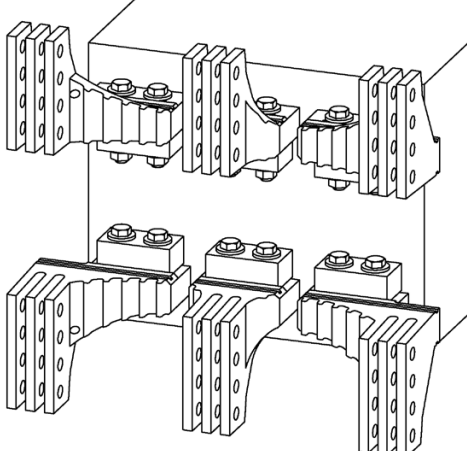
The horizontal connection is the standard connection for fixed-mounted Circuit Breakers and guide frame.



Vertical connection

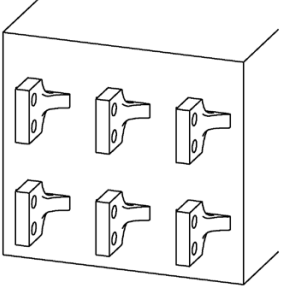
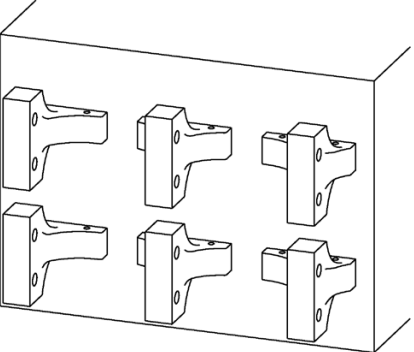
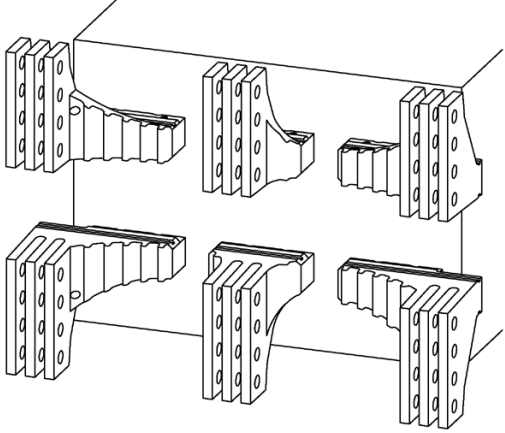
Fixed-mounted breaker

The following examples show the 3-pole circuit breaker:

	<p>Frame size I:</p> <ul style="list-style-type: none">• ≤ 1250 A, S class• 1600 A, N class
	<p>Frame size II:</p> <ul style="list-style-type: none">• 2000 A• 2500 A• 3200 A <p>Vertical terminals left and right asymmetrical</p>
	<p>Frame size II:</p> <ul style="list-style-type: none">• 4000 A <p>Vertical terminals left and right asymmetrical</p>

Guide frame

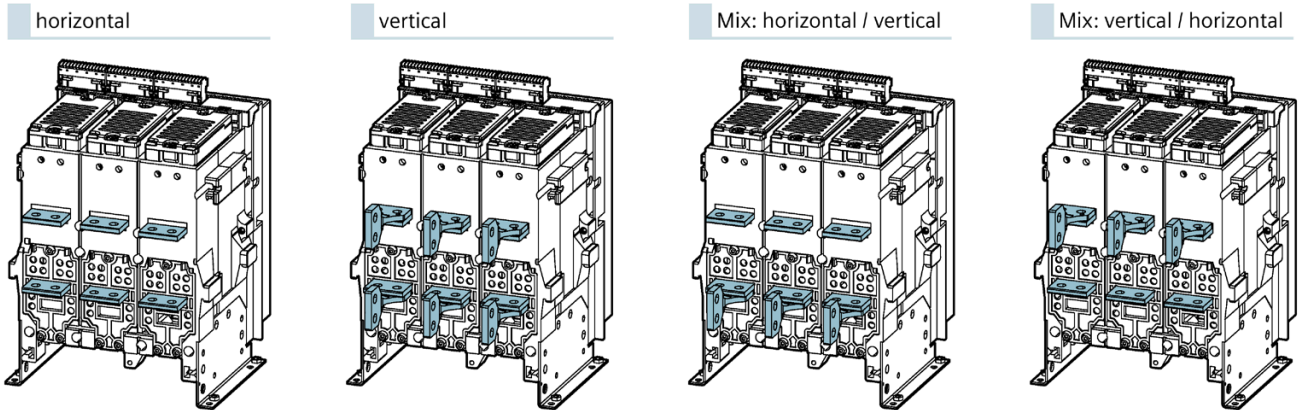
The following examples show the 3-pole guide frame:

	<p>Frame size I:</p> <ul style="list-style-type: none"> • ≤ 1250 A, S class • 1600 A, N class
	<p>Frame size II:</p> <ul style="list-style-type: none"> • 2000 A • 2500 A • 3200 A <p>Vertical terminals left and right asymmetrical</p>
	<p>Frame size II:</p> <ul style="list-style-type: none"> • 4000 A <p>Vertical terminals left and right asymmetrical</p>

Available connection variants

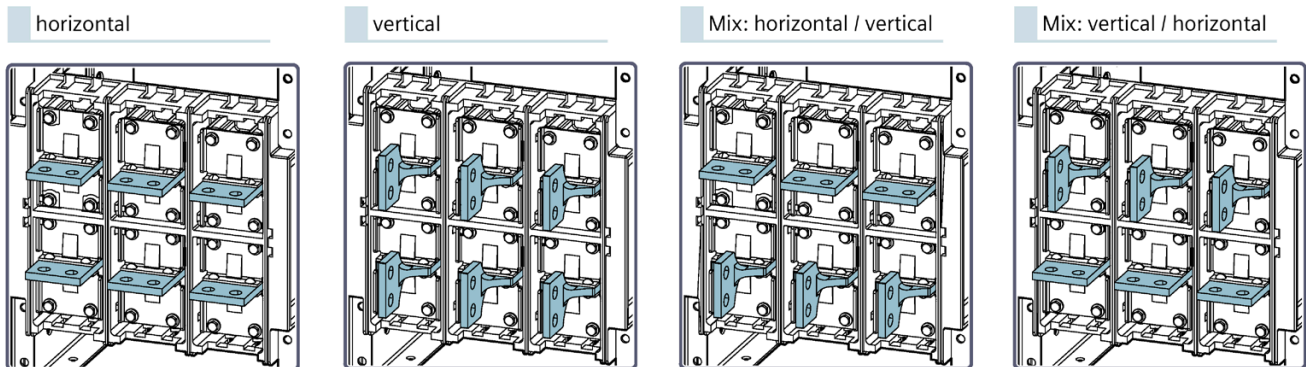
Fixed-mounted breaker

The following examples show the 3-pole Circuit Breaker and the available connection variants:



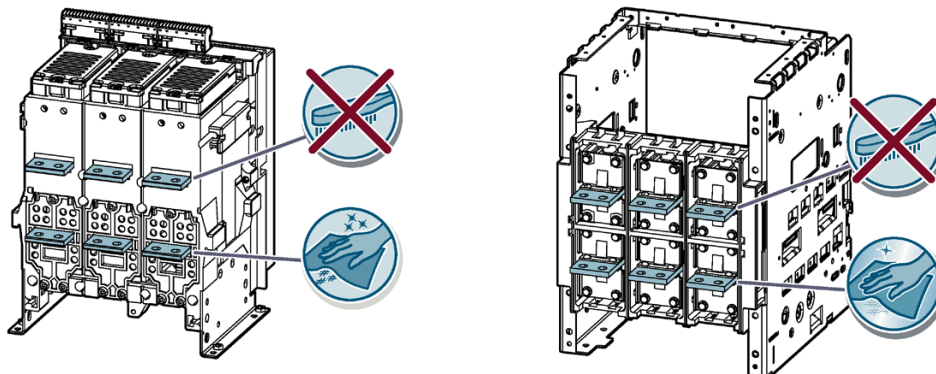
Guide frame

The following examples show the 3-pole guide frame and the available connection variants:

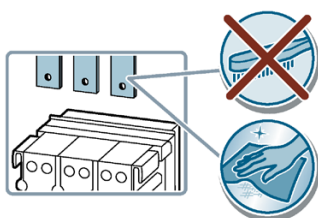


Cleaning and supporting the main connections

Cleaning the main connection



Cleaning the copper bars



Main connection mounting material

Terminal screws with strain washers	M12 (internal diameter = 12 mm acc. to DIN 6769-Fst)
Recommended tightening torque	70 Nm
Required screw strength	8.8 according to DIN 267

Supporting the main connection

The following pictures show you how to support the main connections for horizontal and vertical connections for withdrawable and fixed-mounted Circuit Breakers.

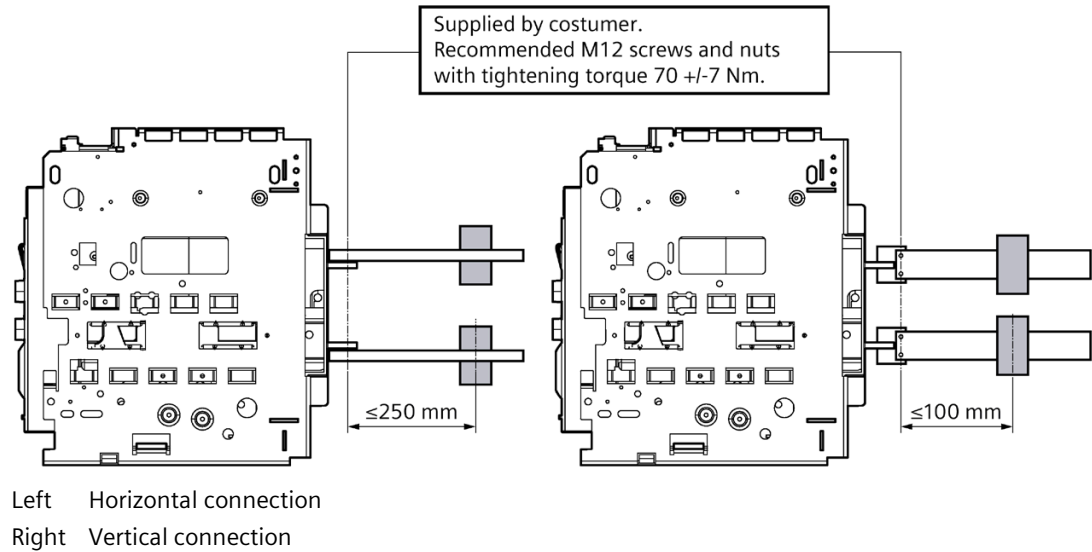


Figure 2-1 Withdrawable circuit breaker

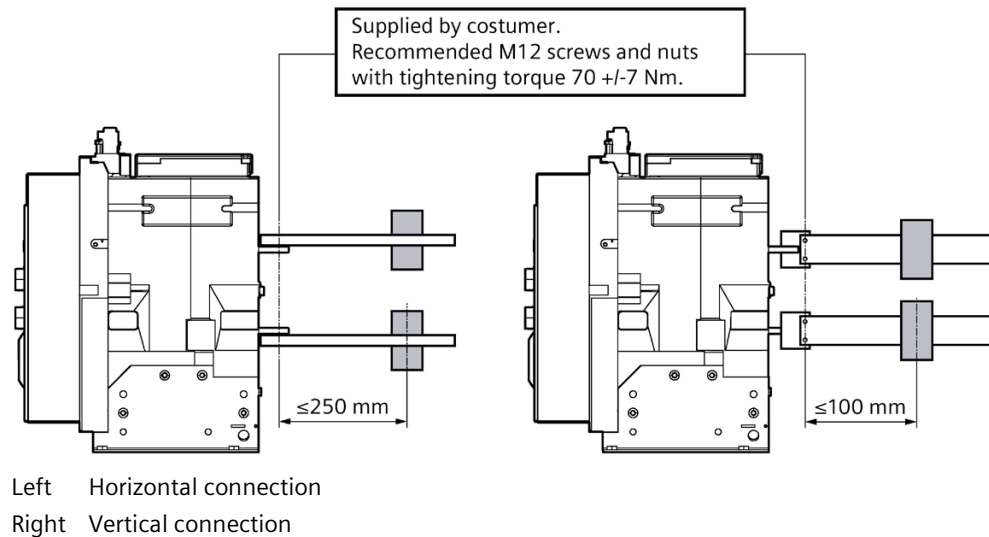


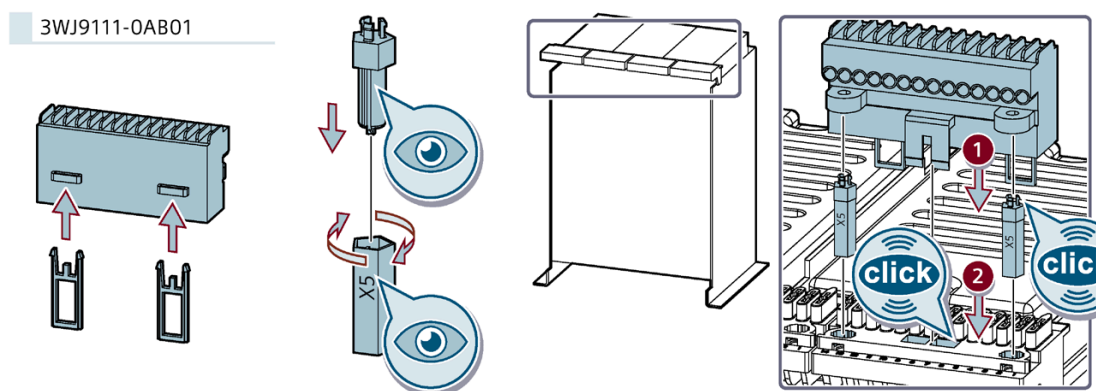
Figure 2-2 Fixed-mounted circuit breaker

See also

Preparation for maintenance work (Page 178)

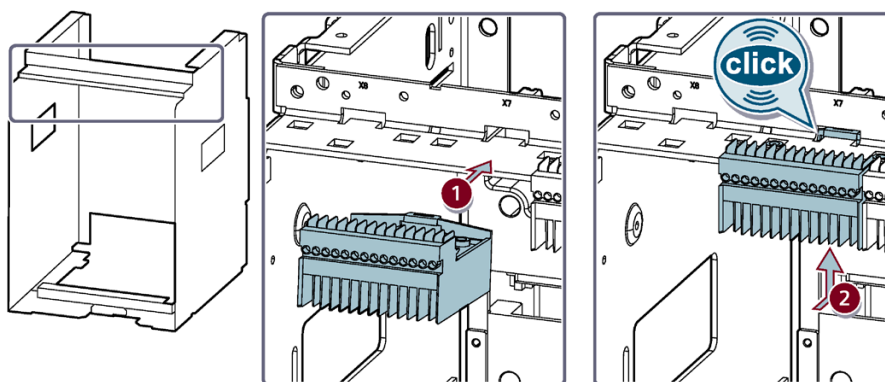
2.1.5.2 Secondary disconnect terminals

Assembly of secondary disconnect terminals (fixed-mounted Circuit Breakers)



- Assemble the coding elements and attach the secure brackets to the secondary disconnect terminal.
- Assemble the secondary disconnect terminal and the coding pieces on the breaker with steps ① and ②

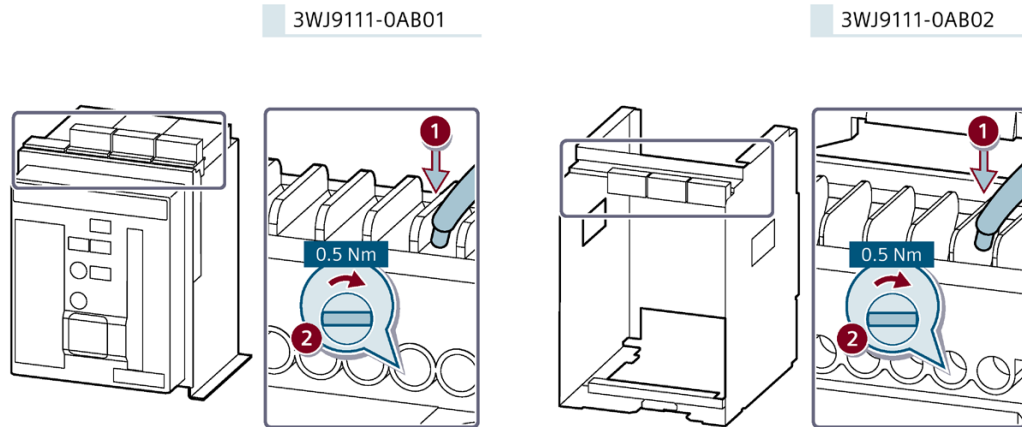
Assembly of secondary disconnect terminals (withdrawable Circuit Breakers)



- Latch the secondary disconnect terminal on the guide frame
- Swivel back until the secondary disconnect terminal attaches to the guide frame. You will hear a "click" sound.

Wiring

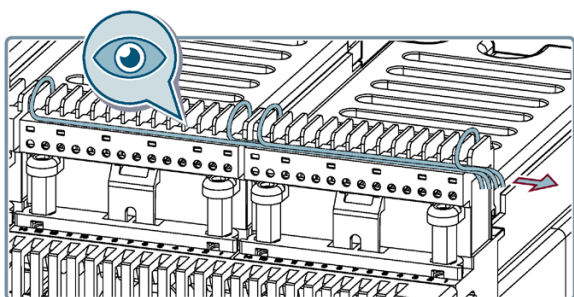
The following pictures show you how to do the wiring at fixed-mounted Circuit Breakers (left) and withdrawable Circuit Breakers (right).



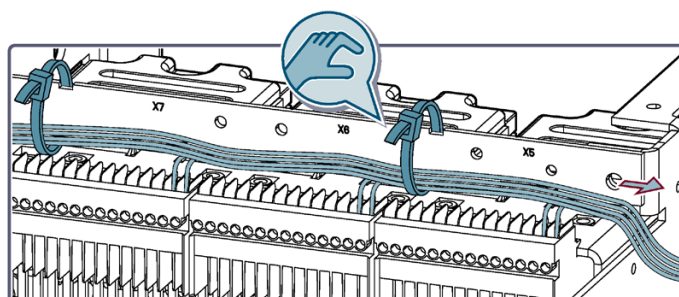
The following table displays the possible wire diameters.

<p>3WJ9111-0AB01</p>	7 mm		0.5 ... 2.5 mm ²		0.5 ... 2.5 mm ²
<p>3WJ9111-0AB02</p>	10 mm	–	0.5 ... 2.5 mm ²	–	–

Routing of the cables from the secondary disconnect terminals



fixed-mounted



withdrawable

Note

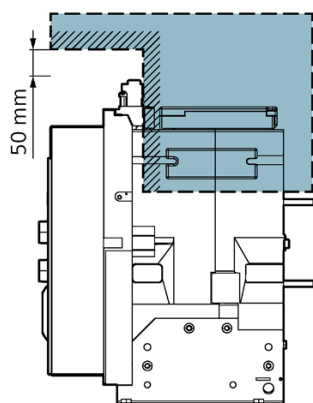
Cable routing

Only route the cables as shown in the pictures above. Make sure to route the cables sideways. Secure them with cable ties on withdrawable Circuit Breakers.

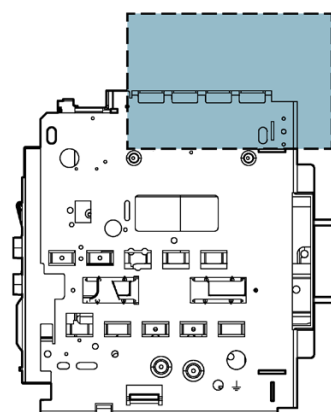
Note

Potential wire damage

Do not install cables in the highlighted areas of the following pictures.



fixed-mounted



withdrawable

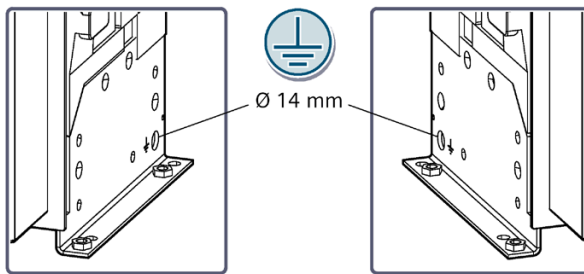
Article No. for spare part

Description	Article No.
Secondary disconnect terminal for fixed-mounted Circuit Breakers 2x coding elements 2x secure brackets	3WJ9111-0AB01
Secondary disconnect terminal for guide frame	3WJ9111-0AB02

2.1.5.3 Connecting the protective conductor

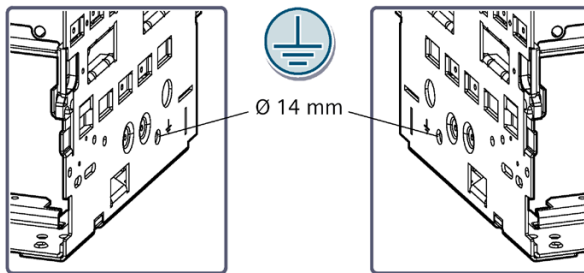
Fixed-mounted Circuit Breaker

The following picture shows where to connect the protective conductor at the fixed-mounted Circuit Breaker.



Guide frame

The following picture shows where to connect the protective conductor at the guide frame.



2.2 Electronic components

2.2.1 Electronic Trip Unit (ETU) - functional overview

NOTICE

We have checked the content of this manual to ensure that it is consistent with the hardware and software described. Discrepancies cannot be wholly excluded, however, which means that we cannot assume responsibility for the correctness of the information provided here.

The information in this manual is reviewed on a regular basis and any necessary corrections are included in subsequent editions.

Overcurrent protection settings

! CAUTION

Adjust parameters only when the Circuit Breaker is switched off.

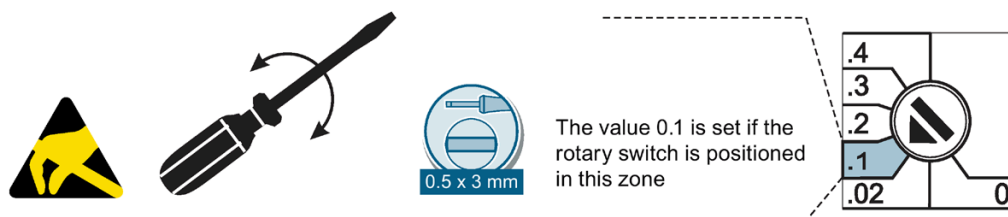
If the parameters are modified with the Circuit Breaker switched on, this can trip the Circuit Breaker unintentionally.

! CAUTION

When planning a project and considering selectivity it has to be ensured loads carried by the Circuit Breaker will not exceed the breaking capacity stated in the 3WJ catalogue.

Upstream protection equipment has to be set in a way, that these faults are interrupted safely.

All parameters are adjusted with rotary coding switches.



Overview of functions

Functions	Electronic trip unit	
	ETU350WJ	ETU360WJ
LT: Overload protection (Long time), L-tripping	✓	✓
Thermal memory can be switched on/off	—	—
ST: Short-time delay short-circuit protection (Short time), S-tripping	✓	✓
Short-time can be switched ON/OFF	—	—
Short-time delay short-circuit protection to I^2t	—	—
INST: Instantaneous short-circuit protection (Instantaneous), I-tripping	✓ ¹⁾	✓ ¹⁾
Instantaneous can be switched on/off	—	—
N: Neutral conductor protection (N Neutral), N-tripping	—	✓
Neutral conductor protection can be switched on/off	—	✓
GF: Ground-fault protection, G-tripping	—	✓
Ground-fault characteristic can be switched to I^2t	—	—
Ground-fault alarm	—	—
Load monitoring	—	—
Leading signal "L-tripping"	—	—
Motor protection function	✓	✓
Alphanumerical display	✓	✓
Communication via Modbus RTU	—	—
Metering function	—	—
Parameterization by rotary coding switches	✓	✓
Remote parameterization of additional functions	—	—
Provision for connecting to an external 24 V DC power supply	—	—

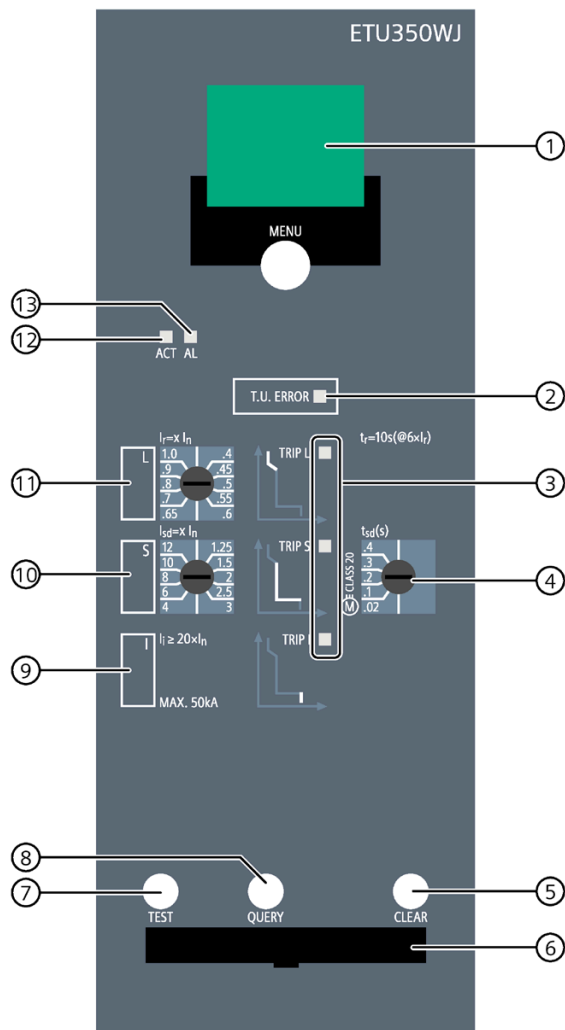
✓ = Standard

O = Optional

— = Not available

¹⁾ = Fixed

2.2.2 ETU350WJ



- ① Alphanumerical display
- ② Indicator: Fault in overcurrent release
- ③ Indicators: Reason for tripping
The reason for tripping is stored for at least two days provided that the electronic trip unit was active for at least 20 minutes prior to tripping.
- ④ Rotary coding switch: Value for delay of short-circuit protection
- ⑤ "CLEAR" button
- ⑥ Test socket
- ⑦ "TEST" button
- ⑧ "QUERY" button
- ⑨ Short-circuit protection fixed
- ⑩ Rotary coding switch: Value for short-time delay/short-circuit trip
- ⑪ Rotary coding switch: Value for overload trip
- ⑫ Indicator: Overcurrent release activated
- ⑬ Indicator: Overload alarm

NOTICE

To protect the electrostatically-sensitive devices, the enclosed protective cap must be placed on the test socket.

Before the protective cap is removed, the breakers must be connected to ground, and the operators must have the same potential.

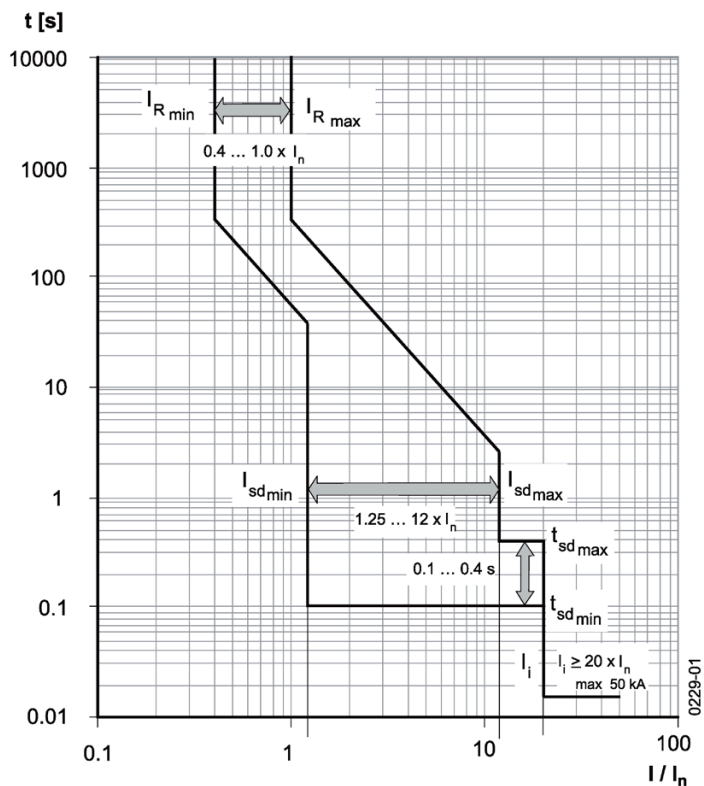
Protection functions

- LT: Overload protection (Long time), L-tripping (Page 50)
- ST: Short-time delay short-circuit release (Short time), S tripping (Page 51)
- INST: Instantaneous short-circuit release (Instantaneous), I-tripping (Page 51)

Characteristic curves

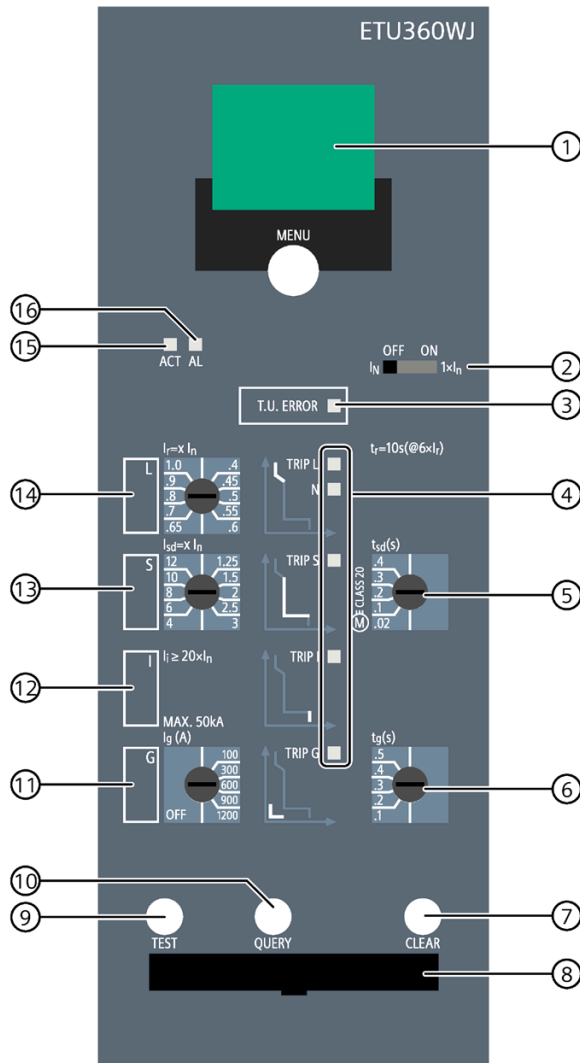
The diagram below only shows the setting ranges of the different parameters. Tolerance ranges are not taken into account here.

L, S, I tripping operation



With a one-pole load in the lowest rated current range, the response times of the short-circuit release can increase by approx. 10 % and the tripping times by approx. 15 % with respect to the characteristic curve.

2.2.3 ETU360WJ



- ① Alphanumerical display
- ② N-conductor protection ON/OFF
- ③ Indicator: Fault in overcurrent release
- ④ Indicators: Reason for tripping
The reason for tripping is stored for at least two days provided that the electronic trip unit was active for at least 20 minutes prior to tripping.
- ⑤ Rotary coding switch: Value for delay of short-circuit protection
- ⑥ Rotary coding switch: Value for delay of ground fault protection
- ⑦ "CLEAR" button
- ⑧ Test socket
- ⑨ "TEST" button
- ⑩ "QUERY" button
- ⑪ Rotary coding switch: Value for ground fault protection
- ⑫ Short-circuit protection fixed

- ⑬ Rotary coding switch: Value for short-time delay/short-circuit trip
- ⑭ Rotary coding switch: Value for overload trip
- ⑮ Indicator: Overcurrent release activated
- ⑯ Indicator: Overload alarm

NOTICE

To protect the electrostatically-sensitive devices, the enclosed protective cap must be placed on the test socket.

Before the protective cap is removed, the breakers must be connected to ground, and the operators must have the same potential.

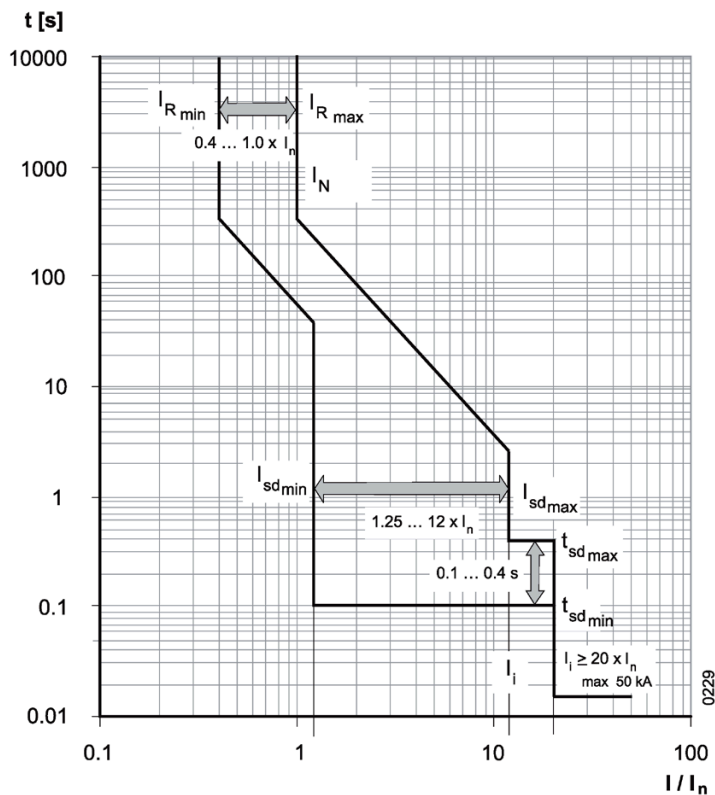
Protection functions

- LT: Overload protection (Long time), L-tripping (Page 50)
- ST: Short-time delay short-circuit release (Short time), S tripping (Page 51)
- INST: Instantaneous short-circuit release (Instantaneous), I-tripping (Page 51)
- GF: Ground-fault protection (Ground-fault), G-tripping (Page 52)
- N: Neutral conductor protection (Neutral), N-tripping (Page 52)

Characteristic curves

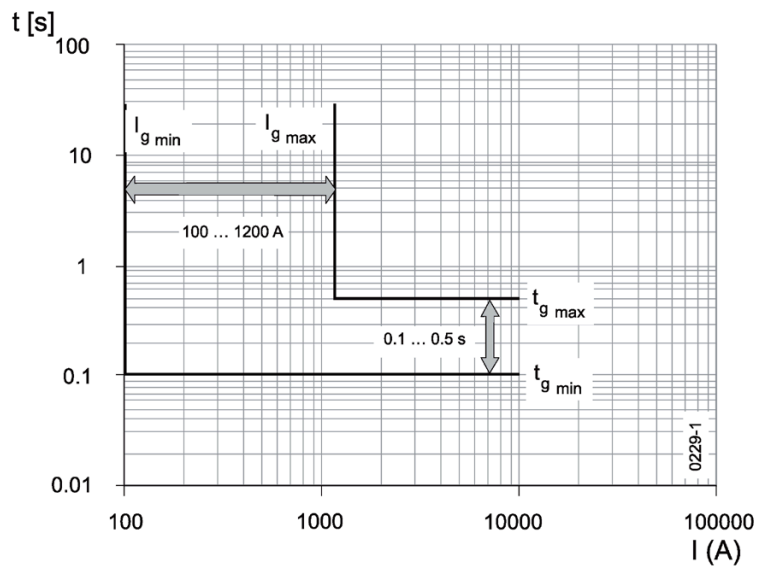
The diagram below only shows the setting ranges of the different parameters. Tolerance ranges are not taken into account here.

L, S, I, N tripping operation



With a one-pole load in the lowest rated current range, the response times of the short-circuit release can increase by approx. 10 % and the tripping times by approx. 15 % with respect to the characteristic curve.

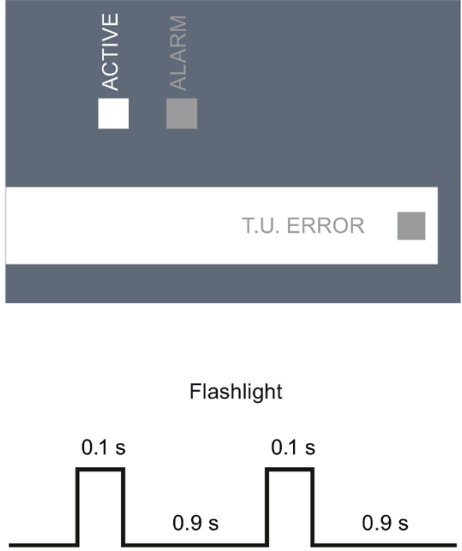

G tripping operation

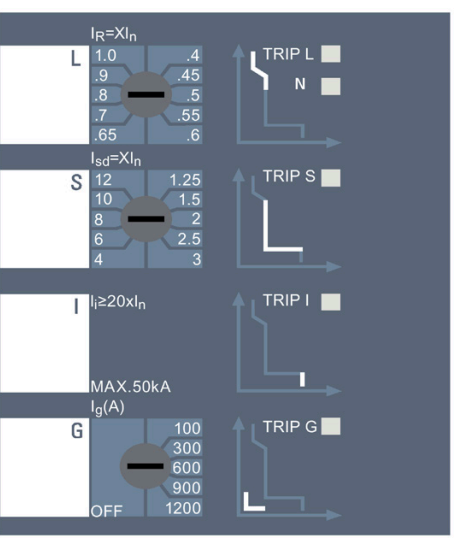
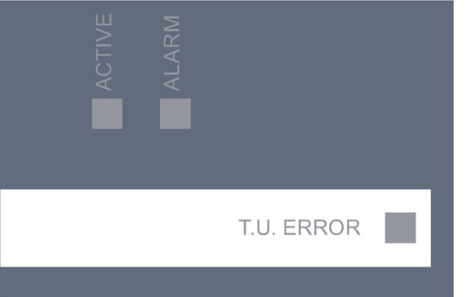


Due to the activation limits of 150 A (FSI) and 200 A (FSII), a ground fault response value of 100 A cannot be ensured with a one-phase load. In this case, the minimum response value is $I_g = 300$ A.

2.2.4 Indicators on the ETU

The indicators provided depend on the electronic trip unit type.

<p>Electronic trip unit is activated $I > I_{min}$ I_{min}: 150 A for frame size I 200 A for frame size II</p>	 <p>The indicator panel shows the 'ACTIVE' indicator (white square) lit, the 'ALARM' indicator (grey square) unlit, and the 'T.U. ERROR' indicator (grey square) unlit. Below the panel is a 'Flashlight' timing diagram showing two pulses, each with a 0.1 s duration and a 0.9 s interval.</p>
<p>Overcurrent alarm Continuous light, if $I \geq I_R$</p>	 <p>The indicator panel shows the 'ACTIVE' indicator (grey square) unlit, the 'ALARM' indicator (white square) lit, and the 'T.U. ERROR' indicator (grey square) unlit.</p>

<p>Protection function has tripped (overcurrent)</p> <ul style="list-style-type: none"> Indicator lights up when the "QUERY" button is pressed Only one reason for tripping is displayed Only the last reason for tripping is displayed 	 <p>The panel displays four protection function settings and their corresponding trip indicators:</p> <ul style="list-style-type: none"> L ($I_R = X I_n$): Rotary selector with values 1.0, .9, .8, .7, .65, .4, .45, .5, .55, .6. Trip indicator: TRIP L (with N). S ($I_{sd} = X I_n$): Rotary selector with values 12, 10, 8, 6, 4, 1.25, 1.5, 2, 2.5, 3. Trip indicator: TRIP S. I ($I_i \geq 20 x I_n$): Trip indicator: TRIP I. G ($I_g(A)$): Rotary selector with values 100, 300, 600, 900, 1200, OFF. Trip indicator: TRIP G.
<p>T.U. ERROR LED</p> <p>1st T.U. Error flashes: The protection function is restricted; the protection parameters are reset to the minimum values. Cause:</p> <ul style="list-style-type: none"> Electronic trip unit defective <p>2nd T.U. Error lights up continuously: The protection function is not ensured. Cause:</p> <ul style="list-style-type: none"> Electronic trip unit defective 	 <p>The panel shows the T.U. ERROR LED indicators:</p> <ul style="list-style-type: none"> ACTIVE indicator (flashing) ALARM indicator (flashing) T.U. ERROR indicator (continuous light)

2.2.5 Protection functions

2.2.5.1 Basic protection functions

The protection functions of the electronic trip unit are available without an additional auxiliary voltage. The required energy is supplied via current transformers integrated in the Circuit Breaker.

To evaluate the currents, the RMS value is calculated by the electronic components of the electronic trip unit.

The individual functions are parameterized by means of rotary coding switches.

Note

Tolerances for the setting currents

L: tripping operations between 1.05 and 1.2 x I_R

S: - 0 %, + 20 %

I: - 0 %, + 20 %

G: - 0 %, + 20 %

Tolerances for the tripping times

L: - 20 %, + 0 % for I²t characteristic

S: - 0 %, + 60 ms or - 0 %, + 10 % for characteristic with fixed delay time

I: < 50 ms

G: - 0 ms, + 60 ms or - 0 %, + 10 % for characteristic with fixed delay time

2.2.5.2 LT: Overload protection (Long time), L-tripping

The setting value I_R determines the maximum continuous current at which the Circuit Breaker can operate without tripping. The time-lag class t_R determines for how long an overload can be present without causing a trip.

Setting values for I _R	
ETU350WJ, ETU360WJ	$I_R = (0.4 / 0.45 / 0.5 / 0.55 / 0.6 / 0.65 / 0.7 / 0.8 / 0.9 / 1.0) \times I_n$

Setting values for t _R	
ETU350WJ, ETU360WJ	t _R = 10 s (at 6 x I _R)

The tripping characteristic curve exhibits an I²t characteristic.

When the motor protection function is active, a different t_R setting applies (see next page).

2.2.5.3 ST: Short-time delay short-circuit release (Short time), S tripping

With the electronic trip units, tripping caused by a short-circuit current I_{sd} can be delayed by t_{sd} .

This enables selectivity with respect to short-circuit protection in switchgear with more than one grading level.

Setting values for I_{sd}	
ETU350WJ, ETU360WJ	$I_{sd} = (1.25 / 1.5 / 2 / 2.5 / 3 / 4 / 6 / 8 / 10 / 12) \times I_n$

Setting values for t_{sd}	
ETU350WJ, ETU360WJ	$t_{sd} = 0 / 0.02(M)^{1)} / 0.1 / 0.2 / 0.3 / 0.4 \text{ s}$

- ¹⁾ The delay time 0.02 s is not a grading time.
In this setting, the motor protection function is activated.

With the setting value $t_{sd} = 0 \text{ s}$, the ETU350WJ and ETU360WJ electronic trip units can support instantaneous short-circuit protection with a variable response value that is lower than the fixed response value I_i .

Motor protection function

A special protection function for electromotive drives is activated with the Circuit Breaker setting $t_{sd} = \textcircled{M}$ (0.02 s). This prevents the short-time delay short-circuit release from responding to the inrush peak of electric motors. At the same time, phase-failure protection is activated and the time constant for the internal, arithmetic simulation of the warming and cooling process is switched from plant protection to motor protection.

ETU350WJ and ETU360WJ:

When motor protection is active, the time-lag class is also set in such a way that, regardless of the default setting $t_R = 10 \text{ s}$, the tripping time for overload protection is 11.2 s @ 7 x I_R , which means that it lies within the tolerance band of class 20 ($6 < t_p \leq 20 \text{ s}$).

2.2.5.4 INST: Instantaneous short-circuit release (Instantaneous), I-tripping

Exceeding the setting value I_i causes the Circuit Breaker to trip instantaneously.

Setting values for I_i	
ETU350WJ, ETU360WJ	$I_i \geq 20 \times I_n$ (fixed) MAX = 50 kA

2.2.5.5 GF: Ground-fault protection (Ground-fault), G-tripping

If the electronic trip unit is equipped with a ground fault protection function, this can protect consumers against excessive ground fault currents.

Ground fault detection can be implemented by means of vectorial summation of the currents of the external conductors and N conductor.

In conjunction with the delay time setting t_g , the response value I_g defines the disconnection of ground faults.

Setting values for I_g	
ETU360WJ	$I_g = 100 / 300 / 600 / 900 / 1200 \text{ A}$

Setting values for t_g	
ETU360WJ	$t_g = 0.1 / 0.2 / 0.3 / 0.4 / 0.5 \text{ s}$

2.2.5.6 N: Neutral conductor protection (Neutral), N-tripping

The ETU360WJ electronic trip unit allows the neutral conductor to be protected against overload. A current transformer for the neutral conductor (which can be retrofitted if necessary) is required for this purpose.

With respect to tripping, the same time-lag class t_R applies as for the overload trip.

Setting values for I_N	
ETU360WJ	$I_N = I_n; \text{ OFF}$

2.2.6 Additional functions

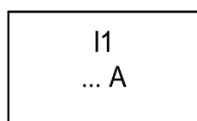
Phase-failure protection

When the Circuit Breaker setting is $t_{sd} = \textcircled{M}$ (0.02s), phase-failure protection is activated.

If the operational current on the phase with the lowest load is 50% less than the operational current of the phase with the highest load when phase-failure protection is active, the setting value I_R is automatically reduced to 80%. If the three phase currents do not differ by more than 50% with respect to each other, the setting value I_R applies.

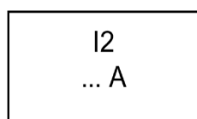
2.2.7 Menus on the displays of the ETU350WJ and ETU360WJ

You can switch from one menu to another by pressing the menu button briefly (< 1 s). The following consecutive menu displays can be selected:



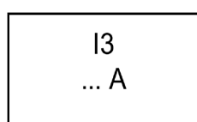
I1
... A

Current in phase L1



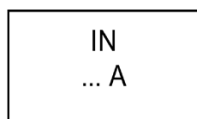
I2
... A

Current in phase L2



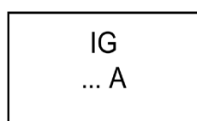
I3
... A

Current in phase L3



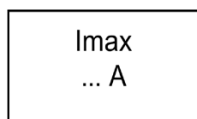
IN
... A

Current in neutral conductor
(for ETU360WJ only)



IG
... A

Ground fault current
(for ETU360WJ only)



I_{max}
... A

Current of phase with highest load of L1, L2, L3, and N

The reason for tripping is displayed during a tripping operation.



LT tripping operation



ST tripping operation



INST tripping operation



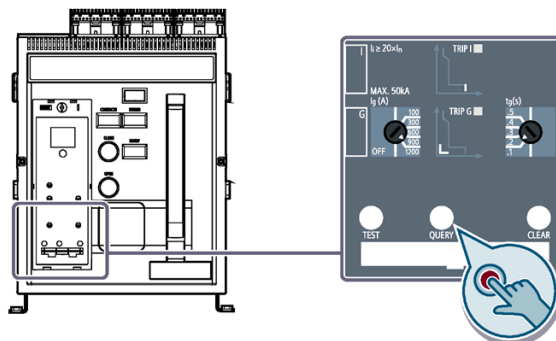
N tripping operation
(for ETU360WJ only)



Ground-fault tripping
(for ETU360WJ only)

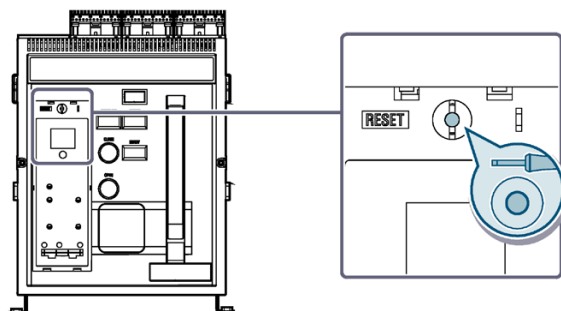
2.2.8 Recommissioning after opening operation by electronic trip unit

1. Find the reason for the tripping of circuit breaker by pushing the button "QUERY" on the ETU.



2. Identify the cause and resolve the issue.
 - Check downstream load.
 - Check ETU settings.
3. After a short-circuit trip, check the Circuit Breaker for any damage.

Inspect the contact system for possible damage, see chapter Inspection & Maintenance (Page 165).
4. Open the transparent cover of the ETU and reset the reclosing lockout by pressing the "RESET" trip signal button.

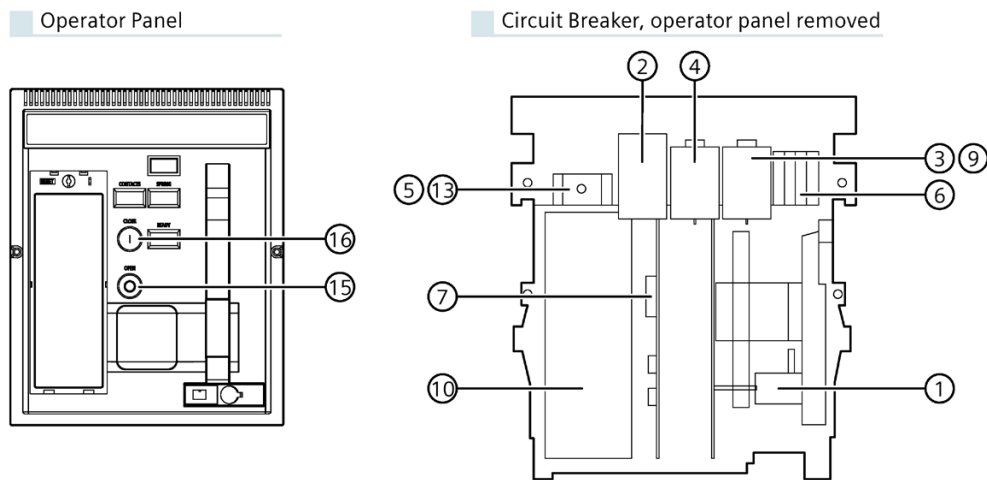


5. Recommission as described below:
 - Inserting the Circuit Breaker into the guide frame (Page 23)
 - Closing and opening (Page 24)

Accessories

3.1 Overview

Version specific



For closing operation

①	Spring charging motor -M
②	Closing coil -Y1

For opening operation

③	Shunt trip -F1
④	Shunt trip -F2
⑤	Tripping solenoid -F5

For monitoring

⑥	Auxiliary switch for switching position indication -S1 ... S6, S60, S61
⑦	Ready-to-close signaling switch -S7
⑧	Undervoltage release -F3
⑨	Undervoltage release with delay -F8
⑩	Electronic trip unit -A1

3.2 Preparatory and concluding installation steps for the installation of internal accessories

For interlocking

⑬	Reclosing lockout -F5 with tripped signaling contact -S11
⑮	Pushbutton "OPEN" (mechanical)
⑯	Pushbutton "CLOSED" (mechanical)

3.2 Preparatory and concluding installation steps for the installation of internal accessories

This chapter describes the accessories available for the 3WJ Air Circuit Breaker. In some cases, the front cover and secondary disconnect terminals have to be removed.

The different preparatory work for the installation of accessories is described in the following section.

Before working on the 3WJ Air Circuit Breaker follow the instructions in chapter Safety instructions (Page 7).

! DANGER

Hazardous voltage
Will cause death, serious personal injury or equipment damage.

Turn off and lock out all power supplying this equipment before working on this device.

! DANGER

Hazardous stored-energy spring mechanism
Will cause death, serious personal injury or equipment damage.

Before starting work, the device must be disconnected from the supply and protected against reactivation.

Only carry out work on the device when the Circuit Breaker is switched off and the stored-energy spring mechanism is discharged.

All devices must be installed and mounted by qualified authorized personnel only.

Note

If a spring charging motor is configured, disconnect the control circuit to the spring charging motor first, in order to prevent the stored-energy spring from recharging.
 If an undervoltage release is configured, control voltage must be applied to the UVR.

Preparatory work

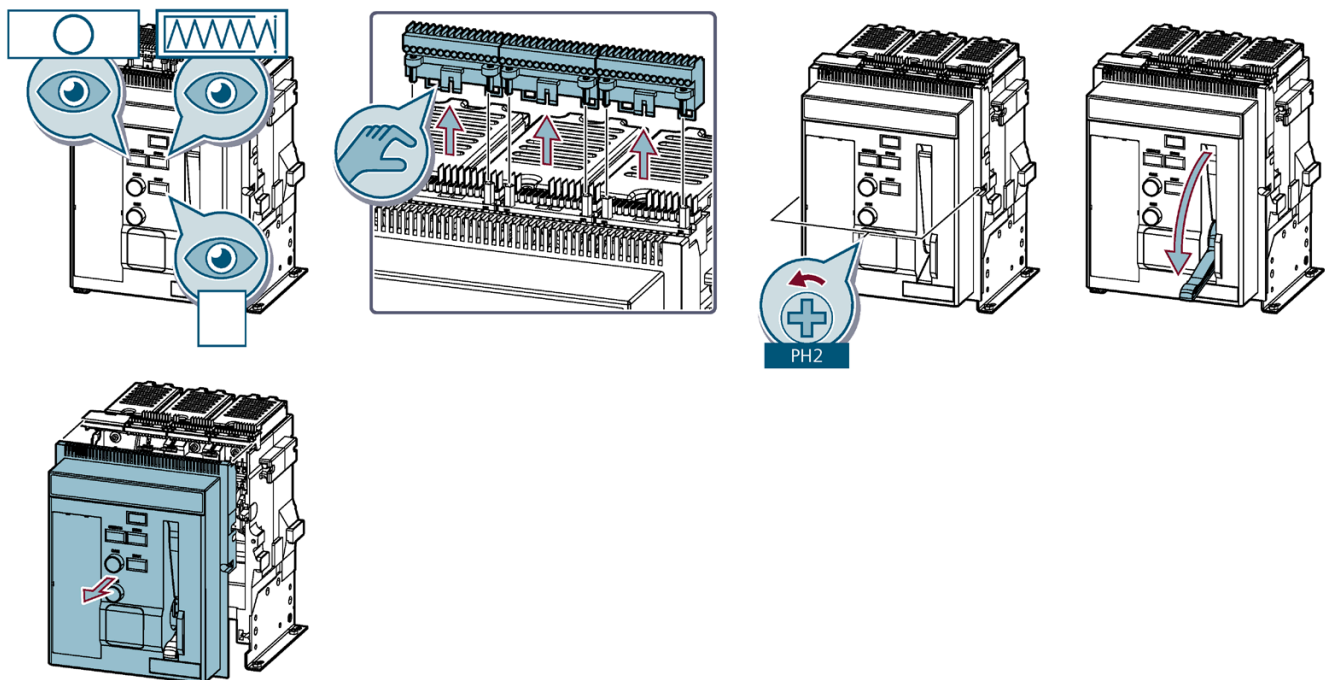
1. Open the Circuit Breaker and discharge the stored-energy spring as described below
2. Rack the Circuit Breaker into maintenance position (disconnected position) and remove it from the guide frame (only withdrawable Circuit Breakers)
3. Remove the operator panel and the secondary disconnect terminals as shown below

Opening the circuit breaker and discharging the stored-energy spring

1. Check that the circuit breaker is ready to close ("OK" indication) and the stored-energy spring is charged ("CHARGED" indication).
2. Press the CLOSE button.
3. Check that the "CLOSED" and "DISCHARGED" indications are active.
4. Press the OPEN button.
5. Check that the "OPEN" indication is active.

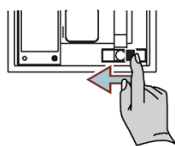
Operator panel

Removal

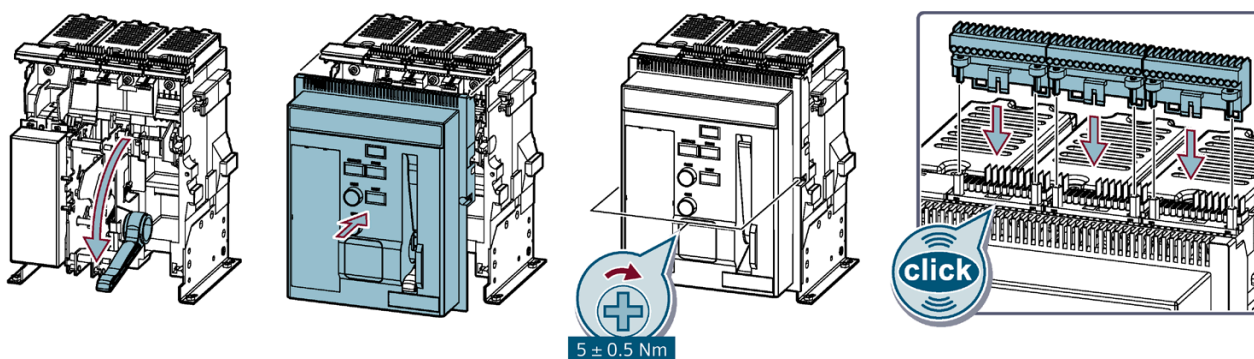


- Check that the Circuit Breaker is OPEN and the stored-energy spring is discharged
- Remove the secondary disconnect terminals
- Unscrew the operator panel
- Pull the spring-charging lever down
- Remove the operator panel

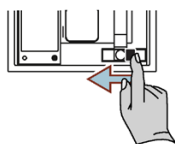
3.2 Preparatory and concluding installation steps for the installation of internal accessories

**Note****Withdrawable circuit breakers**

First close the racking hole, then remove the operator panel.

Installation

- Pull the spring-charging lever down
- Put the operator panel onto the Circuit Breaker

**Note****Withdrawable circuit breakers**

First close the racking hole, then install the operator panel.

- Tighten the screws on the operator panel with 5 ± 0.5 Nm tightening torque.
- Install the secondary disconnect terminals
- Insert into guide frame and rack into test position. (only withdrawable Circuit Breakers)

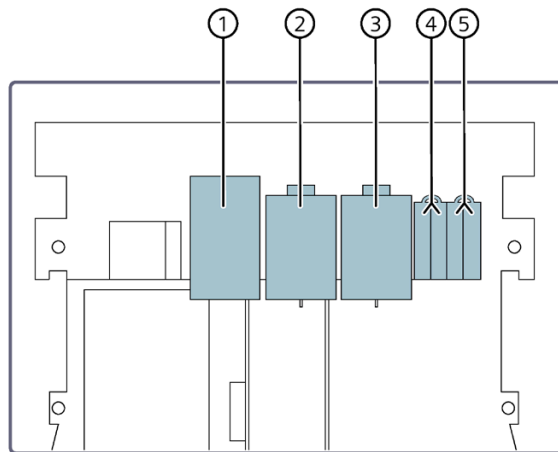
See also

Preparation for maintenance work (Page 178)

3.3 Control and signaling accessories

3.3.1 Overview

Mounting location



- | | |
|--|--|
| ① Closing coil CC (Y1) | ④ First auxiliary switches 2NO + 2NC (S2,S1) |
| ② Second trip ST (F2) | ⑤ Second auxiliary switches 2NO + 2NC (S6,S5)
or Second auxiliary switches 3NO + 1NC (S60,S5)
or Second auxiliary switches 4NO (S60,S61) |
| ③ First shunt trip ST (F1)
or Undervoltage release UVR (F3)
or Undervoltage release UVR-t (F8) | |

Circuit diagrams

See chapter Terminal connection diagram of secondary disconnect terminals (Page 198).

3.3.2 Closing coil, shunt trip and undervoltage release

Closing coil (CC)

The closing coil makes remote closing of the circuit breaker possible. The prerequisite for this is the ready-to-close status of the circuit breaker.

Remote closing can take place by means of electrical signals on the secondary disconnect terminal system.

The closing coil is available in one version:

- Closing coil for continuous duty (100% OP)
This version is suitable for continuous duty with an ON period (OP) of 100%.

The closing coil has no effect on the service life, operating cycles or operating frequency of the circuit breaker.

It can be retrofit.

Shunt trip (ST)

Up to two shunt trips make remote opening of the circuit breaker possible.

Remote opening can take place by means of electrical signals on the secondary disconnect terminal system.

The shunt trips are available in one version:

- Shunt trip for continuous duty (100% OP)
This version is suitable for continuous duty with an ON period (OP) of 100%.
 - The release can be permanently connected to voltage.
 - It locks out on momentary-contact commands, thus making it possible to set up interlocks.

The shunt trips have no effect on the service life, operating cycles or operating frequency of the circuit breaker.

Note

Shunt trip ST and the undervoltage releases are mounted in the same location ③. It is **not** possible to use these accessories simultaneously.

The shunt trips can be retrofit.

Undervoltage release (UVR/UVR-t)

The undervoltage release trips the circuit breaker if the control voltage U_s is unavailable or drops to between 70% and 35% of its normal value (in compliance with the relevant standard) and locks it to prevent reclosing until the auxiliary voltage is restored. The circuit breaker can then be reclosed mechanically or electrically. The undervoltage release does not need to be reset for this purpose.

The undervoltage release can be used for:

- Safe remote-controlled tripping
- Interlocking, to prevent closing
- Checking the voltage in the primary and secondary circuits

The undervoltage release is supplied with voltage via the secondary disconnect terminal system.

It is available in two versions:

- Undervoltage release UVR:
Tripping occurs instantaneously or with a short-time delay, see section "Technical specifications".
- Undervoltage release UVR-t:
Tripping occurs with an adjustable delay time from 0.2 to 3.2 s.

Note

The circuit breaker with an undervoltage release can be closed at a control voltage from 85% to 110% U_s on the undervoltage release.

Note

Shunt trip ST and the undervoltage releases are mounted in the same location ③. It is **not** possible to use these accessories simultaneously.

The undervoltage release can be retrofit.

Technical specifications

The following tables show the technical specifications of the Closing coil (CC), Shunt trip (ST) and Undervoltage releases (UVR/UVR-t).

Closing coil (CC)

Rated control supply voltage U_s		24 V DC
		110 ... 127 V AC / 110 ... 125 V DC
		220 ... 240 V AC / 220 ... 250 V DC
Operating range (acc. to IEC 60947-2)		85 ... 110% U_s
Extended operating range for battery operation		85 ... 126% U_s
		100% OP
Switch-on power AC / DC	24 V DC	40 VA / 40 W
	110 ... 127 V AC / 110 ... 125 V DC	
	220 ... 240 V AC / 220 ... 250 V DC	
Continuous power AC / DC		8 VA / 8 W
Minimum command duration at 100% U_s		60 ms
Maximum command time at 100% U_s		--
Closing time of the circuit breaker at 100% U_s		100 ms
Fuse protection of the control circuit at U_s closing coil		
Smallest permissible DIAZED fuse, gL, slow- response	24 V DC	2 A
	110 ... 127 V AC / 110 ... 125 V DC	1 A
	220 ... 240 V AC / 220 ... 250 V DC	1 A
Miniature circuit break- er with C characteristic	24 V DC	2 A
	110 ... 127 V AC / 110 ... 125 V DC	1 A
	220 ... 240 V AC / 220 ... 250 V DC	1 A

Shunt trip (ST)

Rated control supply voltage U_s		24 V DC
		110 ... 127 V AC / 110 ... 125 V DC
		220 ... 240 V AC / 220 ... 250 V DC
Operating range (acc. to IEC 60947-1)		85 ... 110% U_s
Extended operating range for battery operation		85 ... 126% U_s
		100% OP
Switch-on power AC / DC	24 V DC	40 VA / 40 W
	110 ... 127 V AC / 110 ... 125 V DC	
	220 ... 240 V AC / 220 ... 250 V DC	
Continuous power AC / DC		8 VA / 8 W
Minimum command duration at 100% U_s		60 ms
Maximum command time at 100% U_s		--
Opening time of the circuit breaker at 100% U_s		80 ms
Fuse protection of the control circuit		
Smallest permissible DIAZED fuse, gL, slow- response	24 V DC	2 A
	110 ... 127 V AC / 110 ... 125 V DC	1 A
	220 ... 240 V AC / 220 ... 250 V DC	1 A
Miniature circuit break- er with C characteristic	24 V DC	2 A
	110 ... 127 V AC / 110 ... 125 V DC	1 A
	220 ... 240 V AC / 220 ... 250 V DC	1 A

Undervoltage release (UVR/UVR-t)

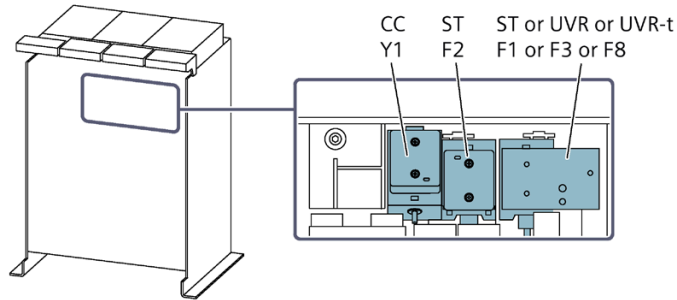
Rated control supply voltage U_s		24 ... 30 V DC
		110 ... 127 V AC / 110 ... 125 V DC
		220 ... 240 V AC / 220 ... 250 V DC
		380 ... 415 V AC
Operating limits	Operate voltage	< 70% U_s
	Pick-up voltage	85 ... 110% U_s
Switch-on power AC / DC		50 VA / 50 W
Continuous power AC / DC		5 VA / 5 W
Break time		
$U_s = 0$ with instantaneous UVR		≤ 80 ms
$U_s = 0$ with short-time delayed UVR		≤ 200 ms
$U_s = 0$ with delayed UVR-t		0.2 ... 3.2 s
For UVR-t by disconnecting the connection at terminals X5.13 and X5.14 (EMERGENCY STOP circuit)		≤ 100 ms
Fuse protection of the control circuit		
Smallest permissible DIAZED fuse, gL, slow-response	24 ... 30 V DC	2 A
	110 ... 127 V AC / 110 ... 125 V DC	1 A
	220 ... 240 V AC / 220 ... 250 V DC	
	380 ... 415 V AC	
Miniature circuit breaker with C characteristic	24 ... 30 V DC	2 A
	110 ... 127 V AC / 110 ... 125 V DC	1 A
	220 ... 240 V AC / 220 ... 250 V DC	
	380 ... 415 V AC	

See also

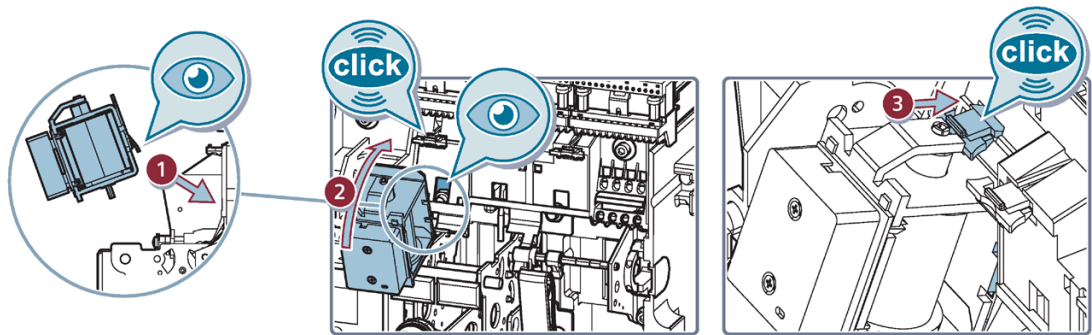
Preparation for maintenance work (Page 178)

3.3.2.1 Installation

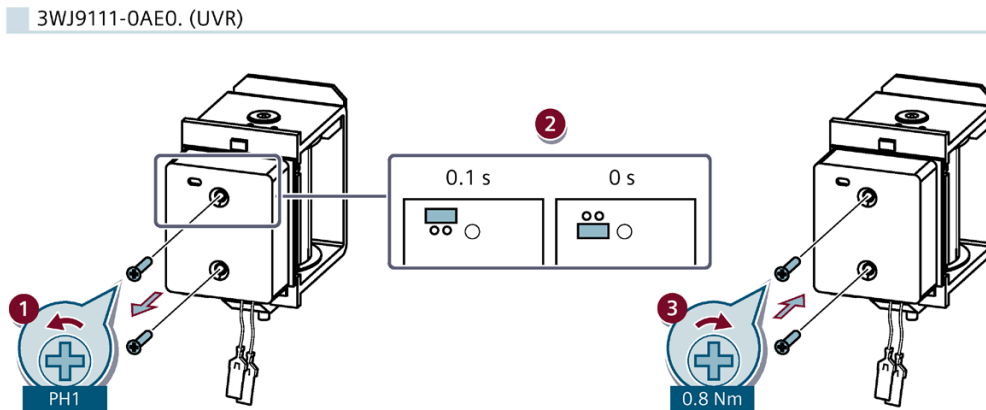
Mounting location

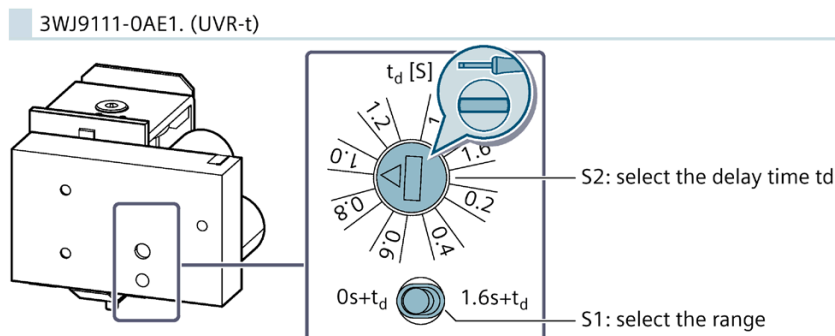


Installation process



Setting the delay time of the Undervoltage release





See also

Terminal connection diagram of secondary disconnect terminals (Page 198)

3.3.2.2 Part number

Closing coil (CC) / Shunt trip (ST), continuous duty	Part number
DC 24 V	3WJ9111-0AD01
110 ... 127 V AC / 110 ... 125 V DC	3WJ9111-0AD05
220 ... 240 V AC / 220 ... 250 V DC	3WJ9111-0AD06

Undervoltage releases (UVR) instantaneous 0 ms, short-delay 200 ms	Part number
DC 24 V	3WJ9111-0AE01
110 ... 127 V AC / 110 ... 125 V DC	3WJ9111-0AE05
220 ... 240 V AC / 220 ... 250 V DC	3WJ9111-0AE06
380 ... 415 V AC	3WJ9111-0AE07

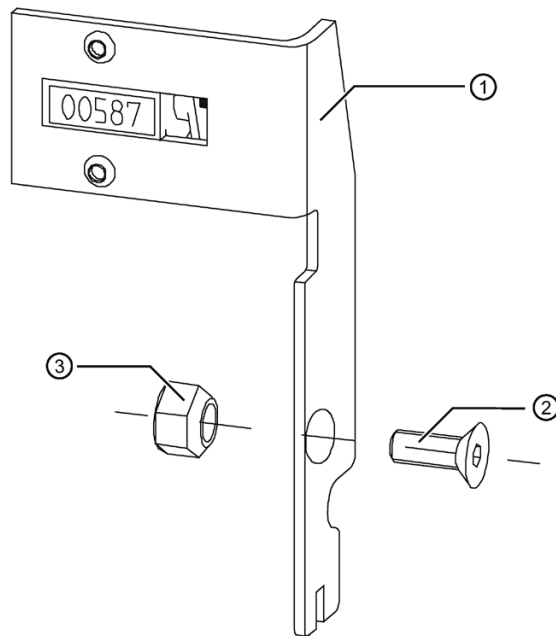
Undervoltage releases (UVR-t) with time delay 0.2 ... 3.2 s	Part number
110 ... 127 V AC / 110 ... 125 V DC	3WJ9111-0AE15
220 ... 240 V AC / 220 ... 250 V DC	3WJ9111-0AE16
380 ... 415 V AC	3WJ9111-0AE17

3.3.3 Counting mechanism

Article No.

Description	Article No.
5-digit operating cycles counter	3WJ9111-0AH04

Check the contents of the packaging



①	Counting mechanism, complete	1x
②	DIN 7991 countersunk screw M6 x 16 - 8	1x
③	Conical nut	1x

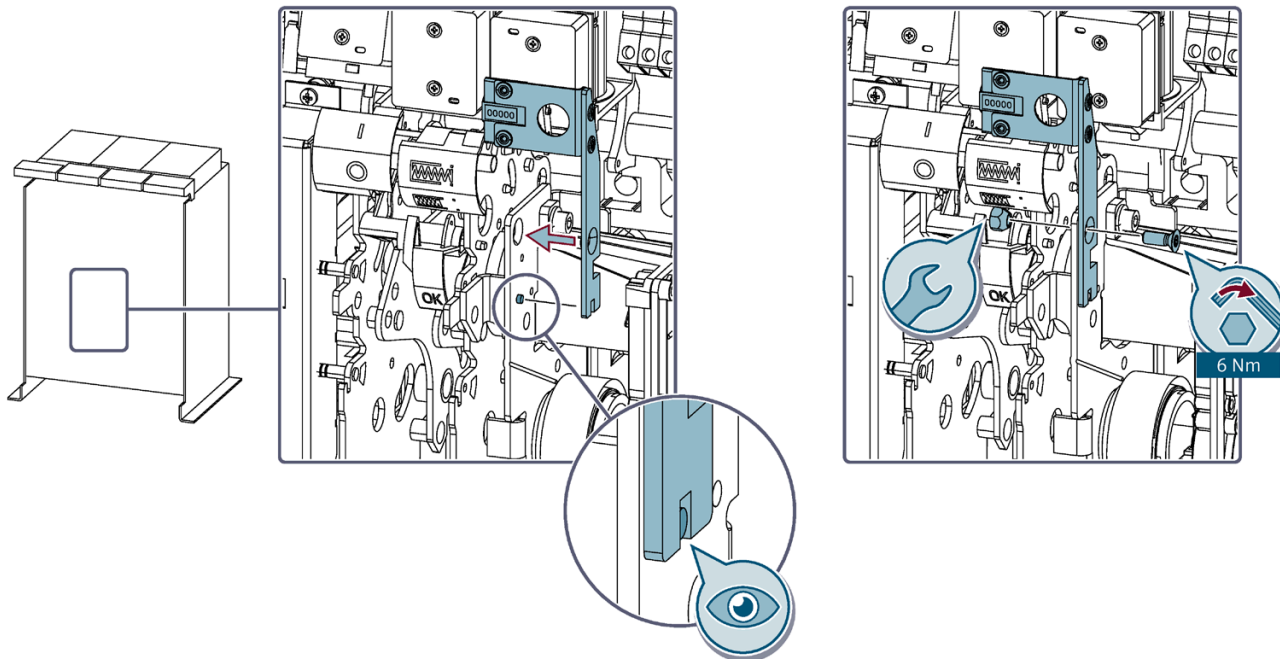
Preparatory work

1. Open the Circuit Breaker and discharge the stored-energy spring.
 2. Rack the Circuit Breaker into maintenance position (disconnected position) and remove it from the guide frame (only withdrawable Circuit Breakers).
 3. Remove the operator panel and the secondary disconnect terminals.
- See chapter Preparation for maintenance work (Page 178)

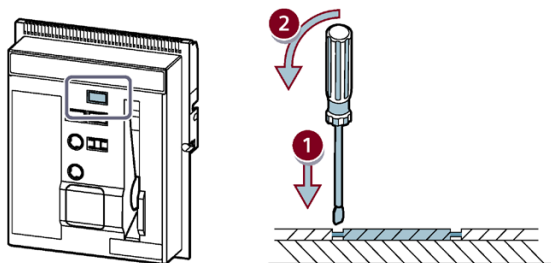
Removing the operator panel

See chapter Preparatory and concluding installation steps for the installation of internal accessories (Page 57)

Installing the counting mechanism



Installing the display window



- Place the operator panel onto a wooden board (make sure that it is in full contact with the surface) near the outline to be cut out.
- Use a screwdriver to cut out the groove base from the pre-pressed groove.

Functional check

Charge the stored-energy spring mechanism and watch the counting mechanism. Once the charging process is complete, the counting mechanism is incremented by one.

CAUTION

Taking the necessary precautions, close and open the Circuit Breaker to discharge the stored-energy spring mechanism.

Installing the operator panel

See chapter Preparatory and concluding installation steps for the installation of internal accessories (Page 57)

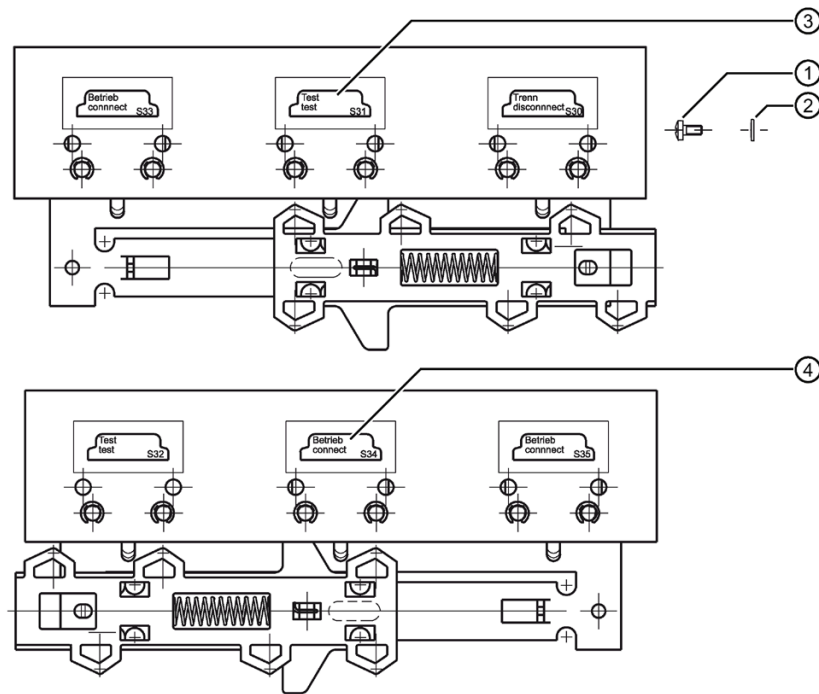
3.4 Monitoring switches and signaling accessories

3.4.1 Position signaling switch for guide frame

Article No.

Description	Article No.
Position signaling switch module (For withdrawable Circuit Breaker only)	3WJ9111-0AH11
Position signaling switch module (For withdrawable Circuit Breaker only)	3WJ9111-0AH12

Check the contents of the packaging



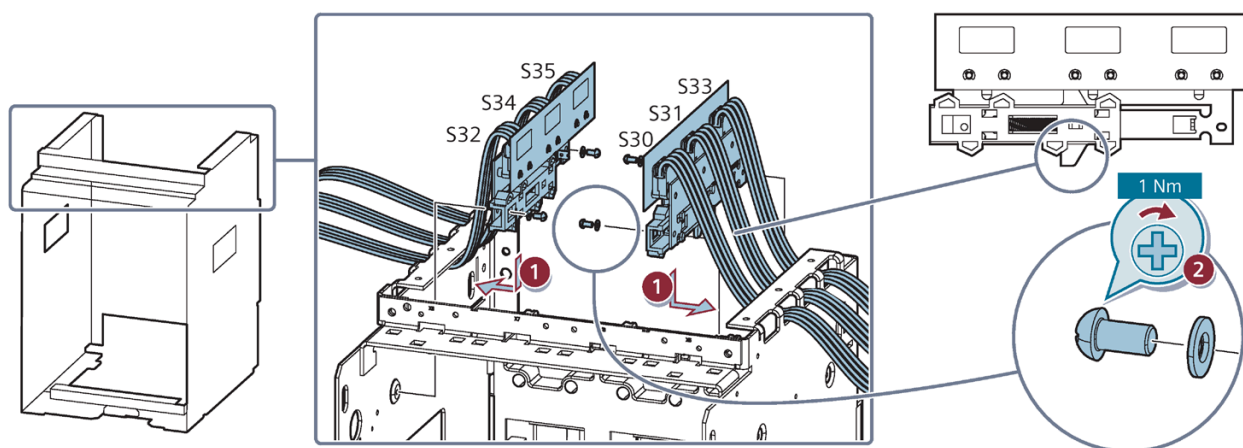
- | | | |
|---|----------------------------------|-----|
| ① | Screw | 4 x |
| ② | Washer | 4 x |
| ③ | Position signaling switch module | 1 x |
| ④ | Position signaling switch module | 1 x |

Preparatory work

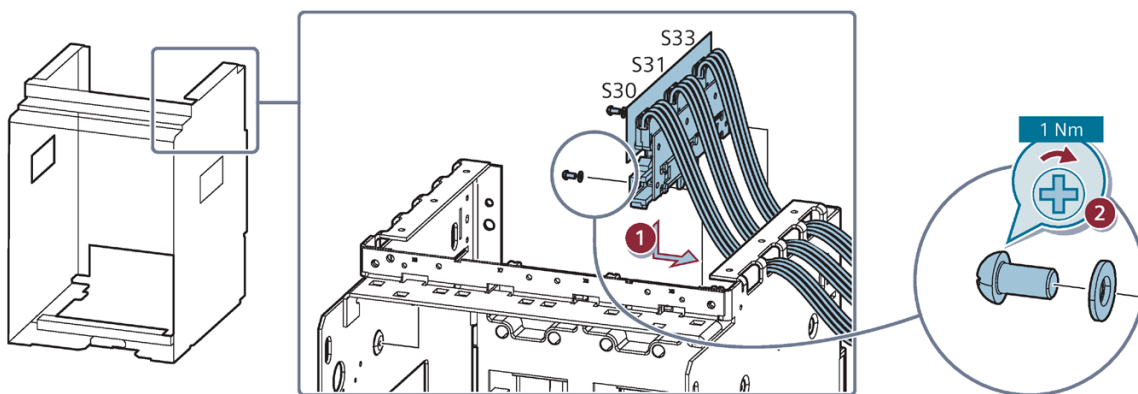
1. Open the Circuit Breaker and discharge the stored-energy spring.
 2. Rack the Circuit Breaker into maintenance position (disconnected position) and remove it from the guide frame (only withdrawable Circuit Breakers).
 3. Remove the operator panel and the secondary disconnect terminals.
- See chapter Preparation for maintenance work (Page 178).

Installing the position signaling switch

3WJ9111-0AH11



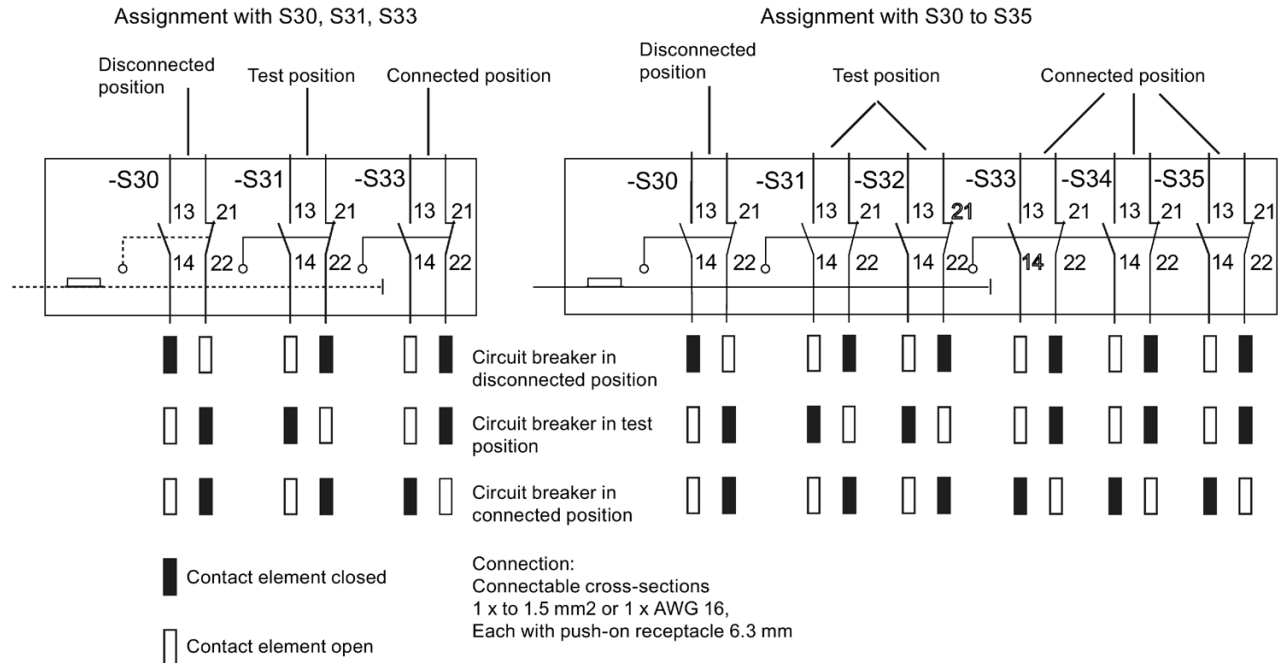
3WJ9111-0AH12



For fixing use a cross-tip screwdriver (size 2).

Connecting the position signaling switch

Circuit diagrams



3.5 Accessories for main connections

3.5.1 Connection bars for guide frame (frame size I)

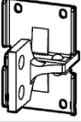

Article No.

Description		Article No.
Vertical connection for guide frame	Size I, up to 1000 A, S class	3WJ9111-0AV11 3WJ9111-0AV12
	Size I, up to 1250 A, S class	3WJ9111-0AV13 3WJ9111-0AV14
	Size I, 1600 A, S class	3WJ9111-0AV15 3WJ9111-0AV16
Horizontal connection for guide frame	Size I, up to 1000 A, S class	3WJ9111-0AX11 3WJ9111-0AX12
	Size I, up to 1250 A, S class	3WJ9111-0AX13 3WJ9111-0AX14
	Size I, 1600 A, S class	3WJ9111-0AX15 3WJ9111-0AX16

Check the contents of the packaging

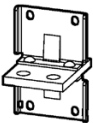

Vertical connections

FS 1

3WJ9111-...	...0AV11	...0AV12	...0AV13	...0AV14	...0AV15	...0AV16
	1000 A		1250 A		1600 A	
	3P	4P	3P	4P	3P	4P
	3x	4x	3x	4x	3x	4x
 M6x25	12x	16x	12x	16x	12x	16x

Horizontal connections

FS 1

3WJ9111-...	...0AX11	...0AX12	...0AX13	...0AX14	...0AX15	...0AX16
	1000 A		1250 A		1600 A	
	3P	4P	3P	4P	3P	4P
	3x	4x	3x	4x	3x	4x
 M6x25	12x	16x	12x	16x	12x	16x

Preparatory work

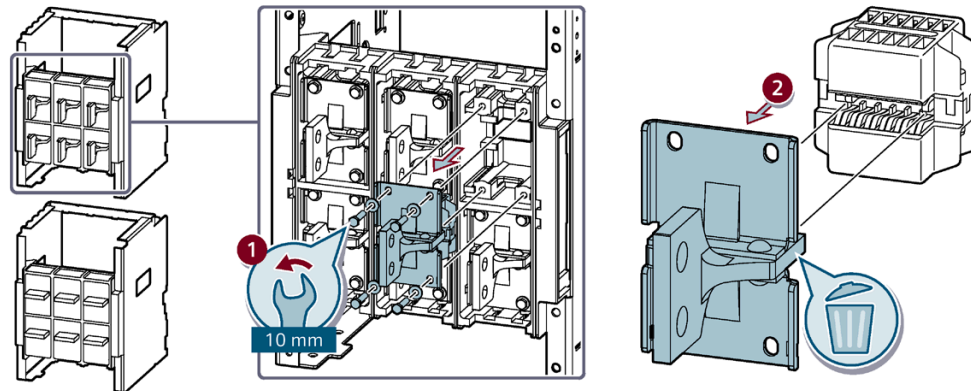
1. Open the Circuit Breaker and discharge the stored-energy spring.
2. Rack the Circuit Breaker into maintenance position (disconnected position) and remove it from the guide frame (only withdrawable Circuit Breakers).
3. Remove the operator panel and the secondary disconnect terminals.

See chapter Preparation for maintenance work (Page 178)

Installing the connection bars

1. Remove any present connection bars. To do so, unscrew the fixing screws and remove the connection bars from the finger clusters. Throw the removed connection bars into the trash.

3WJ9111-0AV1. 3WJ9111-0AX1. FS 1



2. Insert the new connection pieces as shown and secure them by means of the enclosed screws and strain washers.

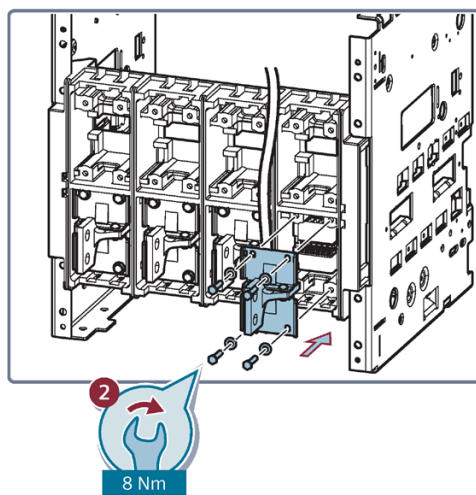
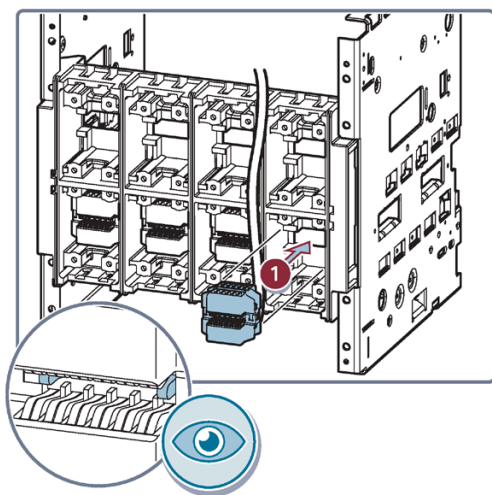
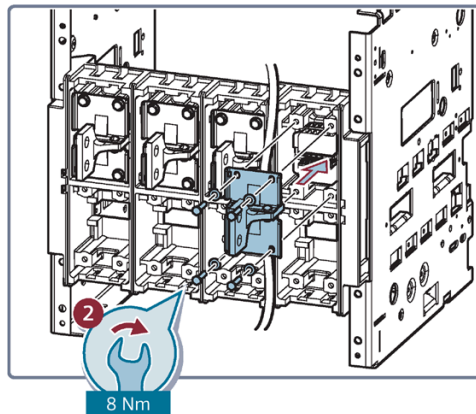
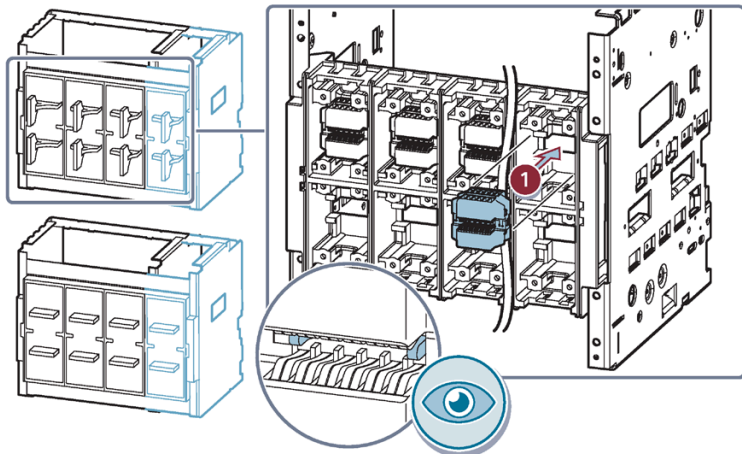
NOTICE

Position of finger clusters

Insert finger clusters only in the position shown in the pictures below.

3.5 Accessories for main connections

3WJ9111-0AV1. 3WJ9111-0AX1. FS1 3P: 3x 4P: 4x



3.5.2 Connection bars for guide frame (frame size II)

Article No.

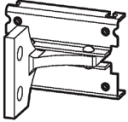
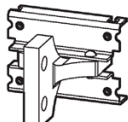
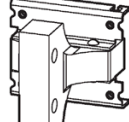
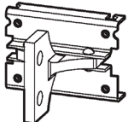
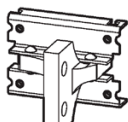
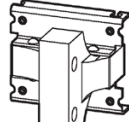
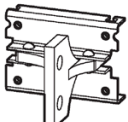


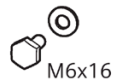
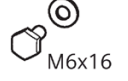

Description		Article No.
Vertical connection for guide frame, sets	Size II, 2000 A, 3P	3WJ9111-0AV21
	Size II, 2000 A, 4P	3WJ9111-0AV22
	Size II, 2000 A, 4P	3WJ9111-0AV27
	Size II, 2500 A, 3P	3WJ9111-0AV23
	Size II, 2500 A, 4P	3WJ9111-0AV24
	Size II, 3200 A, 3P	3WJ9111-0AV25
	Size II, 3200 A, 4P	3WJ9111-0AV26
	Size II, 4000 A, 3P	3WJ9111-0AV31 ¹⁾
	Size II, 4000 A, 4P	3WJ9111-0AV32 ¹⁾
Horizontal connection for guide frame, sets	Size II, 2000 A, 3P	3WJ9111-0AX21
	Size II, 2000 A, 4P	3WJ9111-0AX22
	Size II, 2500 A, 3P	3WJ9111-0AX23
	Size II, 2500 A, 4P	3WJ9111-0AX24
	Size II, 3200 A, 3P	3WJ9111-0AX25
	Size II, 3200 A, 4P	3WJ9111-0AX26

¹⁾ = Only available with initial order and installation by Siemens modification center.

Check the contents of the packaging

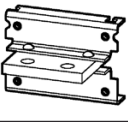
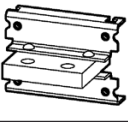
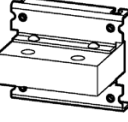
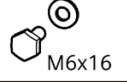
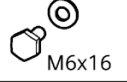
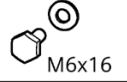
Vertical connection

FS 2

3WJ9111-...	...0AV21	...0AV22	...0AV27	3WJ9111-...	...0AV23	...0AV24	3WJ9111-...	...0AV25	...0AV26
	2000 A				2500 A			3200 A	
	3P	4P	4P		3P	4P		3P	4P
	1x	1x	2x		1x	1x		1x	1x
	1x	1x	1x		2x	3x		2x	3x
	1x	2x	1x						
	12x	16x	16x		12x	16x		12x	16x

Horizontal connection

FS 2

3WJ9111-...	...0AX21	...0AX22	3WJ9111-...	...0AX23	...0AX24	3WJ9111-...	...0AX25	...0AX26
	2000 A			2500 A			3200 A	
	3P	4P		3P	4P		3P	4P
	3x	4x		3x	4x		3x	4x
	12x	16x		12x	16x		12x	16x

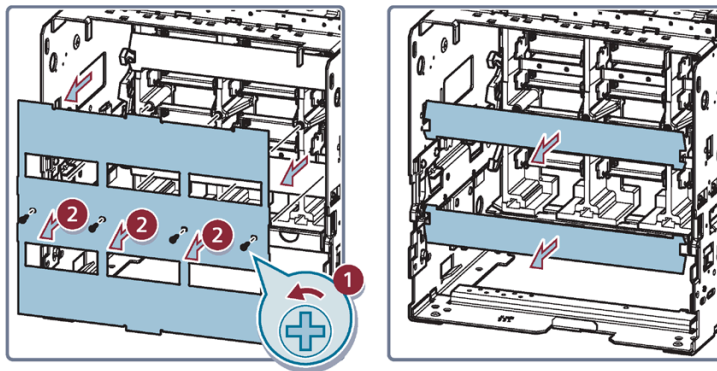
Preparatory work

1. Open the Circuit Breaker and discharge the stored-energy spring.
2. Rack the Circuit Breaker into maintenance position (disconnected position) and remove it from the guide frame (only withdrawable Circuit Breakers).
3. Remove the operator panel and the secondary disconnect terminals.

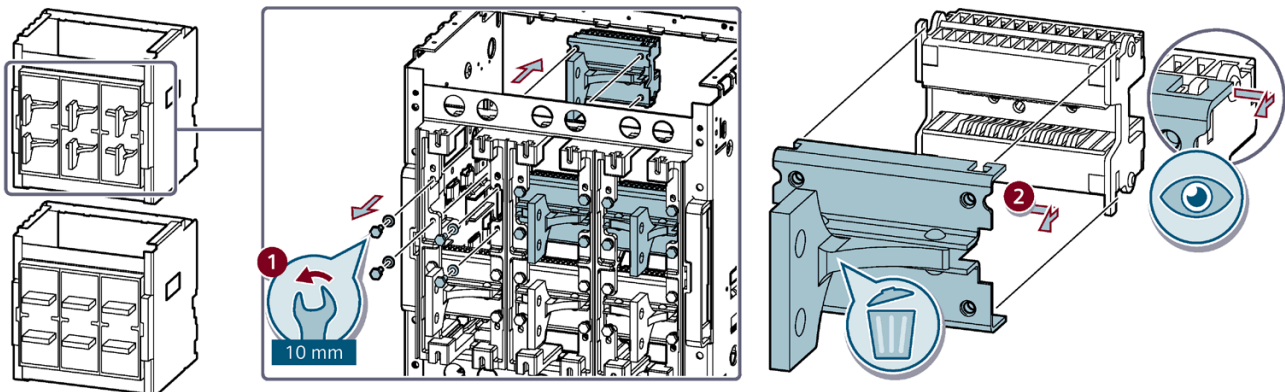
See chapter Preparation for maintenance work (Page 178)

Installing the connection bars

1. Unscrew any connection bars. To do so, unscrew the fixing screw and remove the connection bars with the finger clusters. Throw the removed connection bars into the trash. If present remove the shutter first.



3WJ9111-0AV2. | 3WJ9111-0AX2. | FS 2



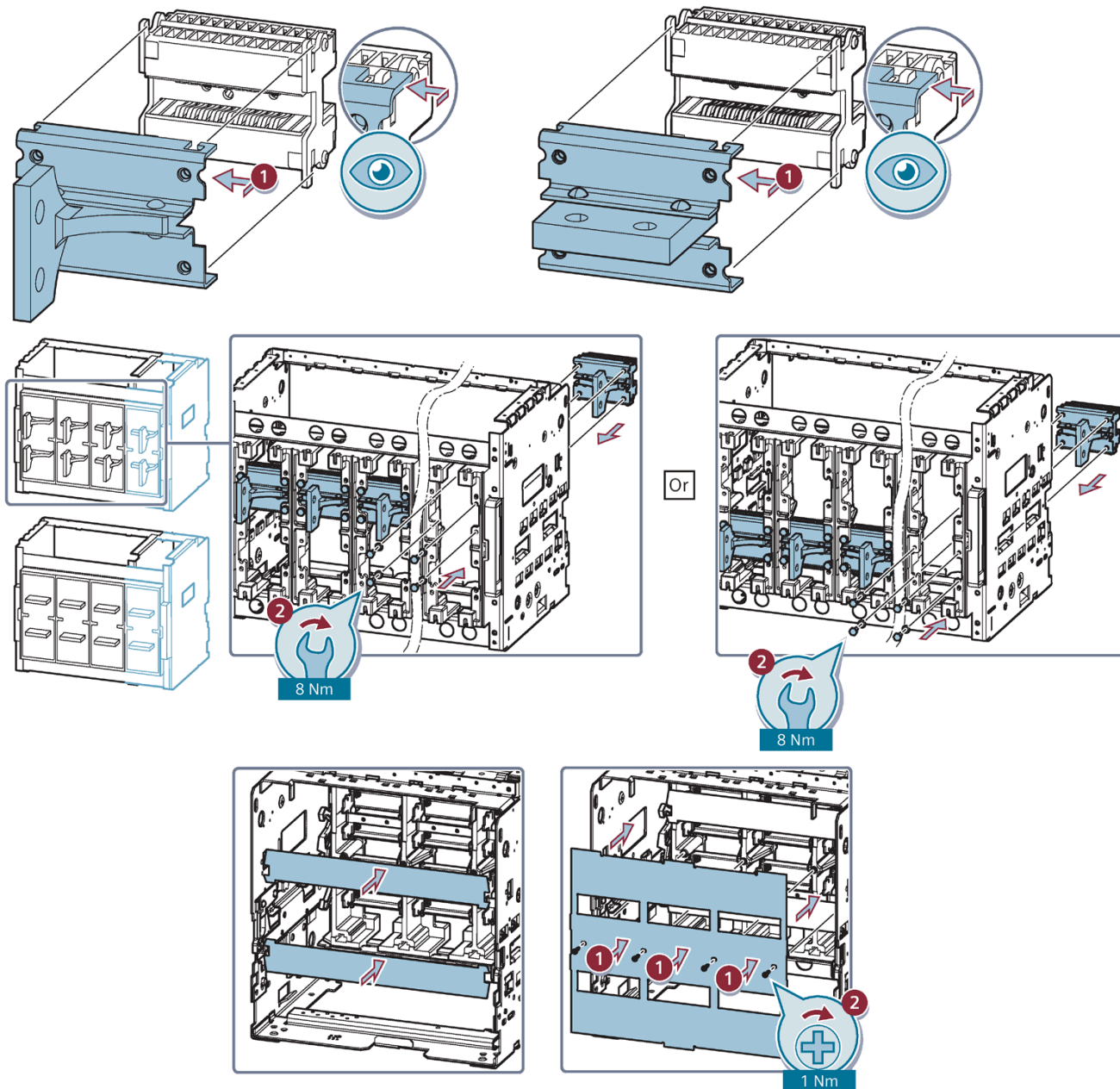
2. Insert the new connection bars and secure them by means of the enclosed screws and strain washers. If present, install the shutter again.

NOTICE

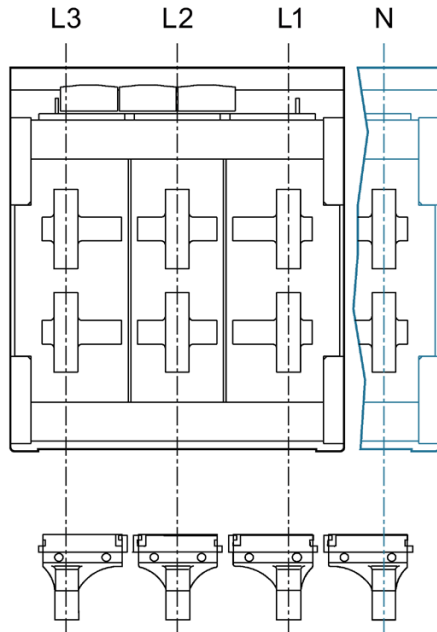
Position of finger clusters

Insert finger clusters only in the position shown in the pictures below.

3WJ9111-0AV2. | 3WJ9111-0AX2. | FS2 | 3P: 3x 4P: 4x



Arrangement of the connection bars



3.5.3 Vertical connections for fixed-mounted Circuit Breaker

Article No.



Description		Article No.
Vertical connection for fixed-mounted Circuit Breaker	Size I, 1000 A, S class, 3P	3WJ9111-0AM11
	Size I, 1000 A, S class, 4P	3WJ9111-0AM12
	Size I, 1250 A, S class, 3P	3WJ9111-0AM13
	Size I, 1250 A, S class, 4P	3WJ9111-0AM14
	Size I, 1600 A, S class, 3P	3WJ9111-0AM15
	Size I, 1600 A, S class, 4P	3WJ9111-0AM16
	Size II, 2000 A, 3P	3WJ9111-0AM21
	Size II, 2000 A, 4P	3WJ9111-0AM22
	Size II, 2500 A, 3P	3WJ9111-0AM23
	Size II, 2500 A, 4P	3WJ9111-0AM24
	Size II, 3200 A, 3P	3WJ9111-0AM25
	Size II, 3200 A, 4P	3WJ9111-0AM26
	Size II, 4000 A, 3P	3WJ9111-0AM31 ¹⁾
	Size II, 4000 A, 4P	3WJ9111-0AM32 ¹⁾

¹⁾ = Only available with initial order and installation by Siemens modification center.

Check the contents of the packaging









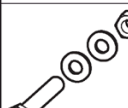
Frame size I

FS 1

3WJ9111-...	...0AM11	...0AM12	...0AM13	...0AM14	...0AM15	...0AM16
	1000 A		1250 A		1600 A	
	3P	4P	3P	4P	3P	4P
	3x	4x	3x	4x	3x	4x
 M12x30	6x	8x	6x	8x	6x	8x

Frame size II

FS 2

3WJ9111-...	...0AM21	...0AM22	3WJ9111-...	...0AM23	...0AM24	3WJ9111-...	...0AM25	...0AM26
	2000 A			2500 A			3200 A	
	3P	4P		3P	4P		3P	4P
	1x	1x		1x	1x		1x	1x
	2x	3x		2x	3x		2x	3x
 M12x45	6x	8x	 M12x45	6x	8x	 M12x80	6x	8x

Note

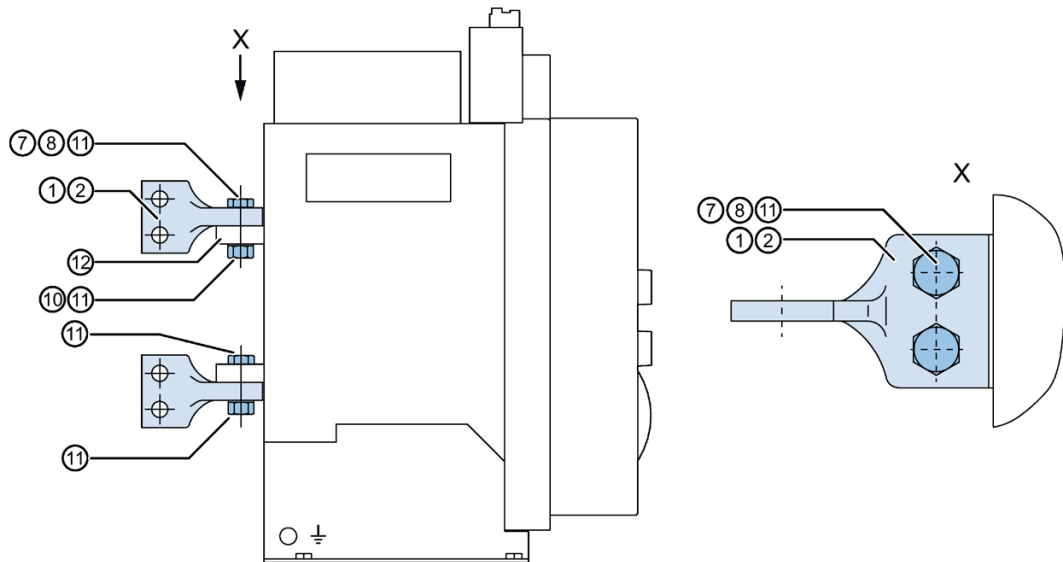
Please order the number of connecting bars as required for the application.

Preparatory work

1. Open the Circuit Breaker and discharge the stored-energy spring.
2. Remove the operator panel and the secondary disconnect terminals

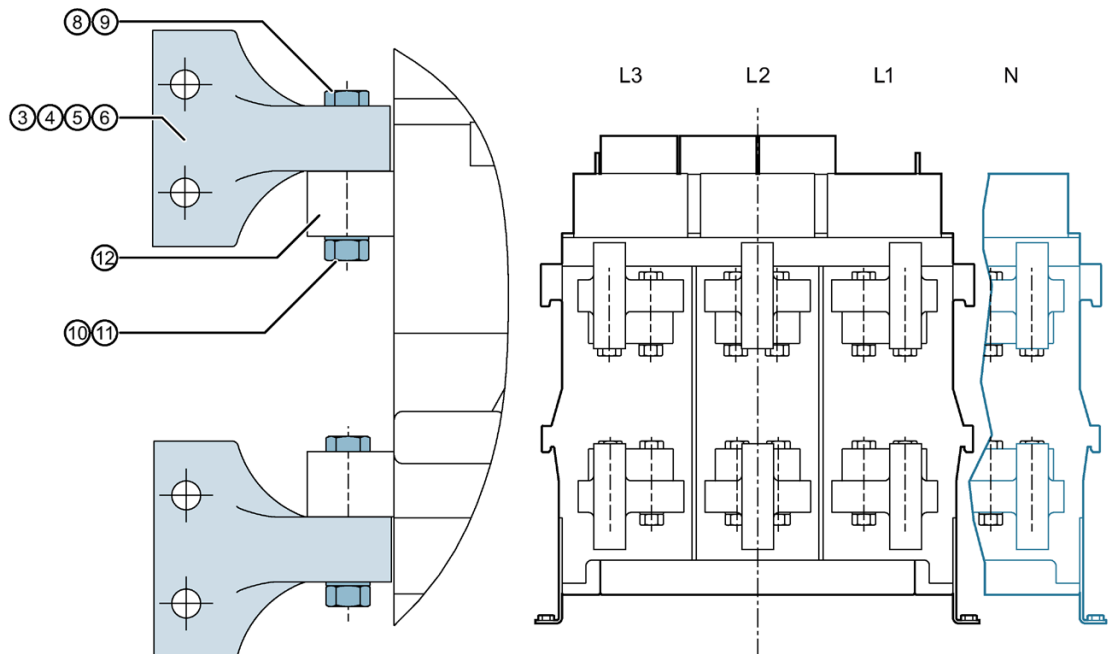
See chapter Preparation for maintenance work (Page 178)

Installing the connection pieces (frame size I)



Place the connection piece ① or ② on the connection bar ⑫ as shown and secure by means of a hexagon socket-head screw ⑦ or ⑧, strain washer ⑪ and hexagon nut ⑩ (tightening torque: 70 ± 7 Nm).

Installing the connection pieces (frame size II)



Place the connection pieces ③ and ④ or ⑤ and ⑥ on the connection bar ⑫ as shown and secure by means of a hexagon socket-head screw ⑧ or ⑨, strain washer ⑪ and hexagon nut ⑩ (tightening torque: 70 ± 7 Nm).

Note

Make sure that connection pieces ③ and ④ or ⑤ and ⑥ (symmetrical and asymmetrical) are mounted in the correct position. The 3-pole version does not have the outer connections on the right.

3.6 Accessories for secondary disconnect terminals

3.6.1 Secondary disconnect terminals for fixed-mounted Circuit breakers

The secondary disconnect terminal for fixed-mounted circuit breakers comprises:

- Base part for secondary disconnect terminal with coding kit
- Compression screw connection terminal for secondary disconnect terminals

The blank cover for secondary disconnect terminals is also available as an accessory for unused secondary disconnect terminal blocks.

Article no.

Secondary disconnect terminals for fixed-mounted circuit breakers	Part number
Base part for secondary disconnect terminal with coding kit	3WJ9111-0AB01
Compression screw terminal for secondary disconnect terminals	3WJ9111-0AB03
Blank cover	3WJ9111-0AB04

Preparatory work

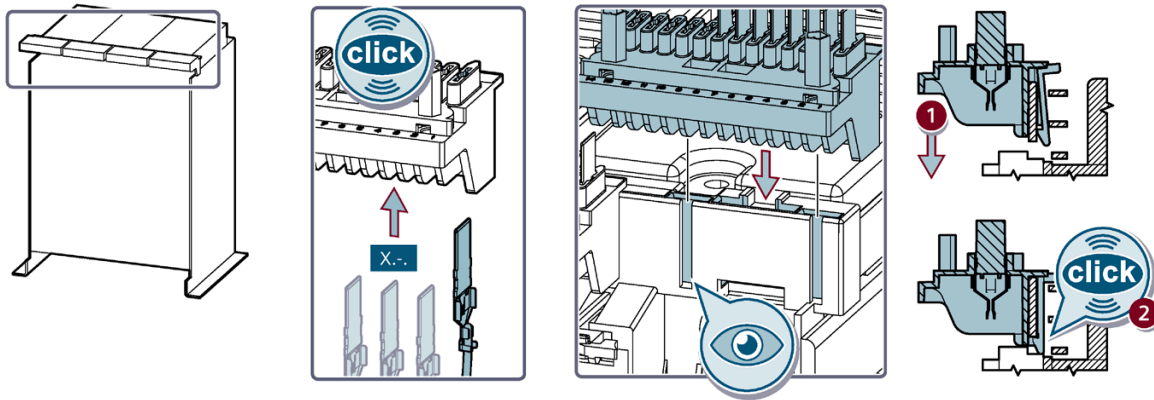
1. Open the Circuit Breaker and discharge the stored-energy spring.
2. Rack the Circuit Breaker into maintenance position (disconnected position) and remove it from the guide frame (only withdrawable Circuit Breakers).
3. Remove the operator panel and the secondary disconnect terminals.

See chapter Preparatory and concluding installation steps for the installation of internal accessories (Page 57).

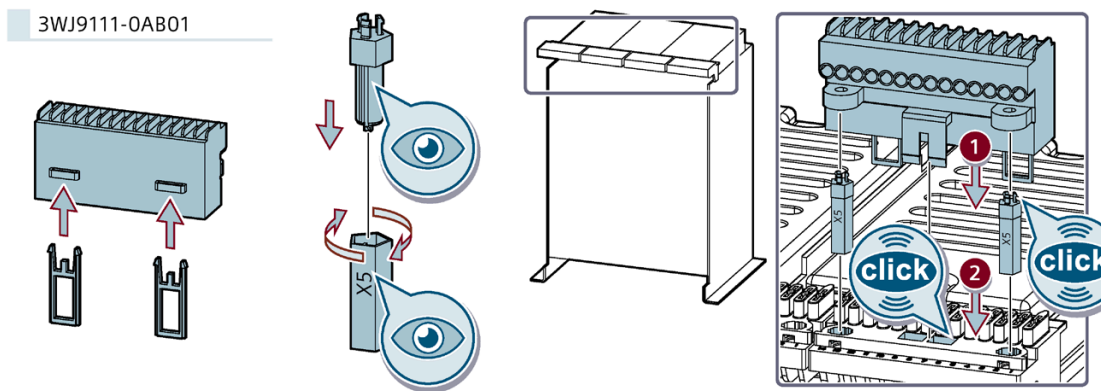
3.6 Accessories for secondary disconnect terminals

Base part for secondary disconnect terminals

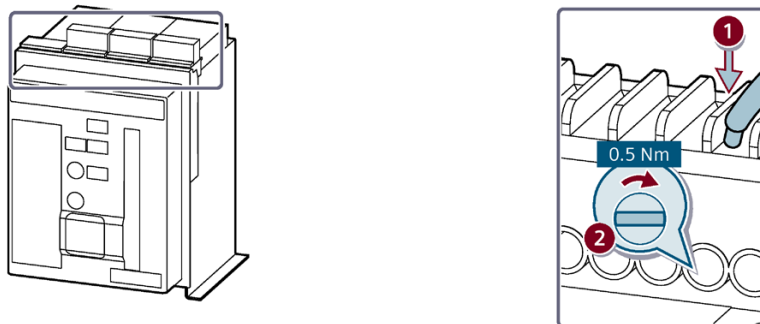
To connect the base part, insert the blade connectors of the corresponding accessory into the base part. Then install the base part to the Circuit breaker.



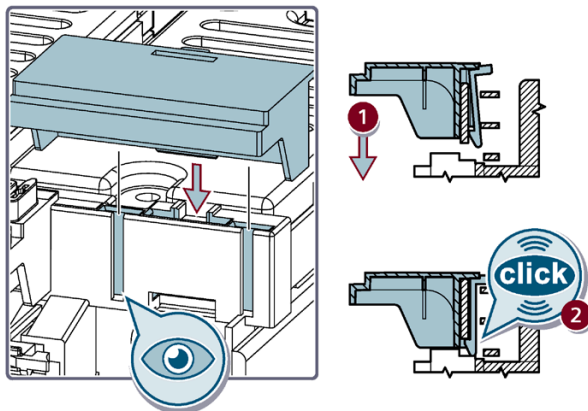
Manual connector and coding kit for secondary disconnect terminals



Connection of secondary disconnect terminals



Installation of blank cover



3.6.2 Secondary disconnect terminals for withdrawable Circuit breakers

The secondary disconnect terminal for the withdrawable circuit breaker comprises:

- Sliding disconnect secondary contact modules for guide frame
- Base part for secondary disconnect terminal
- Compression screw terminal for secondary disconnect terminals

Article no.

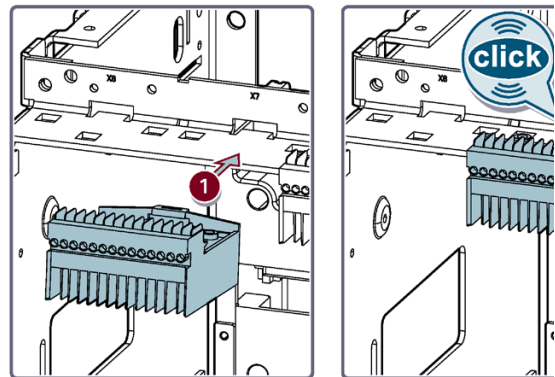
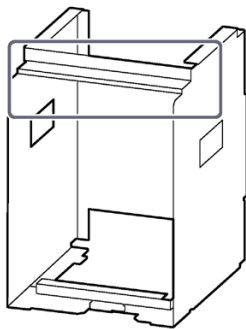
Secondary disconnect terminals for fixed-mounted circuit breakers	Part number
Base part for secondary disconnect terminal with coding kit	3WJ9111-0AB01
Sliding disconnect secondary contact modules for guide frame	3WJ9111-0AB02
Compression screw terminal for secondary disconnect terminals	3WJ9111-0AB03

Preparatory work

1. Open the Circuit Breaker and discharge the stored-energy spring.
2. Rack the Circuit Breaker into maintenance position (disconnected position) and remove it from the guide frame (only withdrawable Circuit Breakers)
3. Remove the operator panel and the secondary disconnect terminals

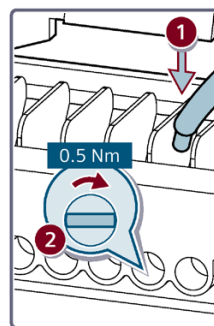
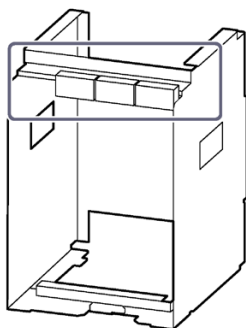
See chapter Preparatory and concluding installation steps for the installation of internal accessories (Page 57).

Sliding disconnect secondary contact modules for guide frame



Installation of the other accessory components for the secondary disconnect terminals corresponds to that of the fixed-mounted circuit breakers, see Chapter Secondary disconnect terminals for fixed-mounted Circuit breakers (Page 83).

Connection of secondary disconnect terminals



3.7 Accessories for the Electronic Trip Unit

3.7.1 Hand-held test device

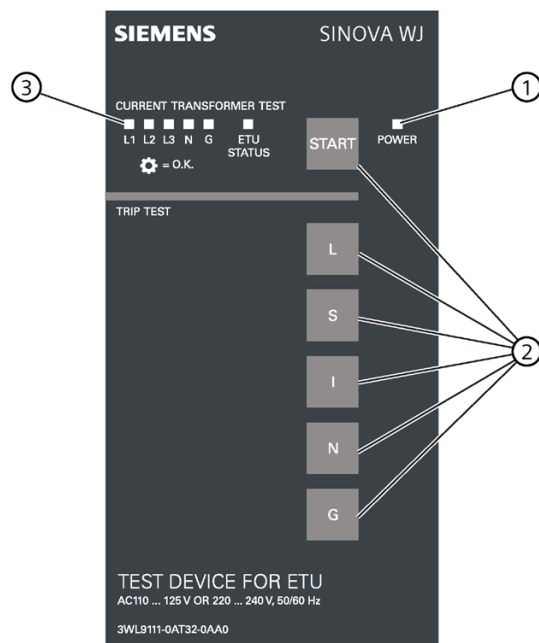
The hand-held test device is used to check that the following devices function properly:

- Electronic trip unit
- Energy and current transformer
- Tripping solenoid F5
- Measured value display

Article No.

Description	Article No.
Manual function tester for electronic trip unit	3WL9111-0AT32-0AA0


View



- ① LED for indicating the operating voltage
- ② Control keys
- ③ 6 LEDs for indicating the test results

Preparatory work

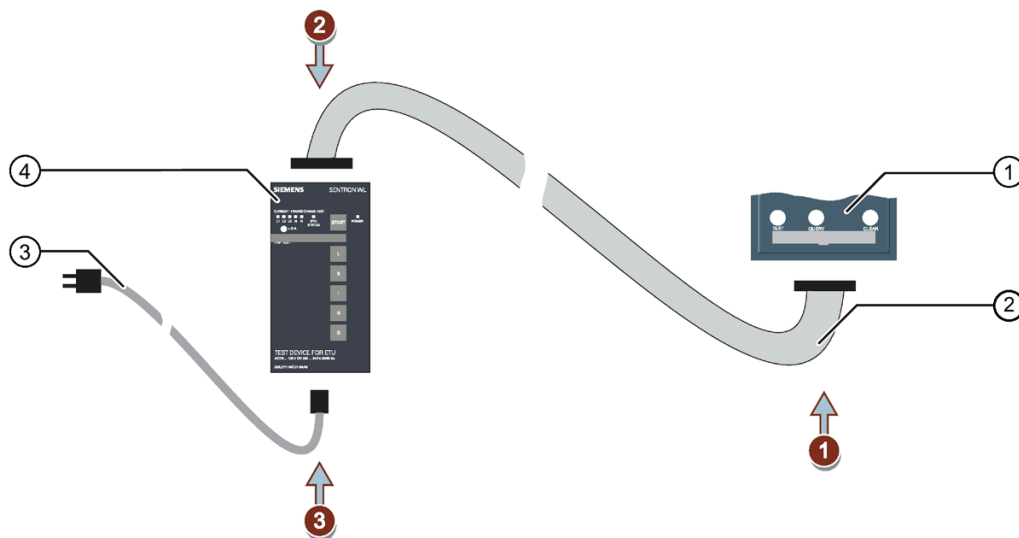
- Open and disconnect the Circuit Breaker.
- Note the setting values of the electronic trip unit.
- Deactivate ground fault protection (if available) on the electronic trip unit ($I_g = \text{OFF}$).
- Setting value $I_R = 1.0 I_n$
- Remove the cover cap from test socket X25 on the ETU.

 CAUTION
<p>Equipment damage</p> <p>If the hand-held test device is used while the Circuit Breaker is closed, this can cause false tripping and destroy the hand-held test device.</p>

Connection

Note

Malfunctions and incorrect test results can occur if the connection sequence is not followed.



- ① Test socket on the electronic trip unit
- ② Cable with SUB D (40 pole) (hand-held test device) to plug connector (40 pole)
- ③ Power supply
- ④ Hand-held test device

Power supply

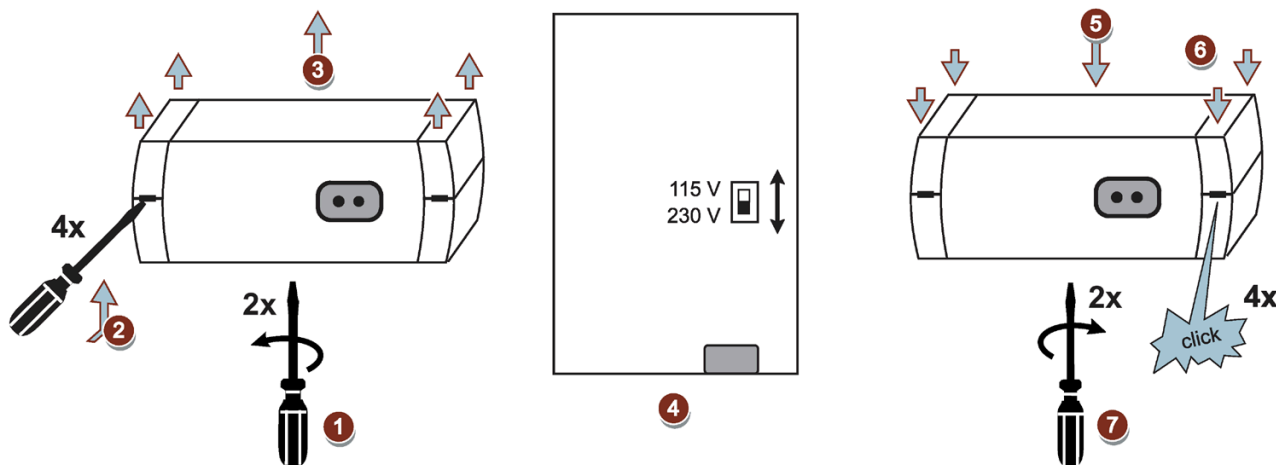
The hand-held test device is supplied from an AC voltage network:

- 220 ... 240 V 50/60 Hz
- 110 ... 125 V 50/60 Hz

Factory setting: 220 ... 240 V

The selector switch is located on the circuit board within the hand-held test device.

Switching the line voltage



Operation

When the power supply is connected, the status test starts automatically with the querying of different electronic trip unit components and parameters. If the status test is successful, the "ETU STATUS" LED lights up (continuous light). If the test is not successful, this means that the electronic trip unit or one of its components is either defective or has not been installed.

Indicator	Meaning
1 x short, pause	Test device defective
2 x short, pause	Electronic trip unit defective
4 x short, pause	<ul style="list-style-type: none"> Parameters set incorrectly Current transformer incorrectly terminated
5 x short, pause	<ul style="list-style-type: none"> Tripping solenoid F5 incorrectly connected or defective Electronic trip unit defective

The status test can be repeated at any time by means of the "START" button (press for at least 3 s). The status test can also be carried out on electronic trip units that have already been activated. In this case, note that the "ETU STATUS" LED may flash twice briefly when the result of the status test is signaled even if no fault is present. To be on the safe side, the electronic trip unit should be deactivated and the status test repeated.

Testing the transformers

To test the energy and current transformers, press the "START" button (for less than 2 s).

START

If the LED lights up, this means that the transformer is functioning properly. If the LED flashes, the transformer is either not installed, incorrectly connected, or defective.

Result of the N transformer test

If the LED flashes (1 s ON, 1 s OFF), this signals a fault with the measuring transformer of the neutral conductor. This might be because a measuring transformer has not been installed (e.g. no external neutral conductor transformer connected), or it has been connected incorrectly, or is defective.

If the LED starts flashing quickly (0.5 s ON, 0.5 s OFF), this signals a fault with the energy transformer of the neutral conductor. This might be because an energy transformer has not been installed (e.g. when an external neutral conductor transformer is connected), or it has been connected incorrectly, or is defective.

Testing the tripping function

- Charge the stored-energy spring mechanism manually.
- Close the Circuit Breaker

To test the tripping function, press either "L", "S", "I", "N", or "G".



The Circuit Breaker trips after the set delay time plus 2 seconds. The reason for tripping can be queried via the "QUERY" button on the electronic trip unit. To do so, the electronic trip unit must have been active for at least 20 minutes. If the Circuit Breaker does not trip, the electronic trip unit is either not equipped with the relevant protection function or is defective.

Testing the measured value display

After the tripping test, the capability of the system to store the reasons for tripping must be tested via the "QUERY" button when the ETU is deactivated.

To test the measured value display, press "I" and "N" simultaneously.



Over a period of 30 s, a current is simulated in L1, L2, L3, N, and G consecutively via the measuring transformer. The LEDs of the corresponding transformers flash. The test is considered successful when current is displayed at the relevant point.

Activating the electronic trip unit

To activate the electronic trip unit, press "N" and "G" simultaneously.



The electronic trip unit remains active until you press a different button.

This function can be used, for example, to test the signaling of the "T.U. Error" LED if the status test ended with the fault "Electronic trip unit defective".

Subsequent steps

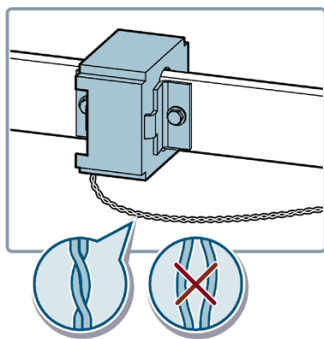
- Restore the setting values you noted down.
- Place the cover cap on test socket X25.

3.7.2 External transformer for neutral conductors (for ETU360WJ)

Note

Cables for secondary connection

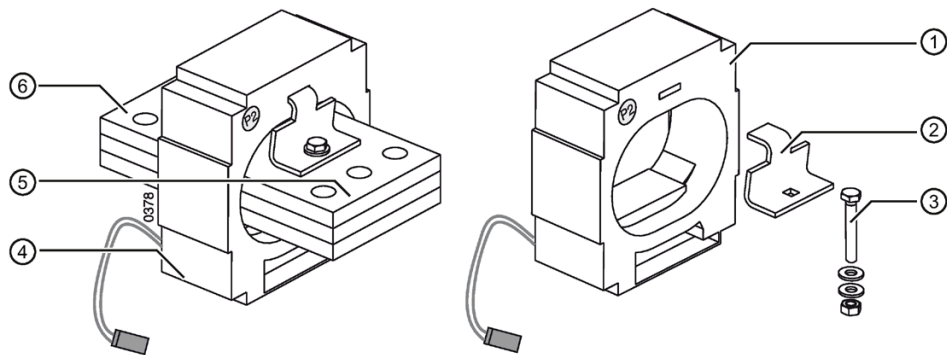
The secondary connection cables from the neutral conductor transformer to the 3WJ Circuit Breaker must be twisted.



Article No.

Description	Article No.	
Current transformers for 3-pole Circuit Breakers, external neutral conductor with copper busbars	Size I	3WJ9111-0AA31
	Size II	3WJ9111-0AA32
Current transformers for 3-pole Circuit Breakers, external neutral conductor without copper busbars	Size I	3WJ9111-0AA21
	Size II	3WJ9111-0AA22

External transformer for neutral conductors



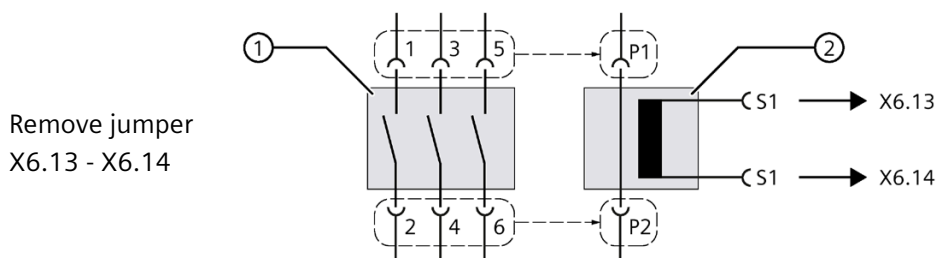
- ① Version for plant-side copper bar
- ② Mounting bracket
- ③ M6 bolt with washers and nut
- ④ Version with copper connection elements
- ⑤ Connection P2
- ⑥ Connection P1

Assignment of connections

This assignment ensures that the current in the Circuit Breaker and external N transformer flows in the same direction.

Note

Any missing auxiliary current connections (secondary disconnect, auxiliary supply connector, sliding contact module for guide frame) can be retrofitted if required.

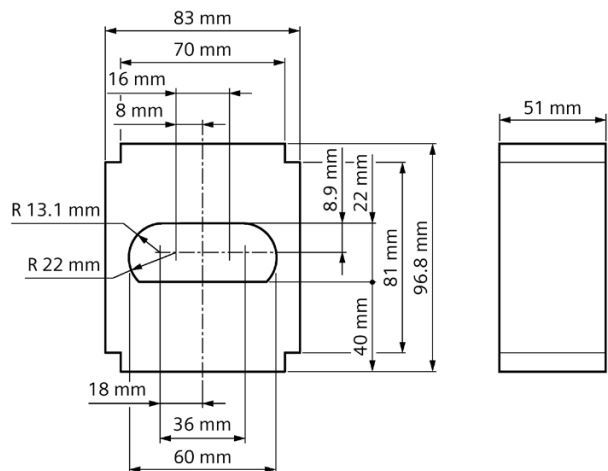


- ① Main circuit
- ② External N transformer

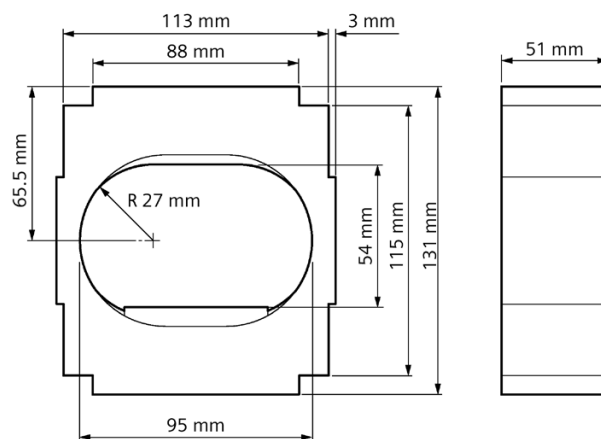
External transformer for neutral conductors - dimension drawings

Without copper bars, Left: FSI, right: FSII

3WJ9111-0AA21

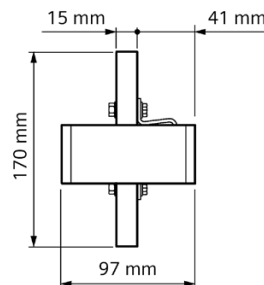
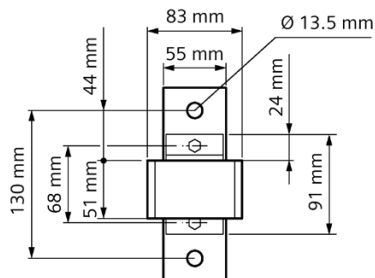


3WJ9111-0AA22

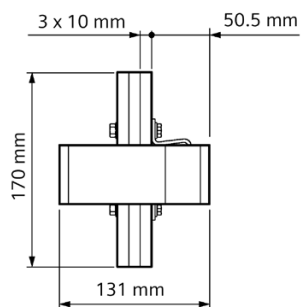
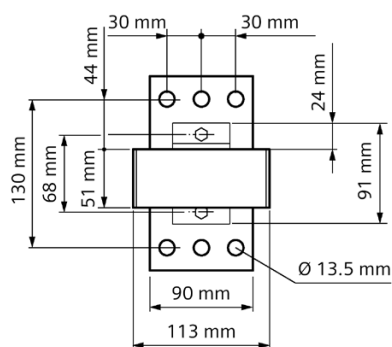


With copper bars, Top: FSI, bottom: FSII

3WJ9111-0AA31



3WJ9111-0AA32



3.7.3 Retrofitting the internal N transformer

Article No.

Description	Article No.
Internal current transformer for neutral conductor, Size I	3WJ9111-0AA14
Internal current transformer for neutral conductor, Size II	3WJ9111-0AA15

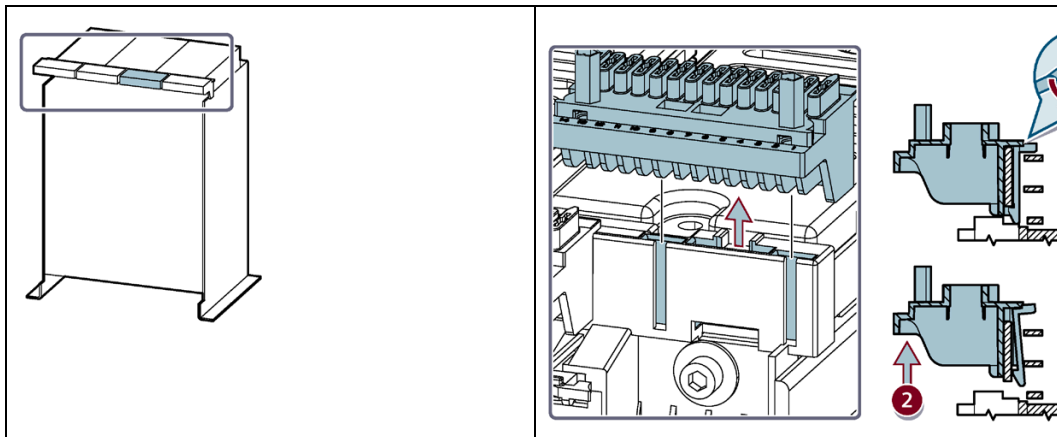
Preparatory work

1. Open the Circuit Breaker and discharge the stored-energy spring.
2. Rack the Circuit Breaker into maintenance position (disconnected position) and remove it from the guide frame (only withdrawable Circuit Breakers).
3. Remove the operator panel and the secondary disconnect terminals.

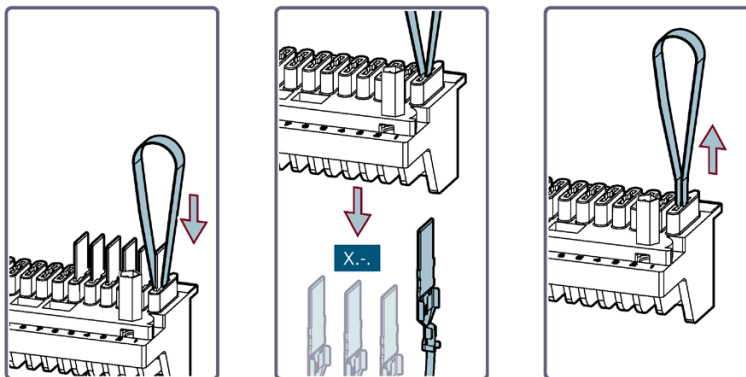
See also chapter Preparation for maintenance work (Page 178)

Retrofitting the Internal current transformer for neutral conductor

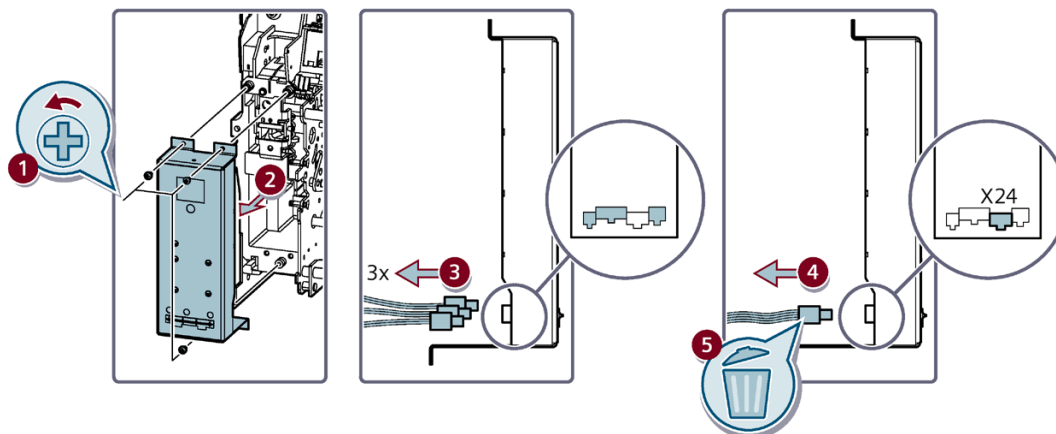
- Remove the secondary disconnect terminal X6



- Remove the connecting plates at X6-13 and X6-14

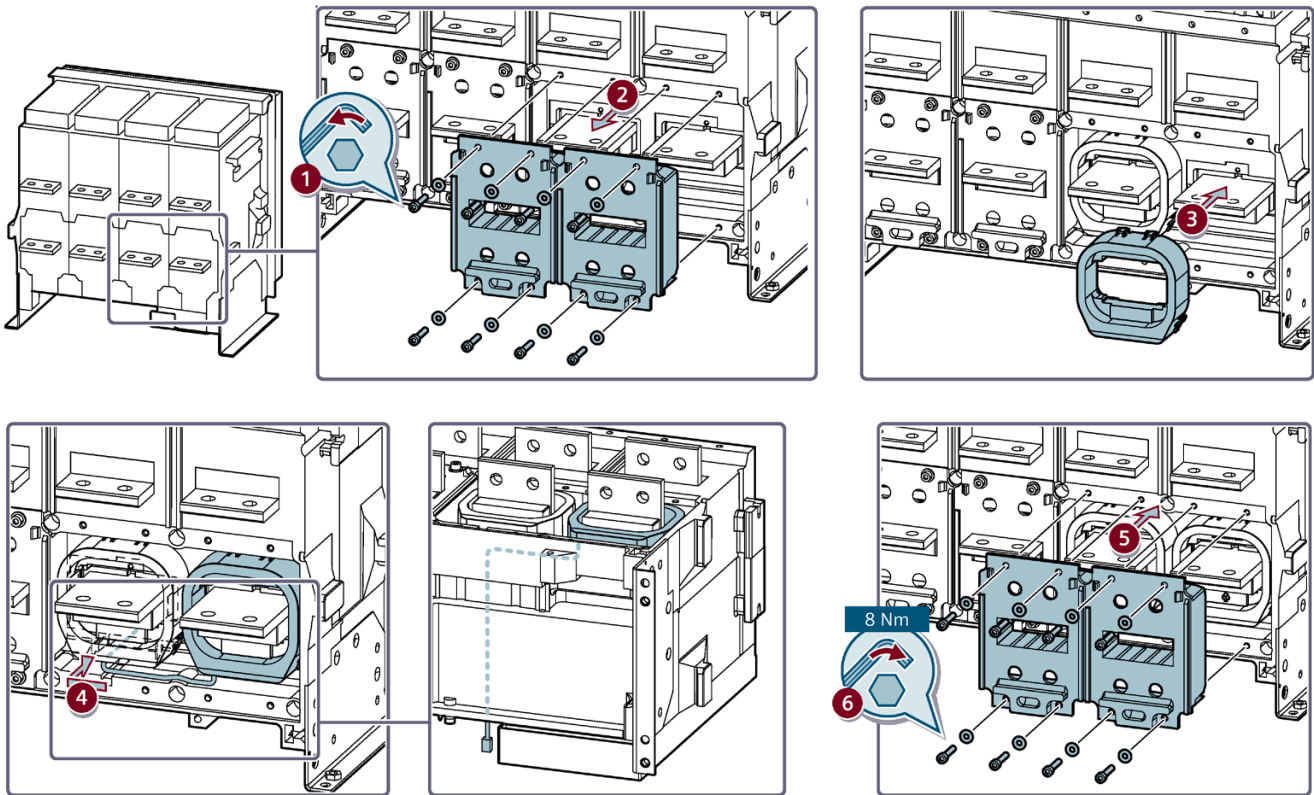


- Remove the electronic trip unit (for details, see Testing of settings and inspection of the electronic trip unit (Page 175)).

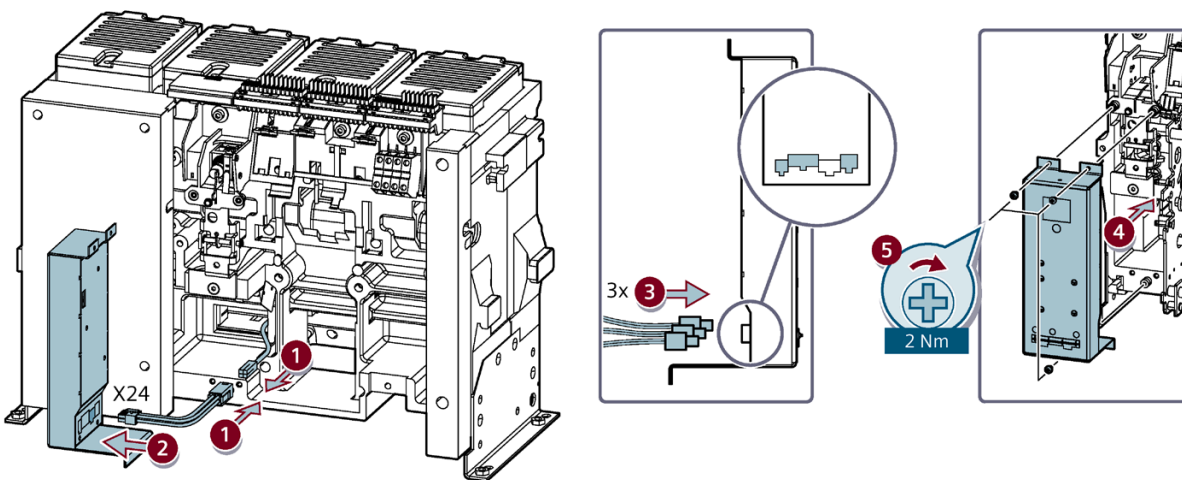


3.7 Accessories for the Electronic Trip Unit

- Install the internal current transformer for neutral conductor as shown below



- Install the ETU again and wire the current transformer as shown below (for details, see Testing of settings and inspection of the electronic trip unit (Page 175)).

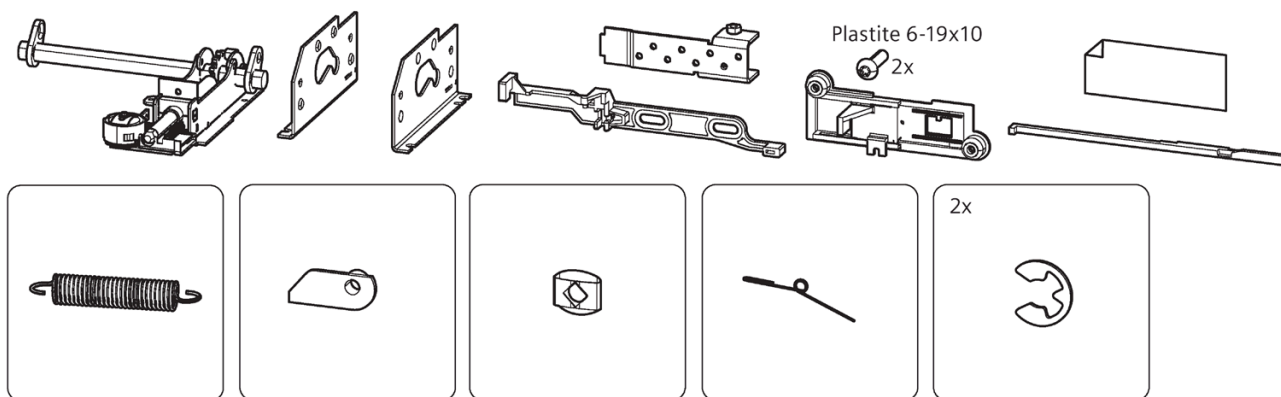


3.8 Conversion sets - fixed-mounted Circuit Breakers to withdrawable Circuit Breakers

Article No.

Description		Article No.
Conversion set from fixed-mounted to withdrawable version	Size I, up to 1600 A, 3P	3WJ9111-0BC11
	Size I, up to 1600 A, 4P	3WJ9111-0BC12
	Size II, up to 4000 A, 3P	3WJ9111-0BC14
	Size II, up to 4000 A, 4P	3WJ9111-0BC15

Check the contents of the packaging



3WJ9111-.....	...0BC11 / 12	...0BC14 / 15
	3P	4P
M6.4	3x	3x
M6x12	4x / 5x	4x / 5x
M6x30	2x	2x
M6x20	8x	8x

Article number	Frame size	Number of poles	Dimension "I" (Part 1)
3WJ9111-0BC11	I	3	281
3WJ9111-0BC14	II	3	381
3WJ9111-0BC12	I	4	371
3WJ9111-0BC15	II	4	501

Preparatory work

1. Open the Circuit Breaker and discharge the stored-energy spring.
 2. Remove the operator panel and the secondary disconnect terminals.
- See chapter Preparation for maintenance work (Page 178)

Removing the operator panel

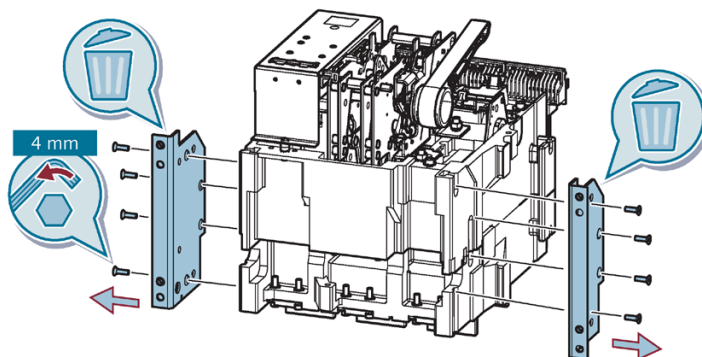
See chapter Preparatory and concluding installation steps for the installation of internal accessories (Page 57)

Removing the circuit breaker angle brackets

Note

Equipment damage

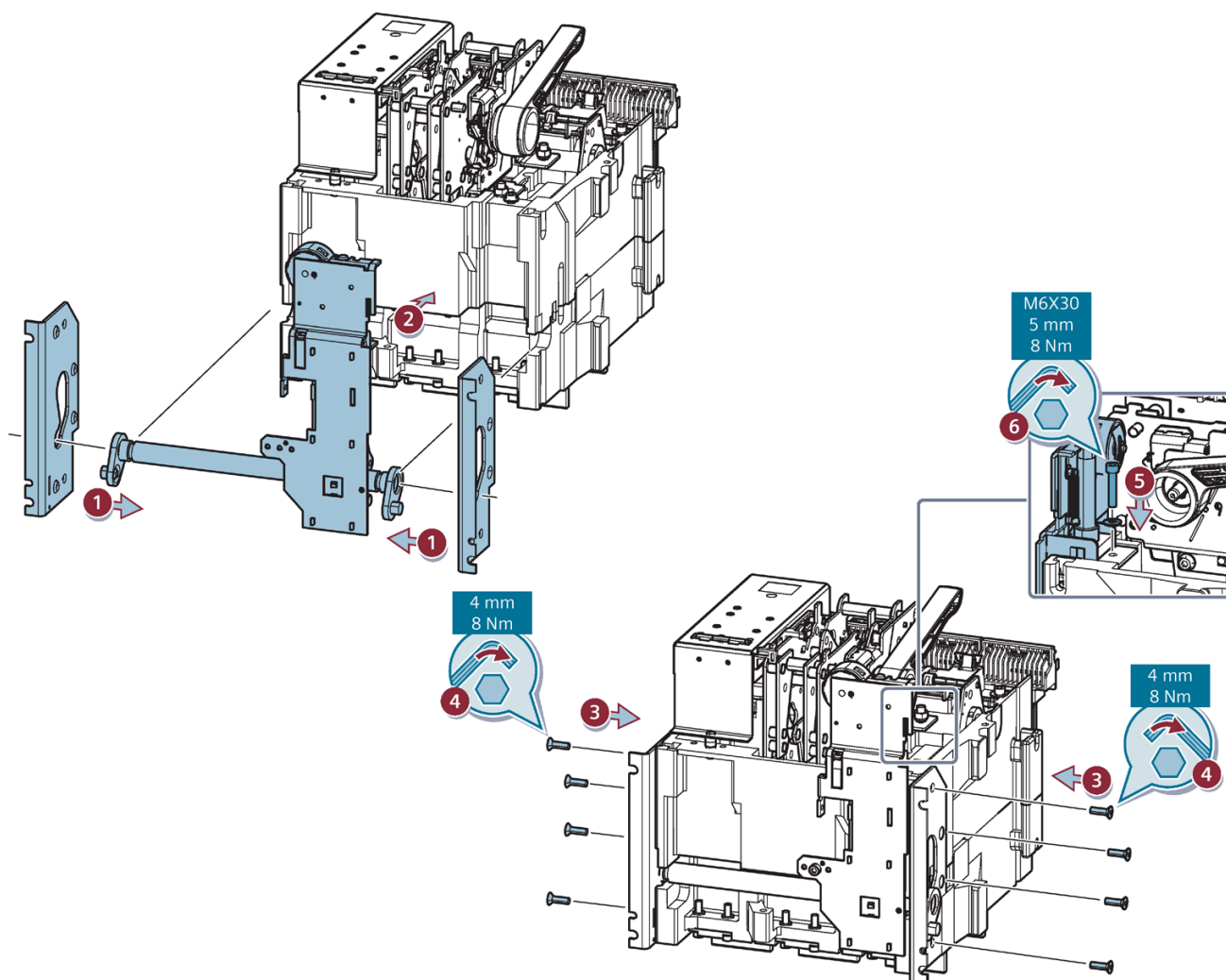
Place the circuit breaker on its rear side and on a soft surface to safely remove the angle brackets.



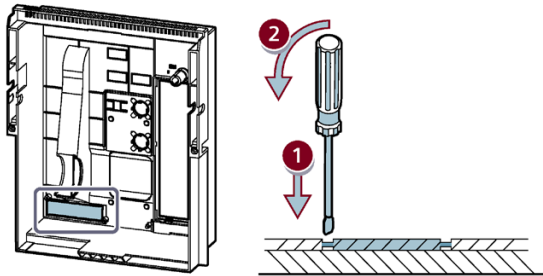
3.8 Conversion sets - fixed-mounted Circuit Breakers to withdrawable Circuit Breakers

Installation of the positioning actuator

- Push the angle brackets over the ends of the shaft with positioning actuator and attach to the bottom of the Circuit Breaker housing.
- Secure the angle brackets with the screws (tightening torque: 8 ± 1 Nm).
- Fix the positioning actuator securely to the circuit breaker with the M6x30 screw (tightening torque: 8 ± 1 Nm).



Preparing the operator panel



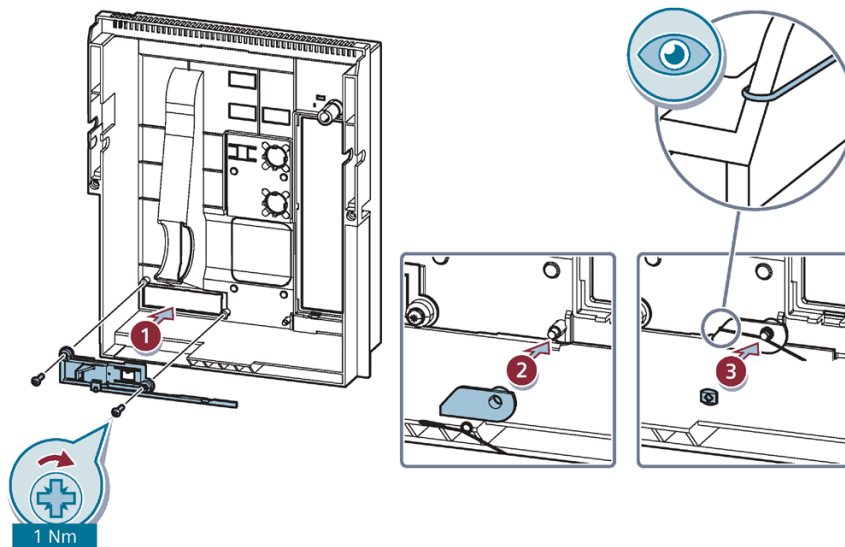
- Place the operator panel on a stable surface near the outline to be cut out.
- Use a hammer and screwdriver to cut out the groove base from the pre-pressed groove.
- File the edges of the cutout.

Installation of the shutter lever

- Screw the shutter to the inside of the operator panel then attach the lever with leg spring to the operator panel.
Make sure that the bent leg of the spring is placed over the lever so that the spring can be moved by the lever.
Secure the lever and the leg spring with the DUOCLIP.

Note

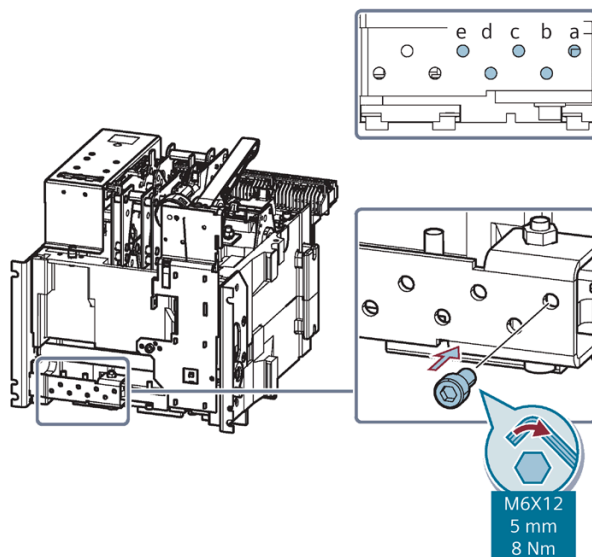
The leg spring must be able to move freely.



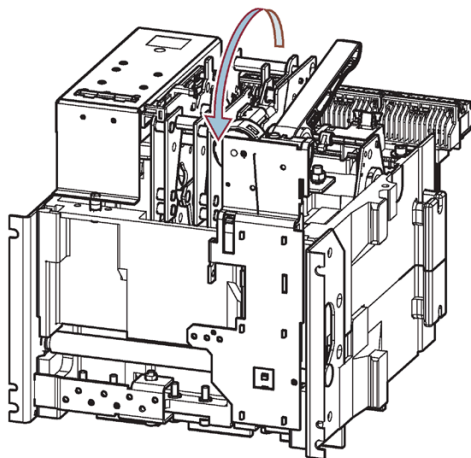
Coding of the circuit breaker and guideframe

To prevent the insertion of a Circuit breaker with different breaking capacity into a guide frame, you must code the Circuit breaker and matching guide frame as shown below.

- Screw the coding screws for the rated current coding into the coding plate of the circuit breaker.

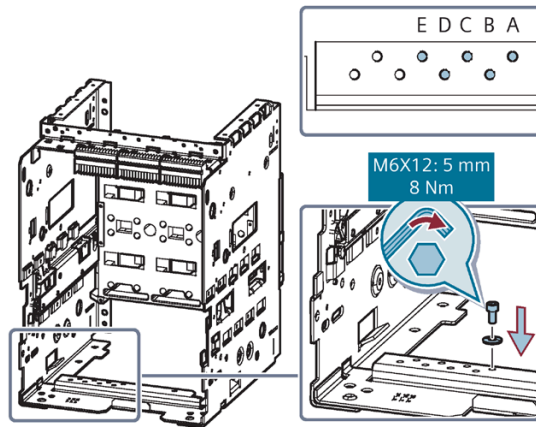


- Place the Circuit Breaker in an upright position again.



- Screw the coding screws for the rated current coding into the coding plate of the guide frame.

3.8 Conversion sets - fixed-mounted Circuit Breakers to withdrawable Circuit Breakers

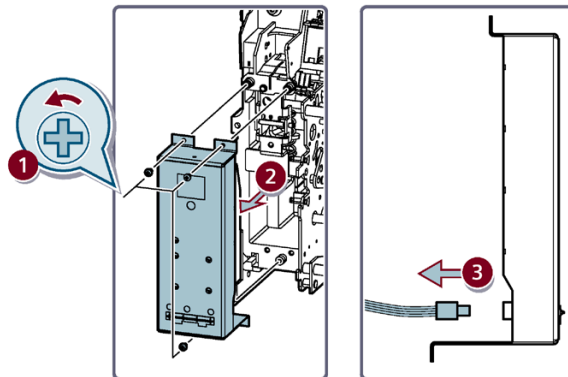


Coding scheme

Breaking capacity; max. rated current		Circuit breaker coding	Guide frame coding
		e-d-c-b-a	E-D-C-B-A
FSI	Up to 1250 A		
	1600 A		
FSII	Up to 2000 A		
	2500 A		
	3200 A		
	4000 A		

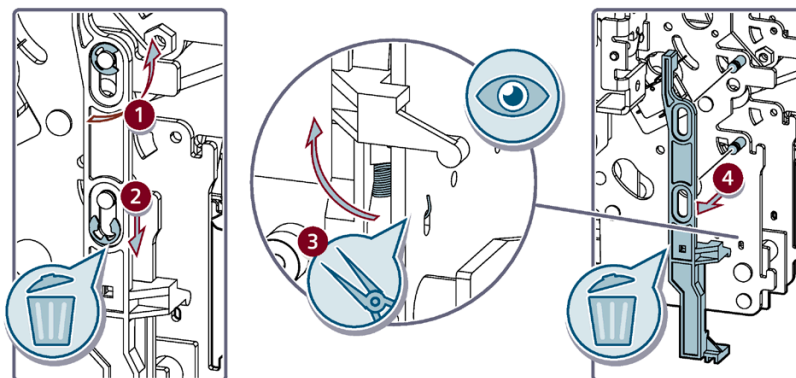
Replacement/installation of the control slider

- Remove the screws of the electronic trip unit.
- Remove the electronic trip unit by unplugging all necessary cables.

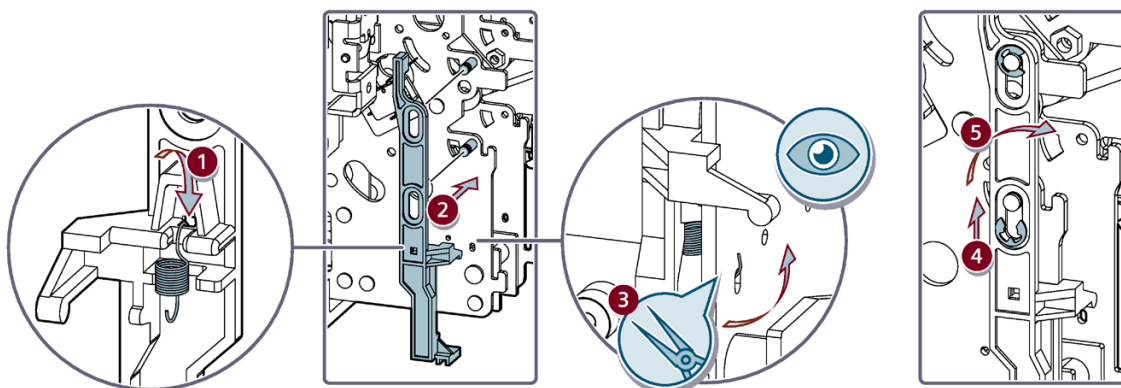


3.8 Conversion sets - fixed-mounted Circuit Breakers to withdrawable Circuit Breakers

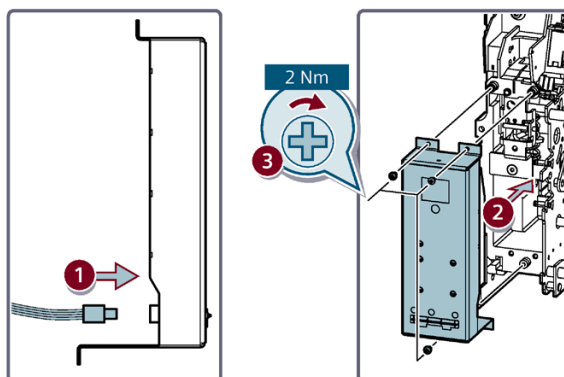
- If present, the plastic control slider must be replaced by the metal control slider in this package.

**Installation of the metal control slider**

- Place the control slider spring with the center eye in the control slider.
- Place the control slider on the side panel of the operating mechanism and attach the control slider spring with the off-center eye to the side panel using pointed pliers.
- Secure the control slider spring with the lock washers

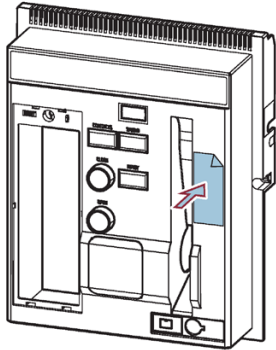


- Install the electronic trip unit. When doing so, make sure that you do not trap any cables.



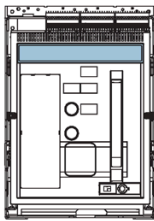
Attaching the adhesive label and updating the Circuit breaker front label

Stick the label onto the front of the operator panel.



Updating the front label:

Change the 11th digit of the MLFB according to the table below by using a permanent marker:



11	Withdrawableversions, without position signalling switch and without shutter	
	3P	3
	4P N left side	4
	Withdrawableversions, without position signalling switch and with shutter	
	3P	5
	4P N left side	6

Installing the operator panel

Preparatory and concluding installation steps for the installation of internal accessories (Page 57)

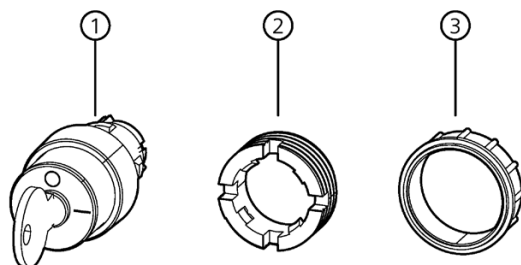
3.9 Accessories for locking and interlocking

3.9.1 Safety locking device

Article No.

Description	Article No.
Safety locking device instead of the OPEN button	3WJ9111-0BA35

Check the contents of the packaging



- | | | |
|---|-------------|----|
| ① | Safety lock | 1x |
| ② | Black ring | 1x |
| ③ | White ring | 1x |

Preparatory work

1. Open the Circuit Breaker and discharge the stored energy spring.
2. Disconnect auxiliary circuits.
3. Rack the withdrawable Circuit Breaker to the maintenance position and remove it from the guide frame.

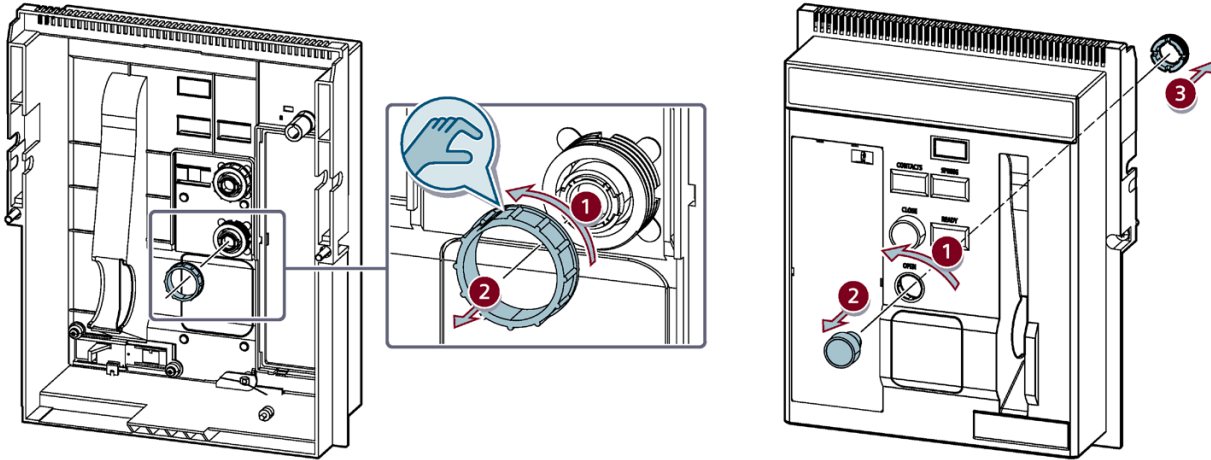
See also Preparation for maintenance work (Page 178)

Removing the operator panel

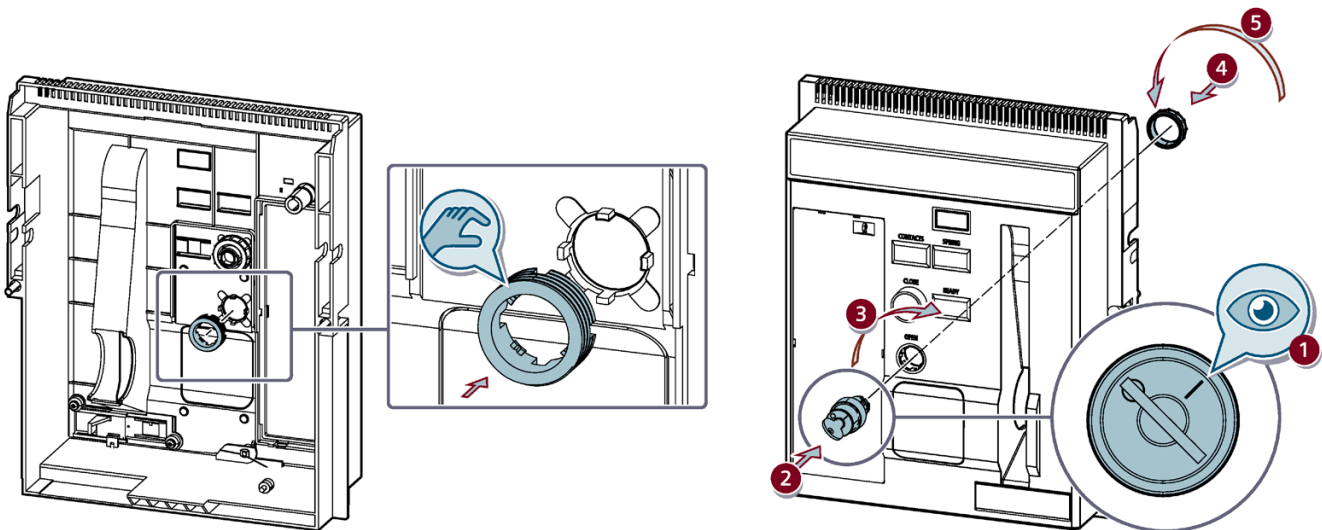
See chapter Preparatory and concluding installation steps for the installation of internal accessories (Page 57)

Installing the safety locking device

- Remove the white ring of the OPEN button. Counter-rotate the OPEN button a little, then remove the OPEN button.



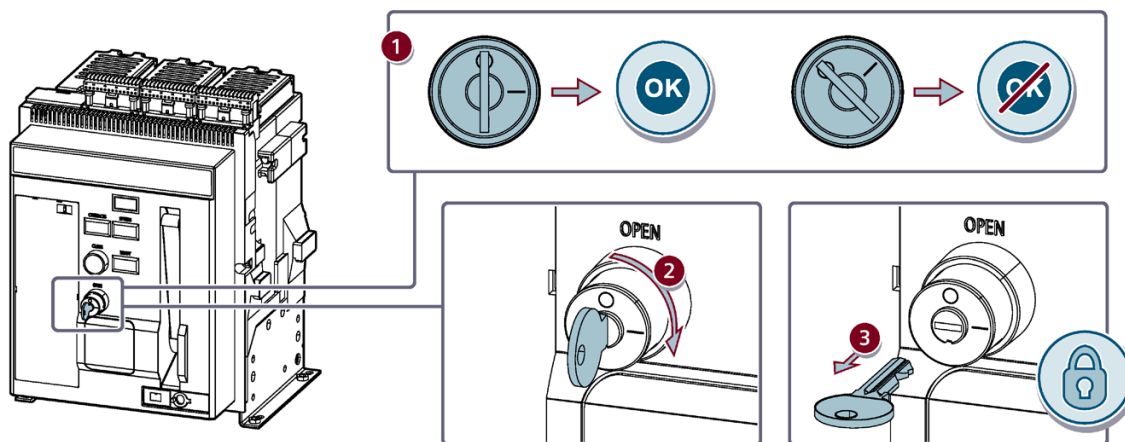
- Attach the black ring and hold it in position. Insert the safety lock and rotate it clockwise to the correct position. The key must be in the upright position pointing at 0. Fix the safety lock with the white ring.



Installing the operator panel

See chapter Preparatory and concluding installation steps for the installation of internal accessories (Page 57)

Functional check



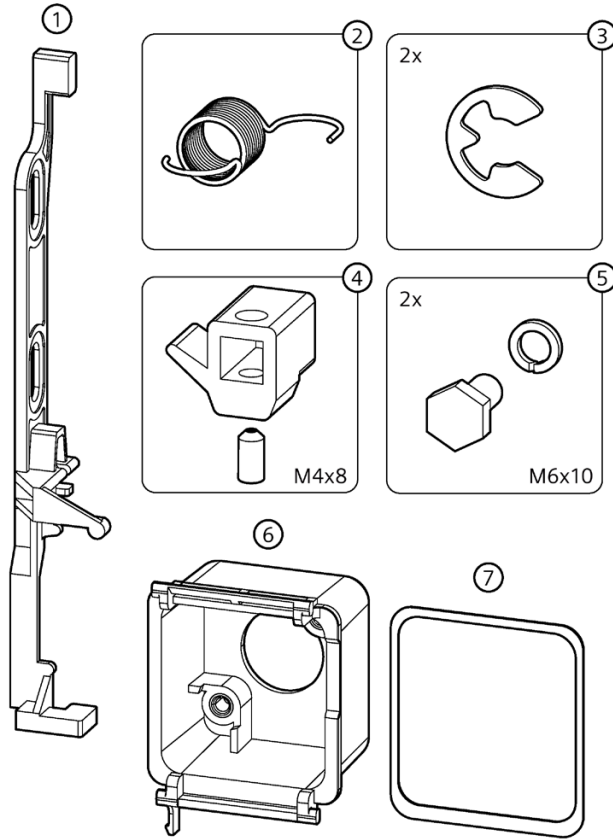
1. Check the installation position of the safety lock as shown in the picture. Correct if needed
2. Turn the key clockwise to the locking position.
3. Remove the key. The Circuit Breaker cannot be put into OPEN state when in this position.

3.9.2 Mounting set for 3WJ lock or CASTELL lock

Article No.

Description	Article No.
Mounting set for 3WJ lock or CASTELL lock	3WJ9111-0BA31

Check the contents of the packaging



①	control slider (metal)	1x
②	control slider spring	1x
③	Lock washer	2x
④	Latch with threaded pin	1x
⑤	Hexagon socket-head screw with spring washer A6	2x
⑥	Housing	1x
⑦	Seal	1x

Note

Additional components

The following components must be ordered from the relevant manufacturer: Castell lock interlock, version FS2.

⚠ CAUTION

Equipment damage: Replacement of plastic control slider

The plastic control slider (if present) must be replaced by the metal control slider in this package, otherwise equipment damage might occur.

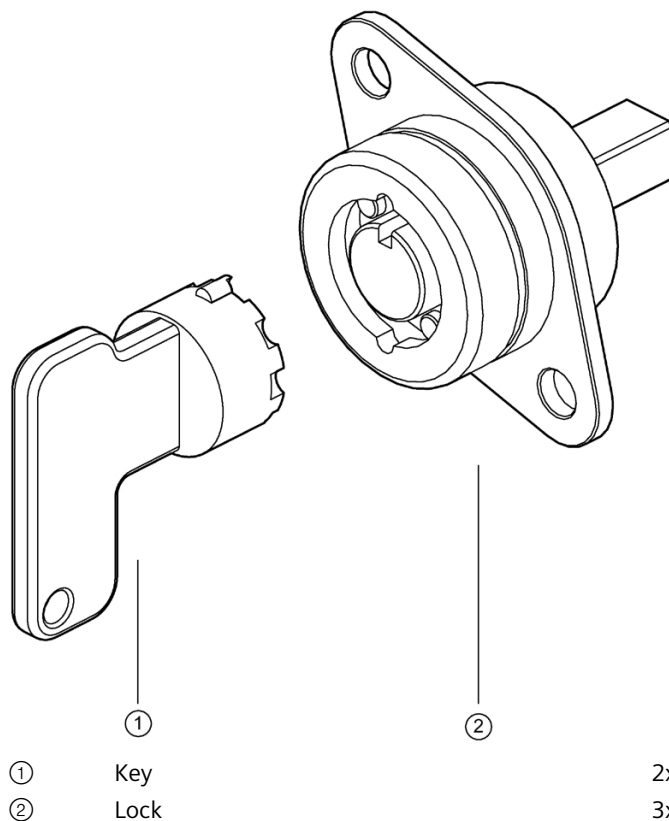
See also

Preparation for maintenance work (Page 178)

3WJ lock (set), 3 locks with 2 keys (Page 109)

3.9.3 3WJ lock (set), 3 locks with 2 keys**Article No.**

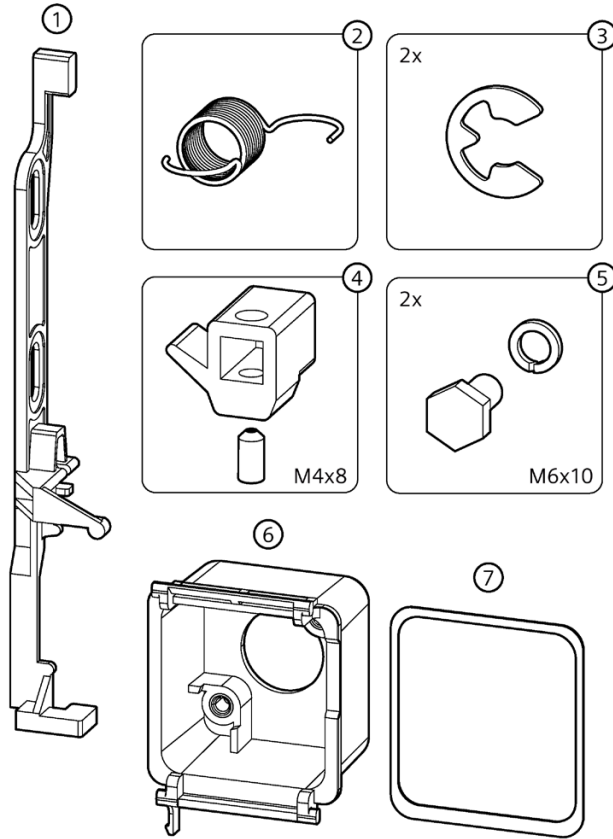
Description	Article No.
3WJ lock (set), 3 locks with 2 keys	3WJ9111-0BA43

Check the contents of the package**Note**

The setup package (Mounting set for 3WJ lock or CASTELL lock) used for 3WJ lock (set) needs to be ordered separately. The article number as spare part: 3WJ9111-0BA31. See also chapter Mounting set for 3WJ lock or CASTELL lock (Page 107).

Setup package for 3WJ lock (set)

Check the contents of the package



①	Control slider (metal)	1x
②	Control slider spring	1x
③	Lock washer	2x
④	Latch with threaded pin	1x
⑤	Hexagon socket-head screw with spring washer A6	2x
⑥	Housing	1x
⑦	Seal	1x
⑧	control slider spring	1x
⑨	Lock washer	2x

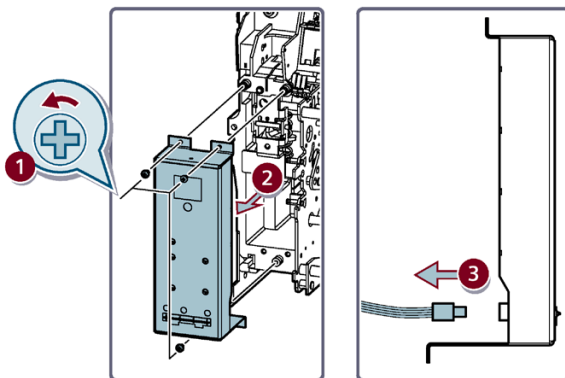
<p>⚠ CAUTION</p> <p>Equipment damage: Replacement of plastic control slider</p> <p>The plastic control slider (if present) must be replaced by the metal control slider in this package, otherwise equipment damage might occur.</p>
--

Removing the operator panel

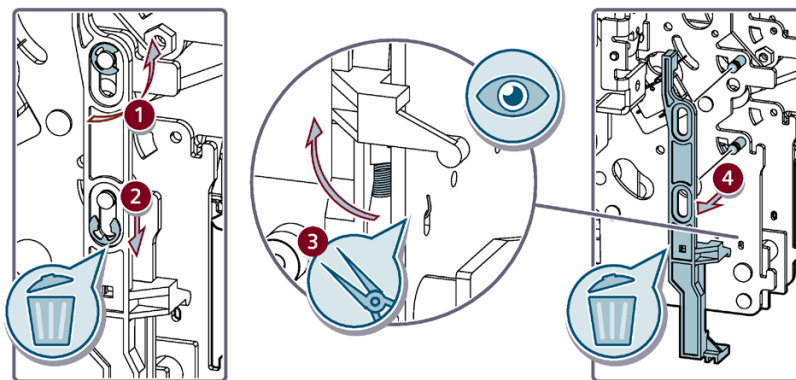
Before installing the 3WJ lock you have to remove the operator panel. The procedure is shown in chapter Preparatory and concluding installation steps for the installation of internal accessories (Page 57)

Replacement/installation of the control slider

- Remove the screws of the electronic trip unit.
- Remove the electronic trip unit by unplugging all necessary cables.



- If present, the plastic control slider must be replaced by the metal control slider in this package.

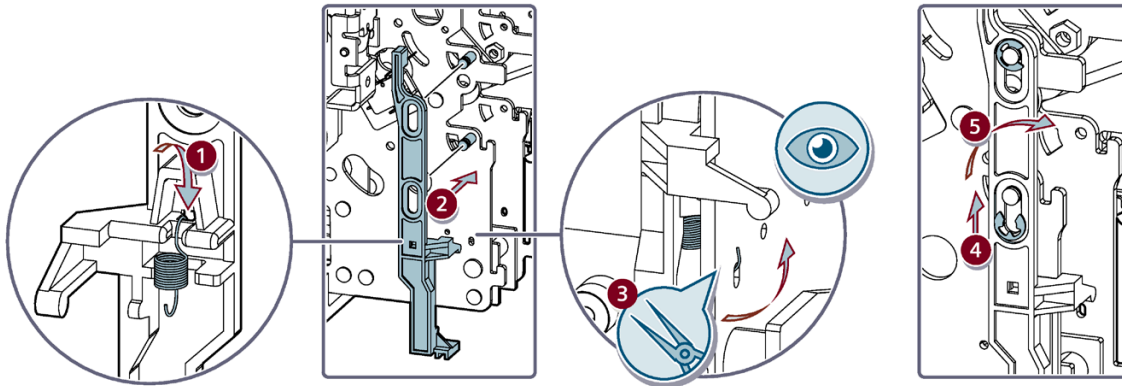


Installation of the metal control slider

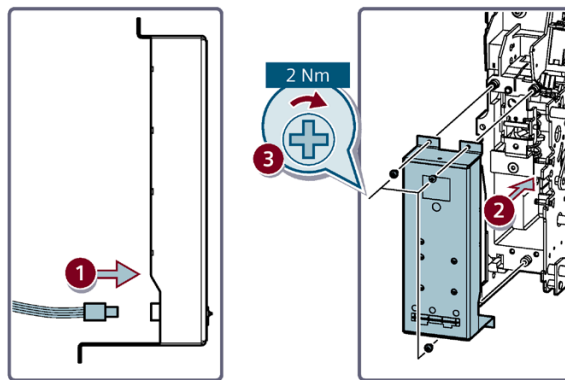
- Place the control slider spring with the center eye in the control slider.
- Place the control slider on the side panel of the operating mechanism and attach the control slider spring with the off-center eye to the side panel using pointed pliers.

3.9 Accessories for locking and interlocking

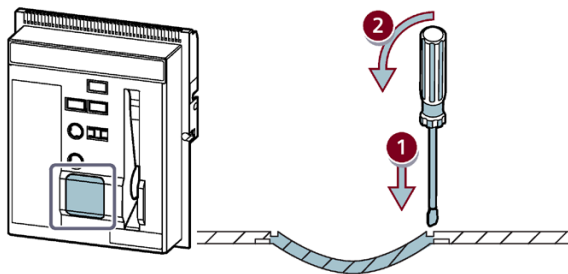
- Secure the control slider spring with the lock washers



- Install the electronic trip unit. When doing so, make sure that you do not trap any cables.



Preparing the operator panel

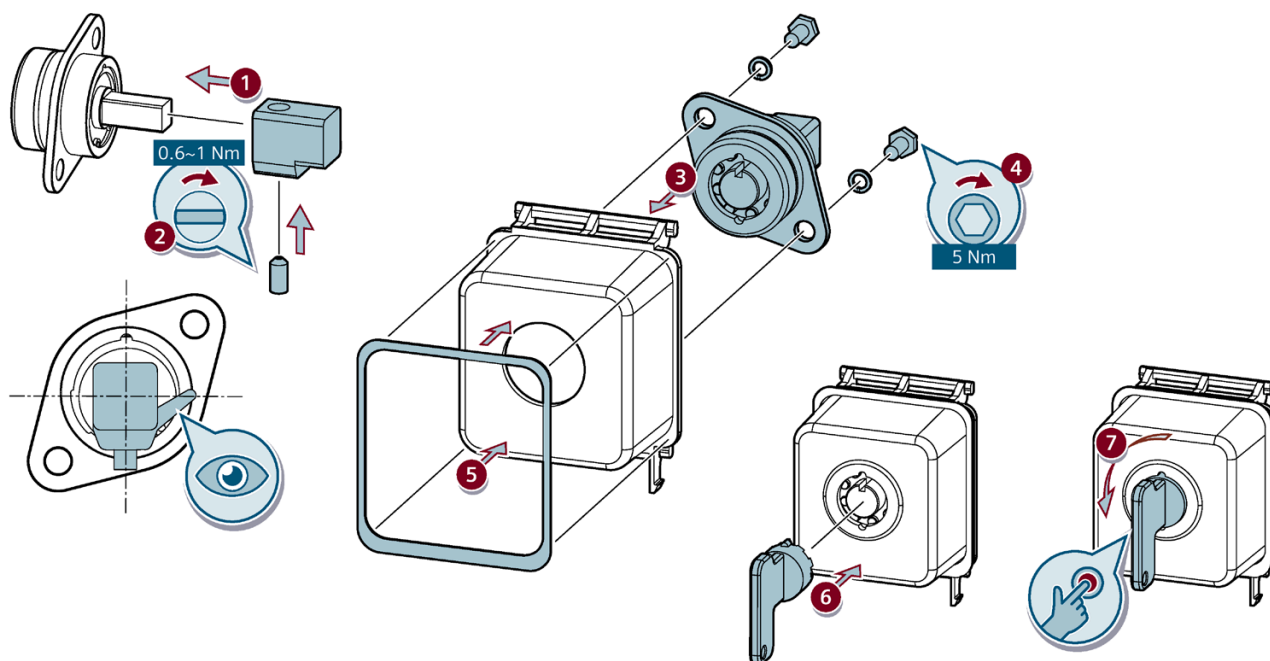


- Place the operator panel on a stable surface near the outline to be cut out.
- Use a hammer and screwdriver to cut out the groove base from the pre-pressed groove.
- File the edges of the cutout.

Preparing the 3WJ lock and installing it in the housing

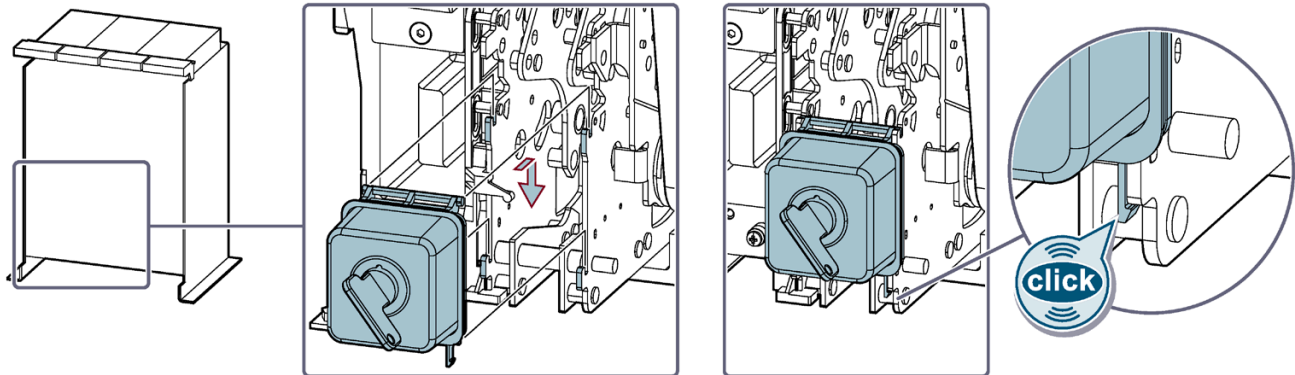
If present: Remove the key.

1. Attach the latch as far as it will go onto the square section of the lock.
2. Secure the latch by means of a threaded pin.
3. Attach the lock with latch to the housing.
4. Screw the lock to the housing with the provided hexagon socket-head screws and spring washers.
5. Attach the seal to the housing.
6. Attach the key to the lock.
7. Rotate the key in counter-clockwise direction to lock.



Installing the housing on the circuit breaker

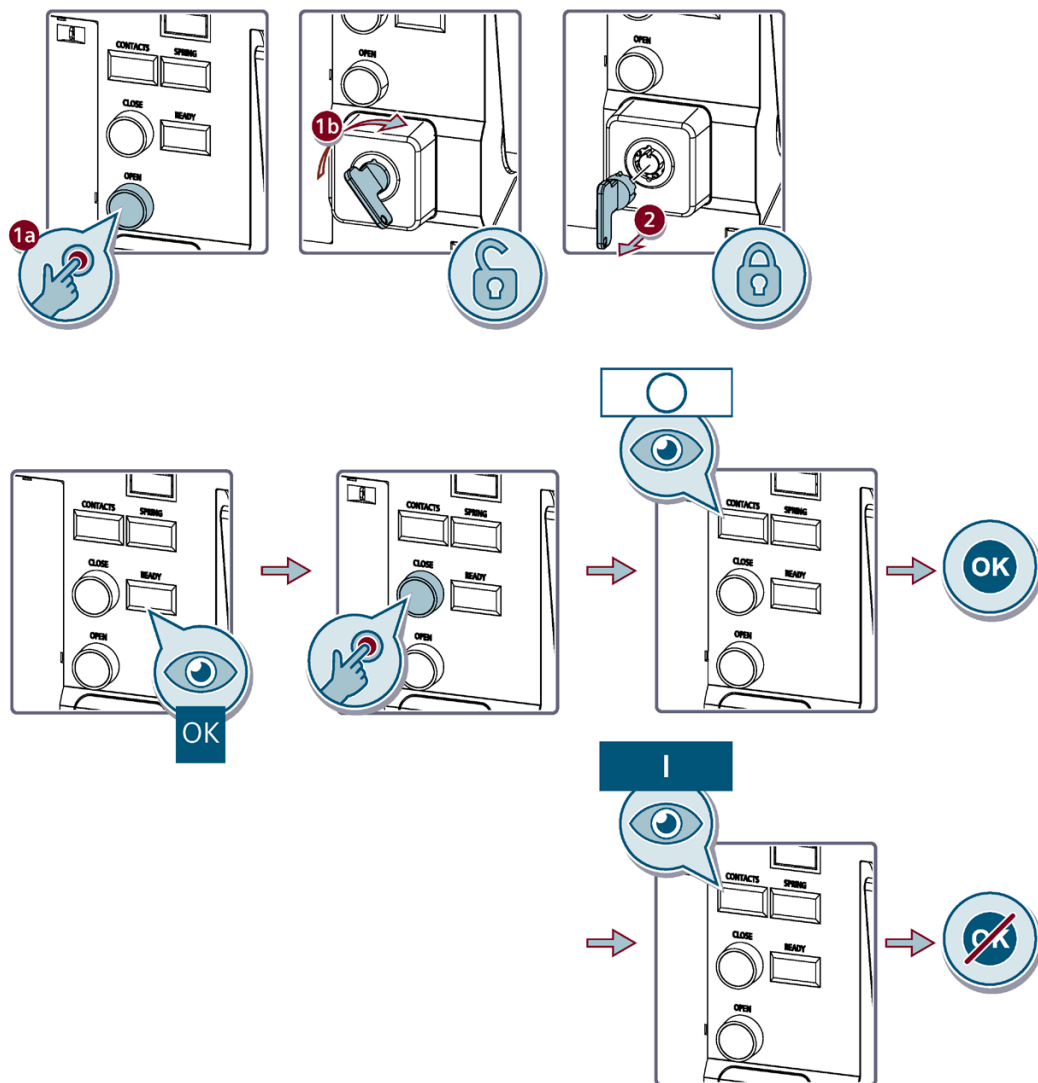
Place the housing with installed lock into the clips on the front side of the operating mechanism. The locking pin must audibly engage.



Installing the operator panel

To finish the installation of the lock you must attach the operator panel again. The procedure is shown in chapter Preparatory and concluding installation steps for the installation of internal accessories (Page 57).

Functional check



While pressing the OFF button, turn the key clockwise to the locking position.

- Remove the key
- The Circuit Breaker cannot close when in this position.

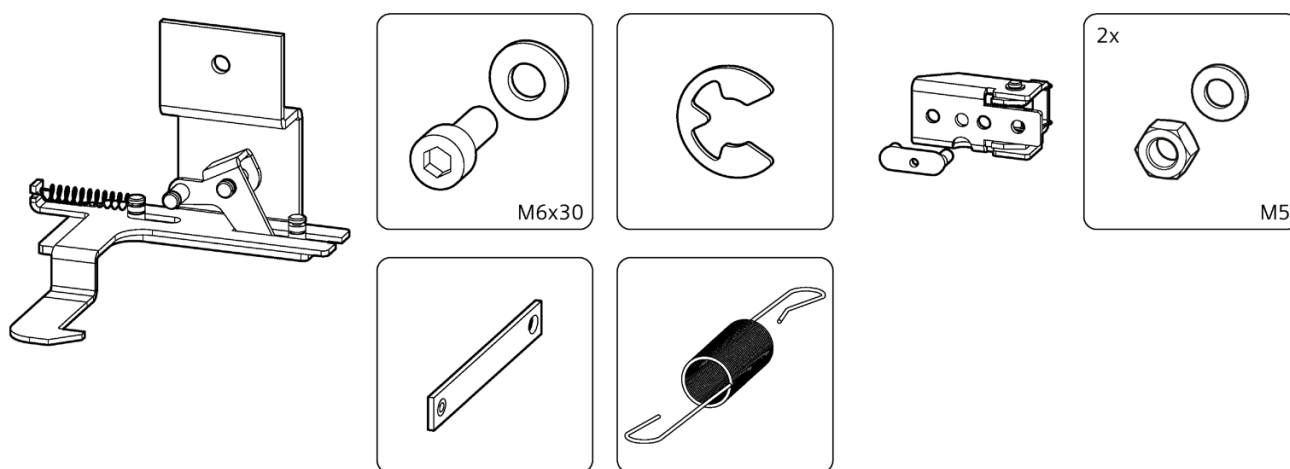
3.9.4 Door interlock

3.9.4.1 Door interlock for fixed-mounted Circuit Breaker

Article No.

Description	Article No.
Door interlock for fixed-mounted Circuit Breaker	3WJ9111-0BB12

Check the contents of the packaging



Preparatory work

- Open the Circuit Breaker and discharge the stored energy spring.
- Disconnect auxiliary circuits .
- Rack the withdrawable Circuit Breaker to the maintenance position and remove it from the guide frame.

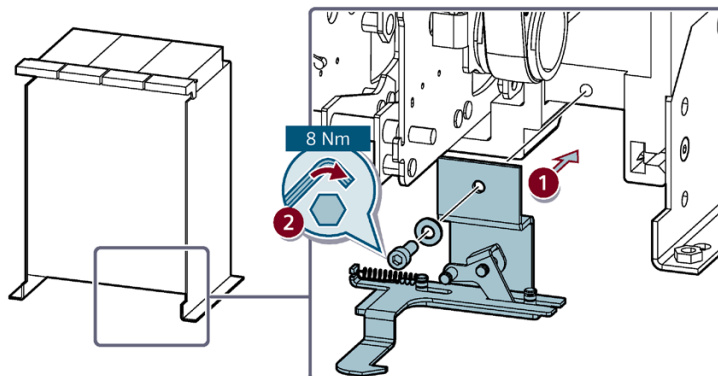
See chapter Preparation for maintenance work (Page 178)

Removing the operator panel

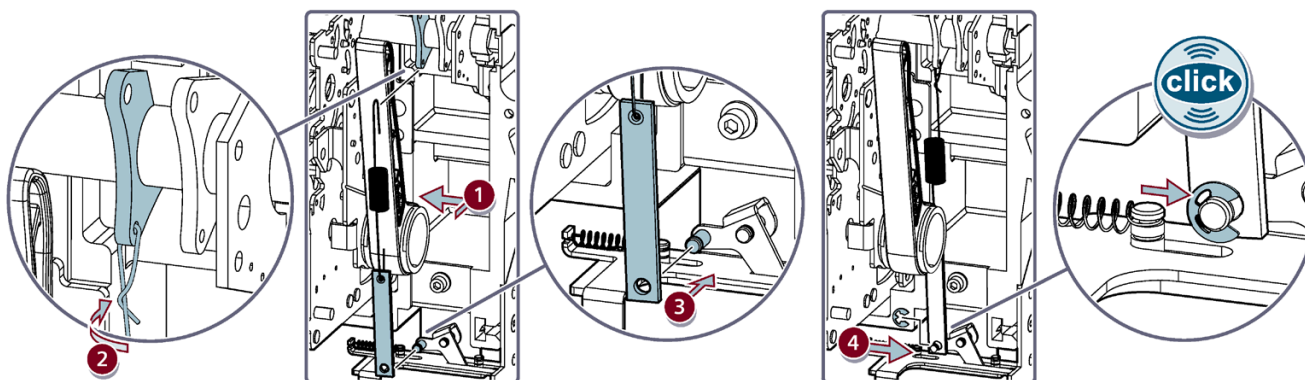
See chapter Preparatory and concluding installation steps for the installation of internal accessories (Page 57)

Installing the interlocking module

- Attach the interlocking module to the front of the Circuit Breaker and secure it with the hexagon screw and washer.



- Attach the tension spring to the lever of the breaker shaft. Insert the tension spring with lug behind the geared motor. Secure the lug with the lock washer.



Installing the operator panel

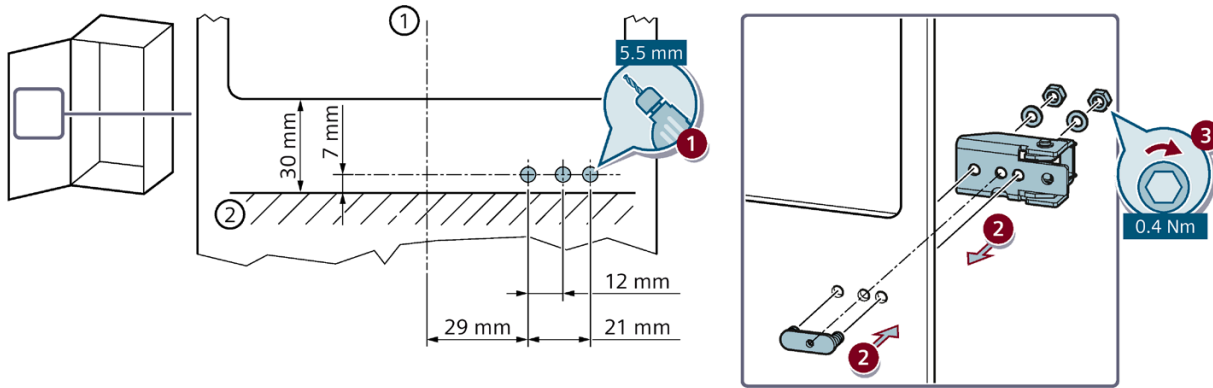
See chapter Preparatory and concluding installation steps for the installation of internal accessories (Page 57)

3.9 Accessories for locking and interlocking

Install the catch in the cabinet door

- Drill holes with a diameter of 5.5 mm in the cabinet door.
- Screw on the catch (tightening torque for component: 0.4 Nm).

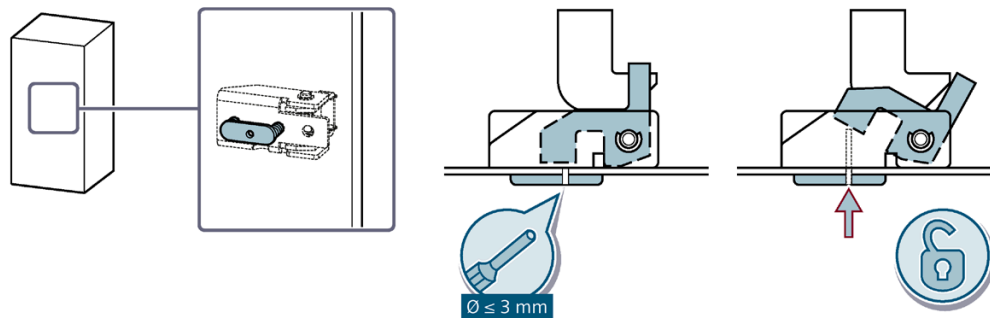
3WJ9111-0BB12
3WJ9111-0BB13



- ① Center of operator panel
- ② Installation level of circuit breaker

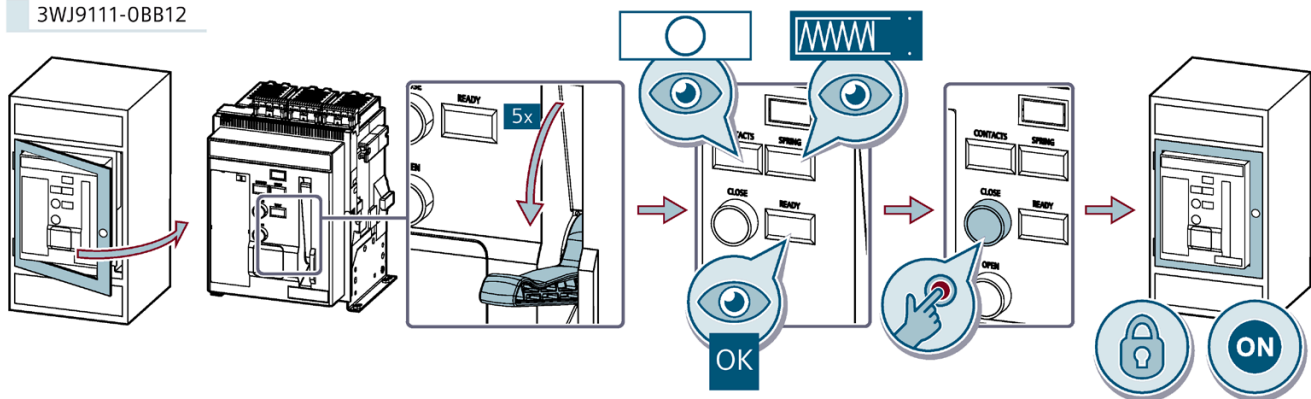
Functional check

The picture below shows how you can overrule the locking mechanism.



The pictures below show the functional check of the locking mechanism.

3WJ9111-0BB12

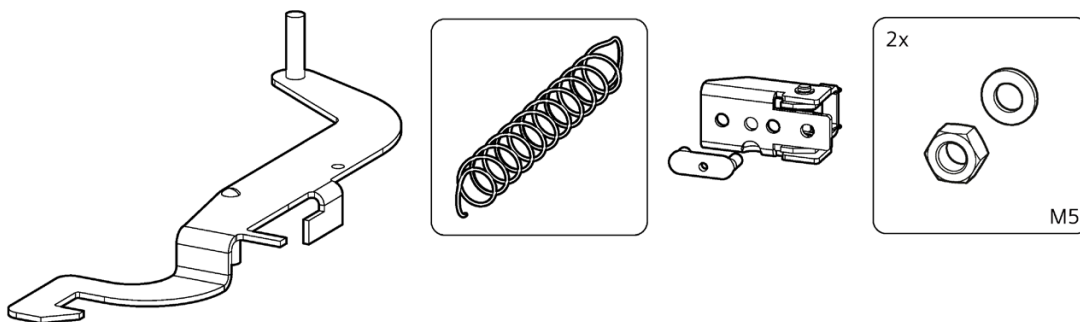


3.9.4.2 Door interlock for guide frame

Article No.

Description	Article No.
Door interlock for withdrawable Circuit Breaker	3WJ9111-0BB13

Check the contents of the packaging



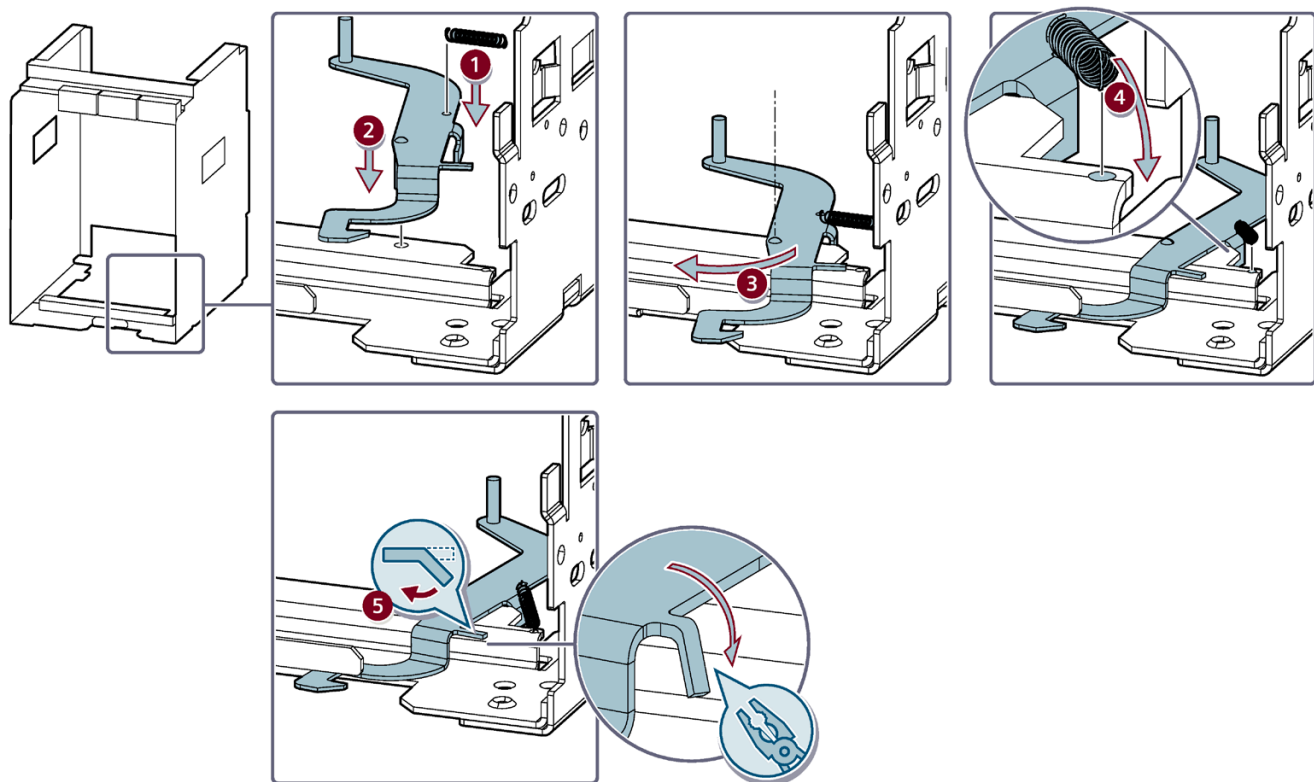
Preparatory work

- Open the Circuit Breaker and discharge the stored energy spring.
- Disconnect auxiliary circuits .
- Rack the withdrawable Circuit Breaker to the maintenance position and remove it from the guide frame.

See chapter Preparation for maintenance work (Page 178)

Installing the bolt in the guide frame

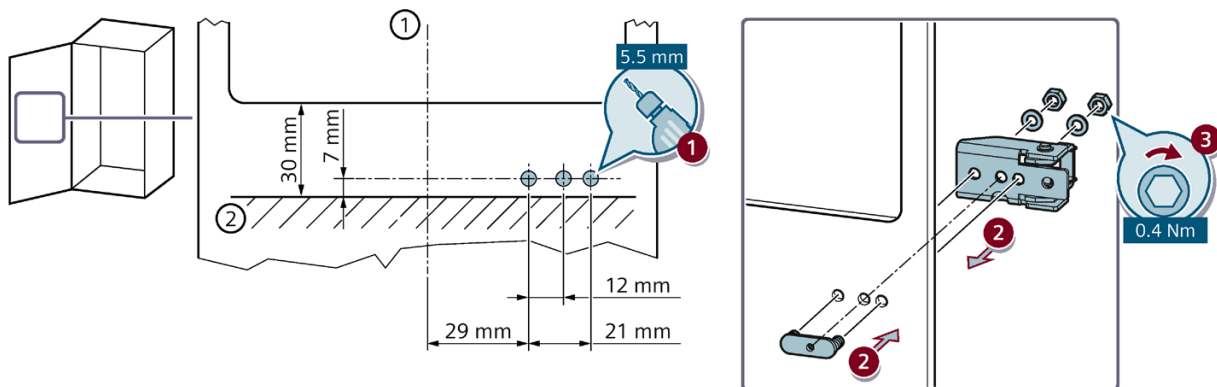
- Place the bolt on the cross member of the guide frame and attach the tension spring to the bolt.
- Rotate the bolt below the metal shaft in front of the cross member and attach the tension spring to the hole ④.
- Bend down the metal lug on the bolt to secure the installation.



Install the catch in the cabinet door

1. Drill holes with a diameter of 5.5 mm in the cabinet door.
2. Screw on the catch (tightening torque for component: 0.4 Nm).

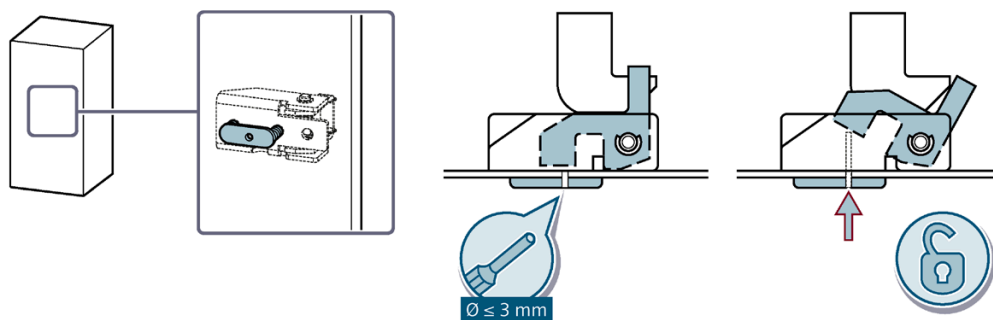
3WJ9111-0BB12
3WJ9111-0BB13



- ① Center of operator panel
② Installation level of circuit breaker

Functional check

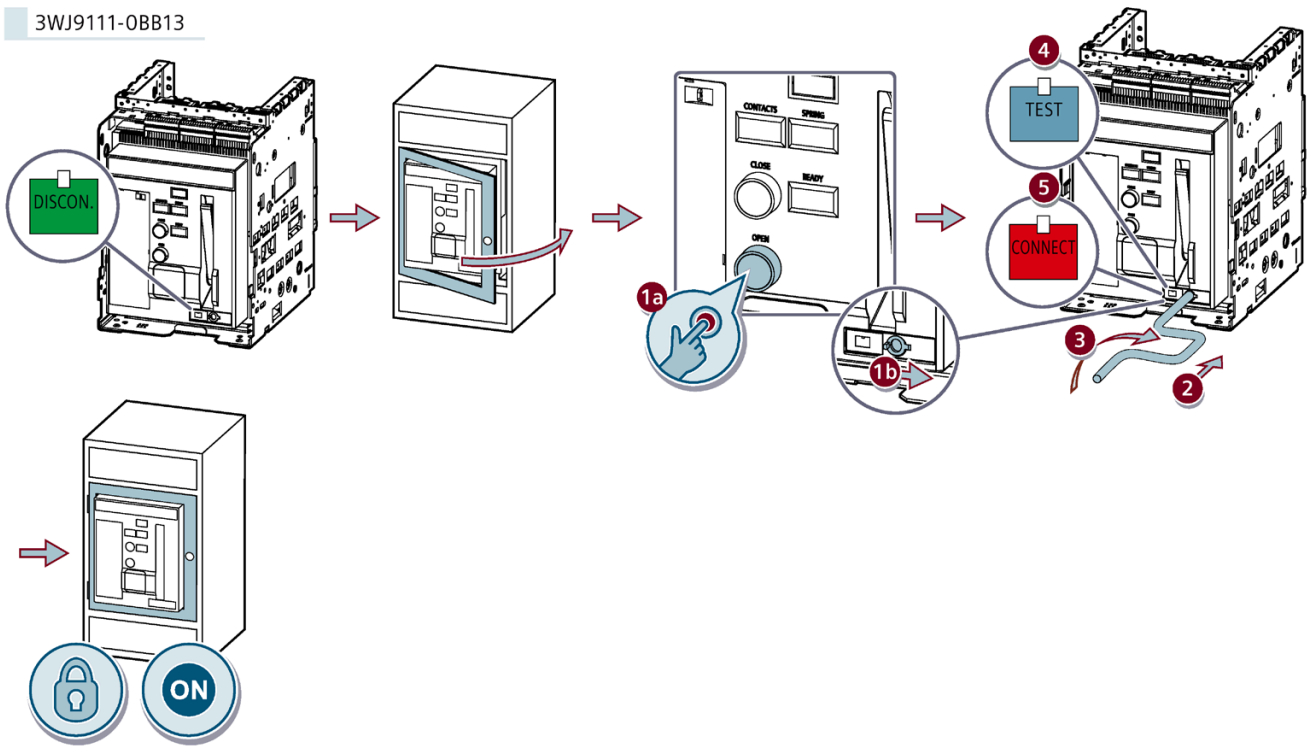
The picture below shows how you can overrule the locking mechanism.



3.9 Accessories for locking and interlocking

The pictures below show the functional check of the locking mechanism.

3WJ9111-0BB13



3.9.5 Mechanical interlock

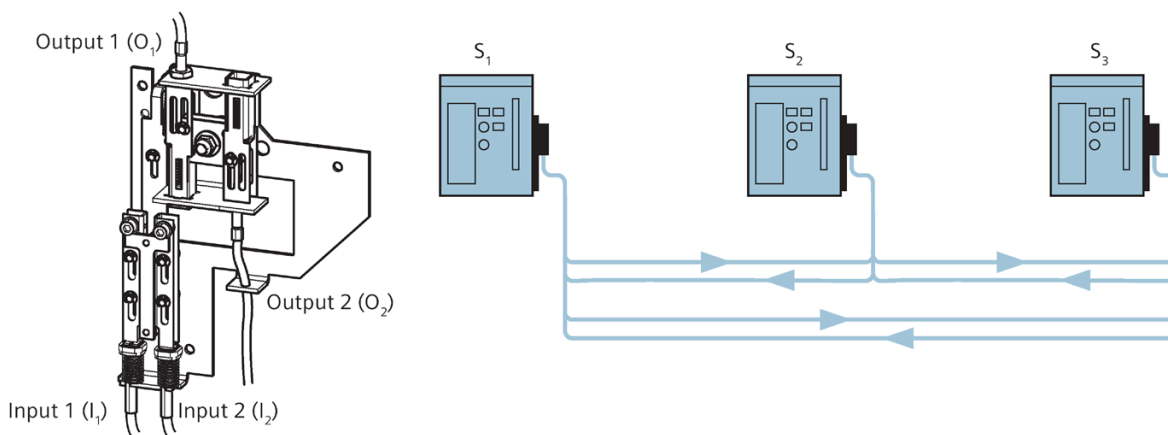
3.9.5.1 Information about mechanical interlock

Note

To ensure that the interlock works properly, the following minimum requirements must be fulfilled by the switchgear:

1. Bowden wires must be laid so that they are as straight as possible.
2. The bending radii of the Bowden wire must be > 50 mm.
3. The total bending angle across the length of the Bowden wire must not exceed 360° .
4. If the Circuit Breakers to be interlocked are arranged vertically, the interlock mechanisms must be aligned.
5. Circuit Breakers to be interlocked must be arranged in such a way that 2 m or 4.5 m Bowden wires can be properly laid in accordance with the conditions specified in points 1. - 4.
6. The Bowden wires must be secured before the interlock is adjusted (e.g. cable ties).
7. When choosing the switchgear compartment, make sure that it provides sufficient room for adjusting the interlock.
8. Openings and cutout sections in system elements must be designed in such a way that the direction of the Bowden wires is not changed and that the wires are not obstructed when they are routed.

Mechanical interlock module

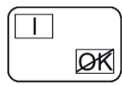
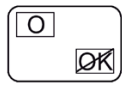
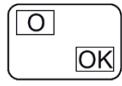


The mechanical interlock module can be used for two or three Circuit Breakers. The following designations apply in the configuration instructions below:

- O_{1/2} : Output information _{1/2}
- I_{1/2} : Input information _{1/2}
- S_{1/2/3}: Circuit Breaker _{1/2/3}

3.9 Accessories for locking and interlocking

If the output information 1 of Circuit Breaker 1 is interconnected with the input information 2 of Circuit Breaker 2, for example, the following abbreviations are used:
 $S_1 O_1 - S_2 I_2$

	The statuses of the Circuit Breakers are indicated on the operator panel as follows:
	Circuit Breaker CLOSED
	Circuit Breaker OPEN and not ready to CLOSE (interlocked)
	Circuit Breaker OPEN and ready to CLOSE (not interlocked)

Configuration: Two Circuit Breakers back to back

Description:

A Circuit Breaker can only be closed when the other is open.

Required equipment:

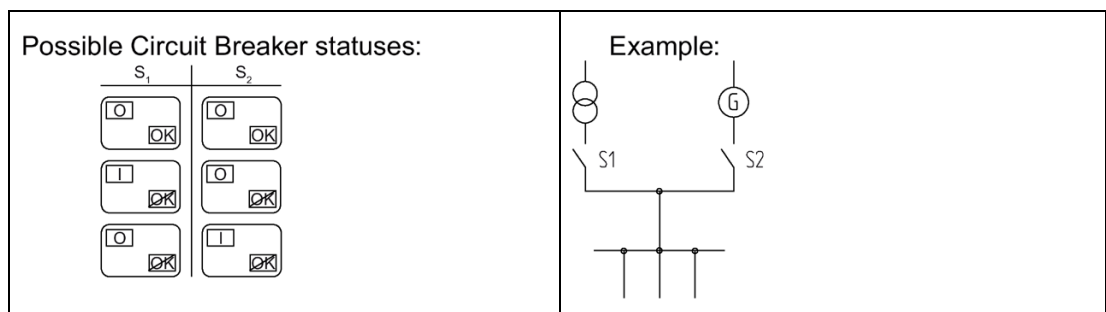
Each Circuit Breaker is equipped with an interlocking module and a Bowden wire.

Terminals for the Bowden wires:

1. Bowden wire: $S_1 O_1 - S_2 I_1$
2. Bowden wire: $S_1 I_1 - S_2 O_1$

Note

The cylinder-head screws with strain washers must be screwed into the index brackets at the following terminals: $S_1 I_1$; $S_2 I_1$.



In certain configurations, additional Bowden wires are required.

Please see chapter Installing Bowden wire (Page 138)

Configuration: Three Circuit Breakers stacked

Description:

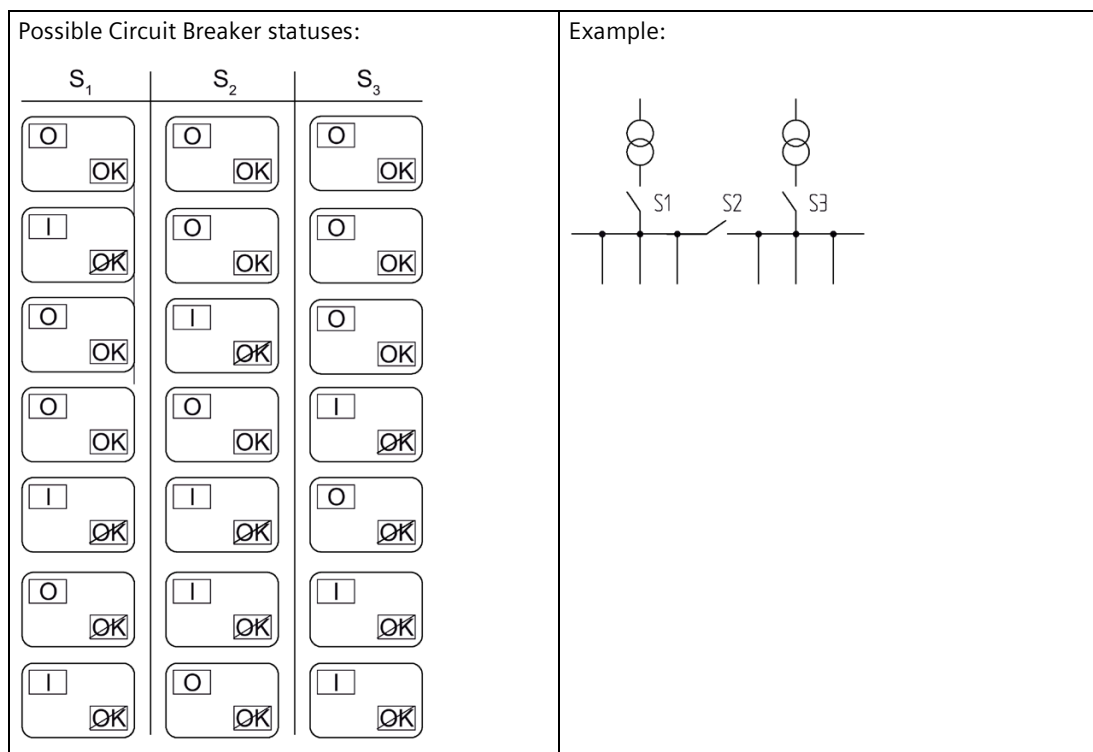
Any two Circuit Breakers can be closed at any time, with the third interlocked.

Required equipment:

Each Circuit Breaker is equipped with an interlocking module and a Bowden wire. Three additional Bowden wires must be ordered separately.

Terminals for the Bowden wires:

1. Bowden wire: S₁ O₁ - S₂ I₁
2. Bowden wire: S₁ O₂ - S₃ I₁
3. Bowden wire: S₂ O₁ - S₁ I₁
4. Bowden wire: S₂ O₂ - S₃ I₂
5. Bowden wire: S₃ O₁ - S₁ I₂
6. Bowden wire: S₃ O₂ - S₂ I₂



Configuration: Three Circuit Breakers stacked

Description:

When one Circuit Breaker is closed, the other two cannot be closed.

Required equipment:

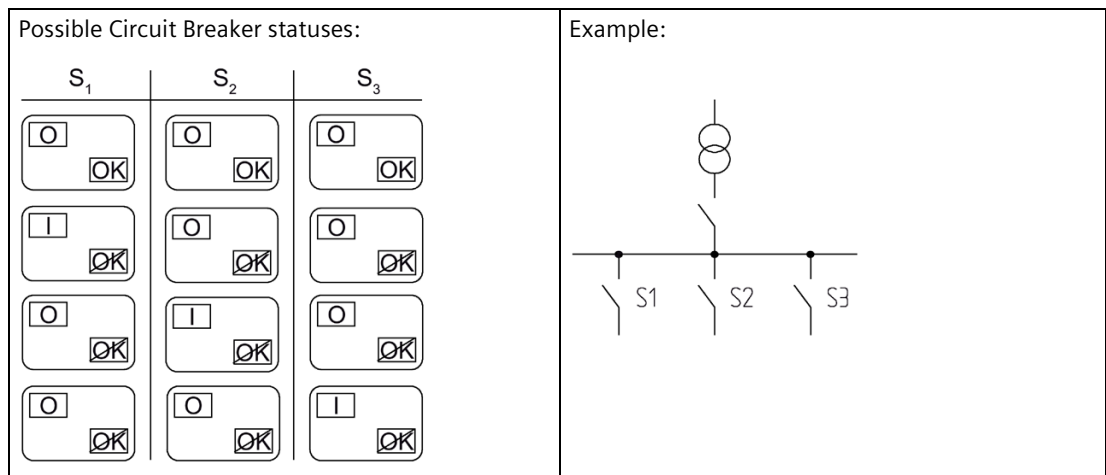
Each Circuit Breaker is equipped with an interlocking module and a Bowden wire. Three additional Bowden wires must be ordered separately.

Terminals for the Bowden wires:

1. Bowden wire: S₁O₁ - S₂I₁
2. Bowden wire: S₁O₂ - S₃I₁
3. Bowden wire: S₂O₁ - S₁I₁
4. Bowden wire: S₂O₂ - S₃I₂
5. Bowden wire: S₃O₁ - S₁I₂
6. Bowden wire: S₃O₂ - S₂I₂

Note

The cylinder-head screws with strain washer must be screwed into the index brackets at the following terminals: S₂I₁, S₃I₁, S₁I₁, S₃I₂, S₁I₂, S₂I₂.



Configuration: Three Circuit Breakers back to back

Description:

Two Circuit Breakers can be closed/opened independently of each other, with the third only ready to be closed when the other two are open. If the third Circuit Breaker is closed, the other two cannot be closed.

Required equipment:

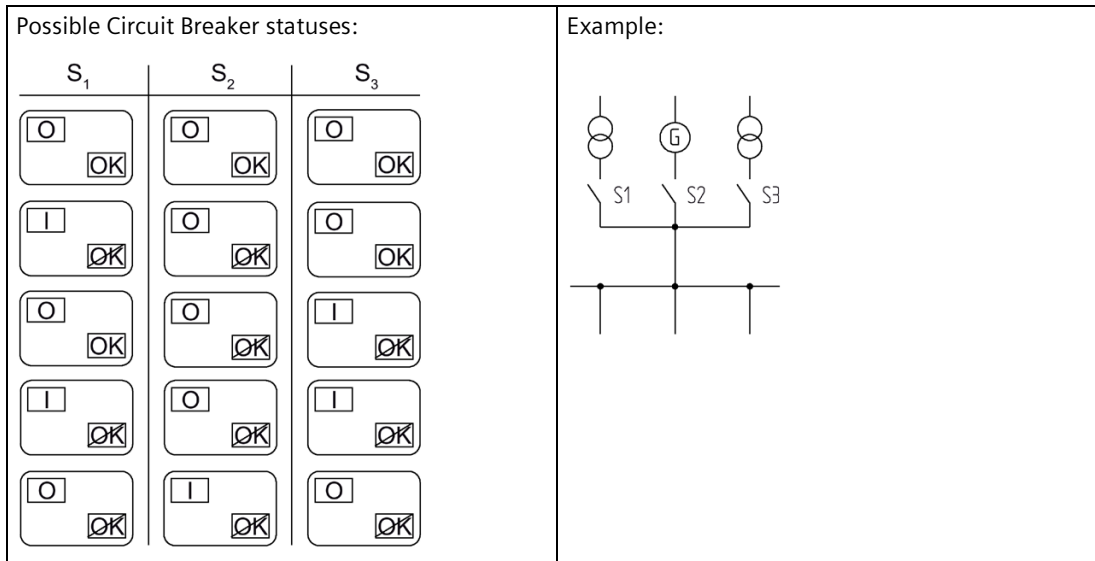
Each Circuit Breaker is equipped with an interlocking module and a Bowden wire. The Bowden wire must be ordered separately.

Terminals for the Bowden wires:

1. Bowden wire: S₁O₁ - S₂L₁
2. Bowden wire: S₂O₁ - S₁L₁
3. Bowden wire: S₂O₂ - S₃L₁
4. Bowden wire: S₃O₁ - S₂L₂

Note

The cylinder-head screws with strain washer must be screwed into the index brackets at the following terminals: S₂L₁, S₁L₁, S₃L₁, S₂L₂.



Configuration: Three Circuit Breakers, of which two are back to back

Description:

One Circuit Breaker can be closed/opened independently of the other two. The two other Circuit Breakers are mutually exclusive, that is, one can only be closed when the other is open.

Required equipment:

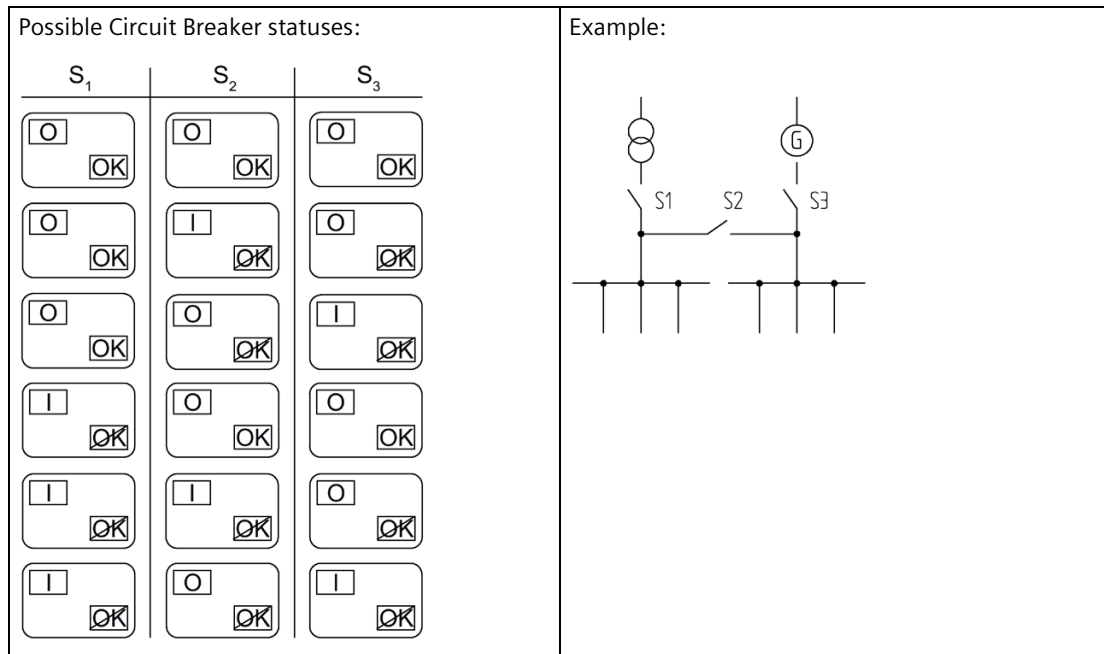
Two of the three Circuit Breakers are each equipped with an interlocking module and a Bowden wire.

Terminals for the Bowden wires:

1. Bowden wire: S₂O₁ - S₃I₁
2. Bowden wire: S₃O₁ - S₂I₁

Note

The cylinder-head screws with strain washers must be screwed into the index brackets at the following terminals: S₃I₁, S₂I₁.



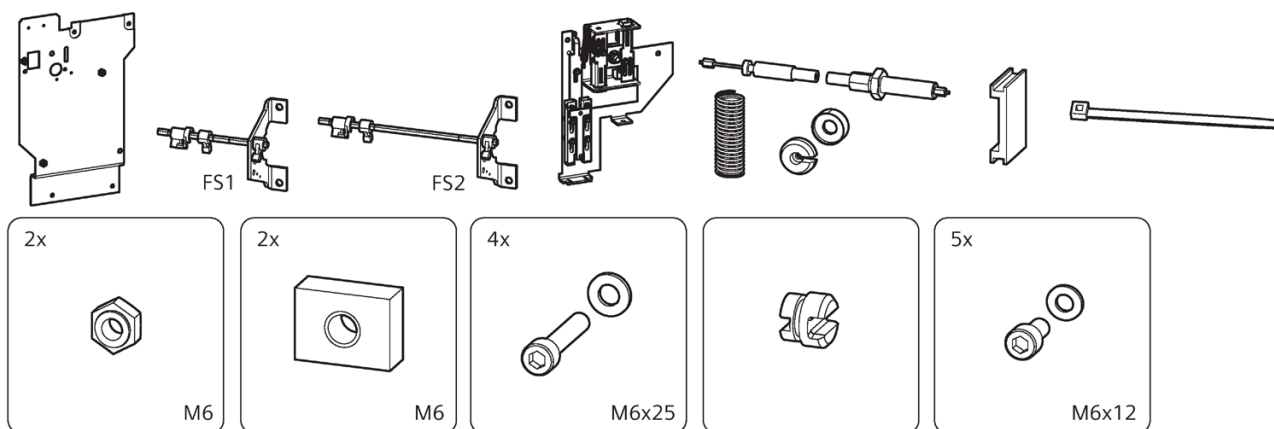
3.9.5.2 Mechanical interlock of fixed-mounted Circuit Breakers

Article No.

Description	Article No.
Mutual mechanical interlock for fixed-mounted Circuit Breaker	3WJ9111-0BB21

Check the contents of the packaging

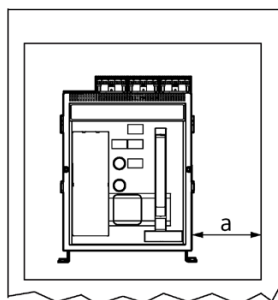
3WJ9111-0BB21



Preparatory work

1. Open the Circuit Breaker and discharge the stored-energy spring.
2. Remove the operator panel and the secondary disconnect terminals.

See chapter Preparatory and concluding installation steps for the installation of internal accessories (Page 57).



The minimum distance (a) required between the Circuit Breaker and the cabinet is as follows:

- For frame size 1 : a = 150 mm
- For frame size 2 : a = 200 mm

If necessary, remove the Circuit Breaker from the cabinet.

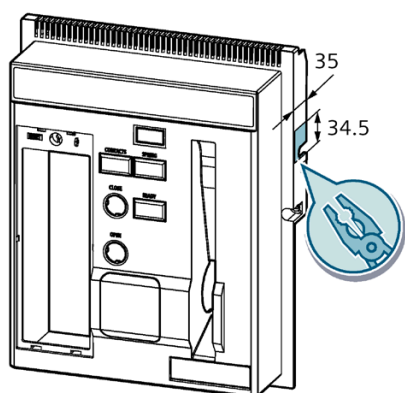
Note

If the mechanical interlock is already installed, continue with "Information about mechanical interlock". - See chapter Information about mechanical interlock (Page 123)

Preparations

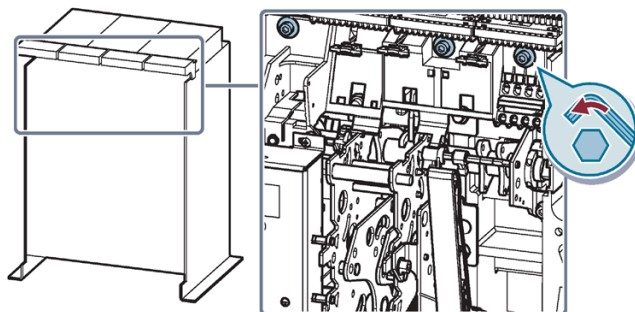
Preparing the operator panel (frame size I)

Break out the groove base from the pre-pressed grooved as displayed in the image below.



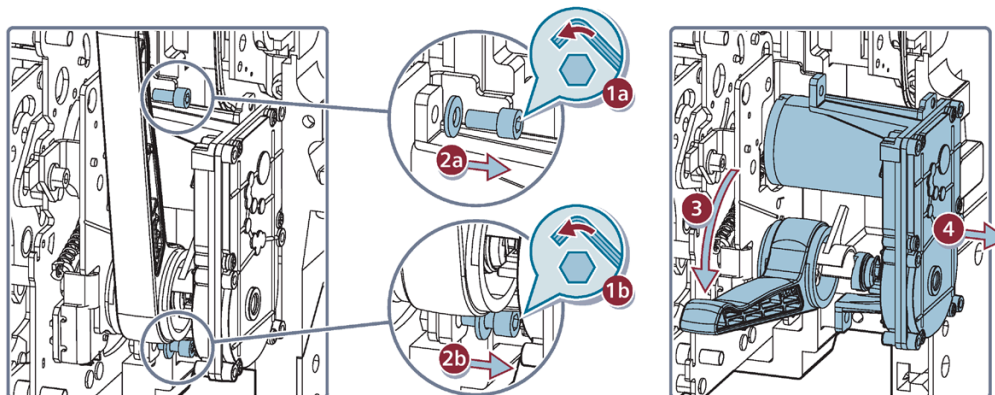
Preparing the mounting plate (frame size I)

Loosen the screws of the mounting plate with 3 or 4 turns each as shown in the image below.

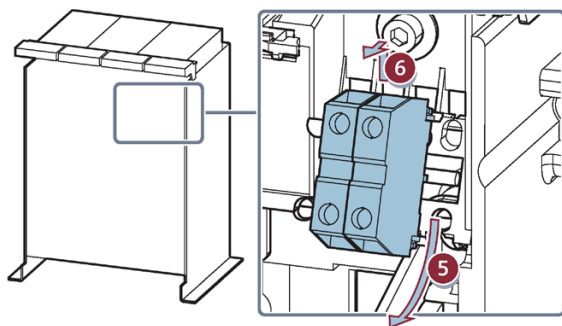


Removing the spring-charging motor and 2nd auxiliary switches (frame size I)

If present, remove an installed spring-charging motor as shown below.

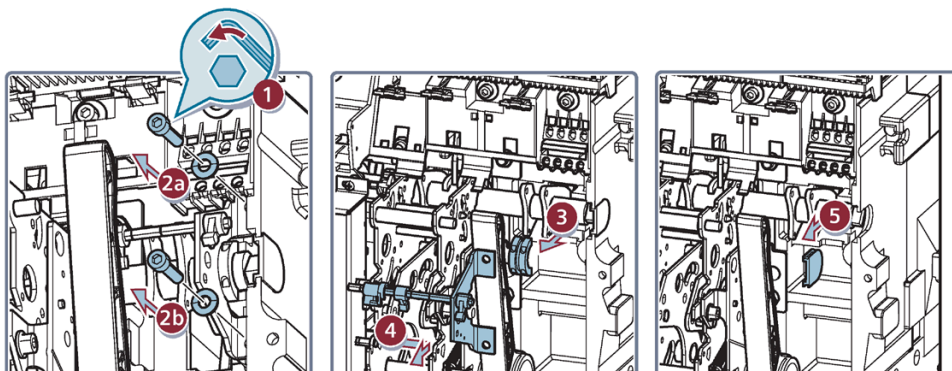


If present, remove the 2nd auxiliary switches as shown below.



Removing the auxiliary shaft and cover

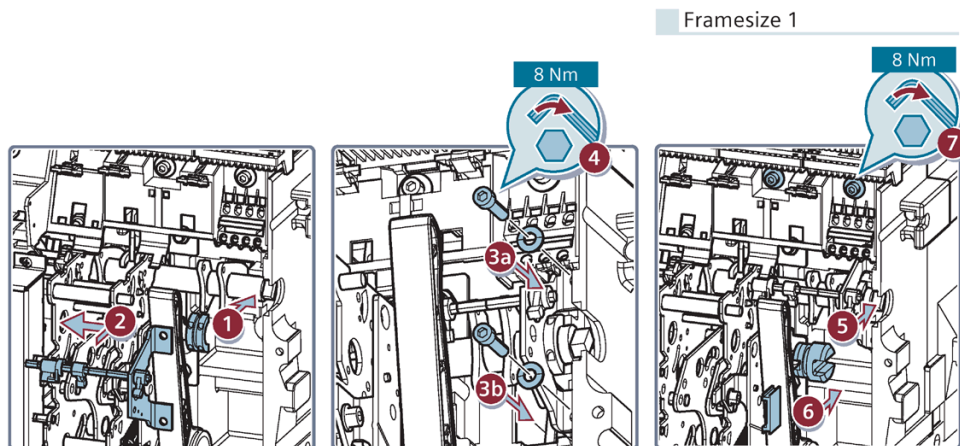
Remove the auxiliary shaft and the cover as shown in the images below.



Installing the auxiliary shaft and the clutch in the Circuit Breaker

Insert the auxiliary shaft and fix it with screws and washer as shown in the images below. Add the clutch (5) and secure cover (6) to fix the clutch.

For framesize I also fix the screws of the mounting plate again.

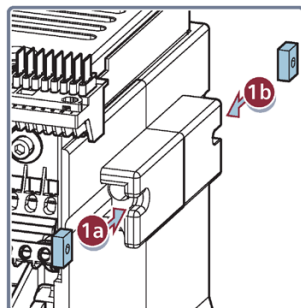


Install the operator panel again.

Installing the fixed-mounted plate and the interlocking module

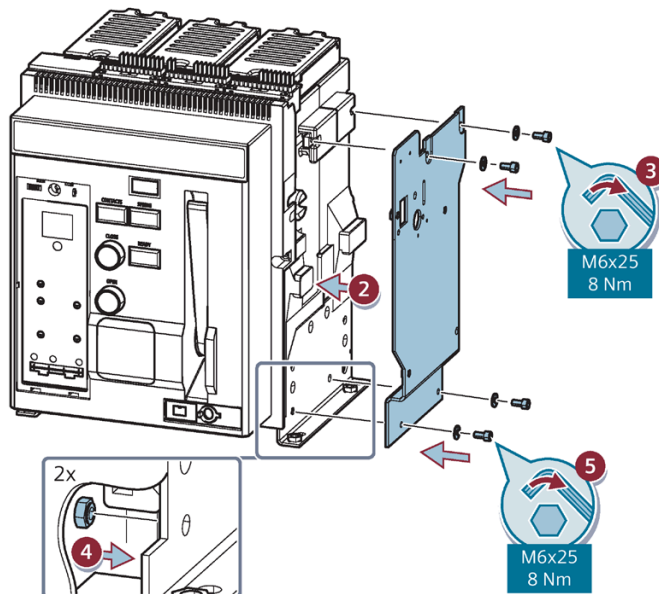
Installing the fixed-mounted plate

1. Push the insert-nuts into the openings provided.

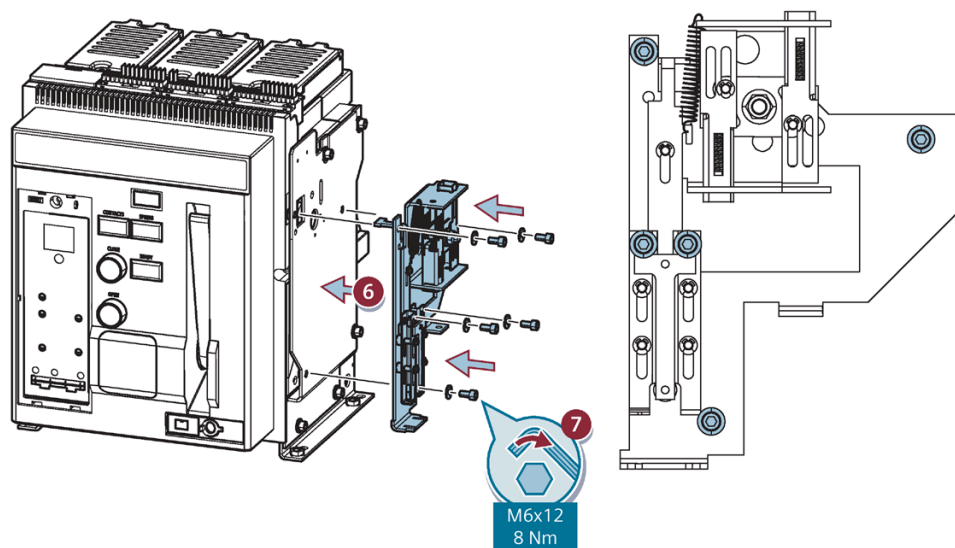


2. Attach the fixed-mounted plate to the side of the Circuit breaker.
3. Secure by means of cylinder-head screws and strain washers (tightening torque: 8 ± 1 Nm).
4. Insert the setnuts.

- Secure by means of cylinder-head screws and strain washers (tightening torque: 8 ± 1 Nm).



- Attach the interlocking module to the fixed-mounted plate.
- Secure by means of cylinder-head screws and strain washers (tightening torque: 8 ± 1 Nm).



Installing Bowden wire

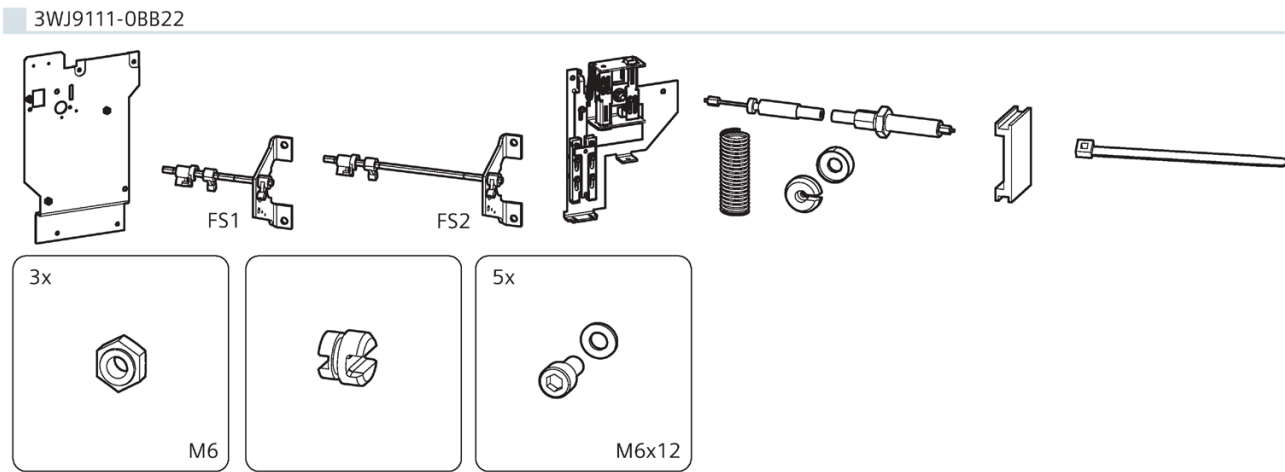
See chapter Installing Bowden wire (Page 138)

3.9.5.3 Mechanical interlock of withdrawable Circuit Breakers

Article No.

Description	Article No.
Mutual mechanical interlock for withdrawable Circuit Breaker	3WJ9111-0BB22

Check the contents of the packaging



Preparatory work

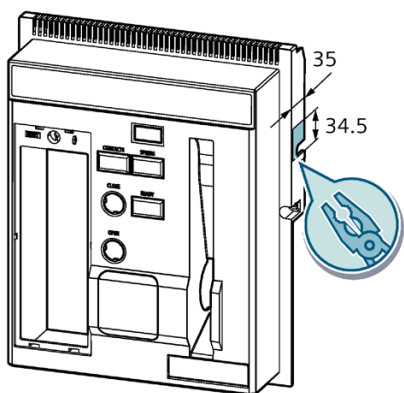
1. Open the Circuit Breaker and discharge the stored-energy spring.
2. Rack the Circuit Breaker into maintenance position (disconnected position) and remove it from the guide frame (only withdrawable Circuit Breakers).
3. Remove the operator panel and the secondary disconnect terminals.

See chapter Preparatory and concluding installation steps for the installation of internal accessories (Page 57)

Preparations

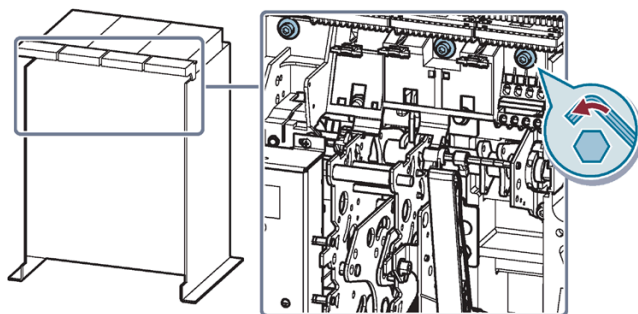
Preparing the operator panel (frame size I)

Break out the groove base from the pre-pressed groove as displayed in the image below.



Preparing the mounting plate (frame size I)

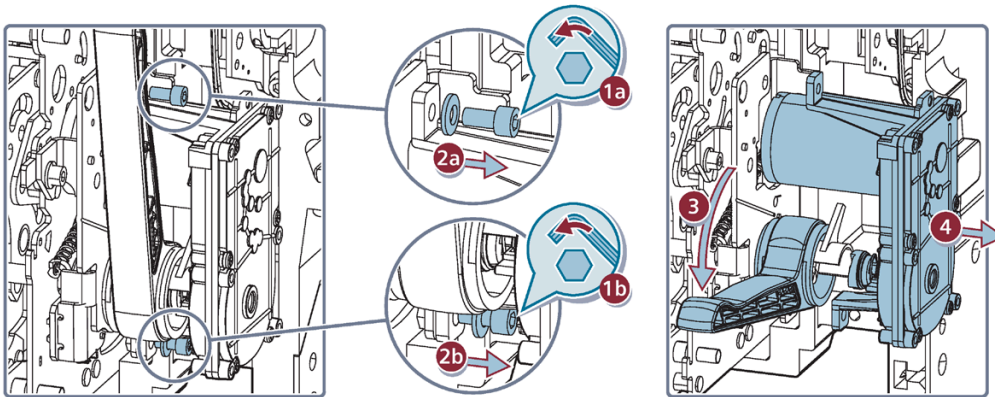
Loosen the screws of the mounting plate with 3 or 4 turns each as shown in the image below.



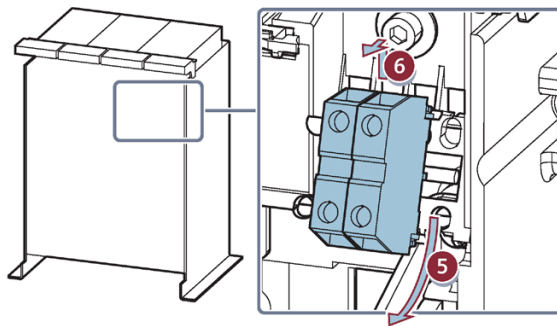
3.9 Accessories for locking and interlocking

Removing the spring-charging motor and 2nd auxiliary switches (frame size I)

If present, remove an installed spring-charging motor as shown below.

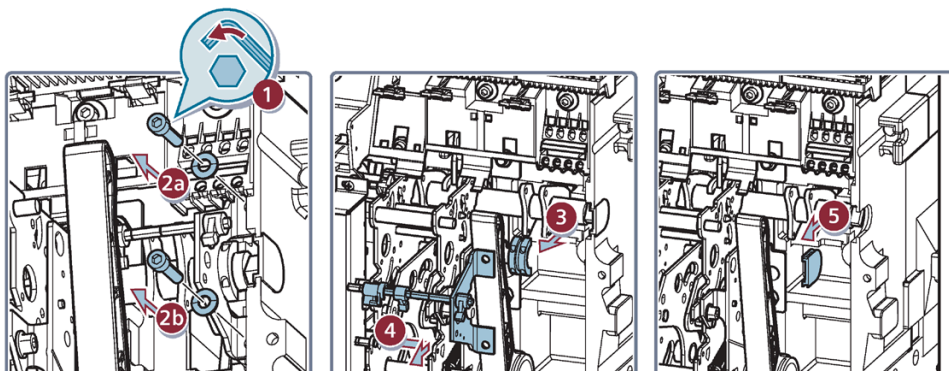


If present, remove the 2nd auxiliary switches as shown below.



Removing the auxiliary shaft and cover

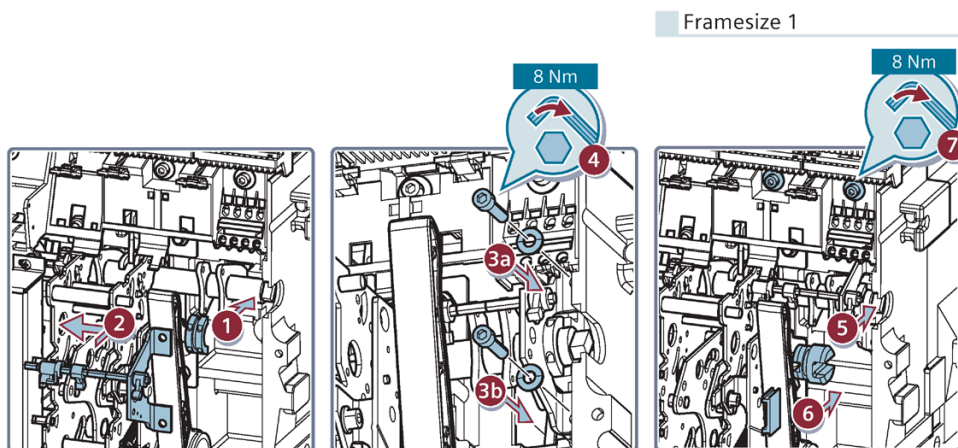
Remove the auxiliary shaft and the cover as shown in the images below.



Installing the auxiliary shaft and the clutch in the Circuit Breaker

Insert the auxiliary shaft and fix it with screws and washer as shown in the images below. Add the clutch (5) and secure cover (6) to fix the clutch.

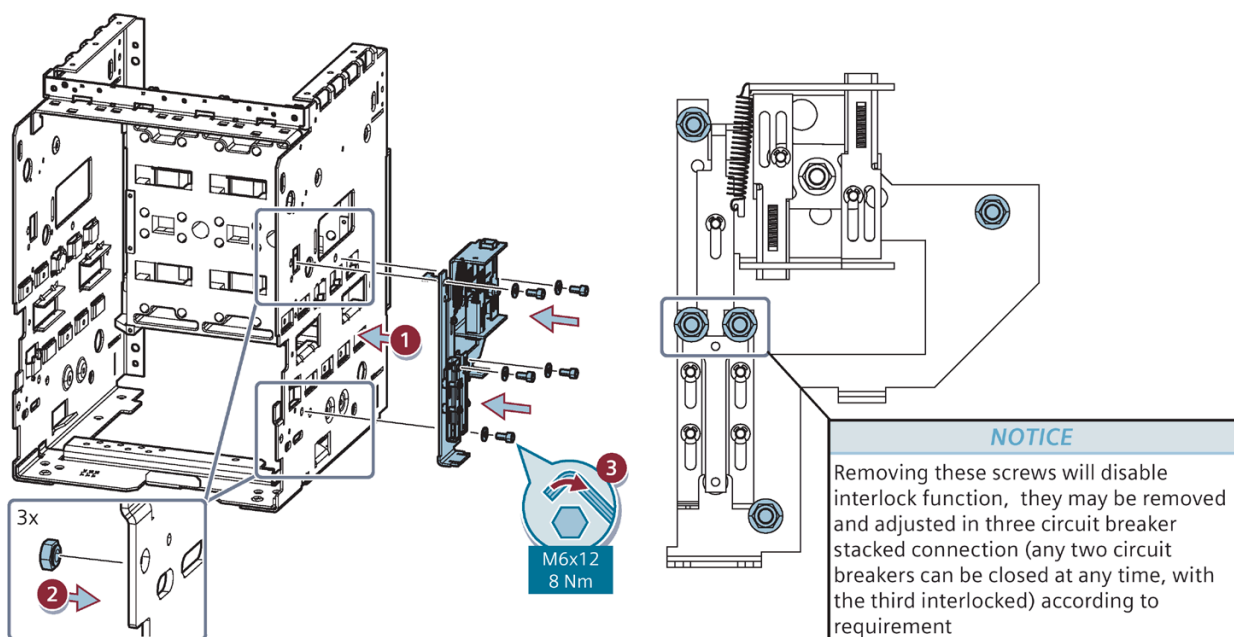
For framesize I also fix the screws of the mounting plate again.



Install the operator panel again.

Installing the interlocking module

1. Attach the interlocking module to the guide frame.
2. Insert the setnuts.
3. Secure by means of cylinder-head screws and strain washers (tightening torque: 8 ± 1 Nm).



3.9 Accessories for locking and interlocking

Installing Bowden wire

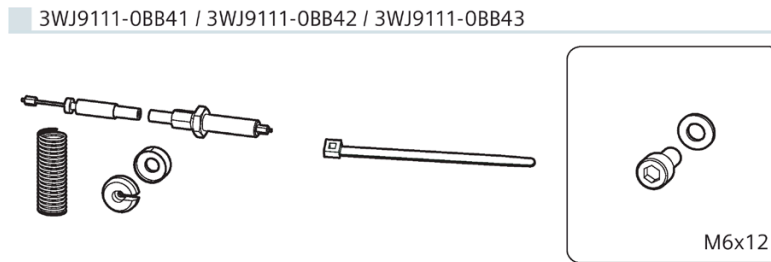
Installing Bowden wire (Page 138)

See also

Preparation for maintenance work (Page 178)

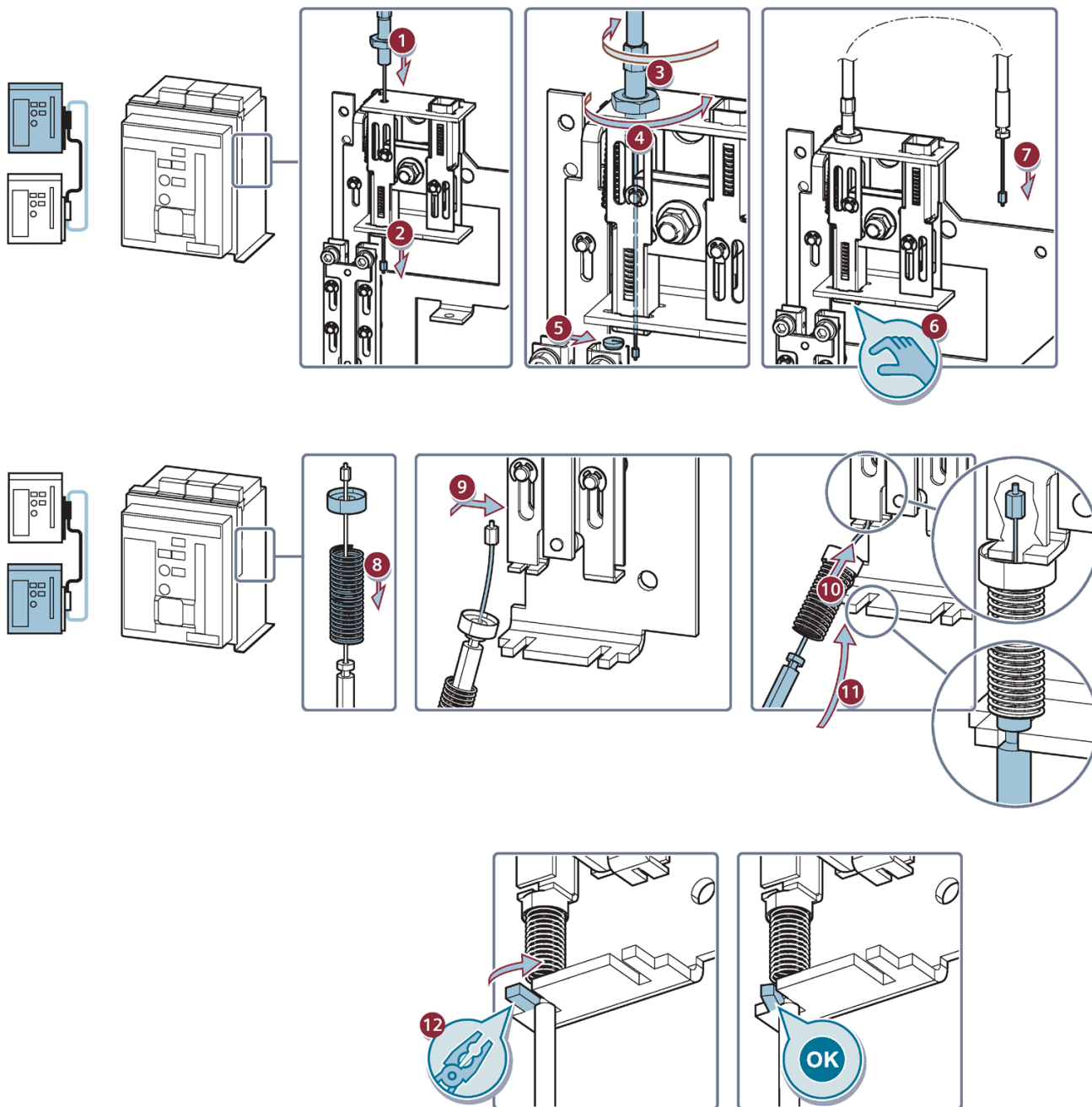
3.9.5.4 Installing Bowden wire**Article No.**

Description	Article No.
Bowden wire (2 m)	3WJ9111-0BB41
Bowden wire (3 m)	3WJ9111-0BB42
Bowden wire (4.5 m)	3WJ9111-0BB43

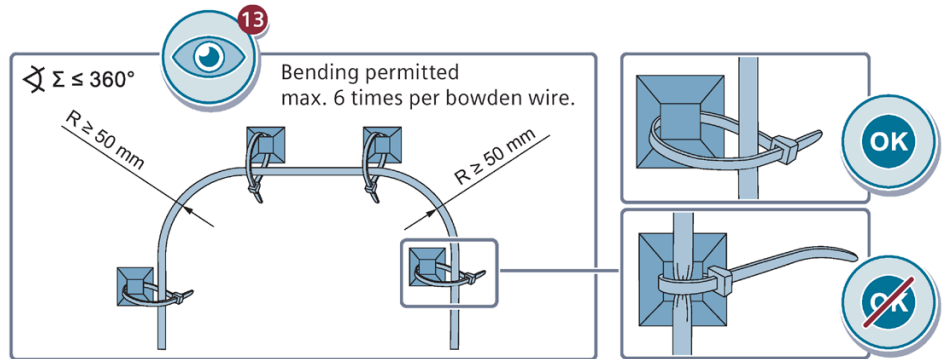
Check the contents of the packaging**Inserting and adjusting the Bowden wire**

- Push the Bowden wire through the angle plate, compression spring and insertable plate.
- Adjust the bowden wire with the adjusting screw ③ and secure with lock nut ④ to the plate.
- Secure Bowden wire with the slotted washer ⑤.
- When the Bowden wire is attached on both sides, the sheath must have approx. 1 mm clearance. If necessary, adjust with adjusting screw.
- Fix the setting by means of the lock nut ⑥.
- Pull the other end of the bowden wire to the next Circuit breaker ⑦.
- Push the compression spring and spring bush over the tube holder and sheath ⑧.
- Insert the Bowden wire into the index brackets ⑨.
- Place the spring bush onto the index brackets ⑩.
Press the compression spring between the spring bush and the plate.

- Push the tube holder into the plate ⑪.
- Bend the nose of the plate with pliers to secure the tube holder ⑫.



Installing the Bowden wire



Bowden wires must be installed in a way that they are not bent excessively (large bending radii).

Secure Bowden wires by means of cable ties .

Minimum permissible bending radius: $R = 50 \text{ mm}$. This bending radius is only permitted a maximum of six times for each Bowden wire. The remaining bending radii should be as large as possible.

The total bending angle across the length of the Bowden wire must not exceed 360° .

! WARNING

Risk of personal injury and/or equipment damage

If a mechanical Circuit Breaker interlock is installed, two or more Circuit Breakers **must not be closed simultaneously** by electrical or mechanical means.

The delay between the close commands must be at least 100 ms.

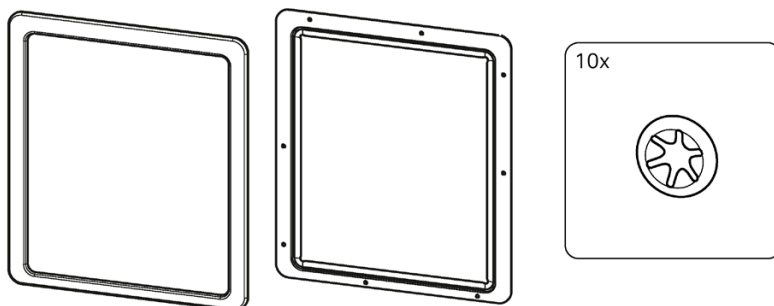
3.10 Accessories for integration in the power distribution equipment

3.10.1 Door sealing frame IP41

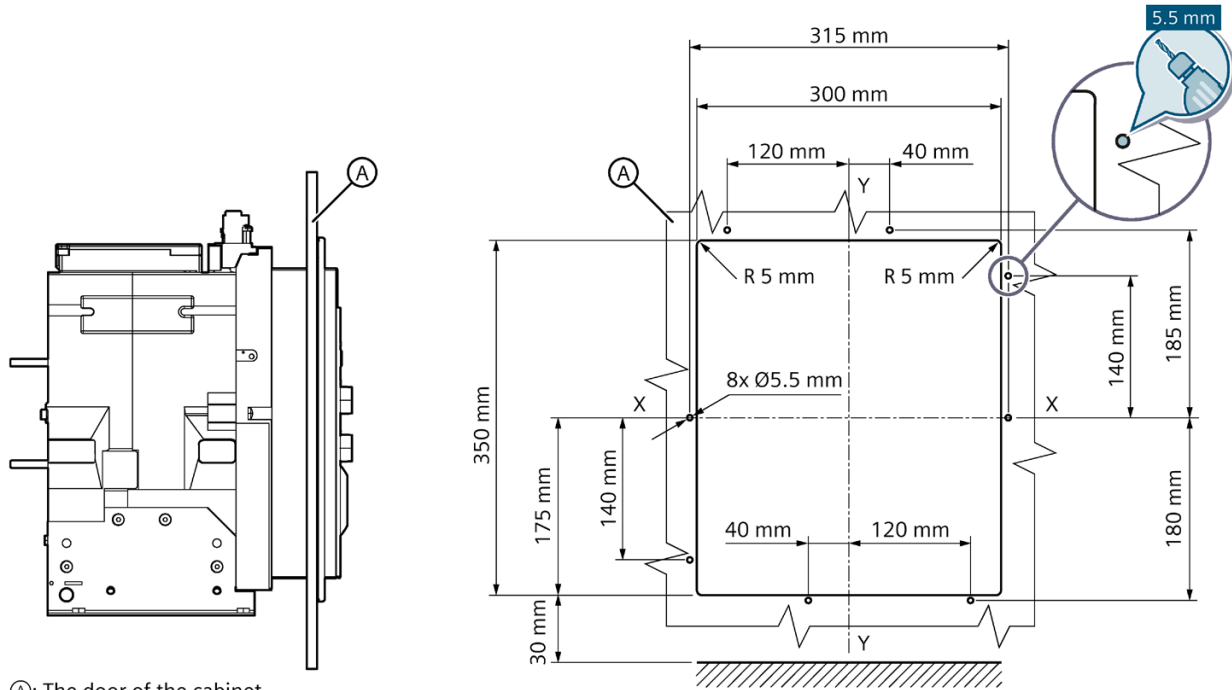
Articel no.

Description	Article No.
Door sealing frame	3WJ9111-0AP01

Check the contents of the package



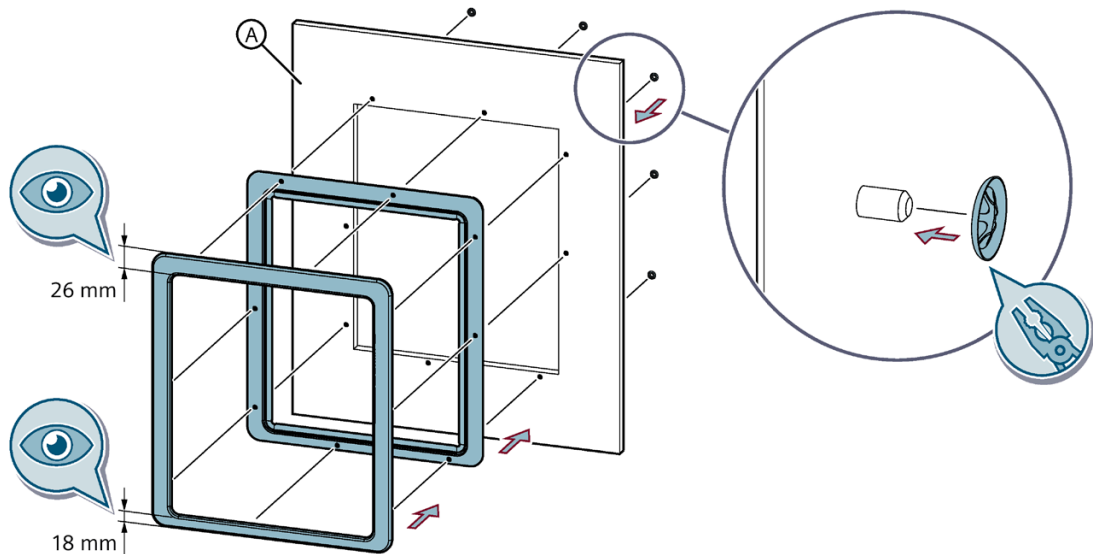
Preparing the switchgear door



Ⓐ: The door of the cabinet

Y Center of the operator panel

Installation of the door sealing frame

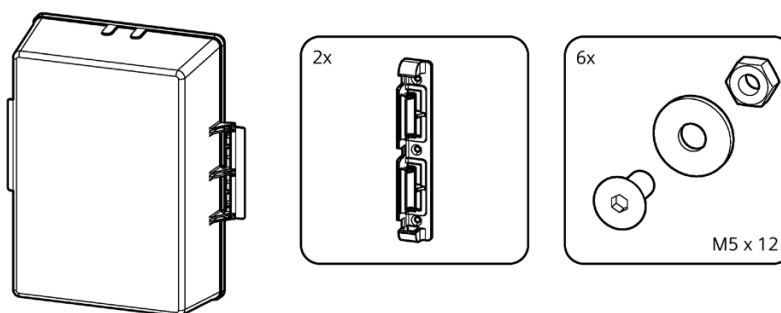


3.10.2 Protective cover IP55

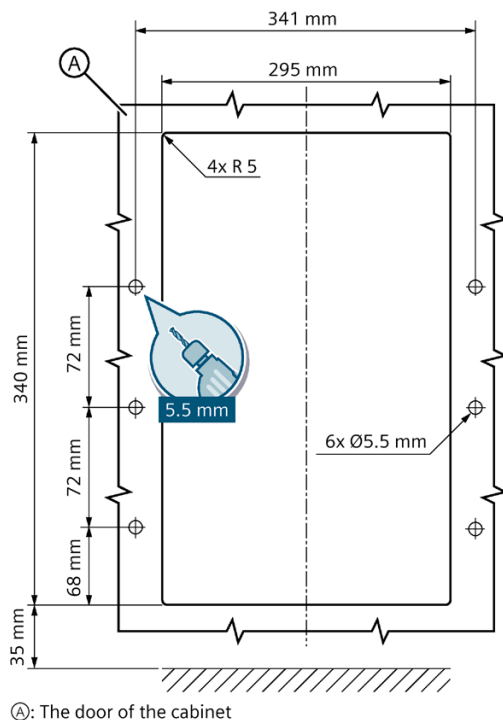
Article No.

Description	Article No.
Protective cover with plastic hinges	3WJ9111-0AP03

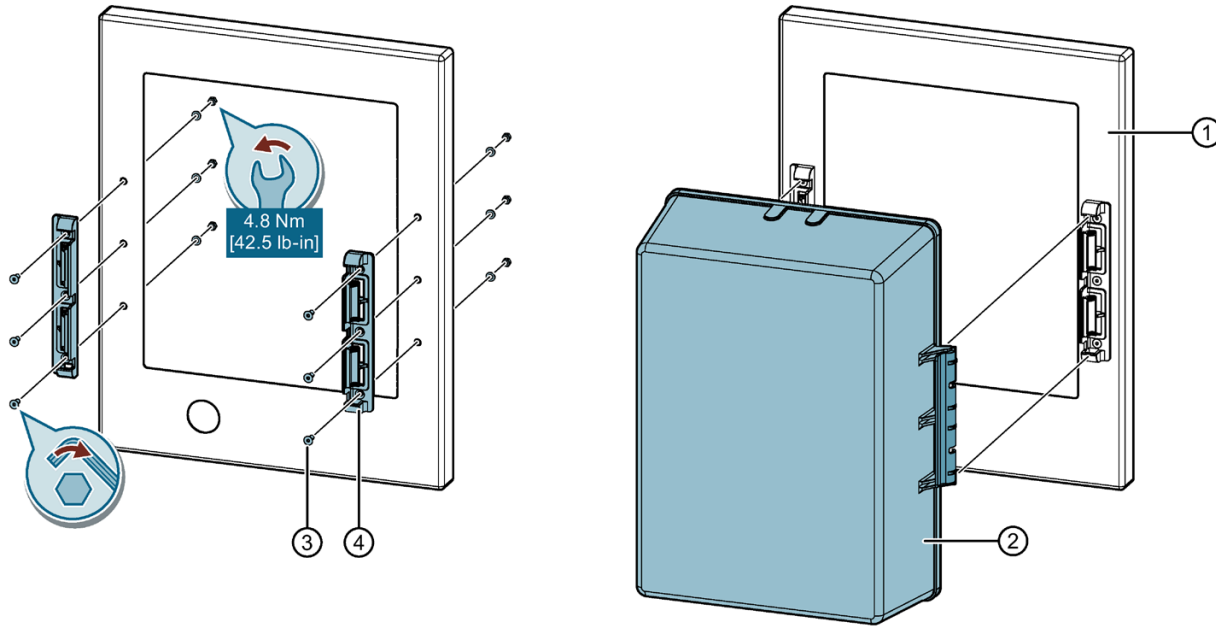
Check contents of the package



Dimension drawing for door cutout and mounting holes

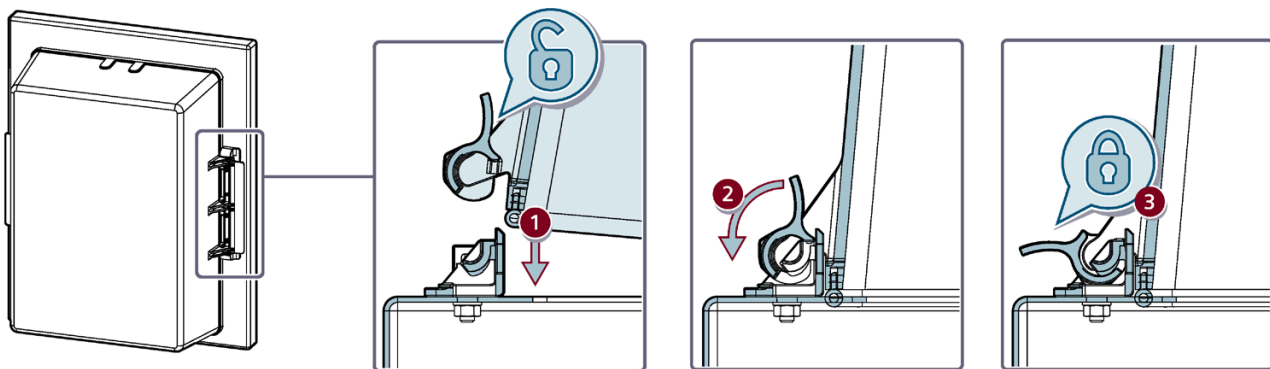


Mounting the protective cover



- ① Cubicle door with door cutout
- ② Protective cover
- ③ 6 x Hexagon socket-head screw M5 with washers and safety nuts
- ④ Hinges with opening function (right and left)

Function



3.10.3 Arc chute cover

The arc chute covers are accessories for the guide frame and the fixed-mounted Circuit breaker. They provide protection for the devices directly above the air Circuit Breaker.

3.10 Accessories for integration in the power distribution equipment

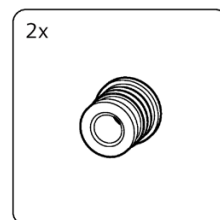
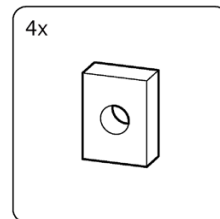
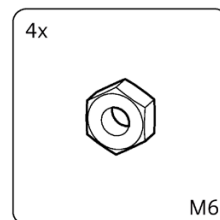
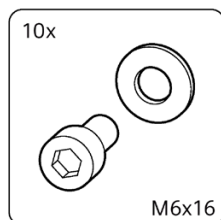
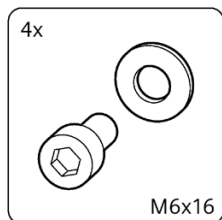
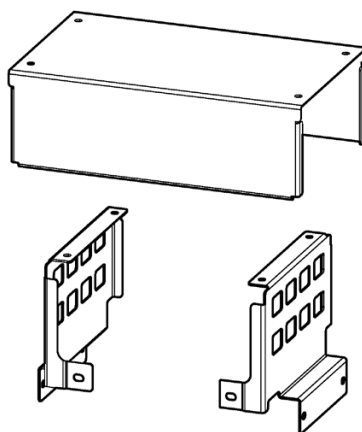
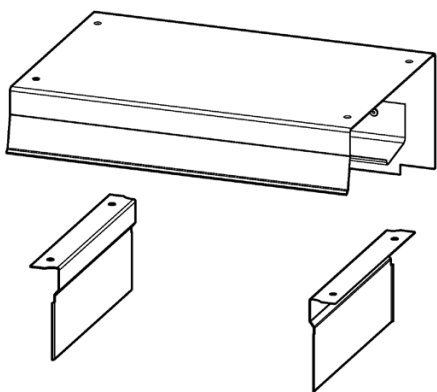
Article No.

Description	Article No.	
Withdrawable Circuit breaker		
Arc chute cover	Size I, 3P	3WJ9111-0AP41
	Size I, 4P	3WJ9111-0AP43
	Size II, 3P	3WJ9111-0AP42
	Size II, 4P	3WJ9111-0AP44
Fixed-mounted Circuit breaker		
Arc chute cover	Size I, 3P	3WJ9111-0AP45
	Size I, 4P	3WJ9111-0AP47
	Size II, 3P	3WJ9111-0AP46
	Size II, 4P	3WJ9111-0AP48

Check contents of package

3WJ9111-0AP41
3WJ9111-0AP42
3WJ9111-0AP43
3WJ9111-0AP44

3WJ9111-0AP45
3WJ9111-0AP46
3WJ9111-0AP47
3WJ9111-0AP48



Preparatory work

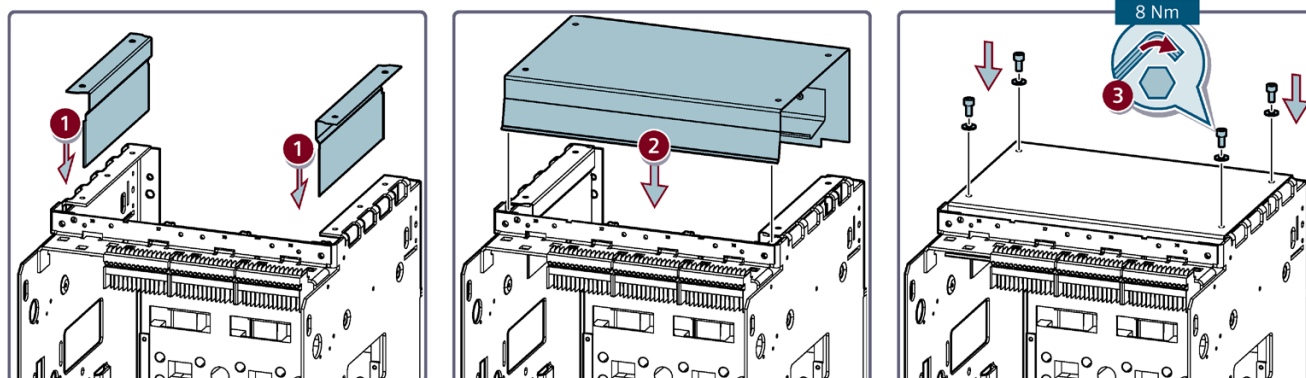
- Open the Circuit Breaker and discharge the stored energy springs
- Disconnect auxiliary circuits
- Rack the Circuit Breaker into maintenance position (disconnected position) and remove it from the guide frame (only withdrawable Circuit Breakers).

See chapter Preparation for maintenance work (Page 178)

Installation on the guide frame

1. Put the side plates onto the guide frame.
2. Put the top piece of the arc chute cover onto the guide frame.
3. Use an allen wrench to fix the arc chute covers to the guide frame with M6x16 screw and washers with a torque of 8 Nm.

3WJ9111-0AP41
3WJ9111-0AP42
3WJ9111-0AP43
3WJ9111-0AP44



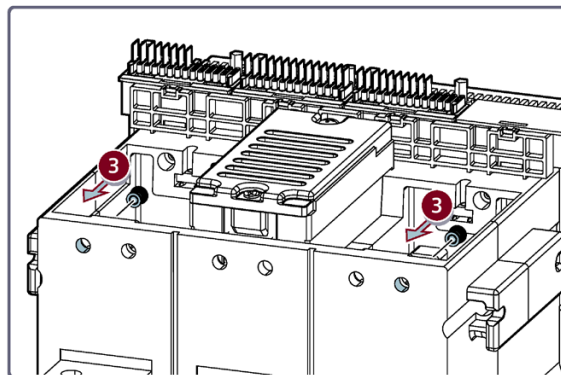
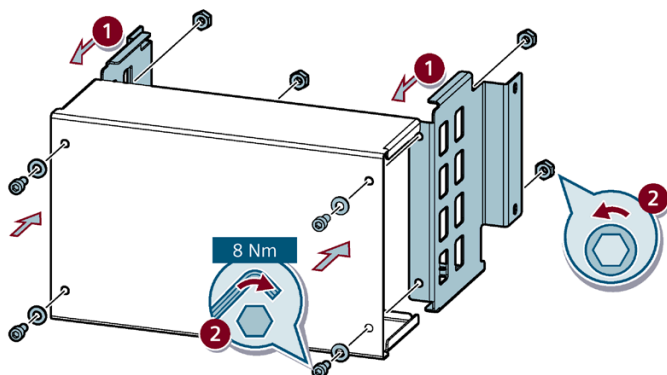
Installation on the fixed-mounted Circuit breaker

1. Attach the side plates to the top palte of the arc chute cover.
2. Attach the pieces to each other with an allen wrench using four sets of M6 screws, washers and nuts.

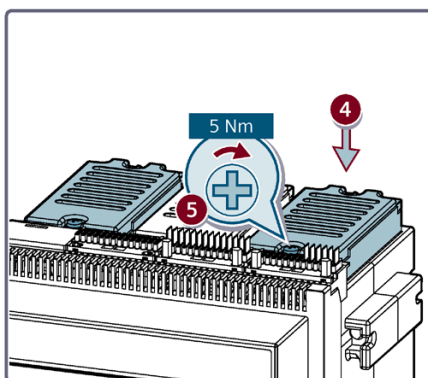
3.10 Accessories for integration in the power distribution equipment

- Put the insert nuts into the back side of the circuit breaker as shown in the picture below.

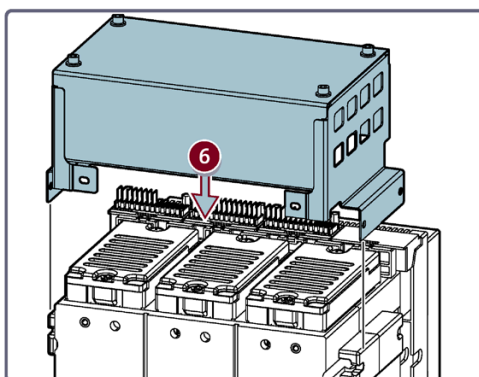
3WJ9111-0AP3.
3WJ9111-0AP45
3WJ9111-0AP46
3WJ9111-0AP47
3WJ9111-0AP48



- Re-install the arc chutes on the outsides of the fixed-mounted circuit breaker.
- Fix them with 5 Nm tightening torque.



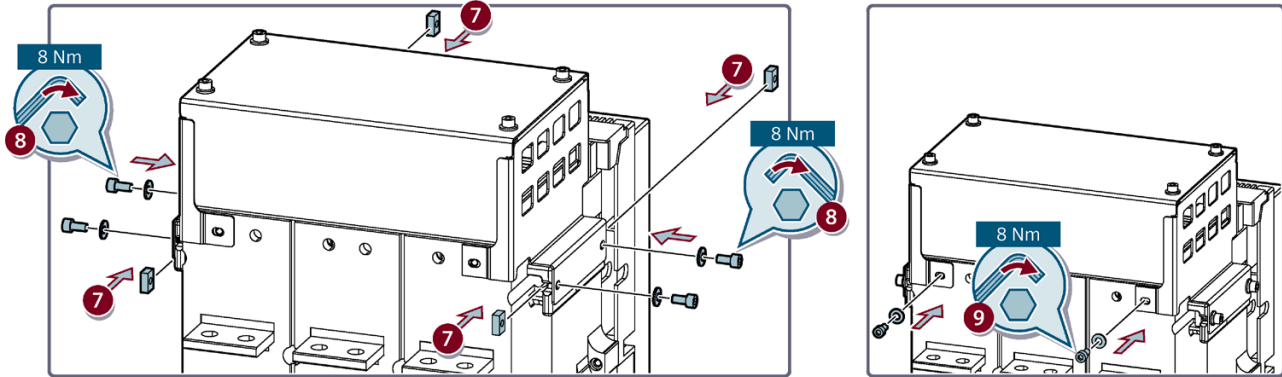
- Put the arc chute cover on the top of the circuit breaker.



- Fix the arc chute cover to the Circuit breaker by inserting the securing pins.

3.10 Accessories for integration in the power distribution equipment

8. Attach the arc chute cover with four M6 screws and washers.
9. Fix the arc chute cover to the rear side of the Circuit breaker and the previously installed insert nuts with two M6 screws and washers,



3.10.4 Shutters

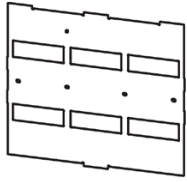
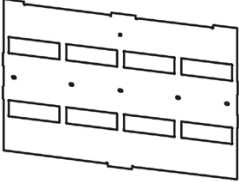
Article No.

Description	Article No.	
Shutters	Framesize I, 3P	3WJ9111-0AP04
	Framesize I, 4P	3WJ9111-0AP08
	Framesize II, 3P	3WJ9111-0AP06
	Framesize II, 4P	3WJ9111-0AP11

Check the contents of the package

3WJ9111-...	...0AP04	...0AP08	...0AP06	...0AP11	3WJ9111-...	...0AP04	...0AP08	...0AP06	...0AP11
	top: 1x	2x	-	-		2x	2x	2x	2x
	2x	2x	-	-		2x	2x	2x	2x
	bottom: 1x	-	2x	2x		2x	2x	2x	2x
	-	-	2x	2x		2x	2x	2x	2x
	4x	6x	-	-		8x	12x	4x	5x
						-	-	4x	5x

3.10 Accessories for integration in the power distribution equipment

3WJ9111-...	...OAP04	...OAP08	...OAP06	...OAP11	3WJ9111-...	...OAP04	...OAP08	...OAP06	...OAP11
	–	–	1x	–		–	–	–	1x

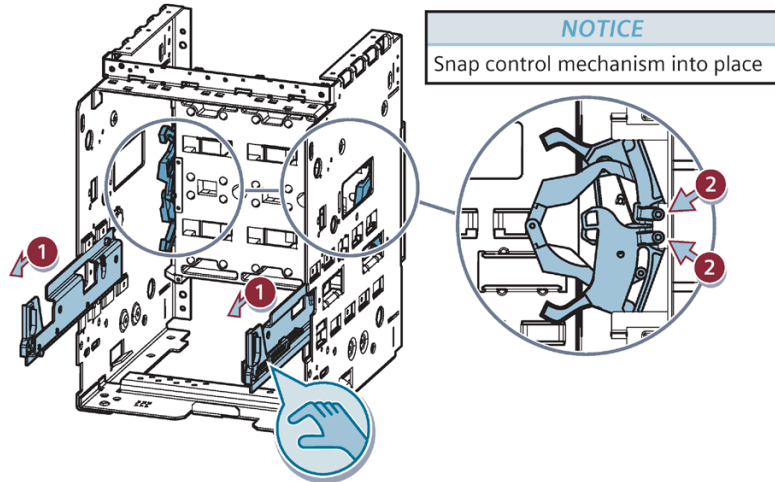
Preparatory work

- Open the Circuit Breaker and discharge the stored energy spring.
- Disconnect auxiliary circuits.
- Rack the Circuit Breaker to maintenance position and remove from the guide frame.

See chapter Preparation for maintenance work (Page 178)

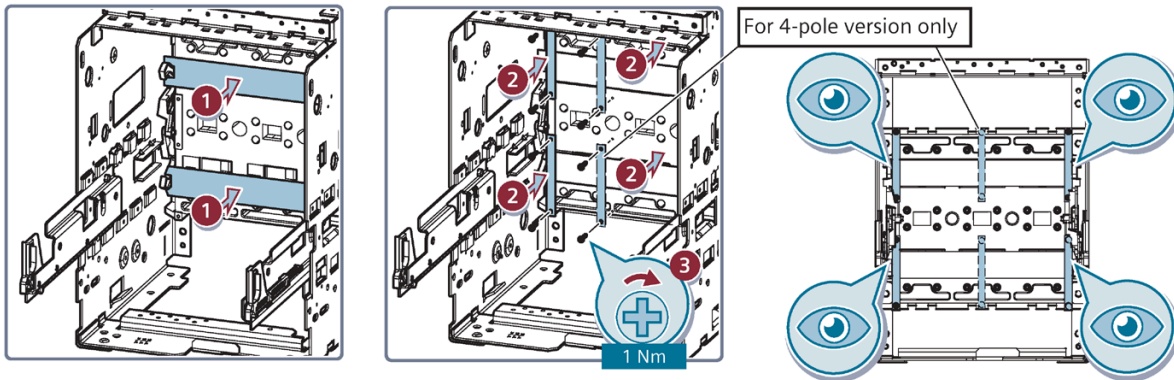
Installation of the shutter - Frame size I

- Check if the control mechanism is properly installed.
To do so, pull out the guiding rails and snap the control mechanism into place.



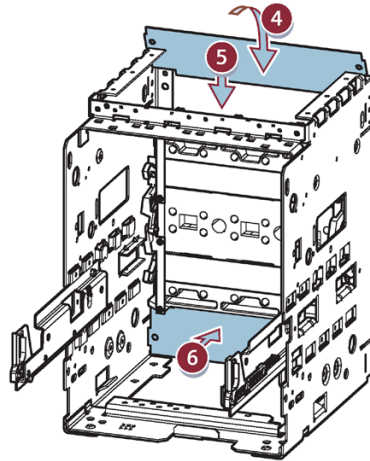
- Place the shutters on the levers of the control mechanism. Attach the cover strips and secure them with the screws.

FS 1

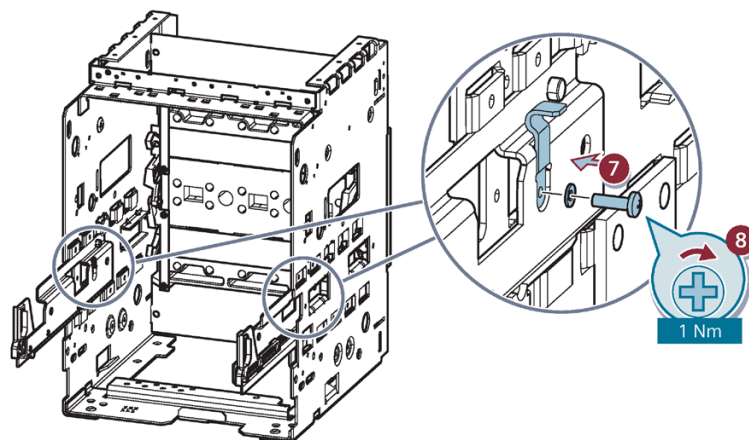


3.10 Accessories for integration in the power distribution equipment

- Insert the upper and lower cover.

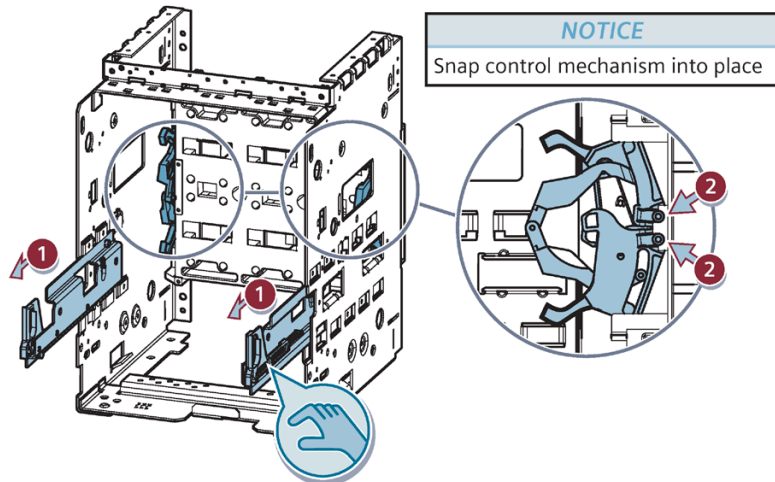


- Screw the hook onto the guiding rails.



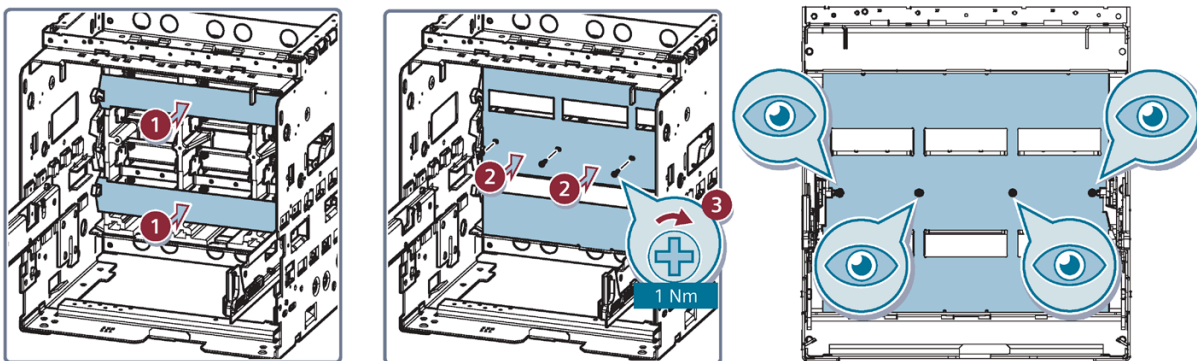
Installation of the shutter - Frame size II

- Check if the control mechanism is properly installed.
To do so, pull out the guiding rails and snap the control mechanism into place.



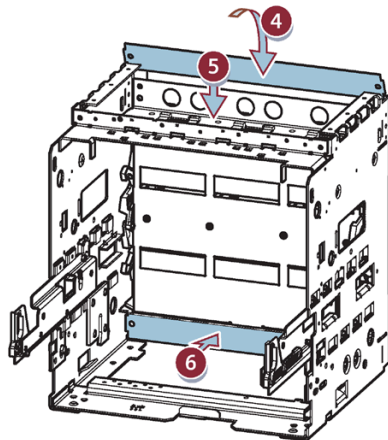
- Place the shutters on the levers of the control mechanism. Attach the insulation plate and secure with the screws.

FS 2

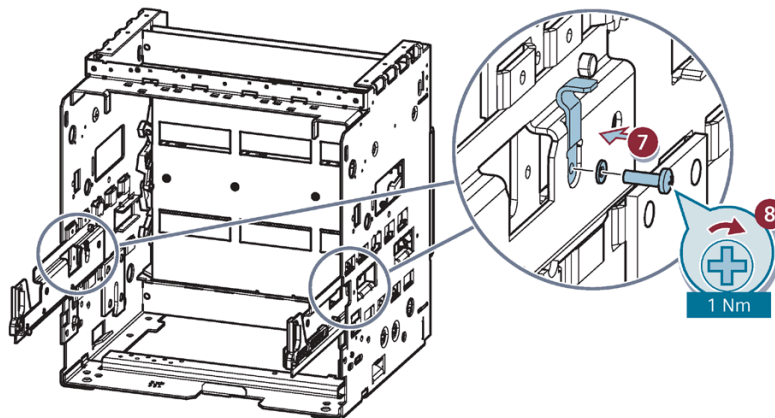


3.10 Accessories for integration in the power distribution equipment

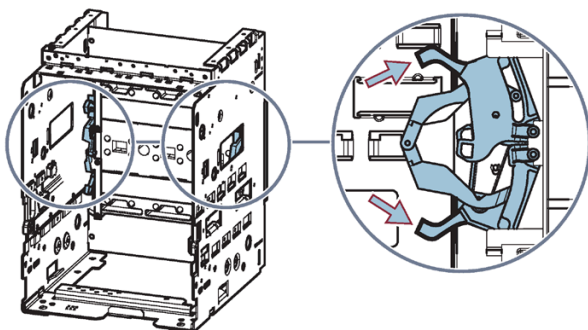
- Insert the upper and lower cover.



- Screw the hook onto the guiding rails.



Functional check

**NOTICE**

Move the upper and lower lever in the direction of the arrow until the shutter is open fully. When you let go of the levers, the shutters should close automatically.

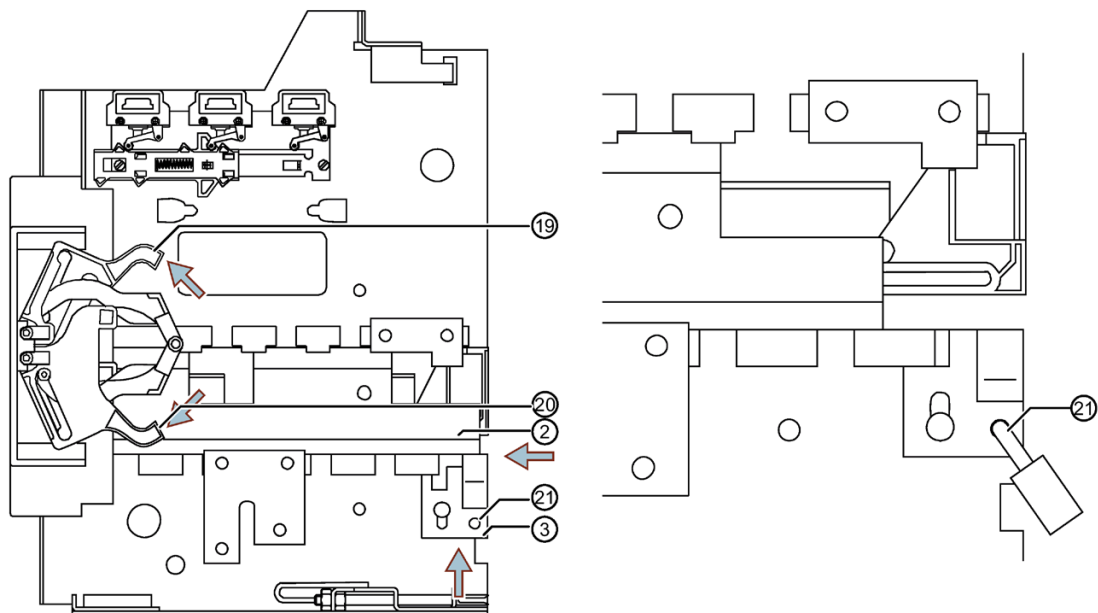
Locking the shutter: frame sizes I and II

Note

The following options are available:

- Both shutters closed
- The top shutter open
- The lower shutter open
- Both shutters open

Two padlocks are required here for each shutter.
These must be provided by the customer.








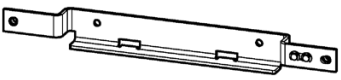

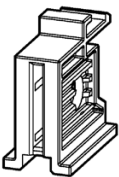



- Both shutters closed:
 - Insert the guides ② as far as they will go.
 - Push the bolt ③ up as far as it will go.
 - Place the padlocks ②① in the holes and lock.
- Upper shutter open:
 - Push the upper lever ①⑨ up in the direction of the arrow.
 - Continue as described above (1).
- Lower shutter open:
 - work sequence as described above (2).
- Both shutters open:
 - Move the upper ①⑨ and lower ②⑩ lever in the direction of the arrow.
 - Continue as described above (1).

3.10 Accessories for integration in the power distribution equipment

3.10.5 Phase barrier

The phase barrier is an accessory of the Circuit Breaker which is used for phase short circuit isolation. It provides necessary guide slots and installs fixed interface on the rear wall of the fixed-mounted Circuit Breaker and guide frame.

Check contents of package

3WJ9111-...	...0AP51	...0AP52	...0AP53	...0AP54	...0AP61	...0AP62	...0AP63	...0AP64
	3P		4P		3P		4P	
	FS 1	FS 2	FS 1	FS 2	FS 1	FS 2	FS 1	FS 2
	2x	-	3x	-	-	-	-	-
	-	2x	-	3x	-	-	-	-
	-	-	-	-	2x	-	3x	-
	-	-	-	-	-	2x	-	3x
	4x	2x	6x	3x	-	4x	-	6x
	-	-	-	-	2x	-	-	-
	-	-	-	-	-	-	2x	-
	-	-	-	-	4x	-	6x	-
	-	-	-	-	-	4x	-	6x
	4x	-	6x	-	-	-	-	-
 M6x16	4x	-	6x	-	4x	8x	4x	12x

3.10 Accessories for integration in the power distribution equipment

3.10.5.1 Phase barrier for fixed-mounted Circuit Breaker

Article No.

Description	Article No.
Phase barrier for fixed-mounted Circuit Breaker, Size I, 3P	3WJ9111-0AP51
Phase barrier for fixed-mounted Circuit Breaker, Size I, 4P	3WJ9111-0AP53
Phase barrier for fixed-mounted Circuit Breaker, Size II, 3P	3WJ9111-0AP52
Phase barrier for fixed-mounted Circuit Breaker, Size II, 4P	3WJ9111-0AP54

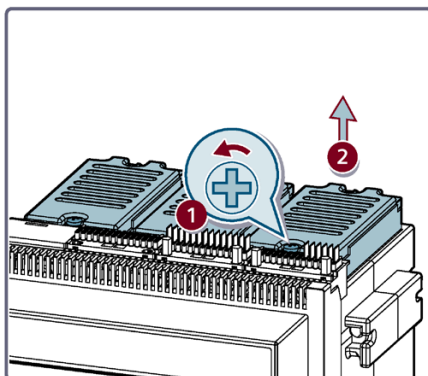
Preparatory work

- Open the Circuit Breaker and discharge the stored energy spring.
- Disconnect auxiliary circuits.

Preparation for maintenance work (Page 178)

Installation - Frame size I

- Remove the arc chutes and store them securely.



Note

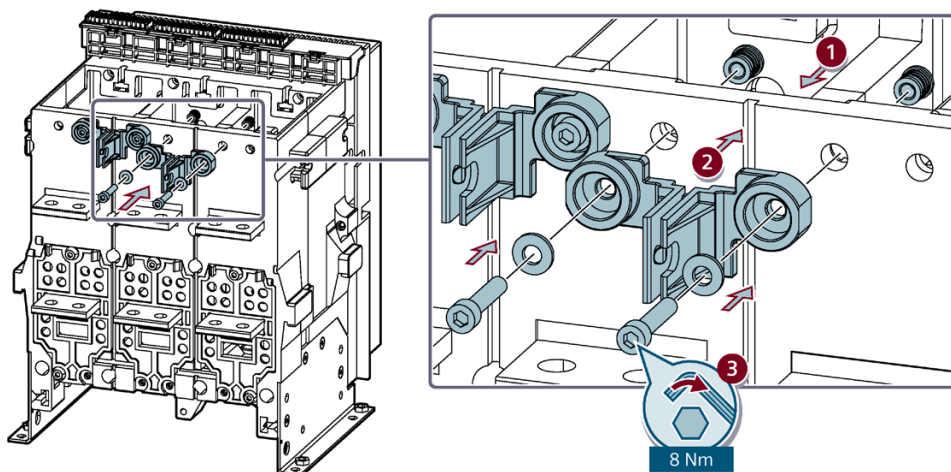
Equipment damage

Risk of damage to the arc chutes. Do not stand the arc chutes vertically on the insulation walls, but lay them on the side



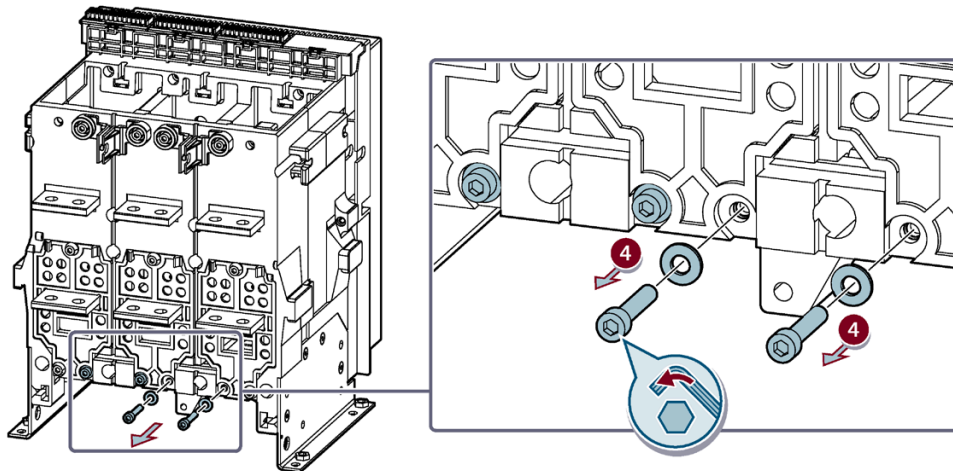
- Place the insert nut into the corresponding hole on the rear side of the Circuit breaker. Then use an allen wrench to attach the socket cap screw and clamping washer with the clips to the upper part of rear side of the Circuit breaker.

3WJ9111-0AP51
3WJ9111-0AP53

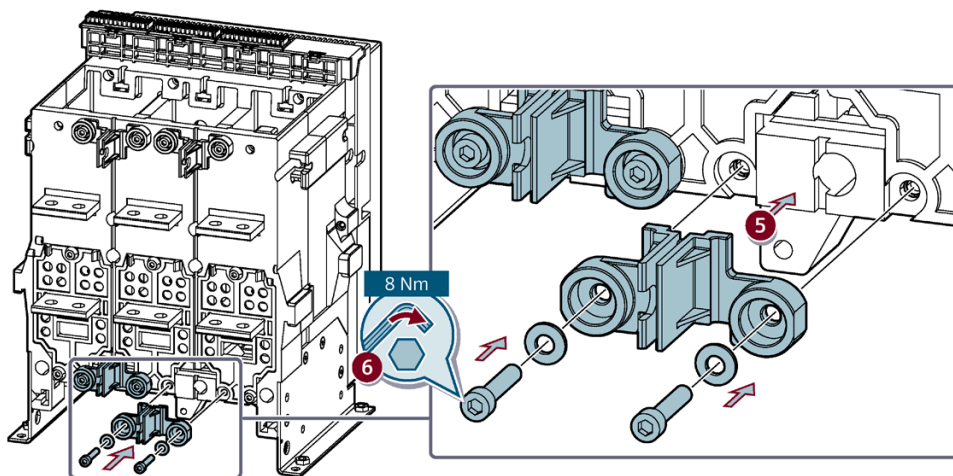


3.10 Accessories for integration in the power distribution equipment

- Remove the fasteners of the corresponding CT cover.

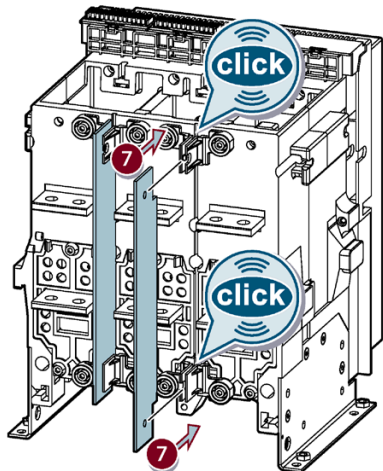


- Use an allen wrench to attach the socket cap screw and clamping washer with the clips to the bottom part of rear side of the Circuit breaker.

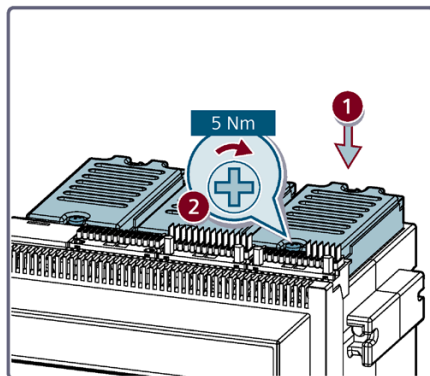


3.10 Accessories for integration in the power distribution equipment

- Insert the phase barrier, which is fixed in the correct position when you hear the "click" sound.
The audible clicking into place ensures that the upper and lower hole of the phase barrier are positioned correctly within the clip.



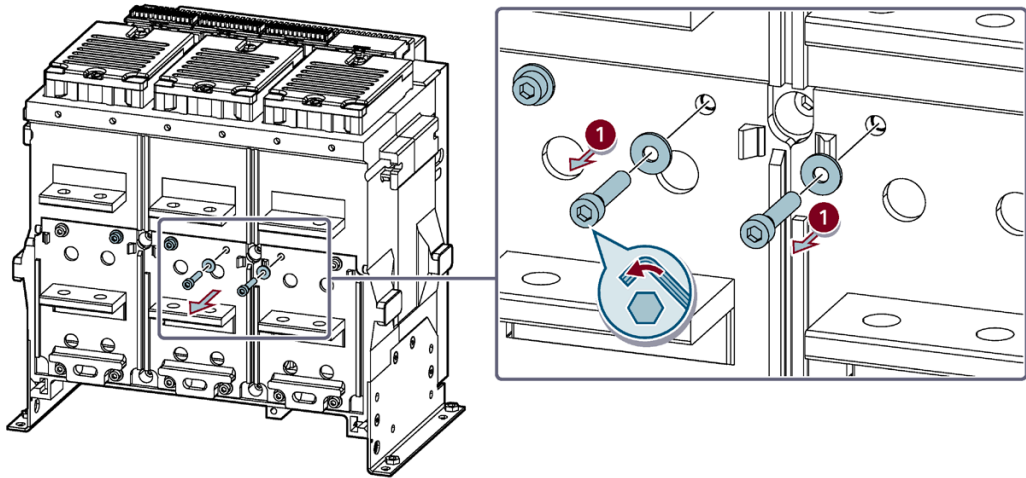
- Install the arc chutes.



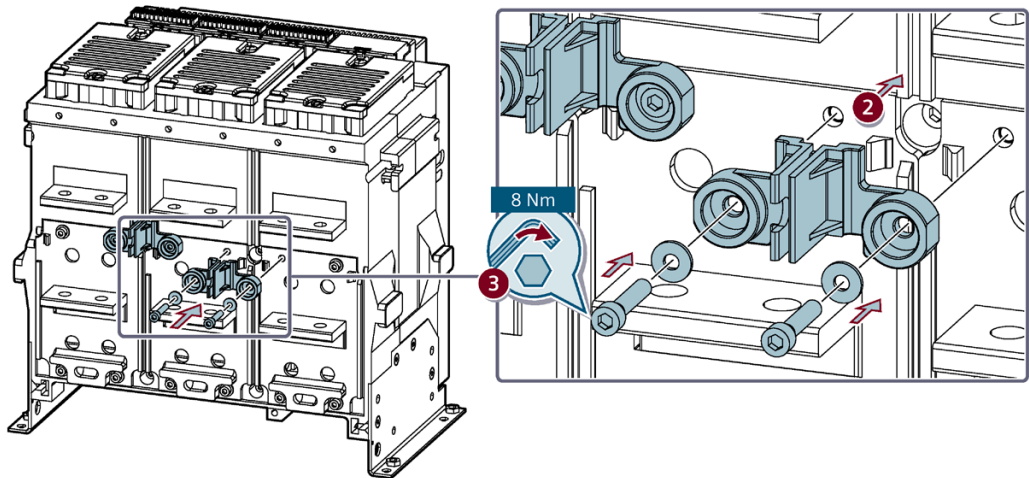
Installation - Frame size I

- Remove the fasteners of the corresponding CT cover.

3WJ9111-0AP52
3WJ9111-0AP54

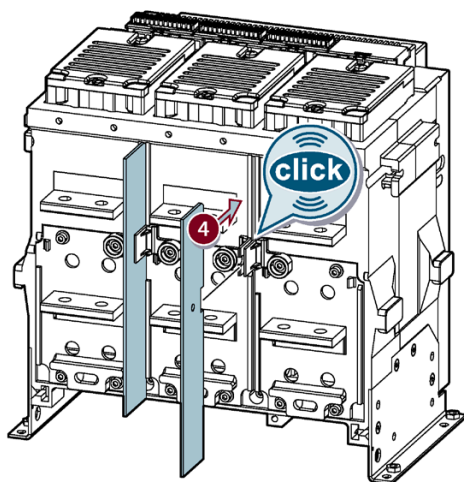


- Use the fasteners to fix the clip to the corresponding mounting hole of the corresponding CT cover.



- Insert the phase barrier, which is fixed in the correct position when you hear the "click" sound.
The audible clicking into place ensures that the upper and lower hole of the phase barrier are positioned correctly within the clip.

3.10 Accessories for integration in the power distribution equipment



3.10.5.2 Phase barrier for guide frame

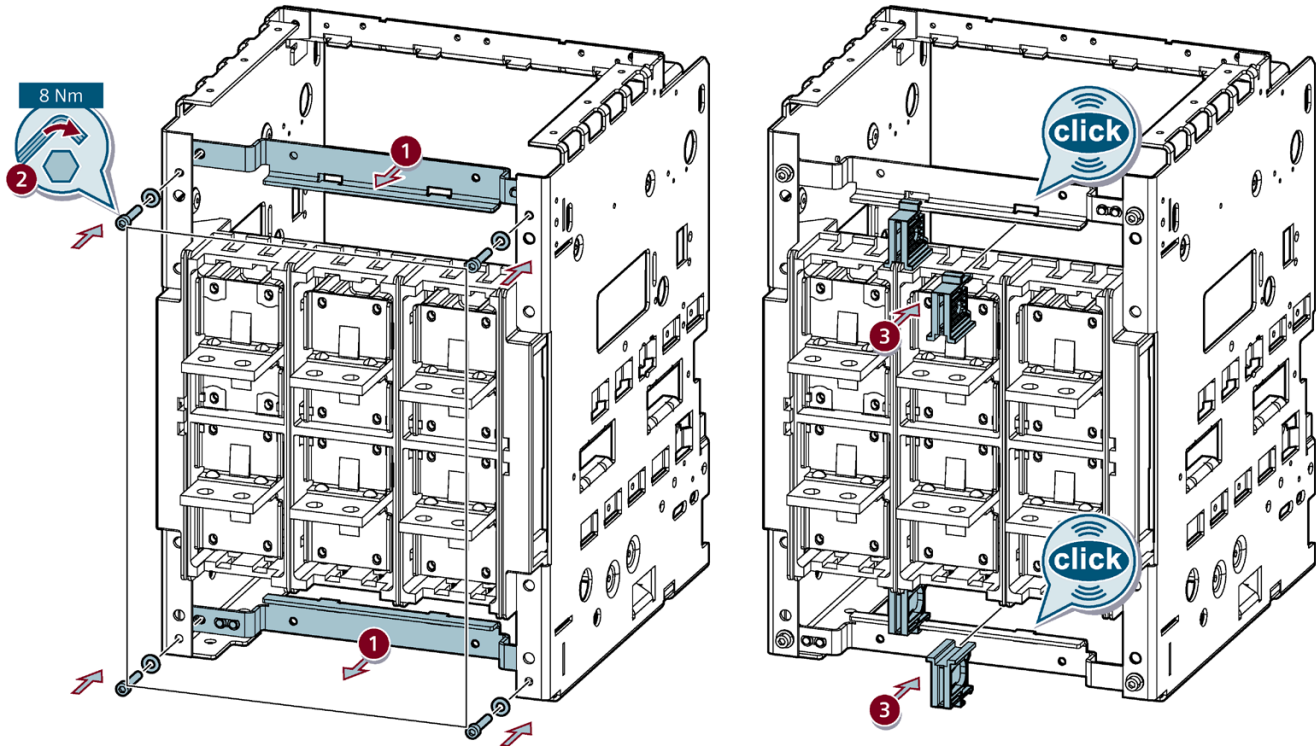
Article No.

Description	Article No.
Phase barrier for withdrawable Circuit Breaker, Size I, 3P	3WJ9111-0AP61
Phase barrier for withdrawable Circuit Breaker, Size I, 4P	3WJ9111-0AP63
Phase barrier for withdrawable Circuit Breaker, Size II, 3P	3WJ9111-0AP62
Phase barrier for withdrawable Circuit Breaker, Size II, 4P	3WJ9111-0AP64

Installation - Frame size I

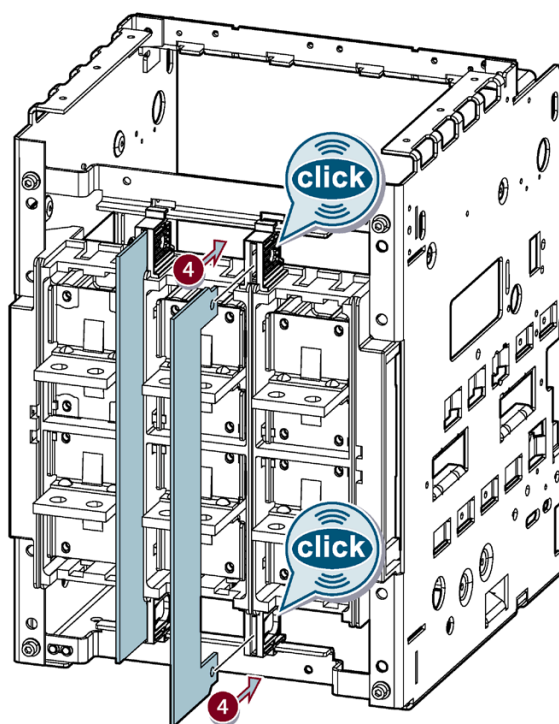
- Screw the crossbar to the upper and bottom location of the guide frame. Ensure that the correct crossbars are installed in the correct position, see picture below for reference. Insert the clips between the crossbars and the rear side of the guide frame. They are fixed in the correct position when you hear the "click" sound. Ensure to install the clips in the correction position as shown in the picture below.

3WJ9111-0AP61
3WJ9111-0AP63



- Insert the phase barrier, which is fixed in the correct position when you hear the "click" sound. The audible clicking into place ensures that the upper and lower hole of the phase barrier are positioned correctly within the clip.

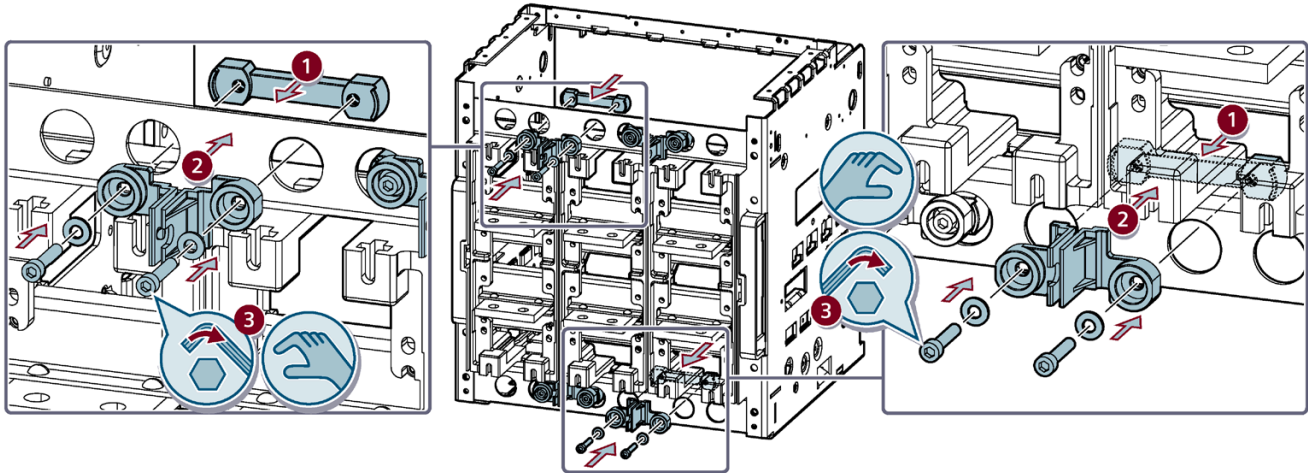
3.10 Accessories for integration in the power distribution equipment



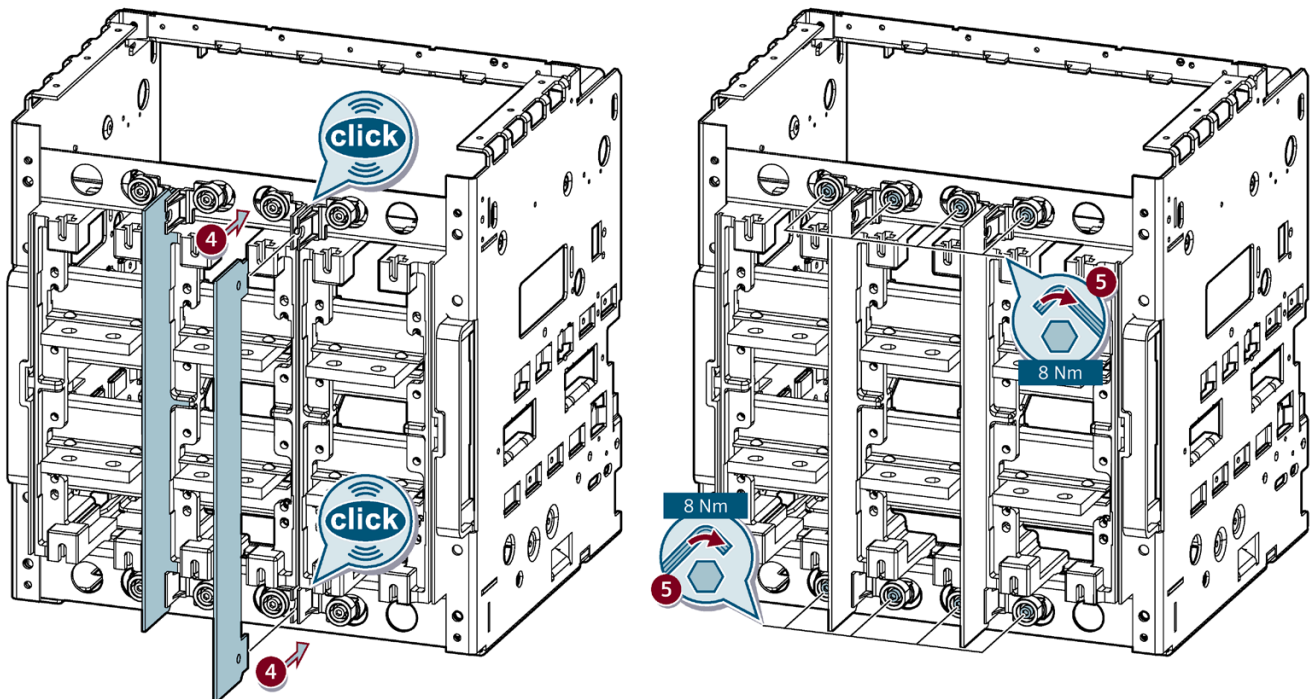
Installation - Frame size II

- Screw the clips to the upper and bottom location of the guide frame. Only hand tighten the screws.

3WJ9111-0AP62
3WJ9111-0AP64



- Insert the phase barrier, which is fixed in the correct position when you hear the "click" sound. The audible clicking into place ensures that the upper and lower hole of the phase barrier are positioned correctly within the clip. Then fasten the screws of the clips with 8 Nm torque.



Inspection & Maintenance

4.1 General

In addition to the costs of purchasing the protection devices and power distribution equipment, the expenditure associated with service and maintenance are a significant cost and time factor for the operator.

- **Inspection:**
Inspection refers to visual inspection of the circuit breaker and testing of the electrical and mechanical functions of the circuit breaker.
- **Maintenance:**
If a defect or problem becomes apparent during the inspection, the circuit breaker must be subjected to a maintenance procedure. During maintenance, parts can be replaced, wiring can be changed or secured, and installed or fitted parts can be refastened.

The following factors have an impact on expenditure and downtimes:

1. Time between inspection intervals

The operator defines the inspection intervals based on the operating conditions of the circuit breaker. In normal operation, the circuit breaker must be inspected at least once a year. If certain conditions are met, the inspection interval can be extended to four years.

For more information, see Chapter **Inspection interval**.

2. Scope of work, tests and checks to be performed

Only inspections are required for the 3WJ circuit breaker.

For more information on the scope of the inspections, see Chapter **Planning of inspection and maintenance**.

3. Number and frequency of components and accessories requiring replacement

Parts only need to be replaced during maintenance:

- If this is deemed necessary based on the inspection results
- When the contacts of the circuit breaker have reached their specified service life and require replacement
- When the circuit breaker has reached the maximum number of operating cycles without maintenance

Provided the specified operating conditions are observed, the service life of the accessory components corresponds to the maximum mechanical service life of the 3WJ circuit breaker.

The 3WJ circuit breaker can be operated at low cost. Among other things, no relubrication of moving parts is necessary thanks to its grease reserves.

4. Qualification of inspection and maintenance personnel


Inspection and maintenance work may only be performed by qualified operator personnel or by a qualified contracted company. This includes replacement of the contact system. For more information, see Chapter **Maintaining the main contacts**.

5. Time required until the circuit breaker or power distribution equipment is ready for operation

The low inspection and maintenance requirements and the possibility for work to be performed locally by qualified personnel mean that the circuit breaker and power distribution equipment are ready to return to operation in a very short time.

4.2 Safety regulations



 DANGER
<p>Hazardous voltage Will cause death, serious personal injury, or equipment damage.</p> <p>During operation, parts of the device or system are carrying hazardous electrical voltage. Improper handling of the device or system can result in death or serious injury, as well as significant material damage.</p> <ul style="list-style-type: none">• Inspection and maintenance may only be performed by qualified personnel.• Pay attention to all the notices provided on the product and in this manual.• Before commencing maintenance work, ensure that no voltage is present on the power distribution equipment and make sure that this condition is maintained while work is being performed (according to EN 50110-1, DIN VDE 0105-100 and BGV A2). <p>Proceed in accordance with the Five Safety Rules:</p> <ul style="list-style-type: none">– Turn off all power supplying the equipment.– Lock out all power supplying the equipment to secure against reconnection.– Verify that no voltage is present on the device.– Ground and short the circuit.– Provide protection against adjacent live parts.

Qualified personnel

Inspection and maintenance may only be performed by qualified personnel.

In the context of these operating instructions and the warning notices on the product, qualified personnel refers to persons who are familiar with the erection, installation, commissioning and operation of the product and who possess the qualifications appropriate for their activities, e.g.:

- Training or instruction/authorization to close and open, ground, and tag circuits and devices and systems in accordance with established safety procedures.
- Training or instruction in the proper care and use of protective equipment in accordance with established safety procedures.
- Training in first aid.

Spare parts

Only spare parts approved by the manufacturer may be used.

4.3 Planning of inspection and maintenance

4.3.1 Inspection interval

 **WARNING**

Malfunction due to insufficient inspection or maintenance

The circuit breaker may not function properly if inspection intervals are not adhered to or if maintenance measures are not performed.

It is absolutely necessary to adhere to the prescribed inspection and maintenance intervals and the instructions on repair and replacement in order to avoid personal injury and damage to equipment.

The operator defines the inspection intervals within the following constraints based on the operating conditions of the circuit breaker:

- At least once a year.
- After each short-circuit trip
- After five overload trips

4.3.2 Scope

Inspection

The inspection comprises:

- Visual inspection for:
 - Pollution
 - Damage
 - Corrosion
- Check of available documentation and of rating/accessory label to ensure that they correspond to the actual circuit breaker equipment.
- Testing of the mechanical function of the circuit breaker by closing and opening (a minimum current load of 200 A is recommended in order to remove the corrosion on the contact surfaces, thereby reducing power losses).
- Mechanical and electrical testing of the rack-in position indicators.
- Testing of auxiliary circuits and of cables to external current sensors for secure fitting of auxiliary supply connectors and for correct connection.
- Testing of mechanical and electrical function of internal accessories.

- Testing of settings of electronic trip unit for plausibility in accordance with the system conditions specified during system planning.
- Inspection of the electronic trip unit by reading out the status and maintenance information.
- Inspection of the arc chutes and arc chute cover for damage or impermissible contact erosion.
- Inspection of the main contacts by means of a visual check of the contact system or the permanently integrated contact erosion indicator.
- Inspection of the IP55 protective cover for correct mounting, correct position and the correct position of the seals.

Checklists and further information regarding the inspection

For recommended checklists and further information, see Chapter Performing inspection (Page 171).

Maintenance

For 3WJ circuit breakers, only the arc chutes, the arc chute covers and the contact system require maintenance.

Replacing arc chutes and the contact system

The arc chutes and the contact system may need to be replaced depending on their condition and at the latest when the number of electrical and mechanical operating cycles without maintenance has been reached.

Note

The contact system may only be replaced if the maximum permissible number of operating cycles with maintenance has not been exceeded.

Replacing the arc chute cover

Optionally fitted arc chute covers must be replaced in the following cases:

- At the latest after three circuit breaker short-circuit trips
- Whenever the arc chutes are replaced

For information about the arc chute cover and installation instructions, see Chapter Arc chute cover (Page 144).

4.3.3 Logging

Note

Obligation to maintain logs for warranty claims

The operator must log all inspection and maintenance work. The logs should be kept in the archive for at least ten years.

In order to make it possible to clearly identify the circuit breaker and the general data, every log should contain the following information:

- General information:
 - Date of inspection/maintenance
 - Name of person responsible for inspection/maintenance
 - Names of other persons involved in inspection/maintenance
 - Date of last inspection/maintenance
 - Mounting location of the circuit breaker (room, power distribution equipment, section, cell)
 - Ambient conditions (temperature, air humidity, pollution degree)
 - Field of application, sector
 - Special events during operation (e.g. short-circuit or overload trips)
 - Known fault scenarios in the past
- Information about the circuit breaker:
 - Circuit breaker type
 - Article number and options
 - Circuit breaker ID number
 - ID number of electronic trip unit
 - Fixed-mounted or withdrawable version
 - Operating cycles recorded by means of mechanical operating cycles counter or electronic trip unit
- Information about inspection work performed

4.4 Performing inspection

4.4.1 General

NOTICE**Material damage resulting from relubrication**

The circuit breaker mechanism is sufficiently lubricated during production. Relubrication of the circuit breaker mechanism is unnecessary and may result in material damage.

Never lubricate the breaker mechanism or the contacts of the circuit breaker.

NOTICE**Material damage due to blown particulates**

Disturbed dust can affect the function of the circuit breaker.

Vacuum the dust using suitable equipment. Never blow out dust using compressed air or similar.

The following checklists are non-binding. Not all of the items listed are relevant for the inspection depending on the scope of supply of the circuit breaker and the installed accessory components.

4.4.2 Visual inspection

Inspect the following components for pollution, damage and rust:

- Operator panel including external electronic trip unit
- Display and operator controls
- For size 2: Lateral front covers on both sides of the operator panel
- Circuit breaker enclosure
- Arc chute covers
- Circuit breaker feet
- Busbar connections (check for signs of overheating and deposits)
- Finger clusters in the guide frame
- When the operator panel is removed: Breaker mechanism (where accessible)
- Internal accessories: Closing coil, shunt trip, spring charging motor

4.4.3 Check of the available documentation and of the rating/accessory label

Check the documentation and the rating/accessory label:

- Document is available and complete.
- Accessory label and labeling of operator panel, including the article number, correspond to the installed internal accessories and available documentation.

4.4.4 Testing of mechanical function of the circuit breaker

Note

Siemens recommends closing and opening under a load of at least 200 A.

Check the following items:

- Manual operating mechanism:
 - Perform nine strokes (final stroke requires slightly more force)
 - Display of charged stored-energy spring
 - Ready-to-close indicator OKCircuit breaker can be operated when OK is indicated.
- Spring charging motor (optional) with auxiliary voltage, general functioning of the motor
- CLOSE – OPEN test using shunt trip or UVR (optional)
- Operating sequence:
Charge – CLOSE – OPEN
- Operating sequence:
Charge – CLOSE – Charge – OPEN – CLOSE – OPEN
- The following conditions interfere with indication of the ready-to-close status:
 - Stored-energy spring not charged
 - Circuit breaker tripped by ETU without a reset of the reclosing lockout
 - Undervoltage release (optional), not energized
- Effect of control gate and interlocking functions on ready-to-close indication
- Mechanical interlocking (optional):
 - Mounting: Secure fitting
 - Adjustment
 - Function
- Permissible bending radii on the installed Bowden cables (optional)

4.4.5 Testing of mechanical function of the withdrawable circuit breaker and the guide frame

Note

The inspection of the withdrawable circuit breaker also includes all the items in Section Testing of mechanical function of the circuit breaker (Page 172).

Check the following items:

- Guide frame and racking mechanism including position indicator
- Visual inspection of finger clusters for damage
- Reliable function of control gate
- Mechanical function:
 - Racking of circuit breaker
 - Opening of shutter
- Function of position signaling switch module
- Position indicator corresponds to actual position of circuit breaker
- Release of racking mechanism interlock in the defined positions
- Effectiveness of racking mechanism interlock in the intermediate positions
- Coding of the withdrawable circuit breaker and the guide frame

4.4.6 Testing of auxiliary circuits

Check the following items:

- Connections to the circuit breaker in accordance with circuit diagram:
 - Secure fitting
 - Correct terminal assignment
- Withdrawable version: Auxiliary supply connector with sufficient tolerance for insertion in the guide frame. Always correct rigid or non-flexible wiring.

4.4.7 Testing of mechanical and electrical function of internal accessories

NOTICE
Damage to accessories
Incorrect auxiliary power supply can damage internal accessories. The electrical functions of the internal accessories may only be tested with auxiliary voltage. Ensure that the rated auxiliary voltage level is applied to the internal accessories.

Note

The test routines of the accessory components are generally described in the relevant operating instructions.

Check the following items:

- Electrical function, e.g. of:
 - Shunt trip, undervoltage release and closing coil
 - Auxiliary switch
 - Signaling switch
- Mechanical functions for auxiliary releases:
 - Free movement of armature
 - Ensure that the armature moves back to its initial position when no voltage is present.
- Smooth running of armature of auxiliary releases
- Function of locks
- Function of interlocks

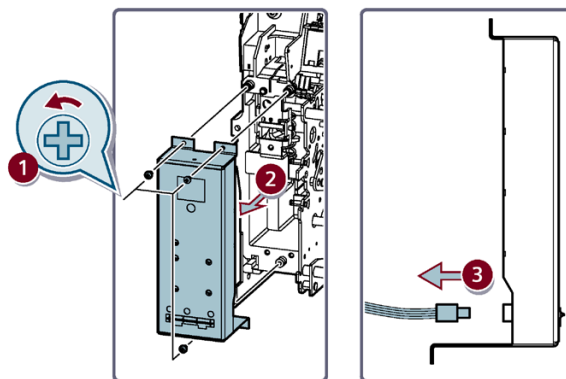
4.4.8 Testing of settings and inspection of the electronic trip unit

Removal

NOTICE

Retrofitting for the electronic trip unit is only permissible by Siemens customer service specialists.

Note the current electronic trip unit settings.

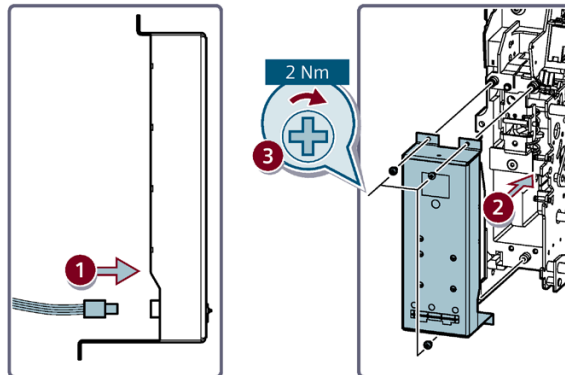


1. Unscrew the electronic trip unit.
2. Remove the electronic trip unit from the breaker.
3. Unplug all plugs from the electronic trip unit.

Note

Make sure that you do not damage the cable harness.

Installation



1. Attach all plugs to the electronic trip unit.
2. Install the electronic trip unit on the breaker.

Note

Make sure that you do not damage the cable harness.

3. Fix the electronic trip unit to the breaker with the corresponding screws.

Test

Note

After the ETU replacement, the Circuit Breaker must be tested with the hand-held test device. You have to perform a CT test and a Trip test.

For more information, refer to the chapter Hand-held test device (Page 86).

4.4.9 Inspection of arc chutes, arc chute covers and main contact system

Check the following items:

- Optical condition of arc chutes as per Chapter Maintaining the arc chutes (Page 180)
- Damage to the arc chute covers on the guide frame (option)
- Main contacts with contact erosion indicator as per Chapter Maintaining the main contact system (Page 181)

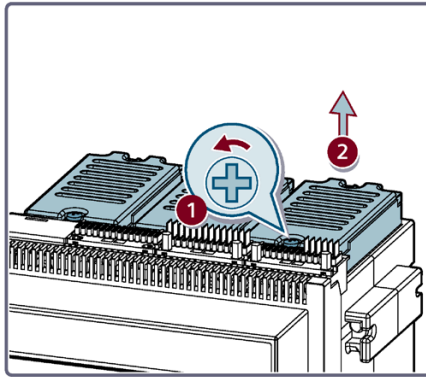
4.4.10 Checking the wear on the contacts

You have to check the wear on the contacts:

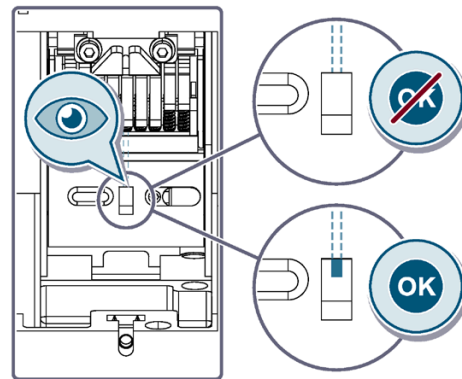
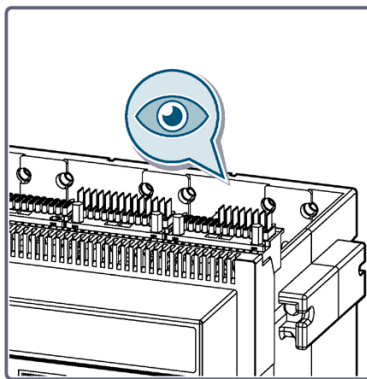
- Every 12 months or after 1000 switching operations
- After serious shutdowns

Process of checking

1. Loosen the fixing screws.
2. Remove the arc chutes.



3. Close the circuit breaker.
4. Perform a visual check of the indicator for wear on the contacts of the main contact system.
If the indicator pin is no longer visible, you must replace the main contact system.

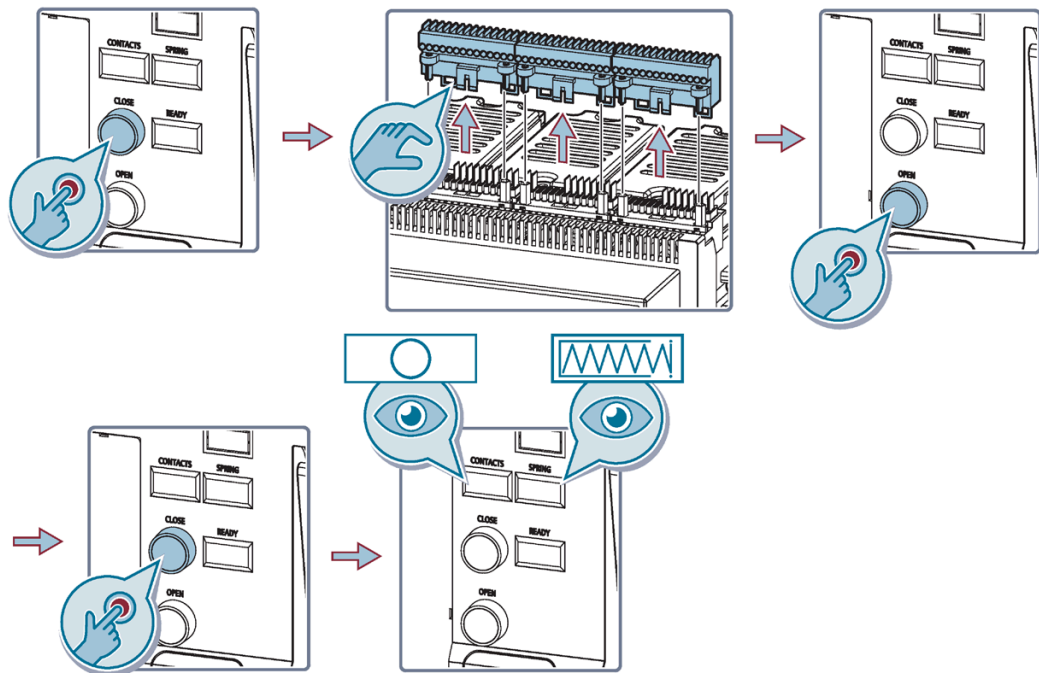


4.5 Preparation for maintenance work

Note

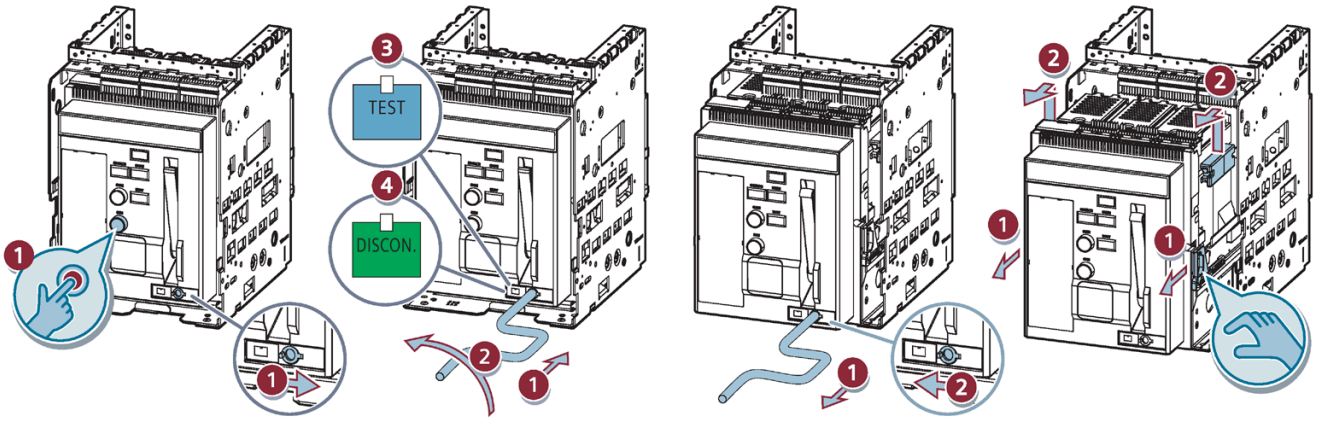
Observe the instructions in Chapter Safety regulations (Page 167).

1. Open the door of the control cabinet.
Follow the instructions in the operating instructions for the relevant interlock to bypass an optionally installed interlock.
2. Open the circuit breaker and discharge the stored-energy spring.



- Press O / OPEN.
- Isolate the auxiliary circuits by unplugging the manual connectors.
- Press I / CLOSE.
A charged stored-energy spring is discharged.
- Press O / OPEN.
- Ensure that the switch position indicator shows OPEN.
The circuit breaker is open.

3. Withdrawable version: Rack the circuit breaker into disconnected position and remove it from the guide frame.



4.6 Maintaining the arc chutes

NOTICE

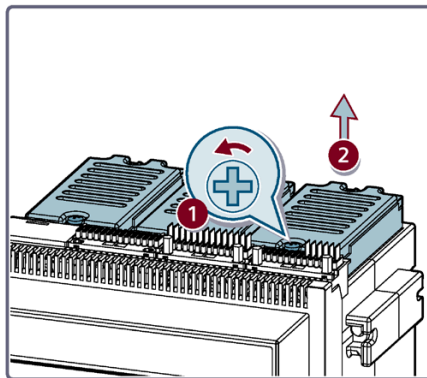
Damage to the arc chutes

If the disassembled chutes are set down in the vertical position, the insulating walls of the arc chutes can be damaged.

Always lay arc chutes on their sides.



1. Remove the arc chute



2. Perform a visual inspection for severe wear.
Wear is indicated by burnout on the arc quenching plates or holes in the side walls of the arc chutes.
3. If you detect severe wear, such as burnout or holes, you must replace the arc chute.
Please refer to the table of article numbers below when reordering.
4. Install the arc chute in the reverse sequence to removal.
Tighten the screw with a tightening torque of 8 Nm.
5. Reset the operating cycles counter in the electronic trip unit after replacing the arc chutes.

Arc chute article numbers

	Article number
Size 1	
Breaking capacity S, 1 pc.	3WJ9111-0AP31
Size 2	
Breaking capacity S, 1 pc.	3WJ9111-0AP32

4.7 Maintaining the main contact system

The main contacts can be replaced as often as required until the circuit breaker has reached its maximum mechanical service life including maintenance. As soon as the circuit breaker has reached its maximum mechanical service life with maintenance, it must be replaced.

The maximum mechanical service life of the circuit breaker depends on the total number of operating cycles achieved. A distinction is made between electrical and mechanical operating cycles.

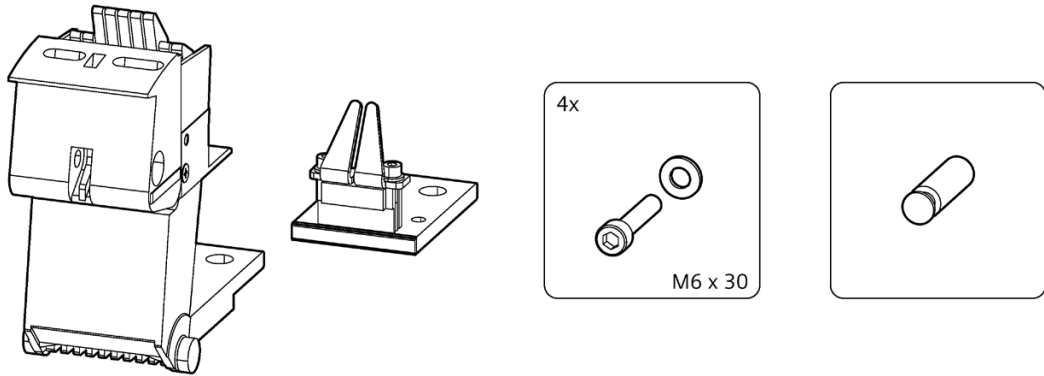
- **Electrical operating cycles:**
Every switching operation (ON or OFF) of an air circuit breaker with current flow via the main contacts up to the maximum rated current is considered an electrical operating cycle. Due to the current flow, wear of the contacts is higher here than in case of a purely mechanical operating cycle.
- **Mechanical operating cycles:**
Every switching operation (ON, OFF) of an air circuit breaker, with or without current flow, is considered a mechanical operating cycle.
The electrical operating cycles are thus a subset of the mechanical operating cycles. The number of mechanical operating cycles is usually greater than the number of purely electrical operating cycles; they can be equal at most.

3WJ mechanical service life		
Endurance (operating cycles)		
3WJ1108, 3WJ1110, 3WJ1112, 3WJ1116		
With maintenance (one time) ⁶⁾	Mechanical	12000
	Electrical (up to 440 V AC)	8000
3WJ1220, 3WJ1225		
With maintenance (one time) ⁶⁾	Mechanical	10000
	Electrical (up to 440 V AC)	4000
3WJ1232, 3WJ1240		
With maintenance (one time) ⁶⁾	Mechanical	10000
	Electrical (up to 440 V AC)	4000

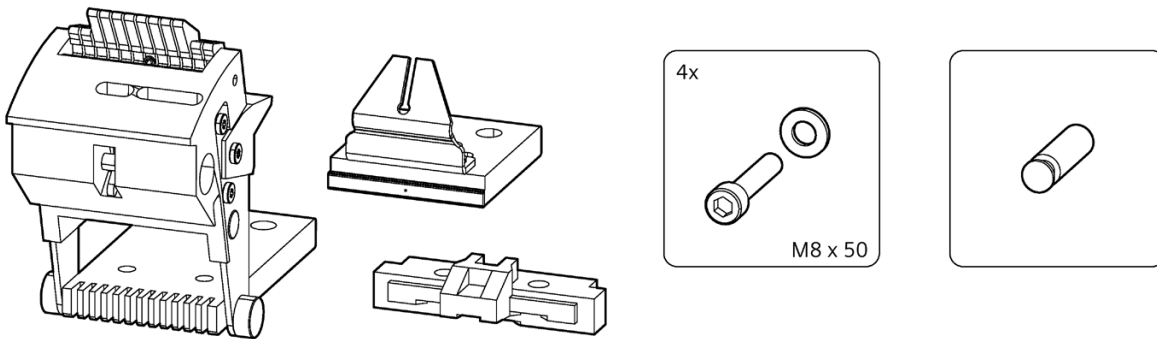
⁶⁾ Maintenance means: Replace main contacts and arc chutes.

Check the contents of the packaging

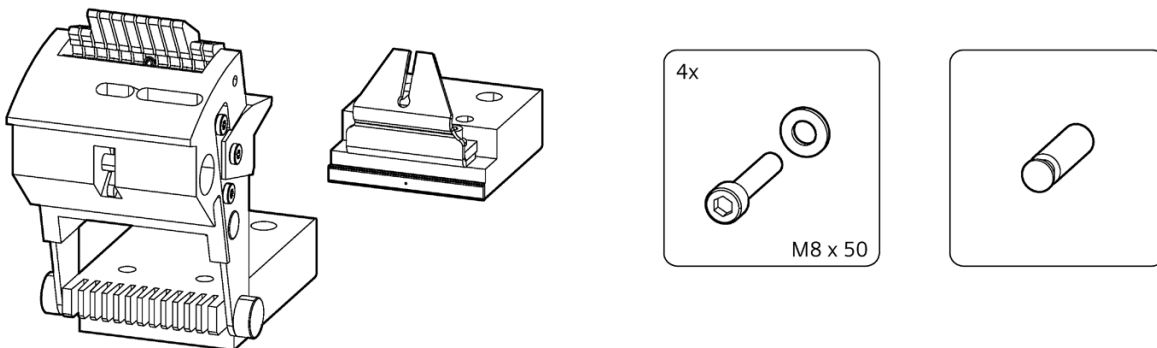
3WJ9111-0AQ0.



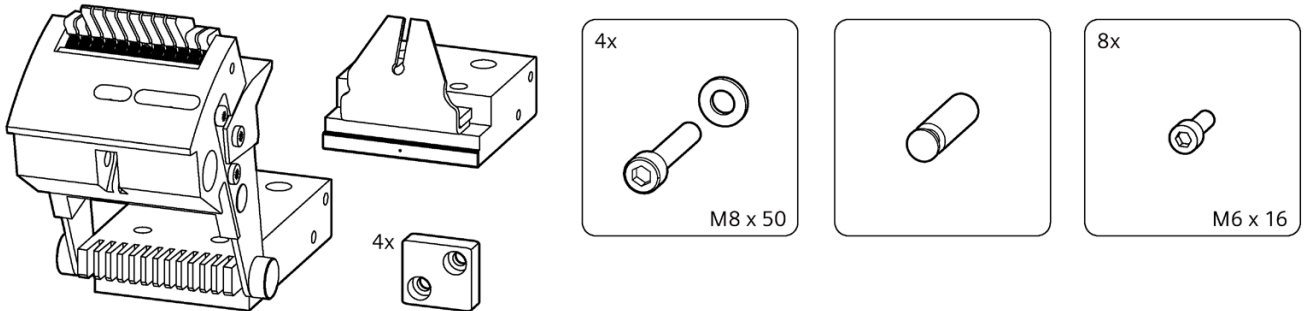
3WJ9111-0AQ11 / 3WJ9111-0AQ12



3WJ9111-0AQ13 / 3WJ9111-0AQ15



3WJ9111-0AQ14

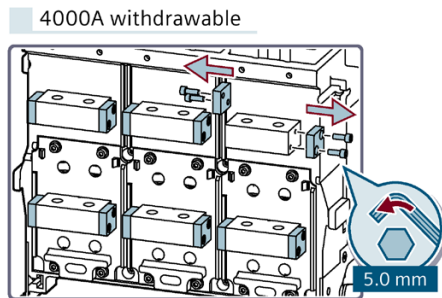


Preparatory steps

Perform all steps outlined in the chapter Preparation for maintenance work (Page 178).

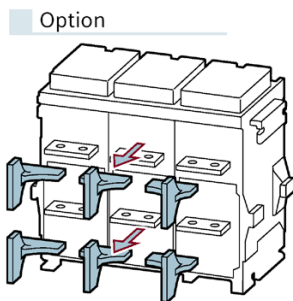
Withdrawable Circuit breaker 4000 A

If you have a 4000 A withdrawable Circuit breaker you have to remove the spacers on the rear contacts before maintaining the main contact system.

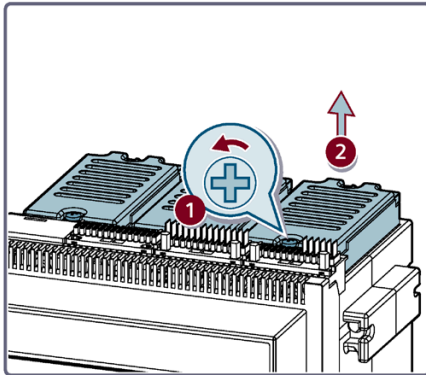


Vertical main connections - optional accessory

If you have vertical main connections mounted, you have to remove them before maintaining the main contact system.

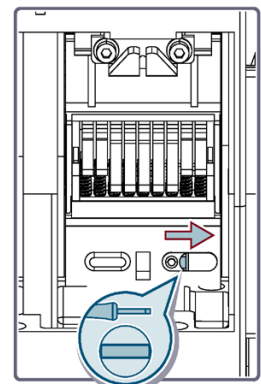
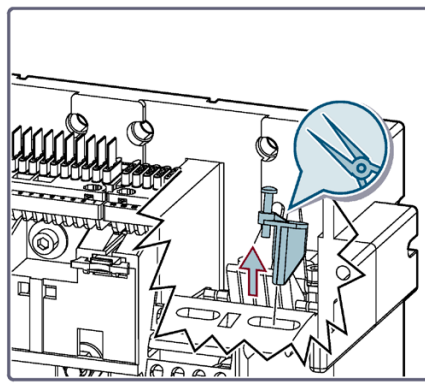
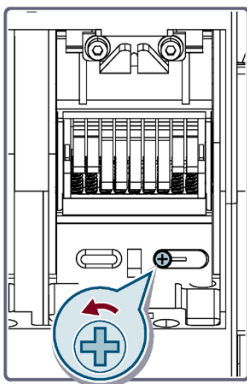
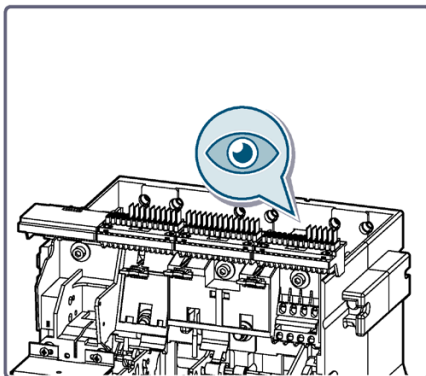


Removing the arc chutes



1. Loosen the fixing screws
2. Remove the arc chutes

Disconnecting the contact carriers



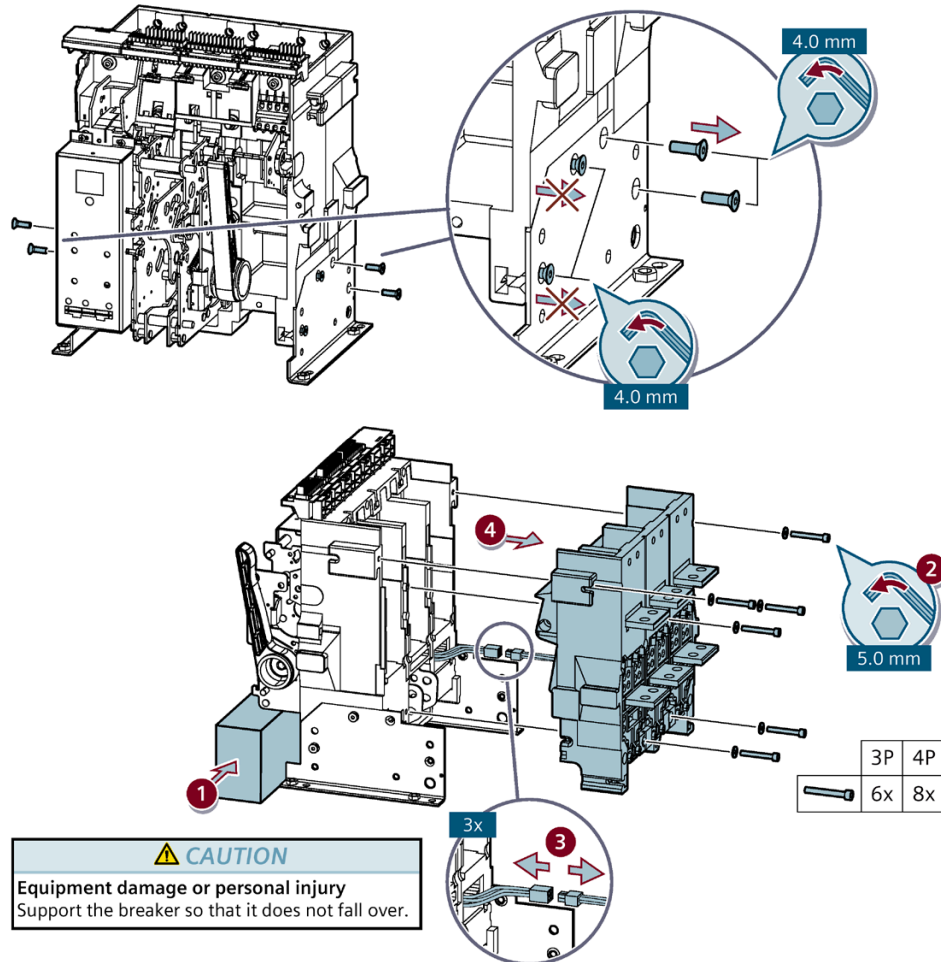
- Unscrew and remove the locking bolt.
- Remove the coupling bolt by means of a screwdriver (as shown).

Removing the rear housing of the Circuit breaker

NOTICE

Keep angle brackets on the Circuit breaker

Only loosen the front screws and remove only the back screws to ensure that the angle brackets are still fixed to the breaker.



CAUTION
Equipment damage or personal injury
Support the breaker so that it does not fall over.

1. Support the breaker

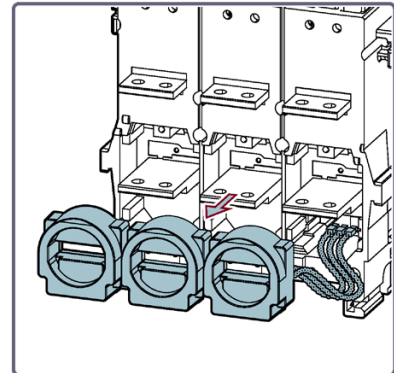
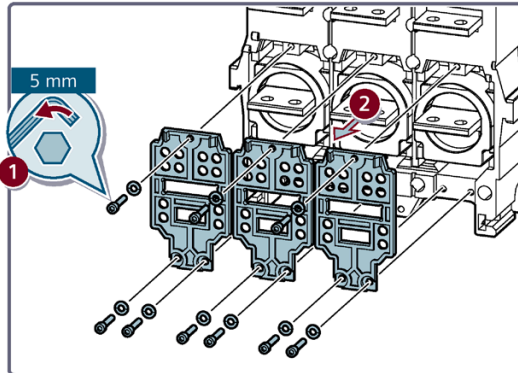
CAUTION

Equipment damage or personal injury may occur

Support the breaker as shown in the picture to prevent it from falling over.

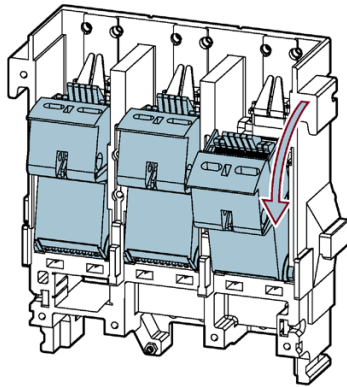
2. Unscrew and remove the screws and washers from the rear housing.
3. Unplug the cables of the internal current transformers.
4. Remove the rear housing.

Removing the internal current transformers



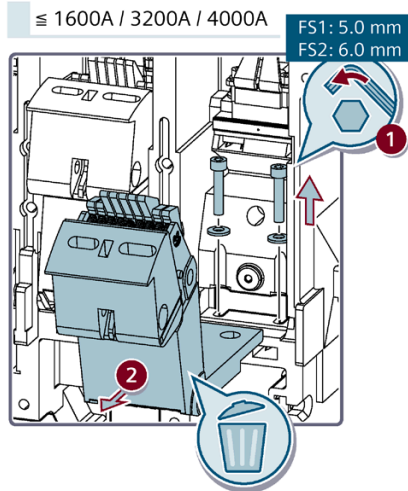
1. Unscrew and remove the screws and washers of the current transformer housing.
2. Remove the current transformer housing.
3. Remove the current transformers from the rear housing of the Circuit breaker.

Removing the contact carriers

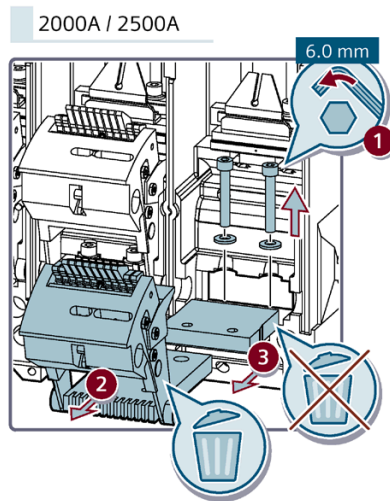


- Pull the contact carriers forward.

- Remove the screws and washers and then remove the contact carrier.



For 2000 A/2500 A versions: Also remove the spacer after removal of the contact carrier.

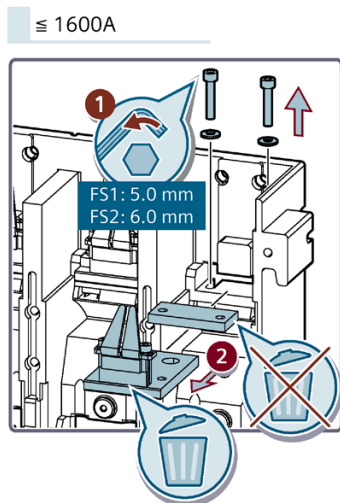


Removing the conduction paths

Unscrew the screws with the washers and remove the conduction paths.

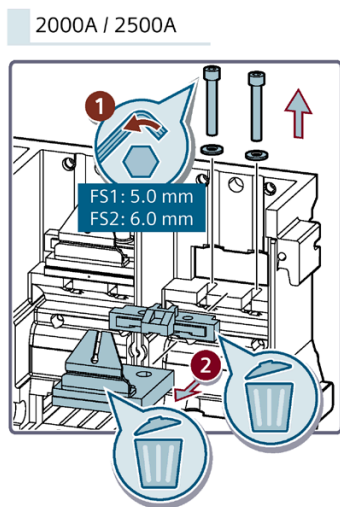
1600 A version

Keep the spacers and throw away the conduction paths.



2000 A/2500 A versions

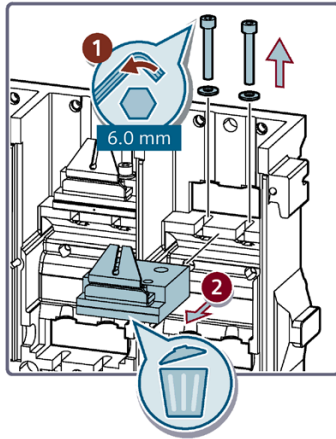
Throw away the spacers and the conduction paths.



3200 A/4000 A versions

Throw away the conduction paths.

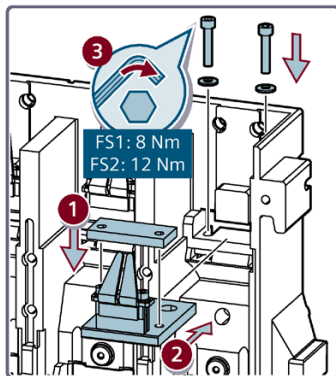
3200A / 4000A



Installing the conduction paths

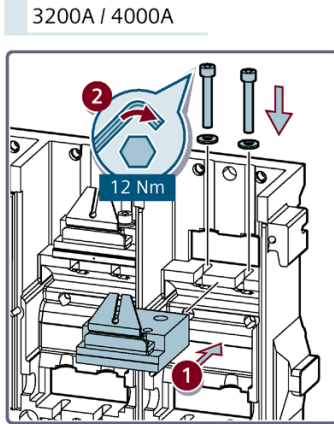
For versions ≤ 2500 A

≤ 2500 A



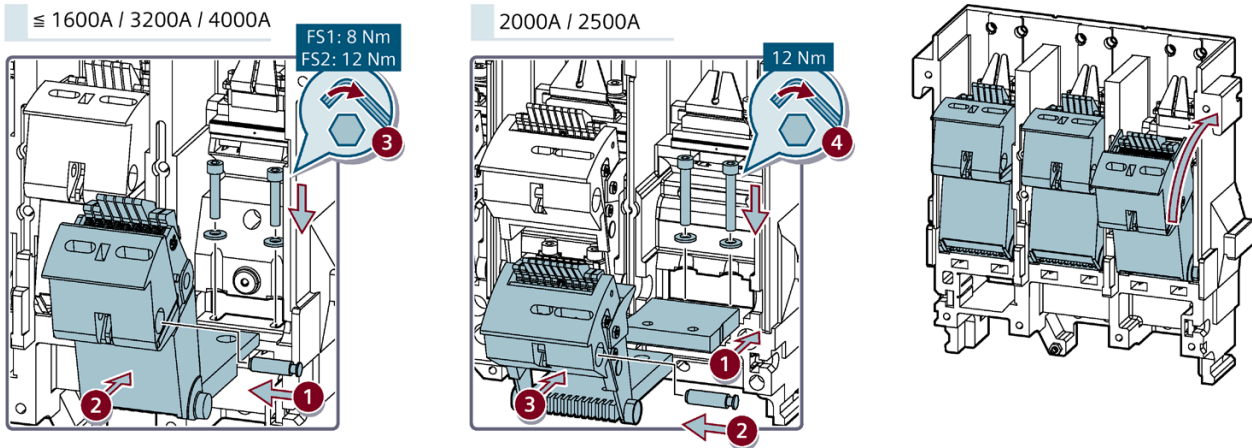
1. Attach the spacers to the conduction paths.
2. Insert the conduction paths with the spacers into the rear housing.
3. Fix the conduction paths with the spacers to the housing by means of the corresponding screws and washers.

For 3200 A/4000 A versions



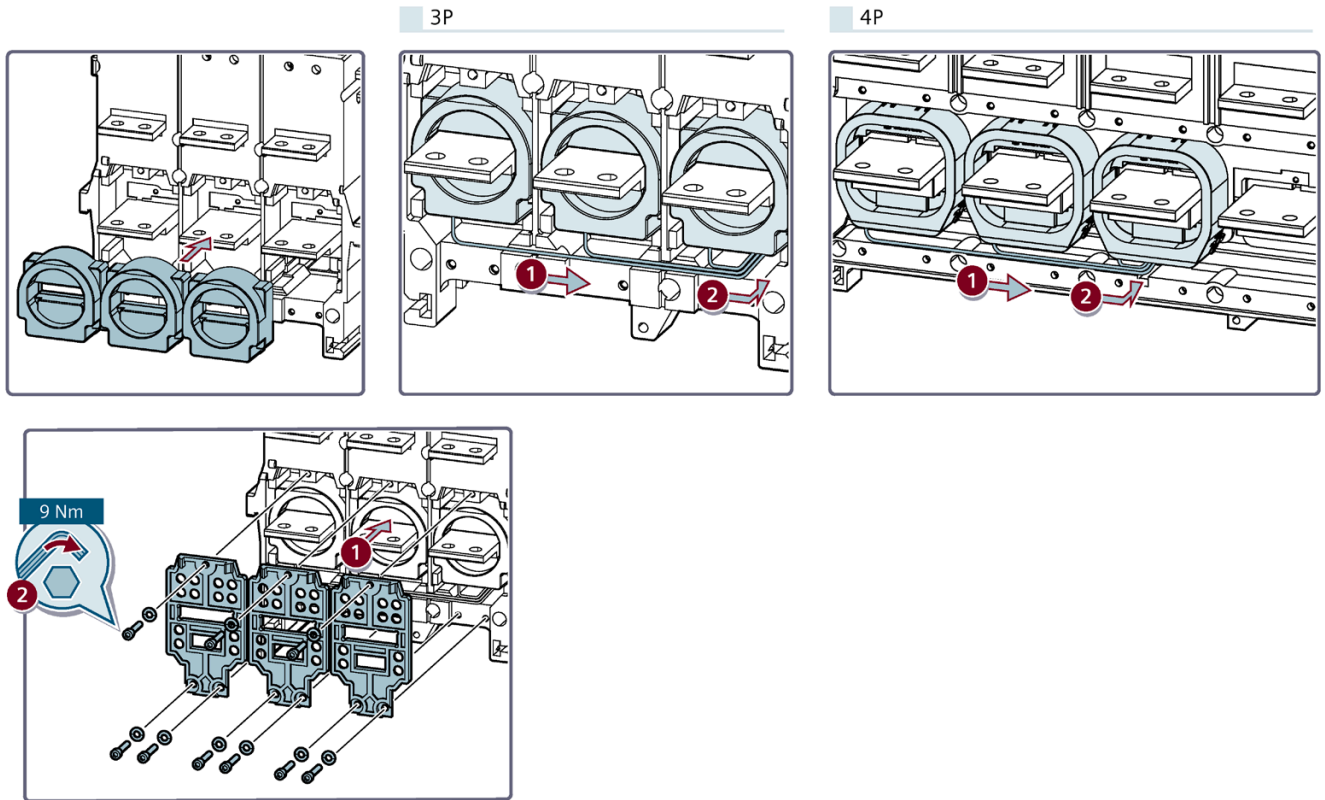
1. Insert the conduction paths into the rear housing.
2. Fix the conduction paths to the housing by means of the corresponding screws and washers.

Installing the contact carriers



- For 2000 A/2500 A versions: insert the spacer into the rear housing.
- Insert the coupling bolts into the contact carriers.
- Insert the contact carriers into the rear housing and secure with the corresponding screws and washers.
- Rotate the contact carriers upwards.

Installing the current transformers



- Insert the internal current transformers into the rear housing.
- Route the cables from the current transformers to the right and guide them through the hole in the rear housing.
- Attach the covers with the corresponding screws and washers.

Attaching the rear housing to the Circuit breaker

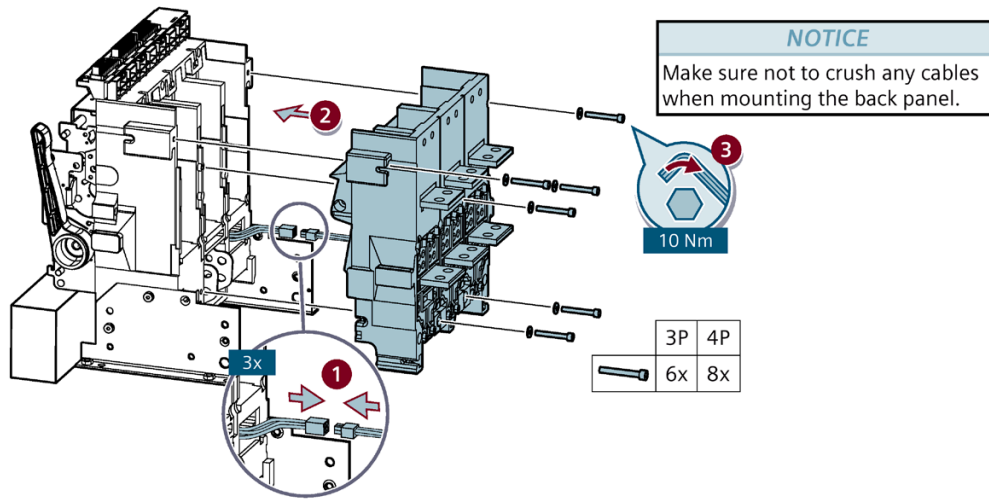


Figure 4-1 A_Rear-panel

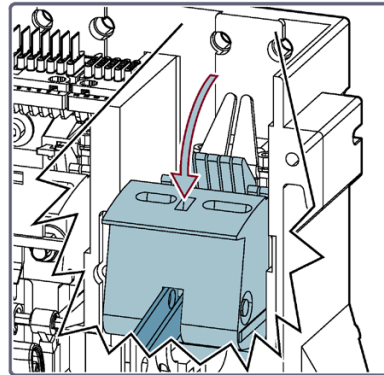
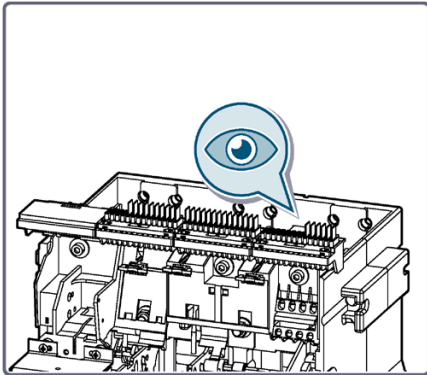
1. Connect all cables of the current transformers.
2. Attach the rear housing.

Note

Make sure not to crush any cables when mounting the back panel.

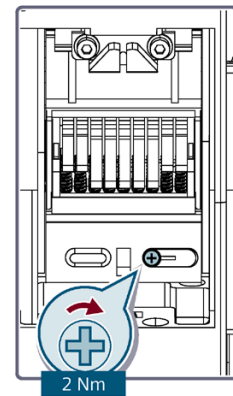
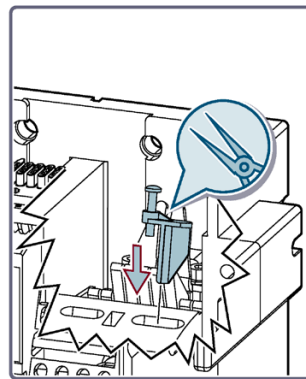
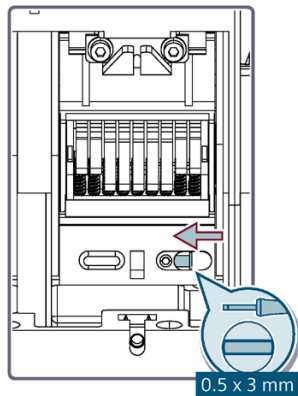
3. Fix the rear housing with the corresponding screws and washers.

Connecting the contact carriers



NOTICE
 Press the contact carrier toward the coupling clips.
 Make sure that the contact carrier fully accommodates the coupling clips.

- Press the contact carrier towards the coupling clips. Make sure that the contact carrier fully accommodates the coupling clips.



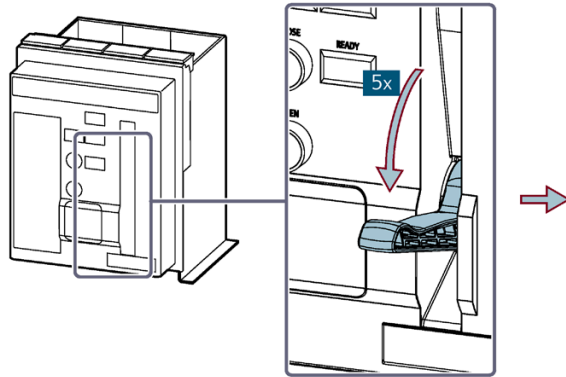
- Insert the coupling bolt as shown and move it to the left by means of a screwdriver.
- Insert the locking bolt with needle-nose pliers and tighten it.

Functional test

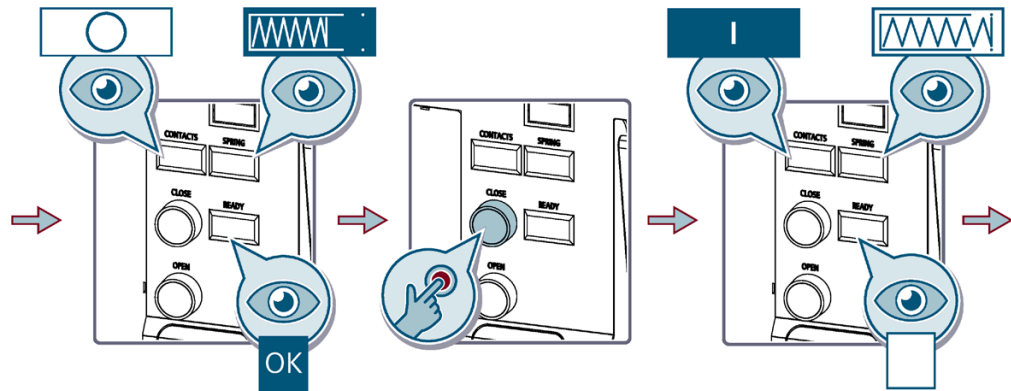
⚠ WARNING
Risk of personal injury
 Do not touch the contacts while opening/closing of the circuit breaker.

4.7 Maintaining the main contact system

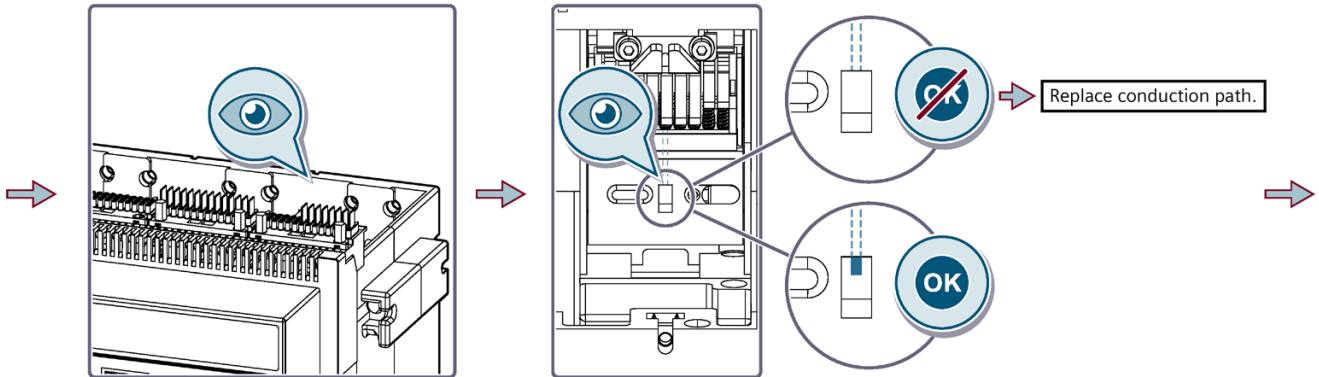
- Charge the stored-energy spring mechanism manually.



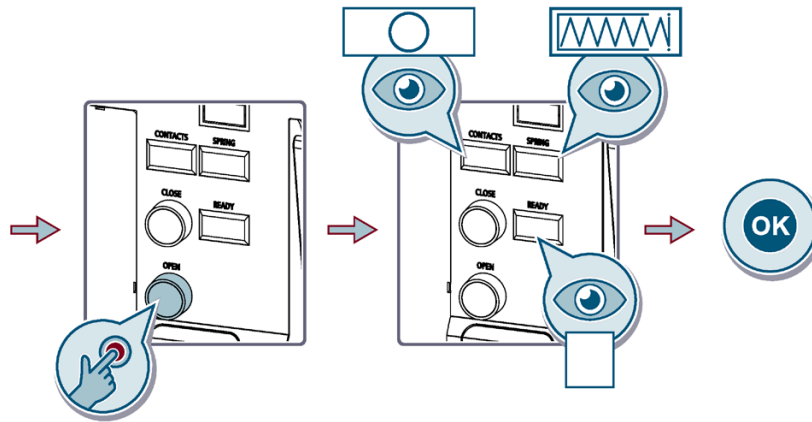
- Close the Circuit breaker.



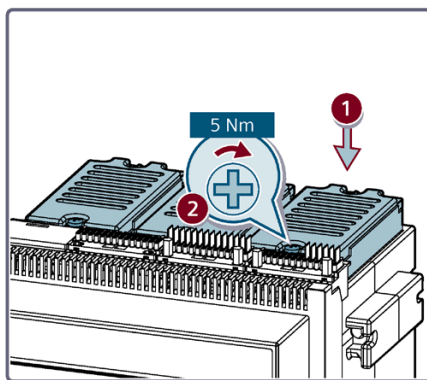
- Check the indicator for wear on the contacts.



- Open the Circuit breaker.



Attaching the arc chutes



- Insert the arc chutes.
- Tighten the fixing screws to secure the arc chutes.

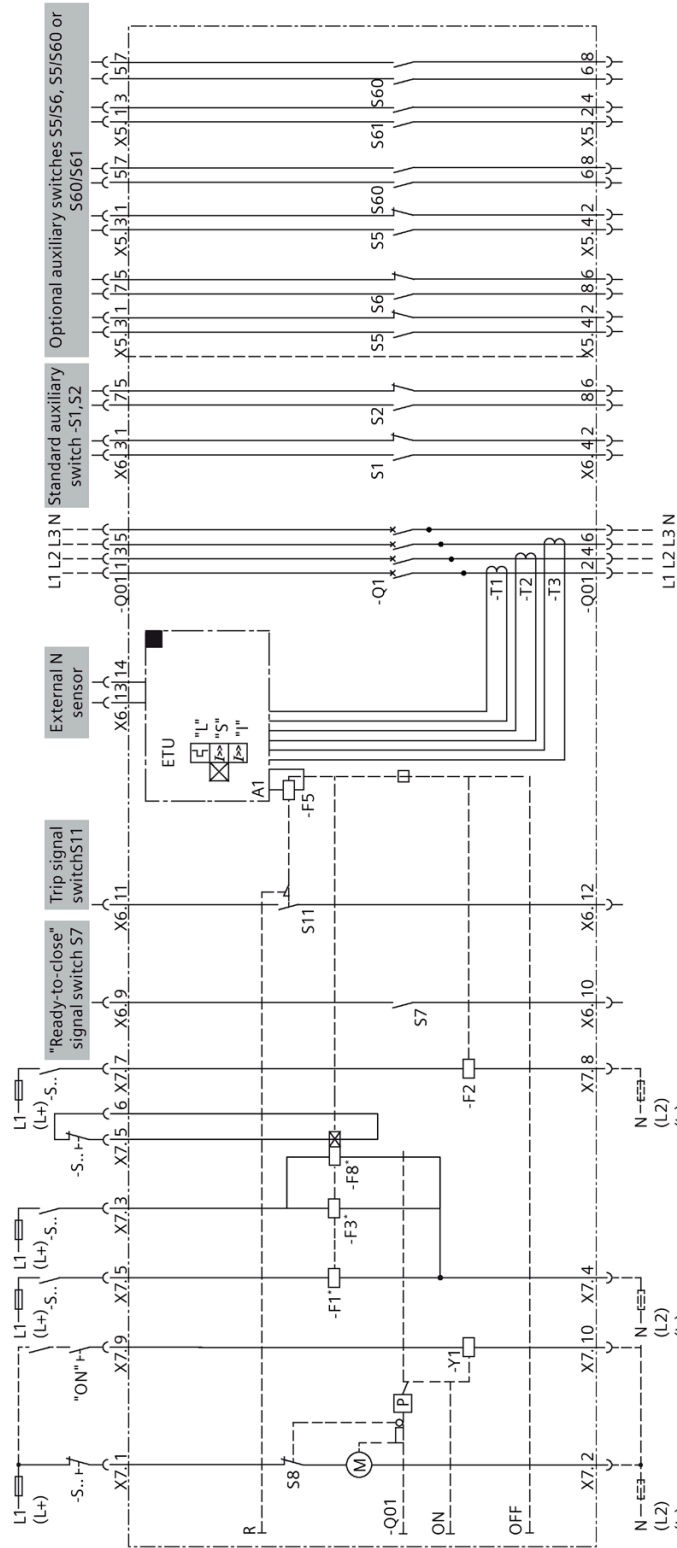
Technical specifications

5.1 Circuit diagrams

5.1.1 Overall circuit diagram

Accessories in overall circuit diagram	
A1	Electronic trip unit
F1/F2	Shunt trip (ST/ST2)
F3	Undervoltage release (UVR)
F5	Tripping solenoid
F8	Undervoltage release with delay (UVR-t)
M	Spring charging motor
ON	Mechanical ON button
OFF	Mechanical OFF button
P	Stored-energy spring mechanism
Q01	Spring charging lever for stored-energy spring
Q1	Main contacts
R	Mechanical indication and resetting plunger for overcurrent tripping
S1/S2/S5/S6/S60/S61	Auxiliary switches
S7	Ready-to-close signal switch
S8	Motor operator switch
S11	Trip signal switch
T1/T2/T3	Current transformers
X5/X6/X7	Secondary disconnect terminals
Y1	Closing coil (CC)

3WJ circuit diagram



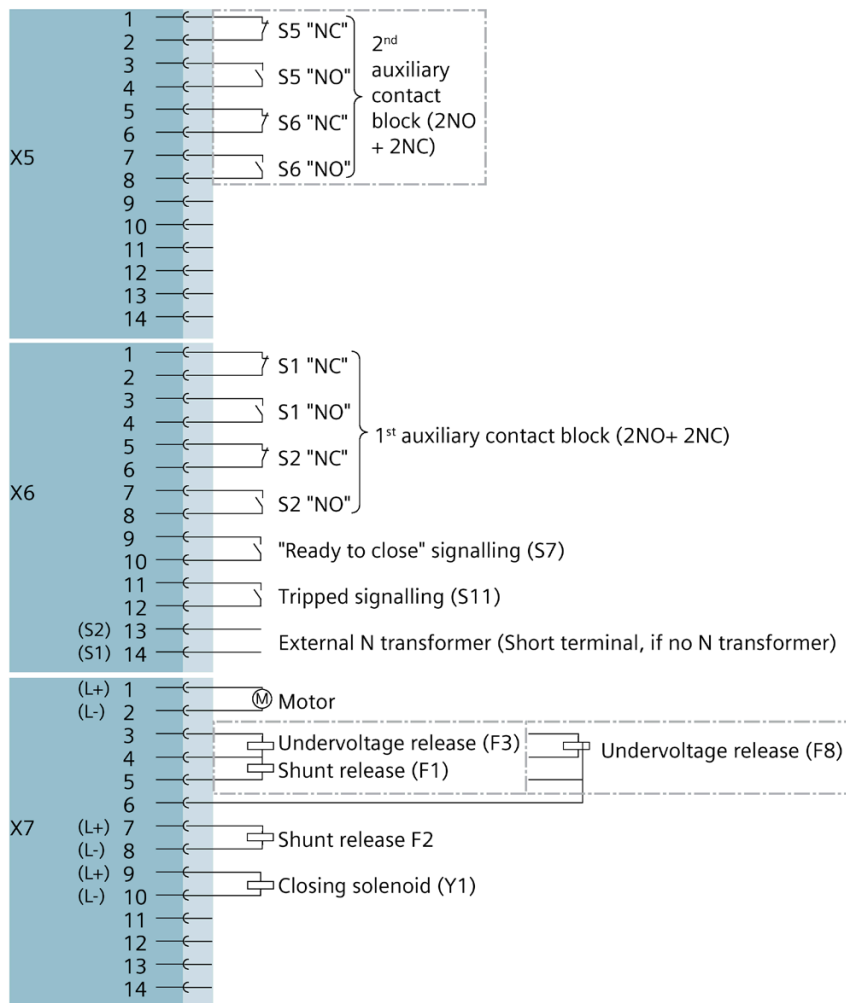
***) Only one F1, F3 or F8 can be mounted per breaker**

- | | | | |
|-------------------------------------|--|---|--|
| A1: Electronic Trip Unit | M: motor | S1/S2/S5/S6/S60/S61: Auxiliary switches | X5/X6/X7: Secondary disconnect terminals |
| F1/F2: Shunt trip | P: Stored-energy spring | S7: Ready-to-close signal switch | Y1: Closing coil |
| F3: Undervoltage release | Q01: Manual storage handle | S8: Motor disconnect switch | |
| F5: Tripping solenoid | Q1: Main contact system | S11: Trip signal switch | |
| F8: Undervoltage release with delay | R: Mechanical indication of overcurrent trip, reset button | T1/T2/T3: Current transformers | |

5.1.2 Terminal connection diagram of secondary disconnect terminals

The following overview shows which part of the internal equipment is connected to which part of the secondary disconnect terminals, i.e. this is a complete auxiliary & control wiring diagram of the Circuit Breaker.

For more information on the detailed wiring of the accessories, refer to the individual Operating instruction of the respective accessory.



5.1.3 Circuit diagram for undervoltage release with delay

The following diagram shows the wiring of an UVR-t (F8).

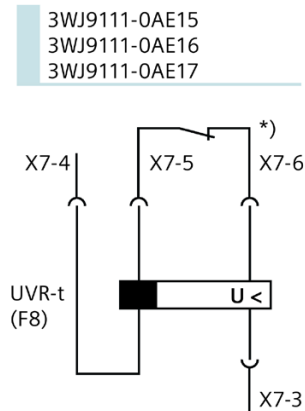


Figure 5-1 *) EMERGENCY STOP switch, interlock switch or jumper switch must be wired across these to terminals. A continuous duty shunt trip may also be used as an electric interlock.

Circuit diagram of accessories

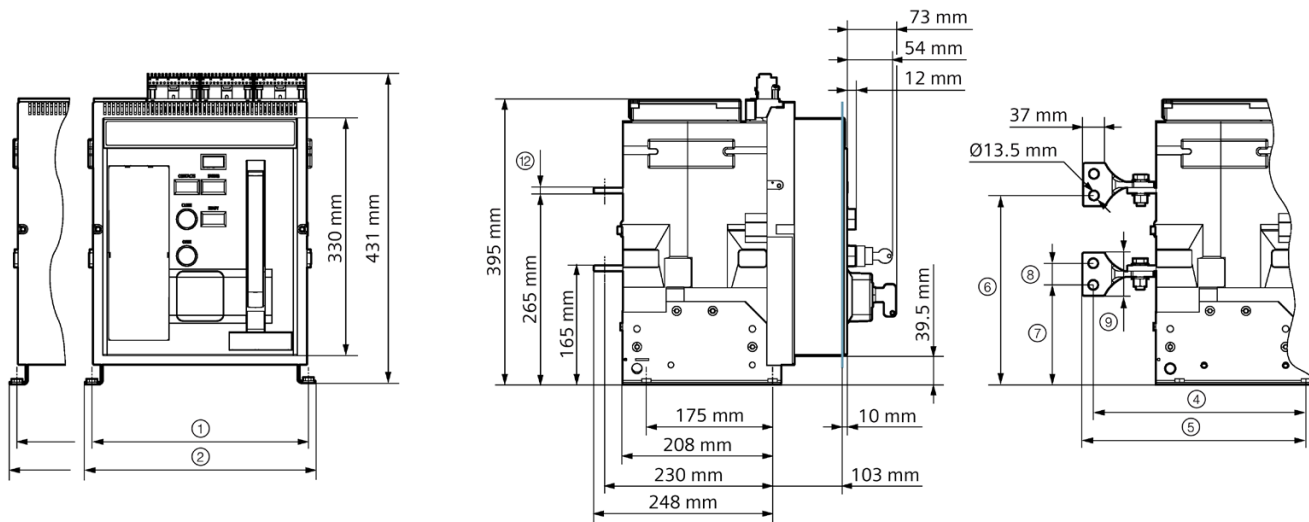
You'll find the circuit diagrams of other accessories in the corresponding operating instruction available on the Internet (<https://support.industry.siemens.com>).

5.2 Dimension drawings

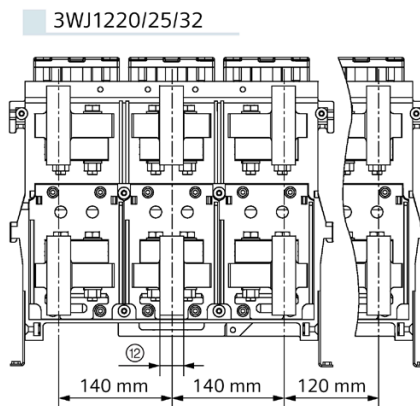
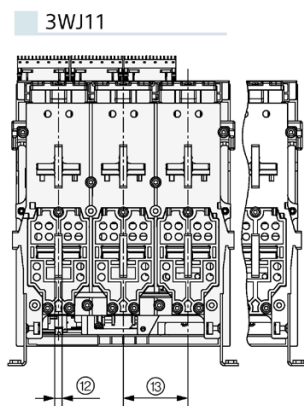
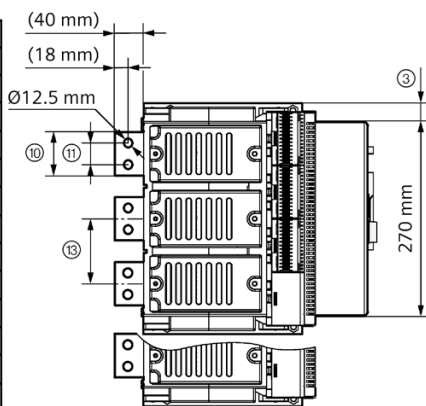
5.2.1 Fixed-mounted Circuit Breakers

The broken contour at the side depicts the 4-pole version.

Horizontal connection and vertical connection for up to 3200 A

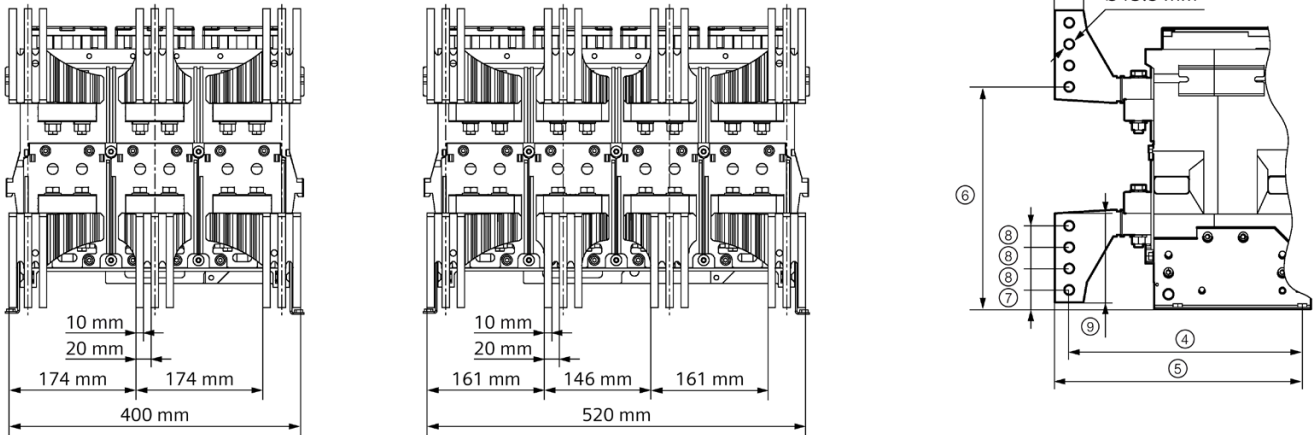


	3WJ11	3WJ1220	3WJ1225	3WJ1232	3WJ1240
①	3P 300 mm	400 mm			
	4P 390 mm	520 mm			
②	3P 320 mm	420 mm			
	4P 410 mm	540 mm			
③	25 mm		75 mm		
④	295 mm	305 mm		327 mm	
⑤	310 mm	320 mm		347 mm	
⑥	265.5 mm	260 mm	267.5 mm	285 mm	312.5 mm
⑦	134.5 mm	130 mm	122.5 mm	95 mm	27.5 mm
⑧	30 mm	40 mm	50 mm	30 mm	
⑨	60 mm	80 mm	100 mm	125 mm	
⑩	60 mm	80 mm		-	
⑪	30 mm	40 mm		-	
⑫	8 mm	10 mm	15 mm	30 mm	-
⑬	90 mm	120 mm		-	



Vertical connection 4000 A version

3WJ1240



Safety distances

No additional safety distance from adjacent, grounded components is required above the Circuit Breaker (on fixed-mounted Circuit Breakers marked with "Ⓢ").

The distance between the connection point and bar support must not exceed 250 mm

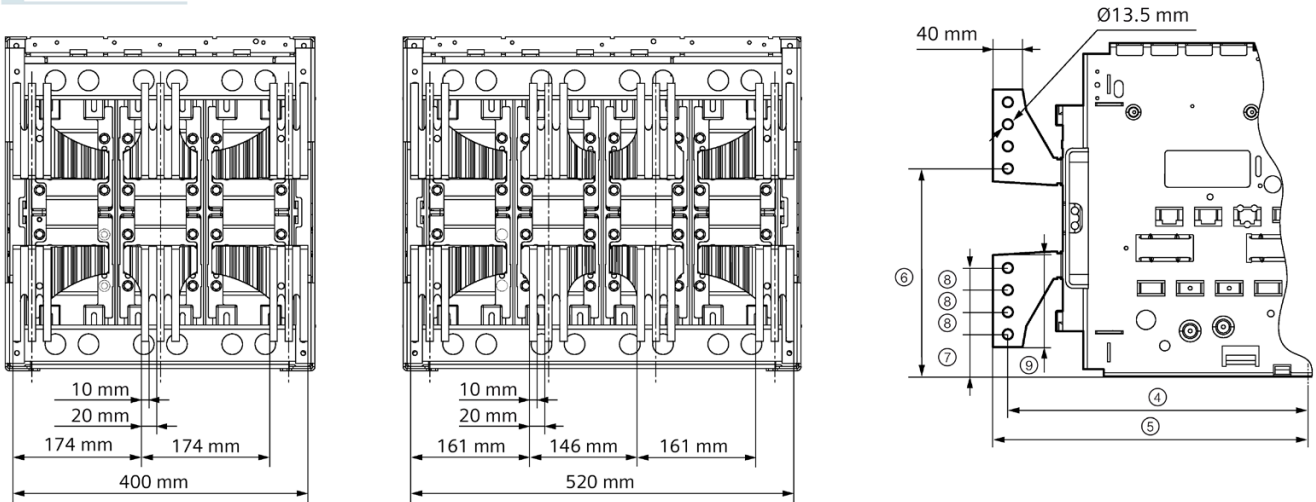
Up to a rated operating voltage of 440 V AC, the vertical bars (e.g. with front connection) must not be shielded if the busbar system is not located above the Circuit Breaker.

On the other hand, live, bare conductors and bars with voltages in excess of 440 V AC (if they are located above the Circuit Breaker and if the current is supplied from above) should be protected against flashover by means of phase barriers, bar covers, or arc chute covers (only use accessories for horizontal or vertical connections).

Optional electrical equipment directly above the Circuit Breaker (if arc chutes are not used) or next to the Circuit Breaker should be protected with a cover. Once you have installed additional phase barriers or covers, you must ensure that heat dissipation from the Circuit Breaker is not impeded.

Vertical connection 4000 A version

3WJ1240



5.2.3 Accessories 3 pole / 4 pole

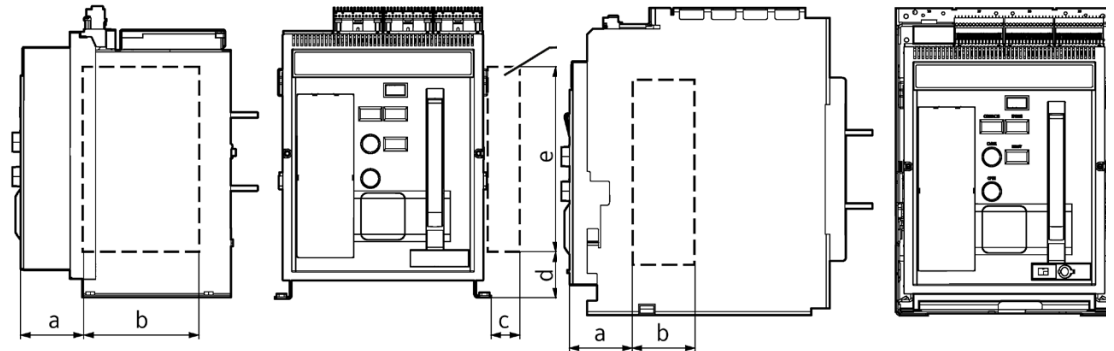
Mechanical interlock (1)

Interlocking device that prevents closing (2).

Comprising an interlock in the cabinet and an interlocking module with Bowden wire.

For fixed-mounted Circuit Breakers

For withdrawable Circuit Breakers

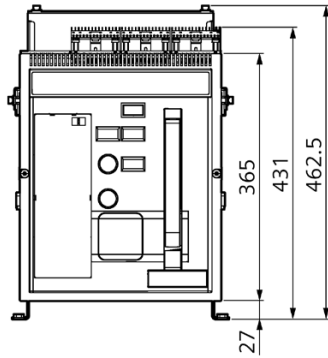


① Distance for interlocking module (without Bowden wire)

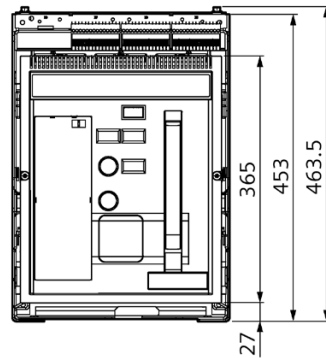
Distance for	a	b	c	d	e
(1)	90	90	50	65	270
(2)	58	215	10	250	115

Arc chute cover

For fixed-mounted Circuit Breakers



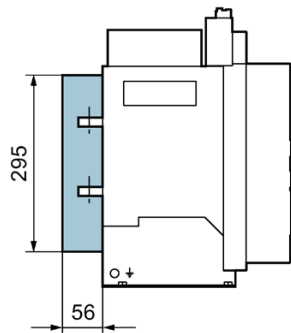
For withdrawable Circuit Breakers



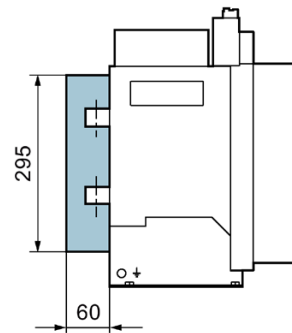
Phase barrier

For fixed-mounted Circuit Breakers

Frame size I

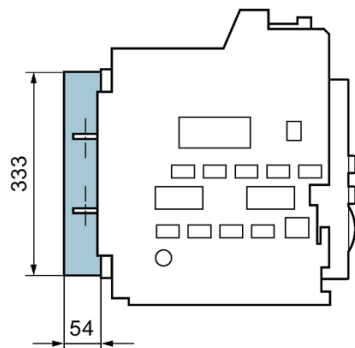


Frame size II

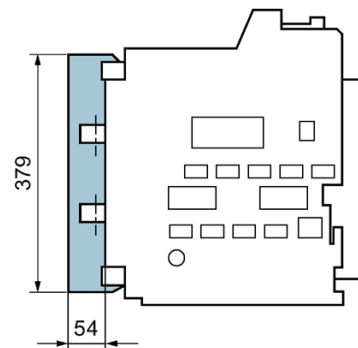


For withdrawable Circuit Breakers

Frame size I

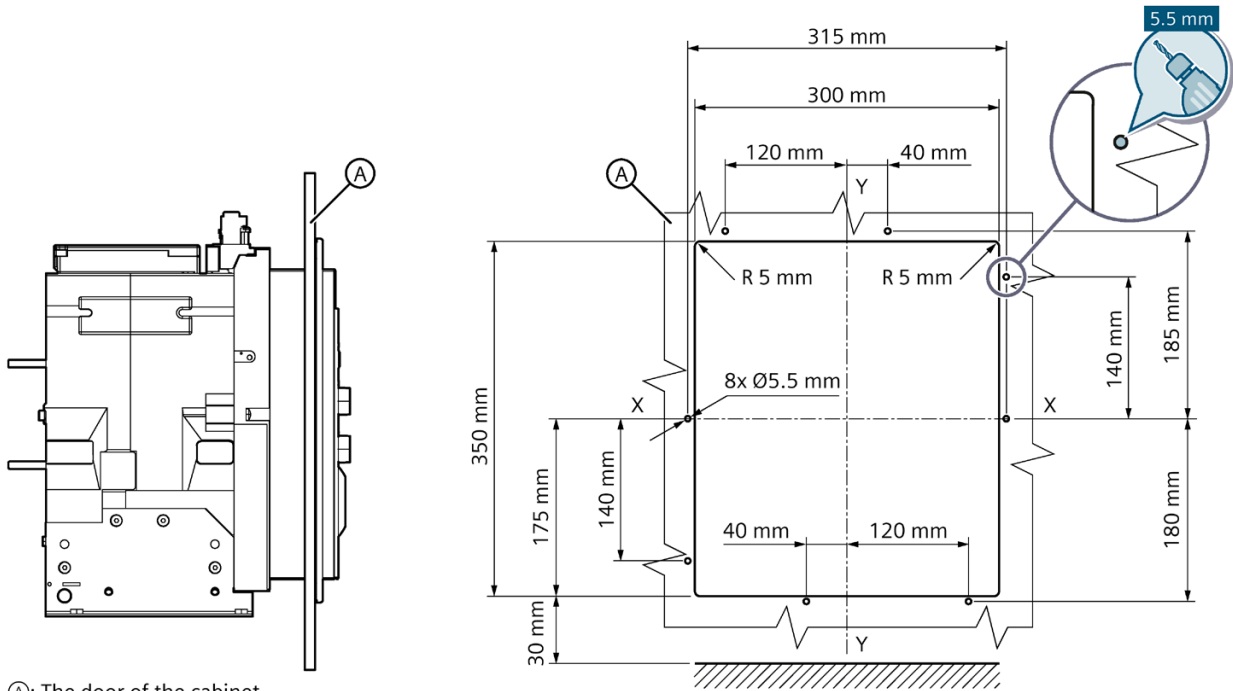


Frame size II



5.2.4 Door cutout

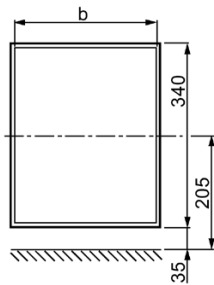
Door cutout for operator panel with door sealing frame



Ⓐ: The door of the cabinet

Door cutout with edge protection

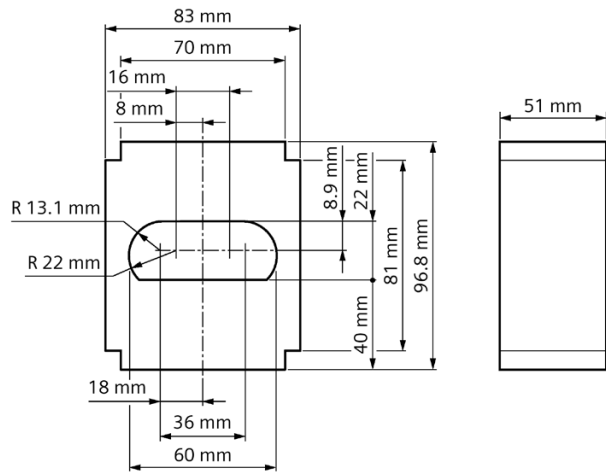
Cutout after edge protection is attached



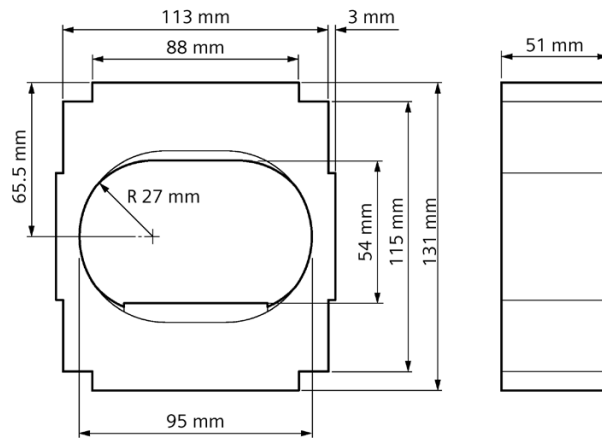
5.2.5 Current transformer for N conductor

Dimension diagrams of current transformers without bus bars

3WJ9111-0AA21

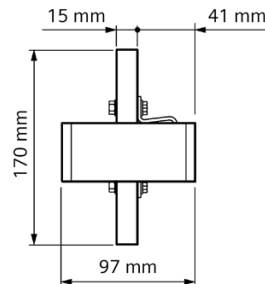
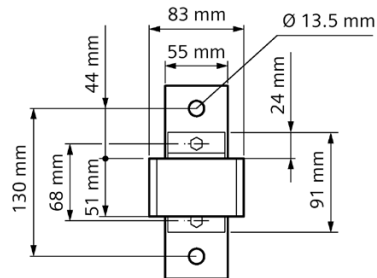


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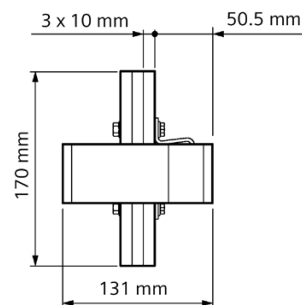
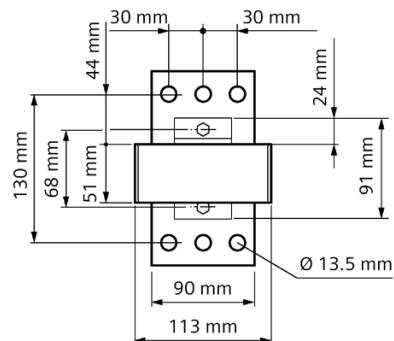


Dimension diagrams of current transformers with bus bars


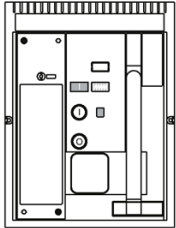
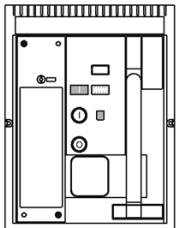
3WJ9111-0AA31



3WJ9111-0AA32



Troubleshooting

Fixed-mounted Circuit Breaker	Withdrawable Circuit Breakers	Fault	Cause	Remedy	
✓	✓	<p>The Circuit Breaker cannot be closed mechanically and/or electrically. (The Circuit Breaker is not ready to close, ready-to-close indicator )</p> 	The stored-energy spring mechanism has not been charged.	Charge the stored-energy spring mechanism.	
✓	✓		The undervoltage release is not excited.	Connect the undervoltage release to the power supply.	
✓	✓		Mechanical reclosing lock-out active.	Rectify cause of overcurrent tripping and press RESET.	
✓	✓		Electrical closing lockout active.	Remove the control voltage of the closing lockout. *)	
✓	✓		Mechanical OFF pushbutton locked.	Enable the pushbutton. ²	
✓	✓		Block against closing. ¹	Close the cabinet door.	
✓	✓		Mechanical Circuit Breaker interlock active (accessories).	Open the interlocking Circuit Breaker or rack it to disconnected position. ²	
✓	✓		Electronic trip unit not installed or installed incorrectly.	Install the electronic trip unit properly.	
	✓			The Circuit Breaker is set to an intermediate position in the guide frame (note the position indicator).	Rack the Circuit Breaker to the disconnected, test, or operating position.
	✓			Shutter for racking handle opening not closed.	Close the shutter (to disconnected, test, or operating position).
✓	✓	<p>The Circuit Breaker cannot be closed by electrical means. (The Circuit Breaker is ready to close, ready-to-close indicator OK)</p> 	The operating voltage of the closing solenoid is incorrect or has not been applied.	Check that the voltage is correct or apply the voltage.	
	✓		The Circuit Breaker is in the disconnected position in the guide frame.	Rack the Circuit Breaker to the test or operating position.	
✓			The auxiliary supply connector has been unplugged.	Plug in the auxiliary supply connector.	
	✓		The guide rails cannot be pulled out to install the Circuit Breaker.	The shutter is locked with one or two padlocks.	Remove the padlocks.

Fixed-mounted Circuit Breaker	Withdrawable Circuit Breakers	Fault	Cause	Remedy
	✓	The Circuit Breaker cannot be switched from the maintenance position to the disconnected position.	The positioning mechanism of the Circuit Breaker is not in the disconnected position (note the position indicator).	Rack the positioning mechanism to the disconnected position.
	✓		You have attempted to insert the Circuit Breaker in a guide frame with a different rated current.	Only use Circuit Breakers with the same rated current as the guide frame.
	✓		The Circuit Breaker and guide frame are encoded differently.	
	✓	When the Circuit Breaker is racked from the disconnected position to the test position, you encounter a high level of resistance as soon as you pass the disconnected position.	The Circuit Breaker was not inserted as far as it will go and the side latches are not yet engaged (warning: danger of destroying the device).	Push the Circuit Breaker to the disconnected position as far as it will go. The side latches must engage.
	✓	When you rack the Circuit Breaker from the disconnected position to the test position, it does not move for the first eight rotations.	No fault, due to the function	Continue racking
	✓	The racking handle cannot be inserted.	The OFF button has not been pressed.	Press the OFF button and, at the same time, move the slide switch to the right.
	✓		The cabinet door is not completely shut.	Close the cabinet door.
	✓		Racking handle opening locked with padlock(s).	Remove the padlock(s). ¹
✓		The cabinet door cannot be opened (door interlock as accessory).	When the Circuit Breaker is closed, this interlocks the cabinet door.	Open Circuit Breaker
	✓		The Circuit Breaker is in the operating position.	Rack the Circuit Breaker to the test position or disconnected position.
¹	Effective when the cabinet door is open (accessory).			
²	Note the following safety information:			

Note

Protective device

Override only if permissible under normal operating conditions.

Disposal

End of maximum life

When the maximum service life with maintenance is reached, the operator must ensure that the circuit breaker and replaced parts are disposed of properly in accordance with the applicable laws and regulations.

Disposal of low-voltage circuit breakers

Siemens low-voltage circuit breakers are environmentally sustainable products consisting largely of recyclable materials.

For the purposes of disposal, we recommend dismantling/separation into the following material fractions:

- Metals:
For forwarding to the recycling facility as mixed scrap
- Plastics:
Disposal as commercial waste for thermal recycling
- Electronics, insulated cables, motors:
Recycling by electrical scrap company

Due to the long service life of the Siemens low-voltage circuit breakers, it may be the case that the instructions for disposal are no longer up to date at the time of decommissioning or that other disposal methods are prescribed by national regulations.

The local customer service centers are available at all times to answer questions with respect to disposal.

Disposal of waste electronic equipment



Waste electronic equipment must not be disposed of as unsorted municipal waste, e.g. household waste. When disposing of waste electronic equipment, the current local national/international regulations must be observed.

ESD guidelines

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**

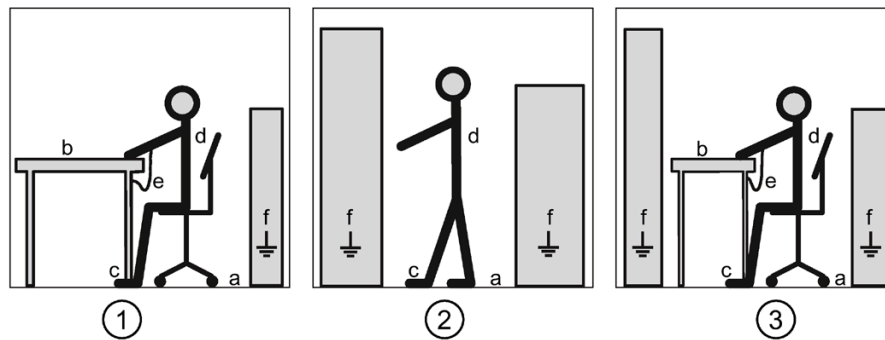
Electronic modules contain components that can be damaged by electrostatic discharge as a result of improper handling.

- You must discharge your body electrostatically immediately before touching an electronic module. 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. metalized 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.



- (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

List of abbreviations

Abbreviation	Meaning
O _{1,2}	Output information 1, 2 (Mechanical circuit breaker interlocking)
ANSI	American National Standards Institute
AUX	Auxiliary switch
AWG	American Wire Gauge
BIM	Breaker identification module
BSS	Breaker status sensor
CB _{1, 2, 3}	Circuit breakers 1, 2, 3 (mechanical circuit breaker interlocking)
CC	Closing coil
COM	Communication module
COMM.	Communication
CONNECT	Connected position
CSA	Canadian Standards Association
CT	Current transformer
D	Duty cycle, see OP (ON period)
DAS+	Dynamic Arc-Flash Sentry
DC	Direct current
DIN	Deutsches Institut für Normung e. V. (German Institute for Standardization)
DISCON	Disconnected position
ESD	Electrostatic sensitive device
EN	European Standard
ESD	Electrostatic sensitive device
ETU	Electronic trip unit
EXTEND.	Enhanced protective function
F5	Tripping solenoid
FS	(Frame) size
G alarm	Ground-fault alarm
G tripping	Ground-fault tripping
GF	Ground fault
I _{1, 2}	Input information 1, 2 (Mechanical circuit breaker interlocking)
I ² t	Current dependency of the delay time according to a formula whereby the product of the time and the square of the current is constant
I ² t _g	Setting for current-dependent delay time of ground-fault tripping at I ² t _g = const
I ² t _{sd}	Setting for current-dependent delay time of short-circuit trip at I ² t _{sd} = const
I ⁴ t	Current dependency of the delay time according to a formula whereby the product of the time and the value of the fourth power of the current is constant
I tripping	Instantaneous short-circuit trip
I _{avg}	Instantaneous average value of the current

Abbreviation	Meaning
I_{cc}	Conditional short-circuit current
I_{cm}	Rated short-circuit making capacity
I_{cs}	Rated service short-circuit breaking capacity
I_{cu}	Rated ultimate short-circuit breaking capacity
I_{cw}	Rated short-time withstand current
ID	ID number
IEC	International Electrotechnical Commission
I_g	Setting for ground-fault protection
I_i	Setting for instantaneous short-circuit trip
I_{IT}	1-pole short-circuit test current (IT systems)
I_N	Setting for N-conductor protection
I_n	Rated current
$I_{n\ max}$	Max. possible rated current
IOM	Input/output module
I_r	Setting for inverse-time delayed overload trip
I_{sd}	Setting for short-time delayed short-circuit trip
I_{THD}	Setting for total harmonic distortion (THD) current
L1	Phase 1
L2	Phase 2
L3	Phase 3
L tripping	Inverse-time delayed overload trip
LED	Light emitting diode
M	Motor
MLFB	Machine-readable product code (German acronym)
N	Neutral conductor
N 117	Australian approval mark
NC	Normally closed contact
NEMA	National Electrical Manufacturers Association
NO	Normally open contact
NIOSH	National Institute for Occupational Safety and Health
N tripping	Tripping due to overcurrent in the N-conductor
OP	ON period
OSHA	Occupational Safety and Health Administration
PIDG	AMP crimp eyelets
PSS	Position signaling switch (module)
PZ 3 ... 6	Crimping tools from Weidmüller in Detmold
RR	Remote Reset (remote trip alarm reset coil)
S tripping	Short-time delayed short-circuit trip
SIGUT	Siemens strain-relief clamp
ST	Shunt trip
ST2	Shunt trip 2 (second shunt trip)
TEST	Test position
t_g	Delay time of ground-fault tripping
t_r	Delay time of overload trip (defined as $6 \times I_r$)
TRIP GF	Cause for last trip was a ground fault
TRIP INST	Cause for last trip was a short-circuit (instantaneous)

Abbreviation	Meaning
TRIP LT	Cause for last trip was an overload in a main conductor
TRIP ST	Cause for last trip was a short-circuit (delayed)
TRIP TEST	Test trip for circuit-breaker testing
t_{sd}	Delay time of short-circuit trip
U_c	Rated control circuit voltage
U_e	Rated operational voltage
U_i	Rated insulation voltage
U_{imp}	Rated impulse withstand voltage
U_{THD}	Setting for total harmonic distortion (THD) voltage
UVR	UnderVoltage Release (undervoltage release, instantaneous)
UVR-t	UnderVoltage Release - time delay (undervoltage release, delayed)
VDE	Verband der Elektrotechnik Elektronik und Informationstechnik e. V. (German Association for Electrical, Electronic and Information Technologies)
V-TAP	Internal voltage tap
WBT	Web-based training
X	Terminal marking according to DIN
Y1	Closing coil
Z = ...	Supplement to article number "Further options"

Glossary

Auxiliary switches

Undervoltage releases and shunt releases are available.

Closing coil

Electrical closing of the energy in the spring energy store.

Current transformer

Generates energy (power supply) for the internal supply of the electronic trip unit.

Electrical closing lockout

This function is designed to electrically interlock two or more Circuit Breakers (closing lockout). The electrical closing lockout prevents the Circuit Breaker from closing with a continuous signal.

Finger contacts

These connect the main connection terminals on the Circuit Breaker to the main terminals on the guide frame.

Mechanical interlock

This function supports different types of mechanical interlocking for Circuit Breakers.

Mechanical reclosing lockout

After overcurrent tripping, the Circuit Breaker is locked against reclosing until the mechanical reclosing lockout function has been manually reset.

Position indicator

This indicates the position of the Circuit Breaker (disconnected/test/operating position) in the guide frame.

Position signaling switch

This is used for remotely displaying the Circuit Breaker position in the guide frame.

Racking rail

Moves the Circuit Breaker in the guide frame.

Rated current coding

The rated current is coded in the factory. Thus every Circuit Breaker can only be used in a guide frame with the same rated current.

Ready-to-close signal switch

This auxiliary switch is actuated depending on the ready-to-close status of the Circuit Breaker.

Safe OFF

This additional function prevents the Circuit Breaker from closing and fulfills the isolation condition in the OFF position according to IEC 60947-2:

- "Mechanical OFF" button pressed
- Main contacts open
- Withdrawable Circuit Breakers: racking handle removed
- The various interlocking conditions are fulfilled

Secondary disconnect terminals coding

The secondary disconnect terminals can be coded to prevent the connecting terminals from being connected incorrectly.

Shunt release (F1, F2)

For remotely opening the Circuit Breaker and blocking it against closing.

Shutters

Shutters are molded-plastic plates for covering live main conducting paths in the guide frame (shock-hazard protection). If the Circuit Breaker is racked to the disconnected position, the shutters are moved over the uncovered contact gaps.

Spring charging lever

The stored-energy spring mechanism is charged by means of a series of pump movements (five actuations of charging lever).

Spring-charging motor

A geared motor automatically charges the stored-energy spring as soon as voltage is applied to the auxiliary supply connections. After one closing operation, the stored-energy spring is again automatically charged for the next closing operation.

Stored-energy spring mechanism

Unit with spring energy store (mechanical energy). The spring is charged by means of the spring charging lever or motorized operating mechanism and maintained in a charged state by means of latches. When these latches are released, the stored energy is routed to the switching contact and the Circuit Breaker closes.

Trip signal switch

Group signal for overload, short-circuit, and ground-fault tripping by means of microswitch.

Undervoltage release (delayed)

For remotely opening and interlocking the Circuit Breaker. Voltage dips must not cause the Circuit Breaker to open.

Undervoltage release (instantaneous/short-time delay)

For remotely opening and interlocking the Circuit Breaker as well as for using the Circuit Breaker in EMERGENCY OFF circuits (to EN 60204-1 / DIN VDE 0113 Part 1) in conjunction with a separate EMERGENCY OFF device. Brief voltage dips ($t_d < 80$ ms for instantaneous undervoltage release, $t_d < 200$ ms for short-time delay undervoltage release) must not cause the Circuit Breaker to open.

Use of tools

Buttons located under a cover that can be accessed through a hole (diameter 6.35 mm) must only be actuated by means of a suitable rod.

Further Information

Always at your disposal: our extensive support
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