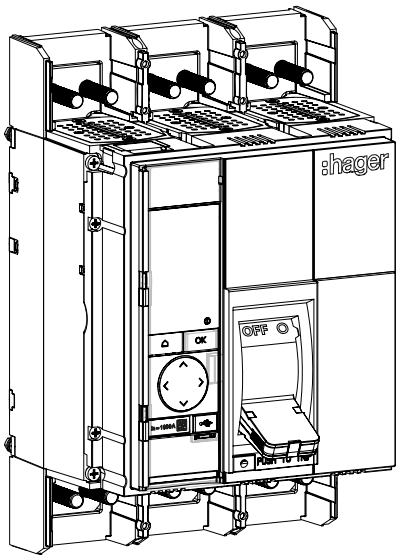
User manual

h3+

PW1600



Moulded case circuit breakers

630 A to 1600 A

CE

UK CA

:hager

EN

1 Safety instructions

Warnings and instructions

This documentation contains safety advice which must be respected for your own safety and to prevent property damage. Safety instructions relating to your own safety are identified by a safety warning symbol in the documentation. Safety advice relating to damage to property is identified by ‘Notice’.

The safety warning symbols and the wording below are classified according to the risk level.

Danger

Danger indicates a situation of imminent danger which, unless averted, will result in death or serious injuries.

Warning

Warning indicates a potentially dangerous situation which, if it cannot be avoided, may result in serious injuries or even death.

Caution

Caution indicates a potentially dangerous situation which, unless averted, may result in minor or moderate injuries.

Notice

Notice indicates a warning message about possible equipment damage.

Information

Information also indicates important instructions for use and particularly relevant information regarding the product, which must be respected to ensure effective and safe use.

Qualified personnel

The product or the system described in this documentation must be installed, operated and maintained by qualified personnel only. Hager Electro accepts no responsibility regarding the consequences of this equipment being used by unqualified personnel. Qualified personnel are those people who have the necessary skills and knowledge for building, operating and installing electrical equipment, and who have received training enabling them to identify and avoid the risks incurred.

Appropriate use of Hager products

Hager products are designed to be used only for the applications described in the catalogues and in the technical documentation relating to them. If products and components from other manufacturers are used, they must be recommended or approved by Hager. Appropriate use of Hager products during transport, storage, installation, assembly, commissioning, operation and maintenance is required to guarantee problem-free operation in complete safety. The permissible ambient conditions must be respected. The information contained in the technical documentation must be respected.

Publication liability

The contents of this documentation have been reviewed in order to ensure that the information is correct at the time of publication. Hager cannot, however, guarantee the accuracy of all the information contained in this documentation. Hager assumes no responsibility for printing errors and any damage they may cause. Hager reserves the right to make the necessary corrections and modifications to subsequent versions.

2 Using this guide

Purpose of the document

This manual is designed to provide users, electricians, panel builders and maintenance personnel with the technical information required to use the circuit breakers PW1600 with electronic trip units.

Field of application

This document is applicable to the PW1600 switch-disconnectors and circuit breakers of the h3+ range.

Revisions

Version	Date
6LE009399A	2024-11

Documents to consult

Document	Reference
User manual for sentinel trip units	6LE007969A
User manual for sentinel Energy trip units	6LE008147A
Installation manual for circuit breakers	6LE009395A
sentinel Energy Modbus communication guide	6LE007964A
HTD210H panel display user guide	6LE002999A
Rotary control installation manual	6LE009240A
Installation manual for rotary control accessories	6LE009406A

You can download these publications and other technical information from our website: www.hager.com

Contact

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3 Circuit breaker operation

3.1 Description

The PW1600 switch-disconnectors and circuit breakers from the h3+ range have the following elements on the front:

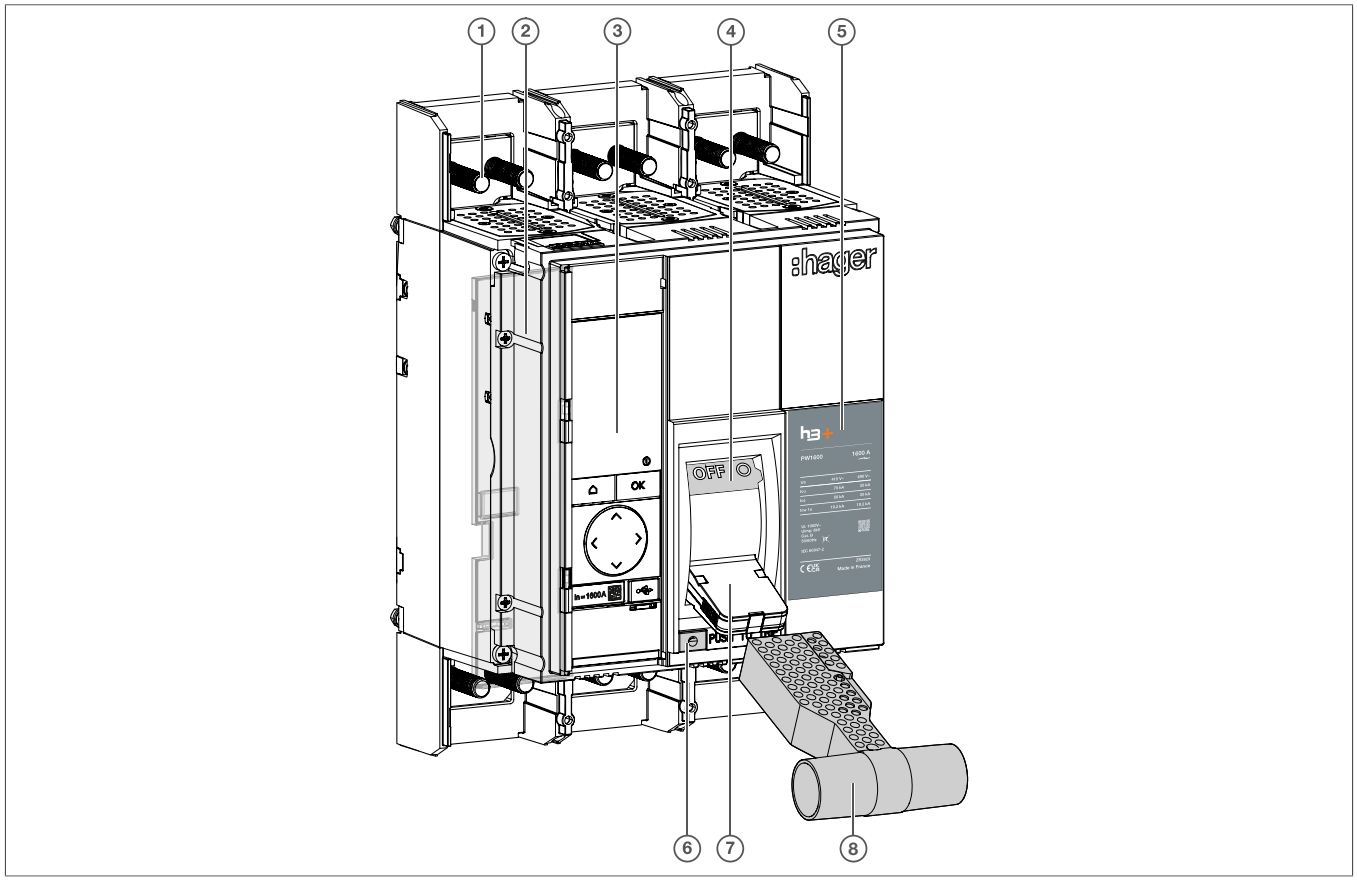
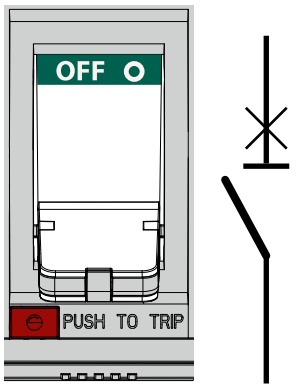
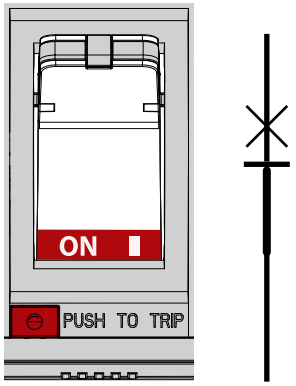
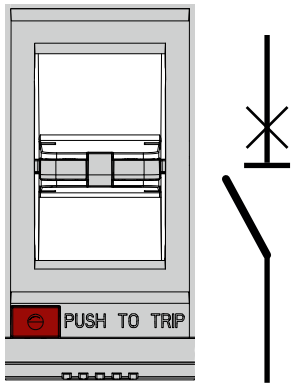


Fig. 1: Description of the circuit breaker

1. Front connections
2. Transparent sealable cover of the trip unit
3. sentinel Energy trip unit
4. Contact opening indicator
5. Identification label
6. Mechanical trip test button
7. Operating handle
8. Extension cable

3.2 Circuit breaker status

The state of the circuit breaker is indicated by the position of the operating handle. There are three different states.

Air circuit breaker	
Circuit breaker closed	
Circuit-breaker open following tripping	

3.3 Closing and opening the circuit breaker

Danger

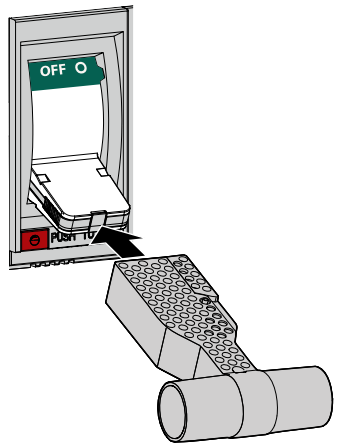
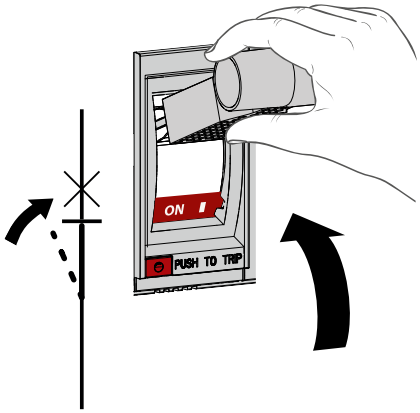
Risk of electric shock, explosion or electric arc.

Inspect the electrical installation and remove the tripping cause before closing the circuit breaker again.

Never close a circuit breaker without first making sure that the installation complies with the safety standards.

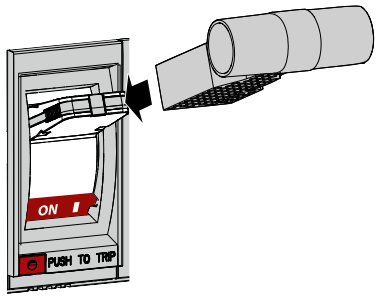
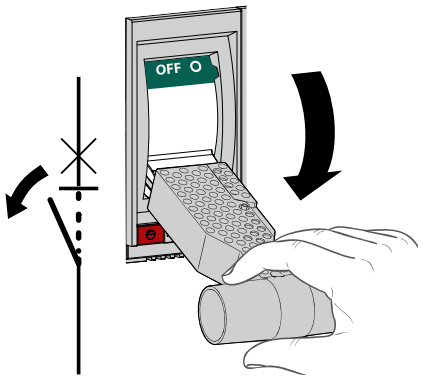
Closing of the circuit breaker

To close the circuit breaker, use the extension operating lever.

1 Insert the extension operating lever into the main switch.	2 Close the circuit breaker.
	

Opening of the circuit breaker

To open the circuit breaker, use the extension operating lever.

1 Insert the extension operating lever into the main switch.	2 Open the circuit breaker.
	

3.4 Reset after tripping

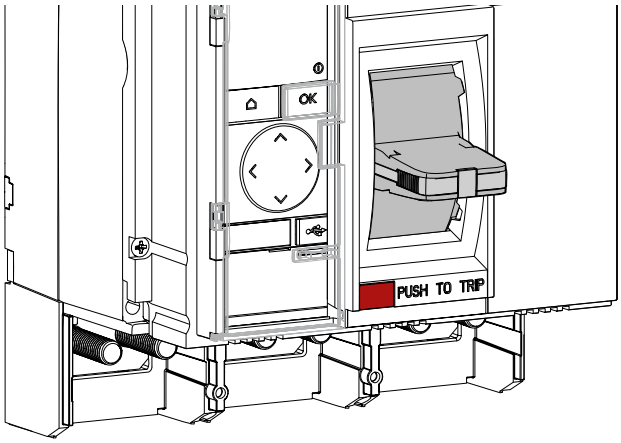
Warning

Risk of reclosing due to an electrical fault

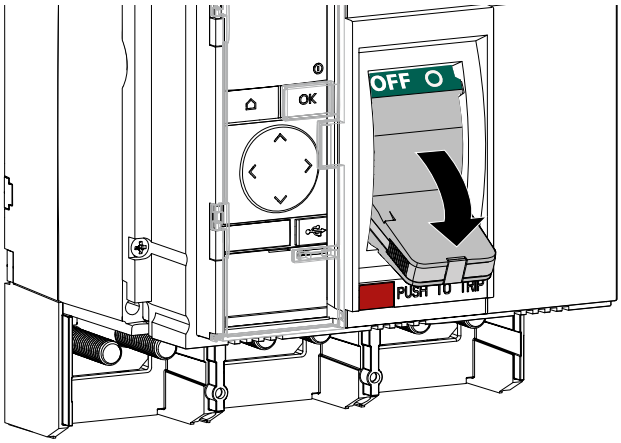
In the event of tripping, do not close the circuit breaker without checking or possibly repairing the electrical installation.

Failure to follow these instructions may result in injuries or material damages.

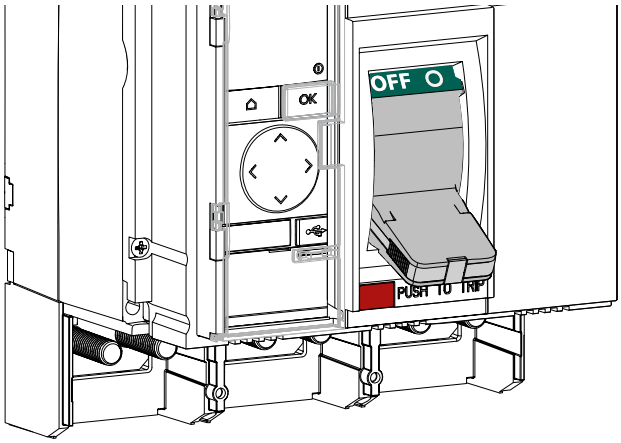
1 Circuit breaker tripped



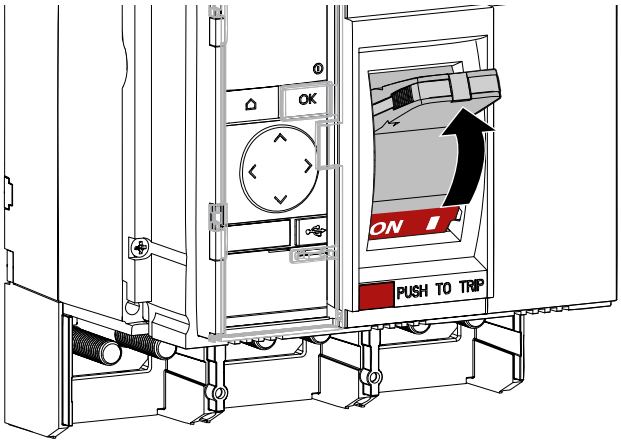
2 Reset the circuit breaker



3 Inspect and repair the electrical installation in accordance with safety instructions



4 Close the circuit breaker



3.5 Locking the circuit breaker using padlocks

Danger

Risk of electric shock, explosion, or electric arc

When the circuit breaker operating mechanism is locked in the (O) OFF position, always use a correctly set voltage-free tester to ensure that the power supply is disconnected before starting work on the device.

Only authorised personnel may work on the installation.

Failure to follow these instructions may result in death or serious injury.

Interlocking the circuit breaker

- Lock the mechanism using a padlock on the circuit breaker operating device in the open (OFF) position. Check to ensure that it is no longer possible to close the circuit breaker by actuating the operating handle.

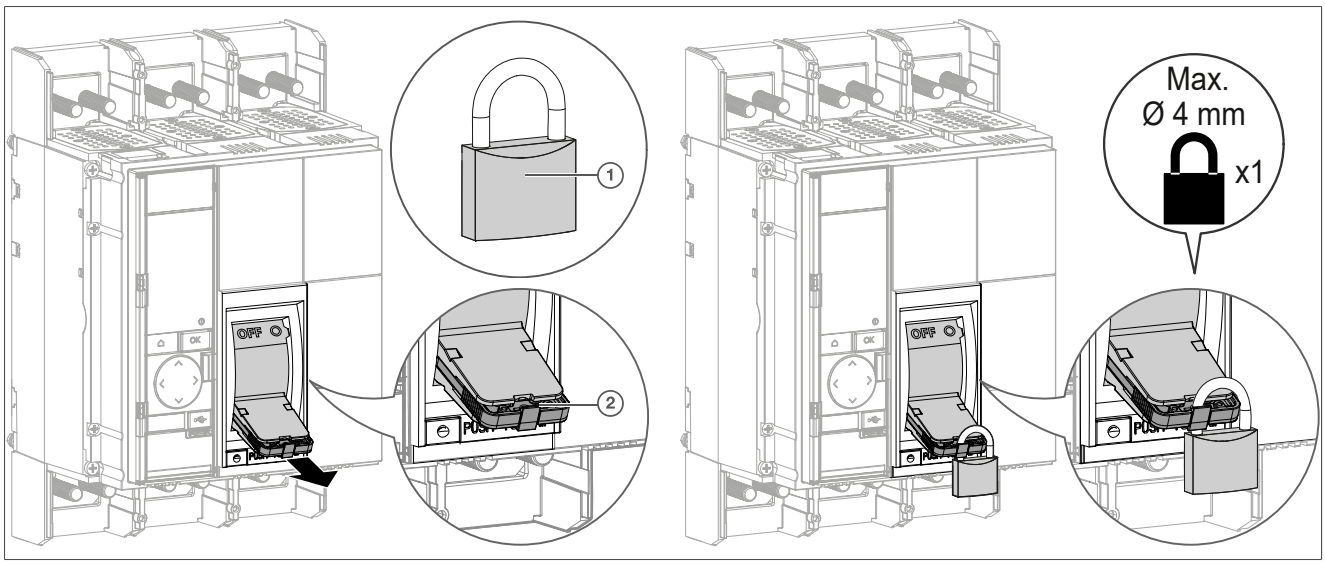


Fig. 2: Installing the padlock on the circuit breaker operating device

① Padlock
② Locking tab pulled

Information

- The diameter of the padlock on the operating handle is max. 4 mm.
- To unlock the device:
  1. remove the padlock,
  2. return the locking tab to its original position.

- Lock the mechanism using a padlocking accessory on the circuit breaker operating device in the open (OFF) position. Check to ensure that it is no longer possible to close the circuit breaker by actuating the operating handle.

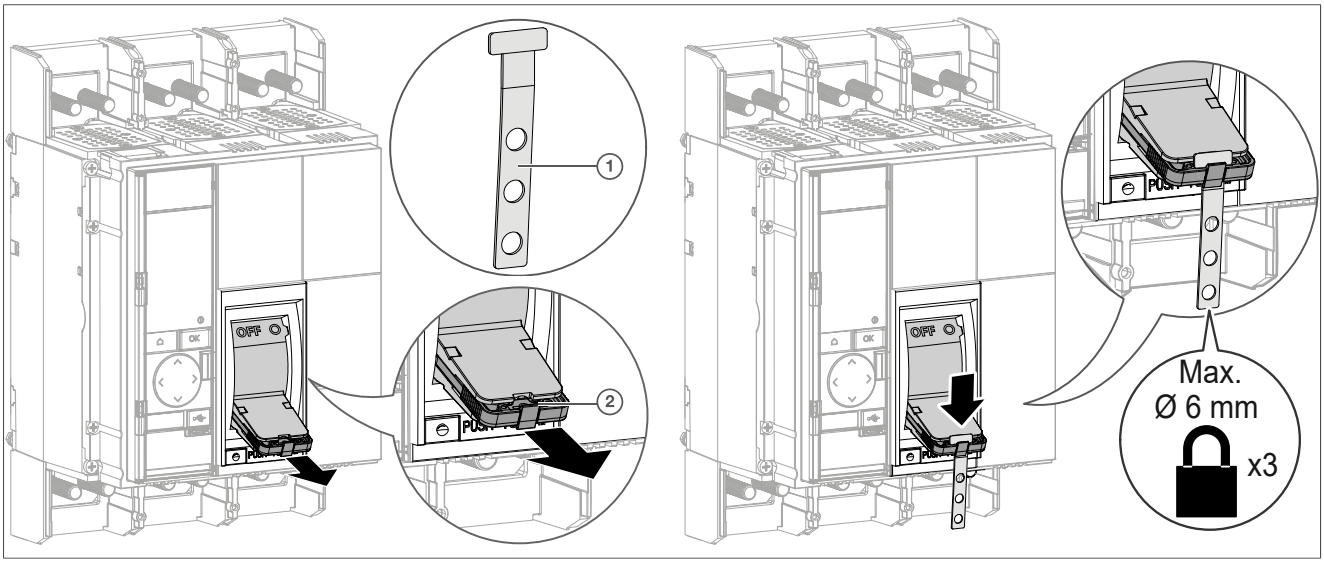


Fig. 3: Installing the padlock accessory on the circuit breaker operating device

① Padlock accessory
② Locking tab pulled

Information

- The padlocking accessory HXA039H can be used to install up to 3 padlocks.
- The diameter of the padlock on the accessory is max. 6 mm.
- To unlock the device:
  1. remove the padlock,
  2. return the locking tab to its original position.

Locking the rotary control

The mechanism can be locked using up to three padlocks. Check to ensure that it is no longer possible to close the circuit breaker by actuating the rotary control handle.

For the installation of interlocking accessories, refer to the following manual:

Accessory	Manual
Rotary control sub-assembly	6LE009240A
Rotary control accessories	6LE009406A

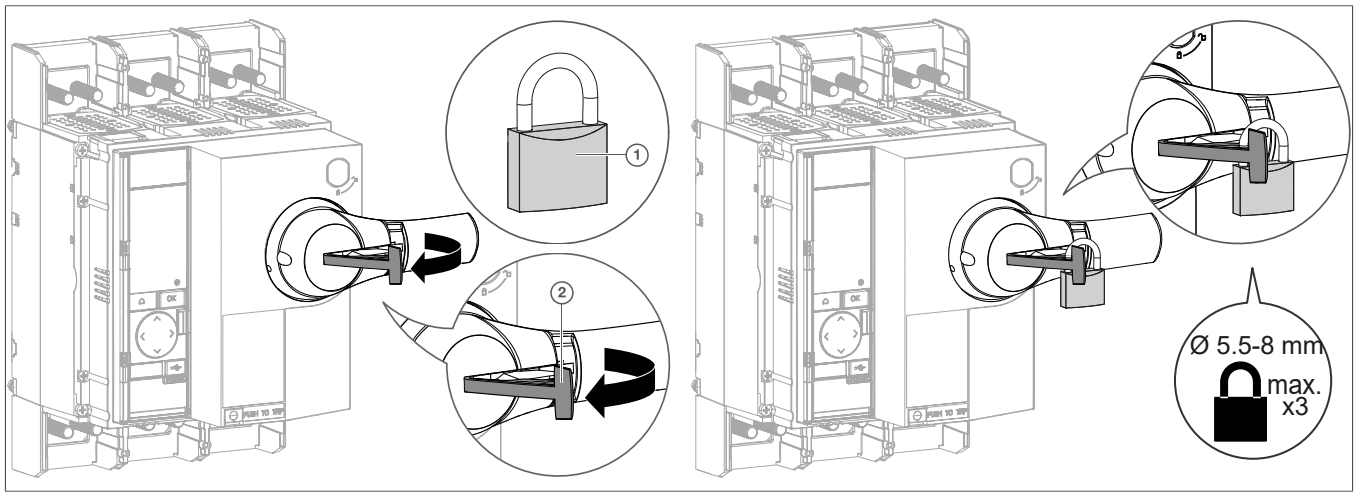


Fig. 4: Rotary control with interlocking padlock

① Padlock
② Tab extended

Information

- The control tab can be used to install up to 3 padlocks.
- The diameter of the padlock on the tab is between 5.5 and 8 mm max.
- Locking of the mechanism with a padlock on the actuator tab can also be combined with a keylock.
- To unlock the device:
  1. remove the padlock,
  2. return the locking tab to its initial position.

3.6 Interlocking of the circuit breaker using a lock

Danger

Risk of electric shock, explosion, or electric arc

When the circuit breaker operating mechanism is locked in the (O) OFF position, always use a correctly set voltage-free tester to ensure that the power supply is disconnected before starting work on the device.

Only authorised personnel may work on the installation.

Failure to follow these instructions may result in death or serious injury.

Locking the rotary control

This interlocking device prevents the circuit breaker from closing or opening using a keylock.

Only the Ronis type lock can be installed.

For the installation of the keylock, refer to the following instructions:

Accessory	Manual
Rotary handle sub-assembly	6LE009240A
Rotary handle accessories	6LE009406A

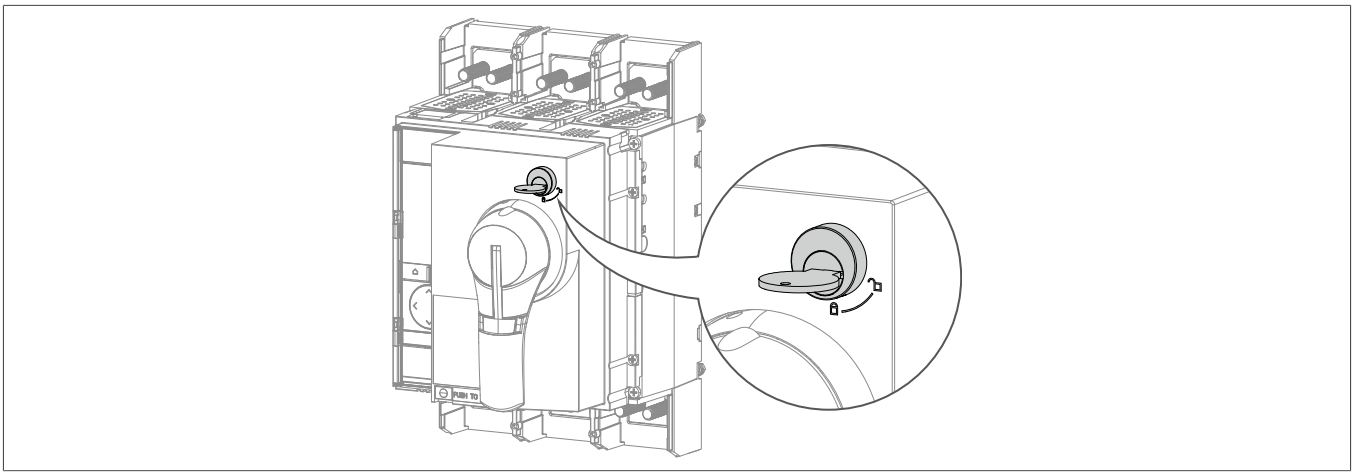
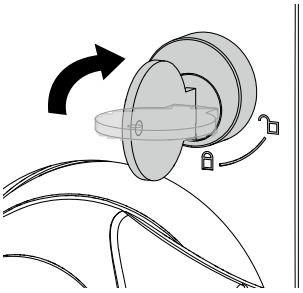
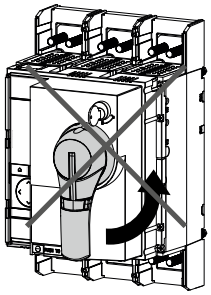
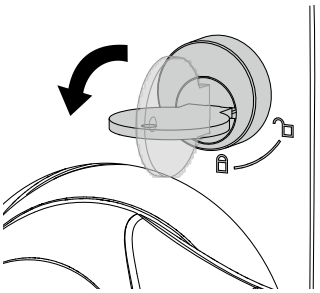


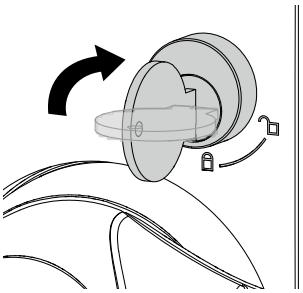
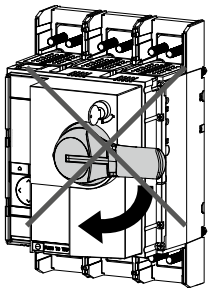
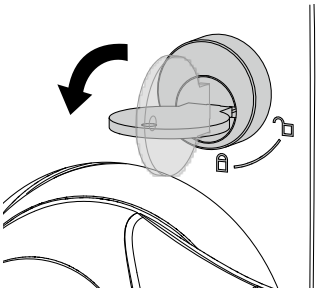
Fig. 5: Rotary handle with Ronis-type keylock

Lock the rotary handle in all positions using a keylock.

Interlocking in ON position:

1 Turn the key to interlock the rotary handle.	2 Check that the control is locked and remove the key.	3 **To unlock the rotary handle, insert and turn the key.**
		

Interlocking in OFF position:

1 Turn the key to interlock the rotary handle.	2 Check that the control is locked and remove the key.	3 **To unlock the rotary handle, insert and turn the key.**
		

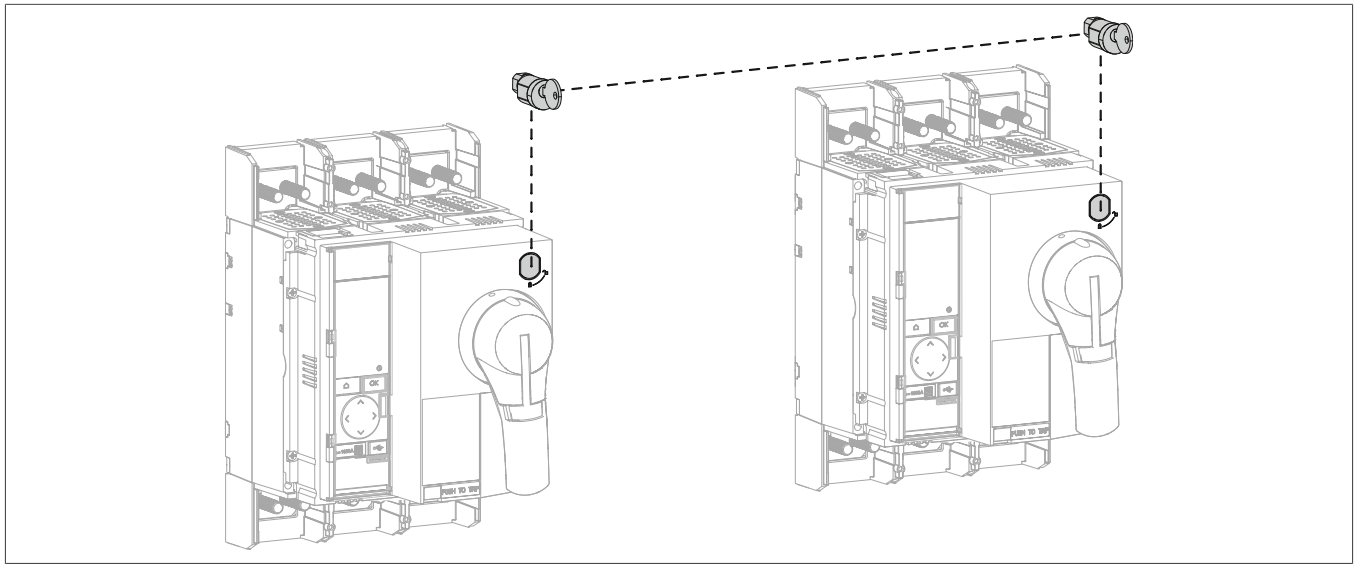
Information

- The circuit breaker trips even when the handle is locked in the closed position (ON),
- The rotary control allows you to combine interlocking either with a padlock or keylock.

4 Interlocking with keys

Interlocking between 2 circuit-breakers is possible using two key locks on the rotary controls and a single key. It relies on the use of two identical locks controlled by a single key.

This approach allows interlocking between two devices that are physically separate or which have significantly different characteristics, such as medium and low voltage equipment or between circuit breakers and switch-disconnectors.



Information

The circuit breaker can be locked in the ON position using a specific setting. For this purpose see the installation manual for the accessory with reference number 6LE009240A.

5 Closing the circuit breaker after a trip operation

Danger

Risk of electric shok, explosion or electric arc

Inspect the electrical installation and remove the tripping cause before closing the circuit breaker again.

Never close a circuit breaker locally or remotely without first making sure that the installation complies with the safety standards.

Following a trip operation, the circuit breaker is open and the trip unit display is flashing.

To identify what triggered the tripping, refer to the following manual:

Accessory	Manual
User manual for sentinel trip units	6LE007969A
User manual for sentinel Energy trip units	6LE008147A

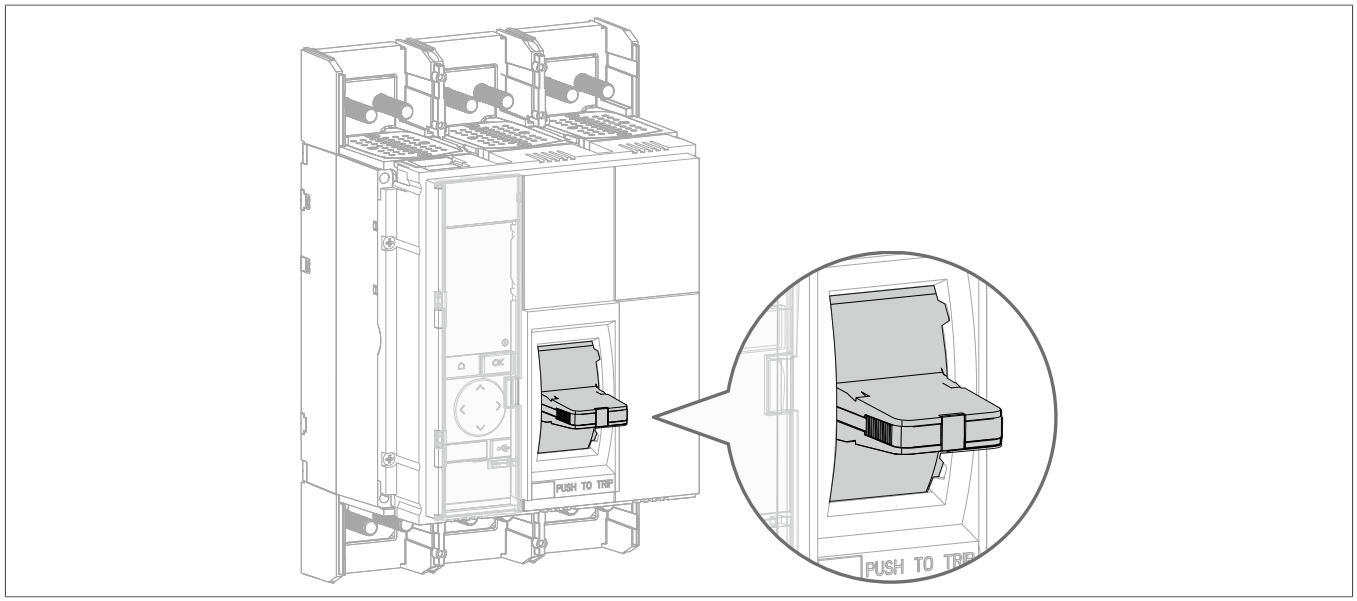
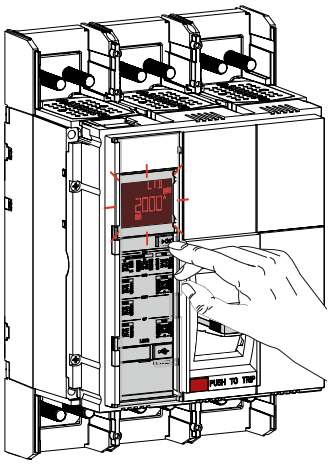


Fig. 6: Circuit breaker tripped (TRIP) in the open position

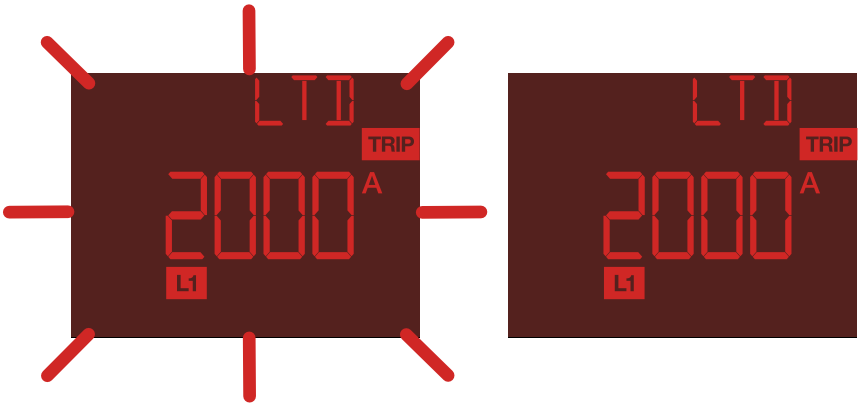
Before closing the circuit breaker, the electronic trip unit display must first be **reset**.

With the sentinel trip unit

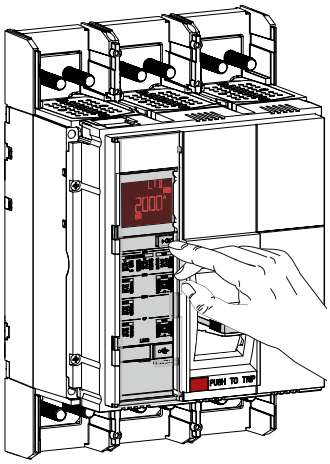
1. **Briefly** press the →OK button.



2. The sentinel trip unit display stops flashing and become steady.



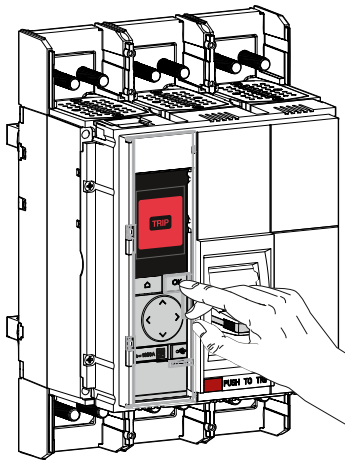
3. Press the →OK button **for more than 3 s**.



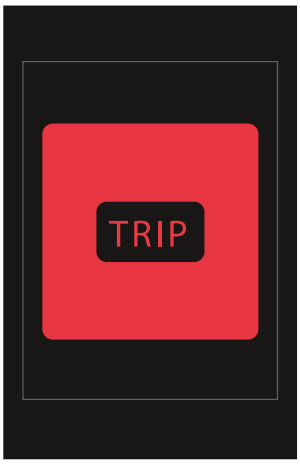
4. Check that the fault is cleared and that the display switches off.

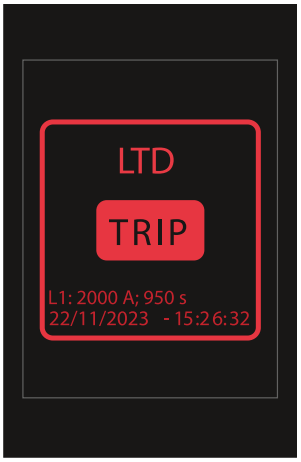
With the sentinel Energy trip unit

1. **Briefly** press the OK button.

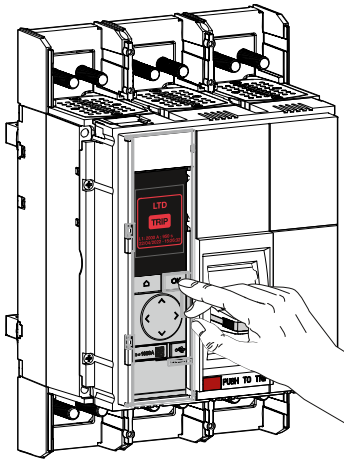


2. The sentinel Energy trip unit display switches from the first flashing message to the second flashing message.

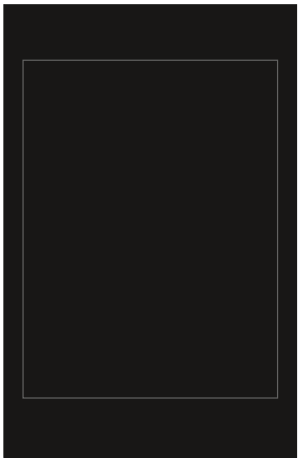




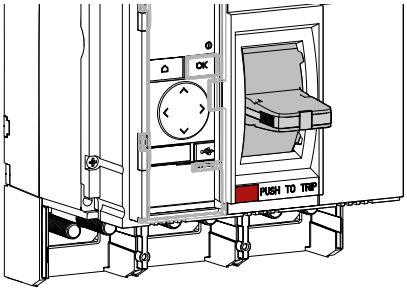
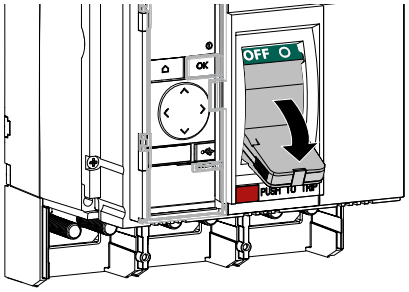
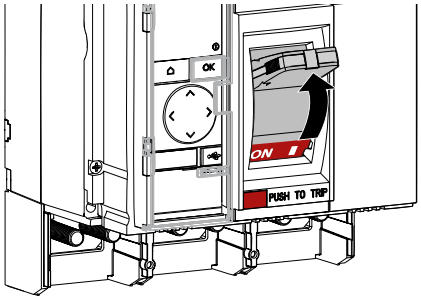
3. Press the OK button **for more than 3 s**.



4. Check that the fault is cleared and that the display switches off.



After inspection and repair of the electrical equipment, you can close the circuit breaker by going through the following steps:

1 The tripped circuit breaker is in the open position (TRIP).	2 Reset the circuit breaker.	3 Close the circuit breaker.
		

Check that the **ReadyToProtect** indicator:

– flashes (or remains lit) on the sentinel trip unit display,
– is lit on the sentinel Energy trip unit.

If the display remains off, connect an external battery to the USB-C socket to perform this check.

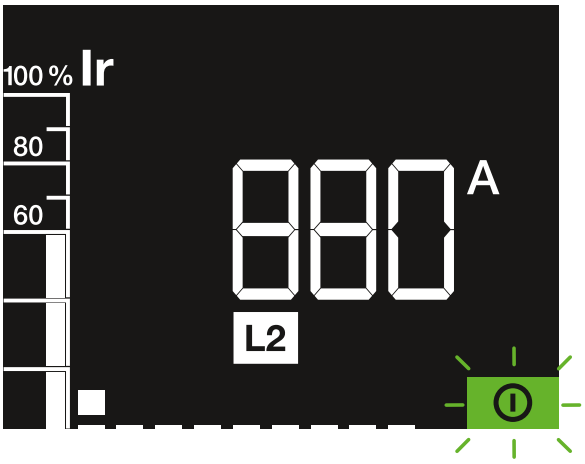


Fig. 7: sentinel trip unit

Fig. 8: sentinel Energy trip unit

Information

The trip unit must be powered in order for it to perform its protection functions. It is powered on condition that a minimum current of 120 A on one phase or 80 A per phase passes through the circuit breaker.
If this condition cannot be guaranteed, it is recommended that a 24V DC SELV external power supply be connected (recommended product reference Hager HTG911H) on the type D terminal to guarantee optimal operation of the trip unit and prevent malfunctions in the electrical installation associated with a breach in the trip unit's continuity of operation.

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