

Medium Voltage Distribution

RM6

Instructions for use

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Safety Information

Important Information

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service or maintain it. The following special messages may appear throughout this bulletin or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of either symbol to a "Danger" or "Warning" safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ DANGER
DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING
WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION
CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE
NOTICE is used to address practices not related to physical injury. The safety alert symbol shall not be used with this signal word.

Please Note

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and has received safety training to recognize and avoid the hazards involved.

Information Advice



INFORMATION-ADVICE


We draw your attention on this particular point.

Diffusion Rules

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Safety Instructions

Safety Rules

 DANGER
<p>HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH</p> <ul style="list-style-type: none"> • Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. • This equipment must only be installed and serviced by qualified electrical personnel. • Turn off all power supplies of the equipment before working on or inside equipment. • Always use a properly rated voltage sensing device to confirm power is off. • Set all devices, doors and covers before turning on power to this equipment. • Do not use solvents and alcohol for cleaning. • Do not use high-pressure cleaner. • Beware of potential hazards, and carefully inspect the work area for tools and objects that may have been left inside the equipment. <p>Failure to follow these instructions will result in death or serious injury.</p>

Disposal of the Equipment at End-of-Life

This equipment contains compressed springs.

 WARNING
<p>HAZARD OF MECHANICAL IMPACT</p> <ul style="list-style-type: none"> • Apply appropriate personal protective equipment (PPE) and follow safe work practices. • This equipment must only be dismantled by qualified personnel. <p>Failure to follow these instructions can result in death, serious injury or equipment damage.</p>

NOTE: This equipment contains SF6 gas. SF6 is a powerful greenhouse gas. Prior to disposal of the equipment at end-of-life, the SF6 gas must be recovered in order for it to be recycled, reclaimed or destroyed.

- Do not carry out any dismantling operations unless authorized.
- Do not handle SF6 gas unless certified according to local regulation.
- Do not release SF6 gas to the atmosphere.

Penalties may apply according to local regulations and rules (Regulation (EU) N°517/2014 for all European countries).

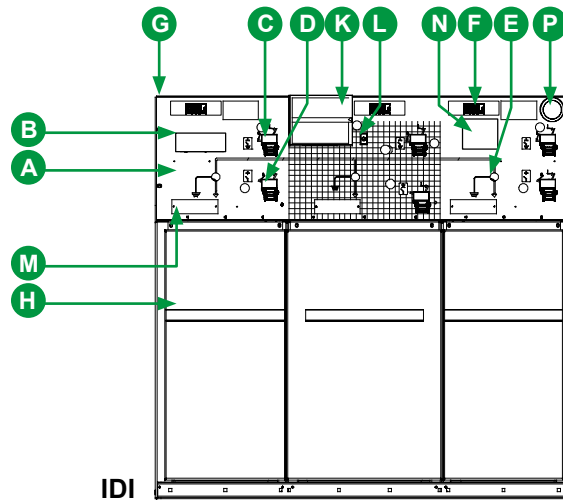
Schneider Electric offers a complete service to dismantle and recycle Medium Voltage equipment and SF6 gas at end-of-life. This service is compliant with IEC 62271-4 and conforms to local regulations. Contact Schneider Electric for more information.

General Description

I = Switch & earthing switch	DE-Mt = Double extensible metering
Q = Switch-fuse combination & earthing switch	NE = No Extensible
D = Circuit Breaker up to 200A & earthing switch	DE = Double Extensible
B = Circuit breaker up to 630A & earthing switch	LE = Left Extensible
Ic = Busbar coupling switch & earthing switch	RE = Right Extensible
Bc = Busbar coupling circuit breaker up to 630A & earthing switch	
O = Cable connection	

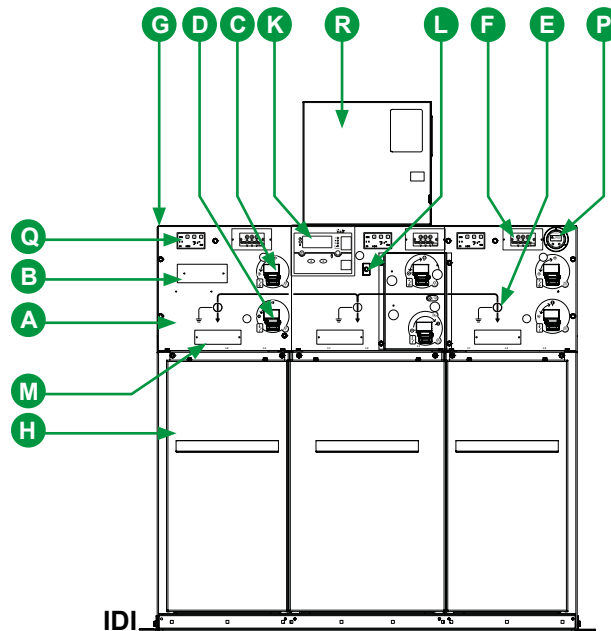
Circuit-breaker and Switch Function

- A: operating mechanism front plate comprising the mimic diagram
- B: nameplate
- C: earthing switch operating shaft
- D: switch operating shaft
- E: function (switch or circuit breaker) position indicator
- F: voltage indicator
- G: LV connection access trunking
- H: connection bushing access panel
- K: VIP40/45 - VIP400/410 protection relays
- L: D function (CB opening pushbutton) opening pushbutton
- M: designation plate
- N: pressure switch or gauge label
- P: location of optimal pressure switch or gauge



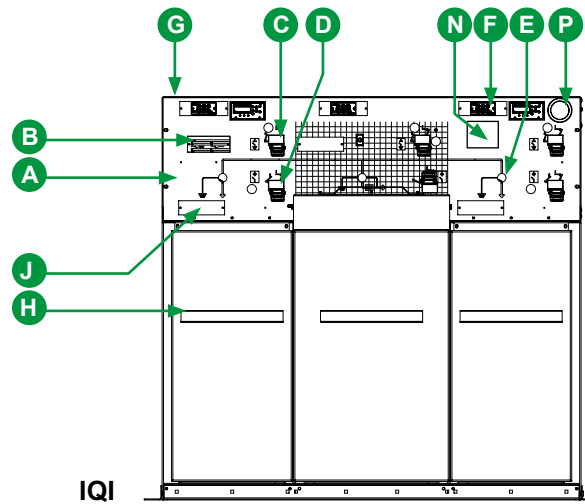
RM6 Connected Advanced Circuit-breaker and Switch Function

- A: operating mechanism front plate comprising the mimic diagram
- B: nameplate
- C: earthing switch operating shaft
- D: switch operating shaft
- E: function (switch or circuit breaker) position indicator
- F: voltage indicator
- G: LV connection access trunking
- H: connection bushing access panel
- K: VIP410 protection relay
- L: circuit breaker opening pushbutton (D function)
- M: designation plate
- P: location of optimal pressure switch
- Q: switch control unit (SC150H module)
- R: RM6 Connected Advanced cabinet



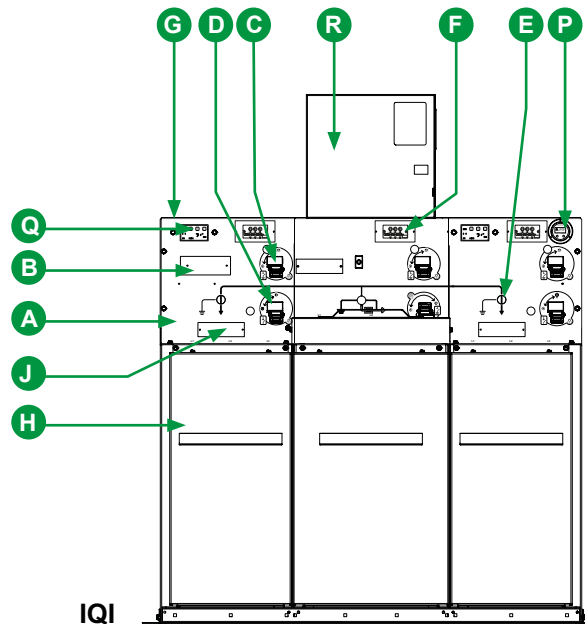
Switch-fuse Combination and Switch Function

- A: operating mechanism front plate comprising the mimic diagram
- B: nameplate
- C: earthing switch operating shaft
- D: switch operating shaft
- E: function position indicator
- F: voltage indicator
- G: LV connection access trunking
- H: connection bushing access panel
- J: designation plate
- N: pressure switch or gauge label
- P: pressure switch or gauge



RM6 Connected Advanced Switch-fuse Combination and Switch Function

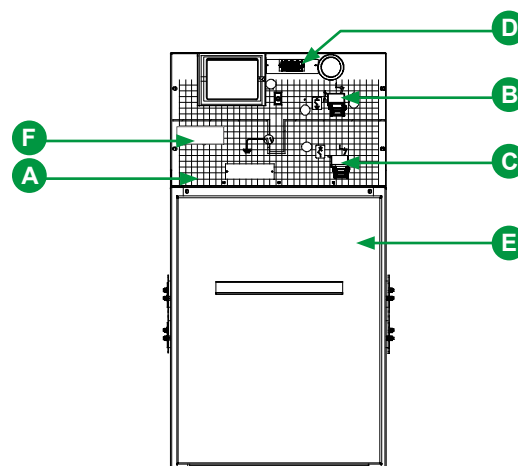
- A: operating mechanism front plate comprising the mimic diagram
- B: nameplate
- C: earthing switch operating shaft
- D: switch operating shaft
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- J: designation plate
- P: pressure switch
- Q: switch control unit (SC150H module)
- R: RM6 Connected Advanced cabinet



“Switchboard Coupling” Switch and Circuit-breakers

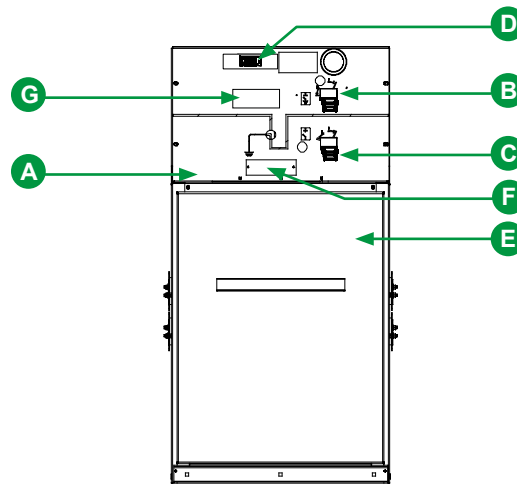
1: DE-Bc station with earthing switch

- A: control panel featuring the mimic panel
- B: earthing switch operating shaft
- C: switch operating shaft
- D: voltage indicator
- E: connection bushing access panel
- F: nameplate



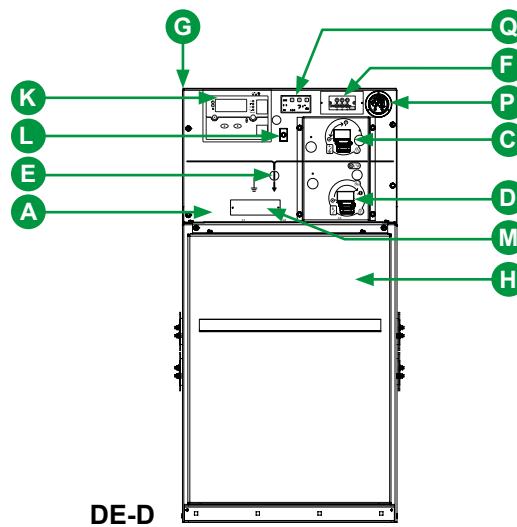
2: DE-Ic station with earthing switch

- A:** control panel featuring the mimic panel
- B:** earthing switch operating shaft
- C:** switch operating shaft
- D:** voltage indicator
- E:** connection bushing access panel
- F:** customer's designation plate
- G:** nameplate



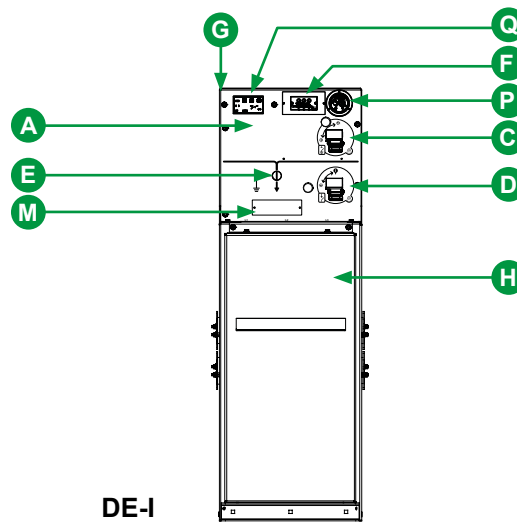
RM6 Connected Advanced Circuit-breaker Function

- A:** operating mechanism front plate comprising the mimic diagram
- C:** earthing switch operating shaft
- D:** switch operating shaft
- E:** function (switch or circuit breaker) position indicator
- F:** voltage indicator
- G:** LV connection access trunking
- H:** connection bushing access panel
- K:** VIP410 protection relay
- L:** circuit breaker opening pushbutton (D function)
- M:** designation plate
- P:** pressure switch
- Q:** switch control unit (SC150H module)



RM6 Connected Advanced Switch Function

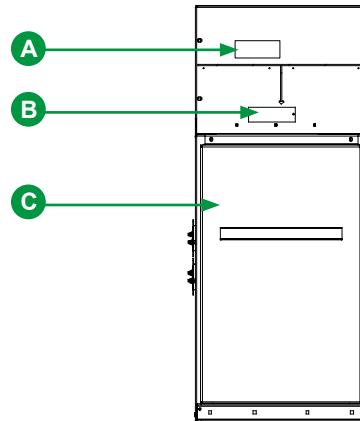
- A:** operating mechanism front plate comprising the mimic diagram
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- D:** switch operating shaft
- E:** function (switch or circuit breaker) position indicator
- F:** voltage indicator
- G:** LV connection access trunking
- H:** connection bushing access panel
- M:** designation plate
- P:** pressure switch
- Q:** switch control unit (SC150H module)



Cable Connection Function

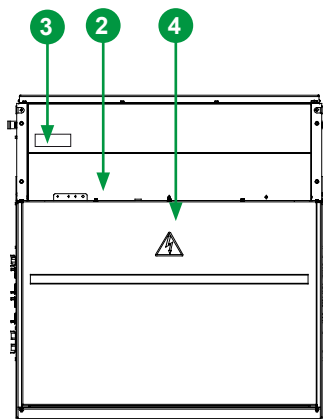
Example presented: DE-O

- A: nameplate
- B: designation plate
- C: connection bushing access panel

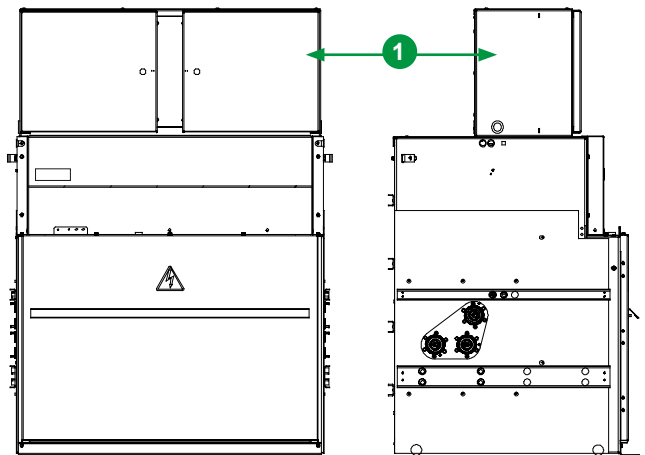
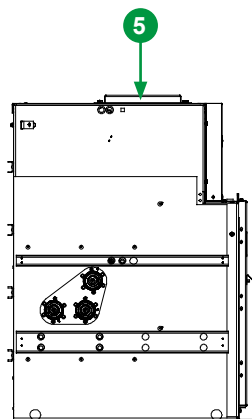


Metering Cubicle

- 1: LV cabinet
- 2: voltage transformer access panel
- 3: nameplate
- 4: access panel to current transformer
- 5: LV compartment



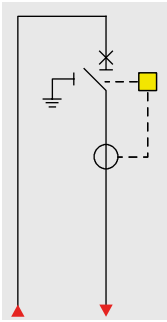
without LV cabinet



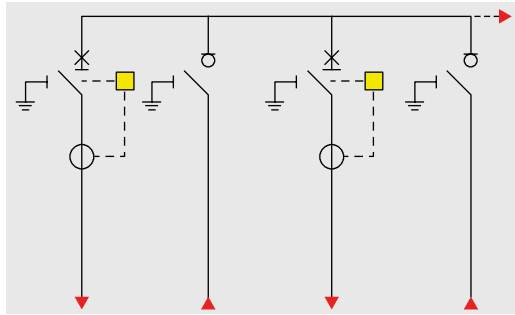
with LV cabinet

Example of Single-line Diagrams

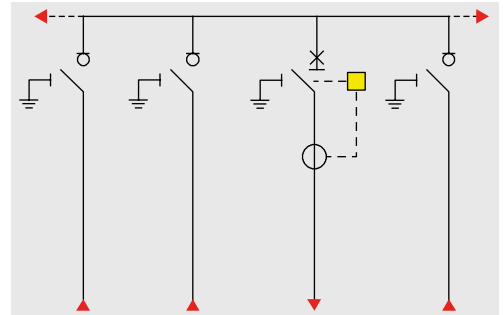
NE-D



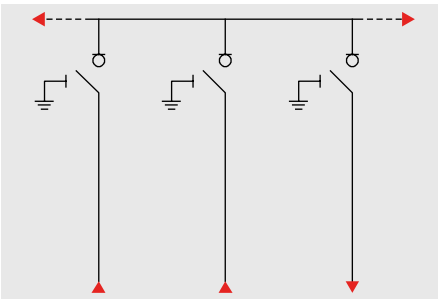
RE-DIDI



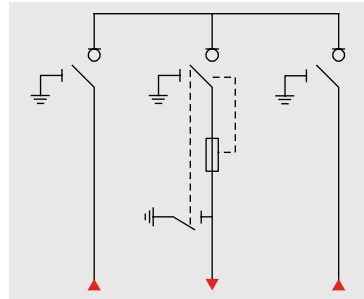
DE-IIBI



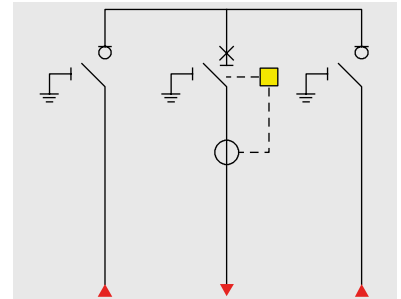
DE-III



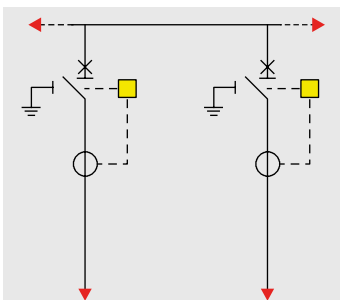
NE-IQI



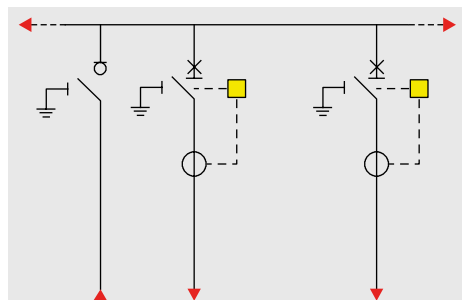
NE-IDI



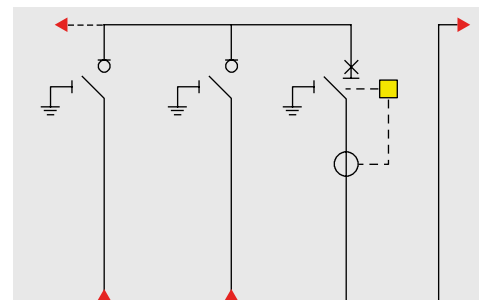
DE-DD



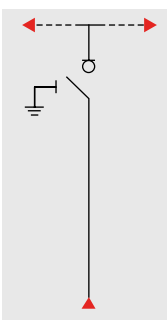
DE-IDD



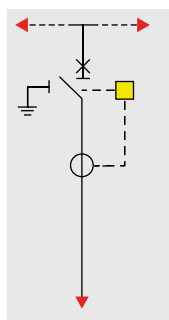
DE-IIBc



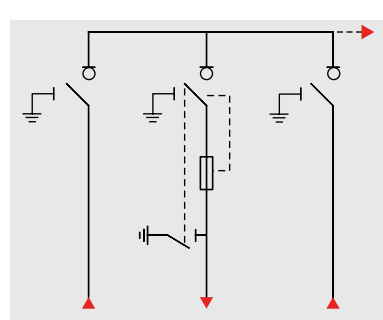
DE-I



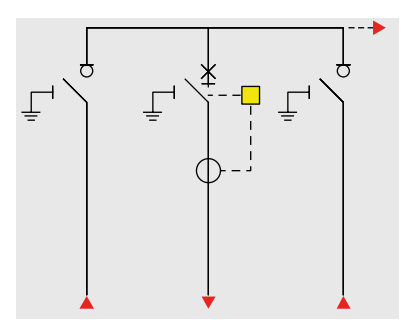
DE-D



RE-IQI



RE-IDI



Instructions for Putting the RM6 into Operation

Prior to Energize

⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Check that all connection bushings are fitted with connectors or with insulating caps.
- Check that nothing has been left in the connection compartment.
- Check that the fuses have been properly fitted.
- Check that the RM6 is correctly connected to earth.

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

Operating Test before Energizing

Operate the earthing switch and main switching device of each functional units several times (minimum 2 times).



Energizing the Incoming MV Cables

⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Before energizing the cables, the switch must be in open position.
- Before energizing the cables, the earthing switch must be in open position.

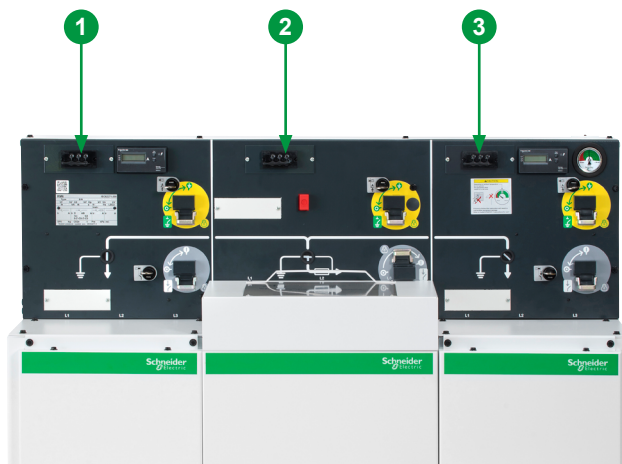
Failure to follow these instructions will result in death or serious injury.



Unit with Voltage Presence Indicating System

An example of the IQI cubicle

1 and 3: indication of voltage presence on network cables.
2: indication of voltage presence downstream of fuses for a switch-fuse combination.



Presentation of VPIS

VPIS: Voltage Presence Indicating System, provides light indication image of MV voltage presence with 3 built-in lights.

Identify which VPIS version you have.



VPIS-V2: production starting from March 2009.
 The VPIS-V2 is not compliant with RM6 Connected Advanced unit.



VPIS-V3
 The VPIS-V3 is installed as standard in RM6 Connected Advanced unit.

Complying with IEC 62271-206 "Voltage presence indicating systems".

⚠ ⚠ DANGER

HAZARD OF ELECTRICAL SHOCK

To ensure that the system is de-energized do not rely on only the indication provided by a VPIS alone.

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

NOTE: When the ambient lighting is particularly bright, it may be necessary to improve visibility by protecting the indication.

Rules for the Use of Phase Concordance Unit

The Phase Concordance Unit allows a check of the phase concordance between 2 energized functional input units on the same panel before closing the switches. It is a way of making sure that all three cables are each connected to the corresponding phase of the panel.

- **Phase concordance** : the phase concordance light remains unlit.
- **No phase concordance** : the Phase Concordance Unit light is lit.

The table below suggests upgrades to VPIS-V2 or VPIS-V3.

NOTICE

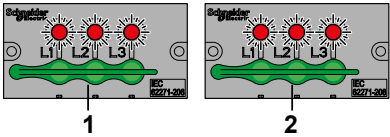
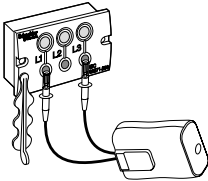
HAZARD OF MISHANDLING
 After carrying out phase concordance make sure to put back the black or green seal and place it correctly in position.
Failure to follow these instructions can result in equipment damage.




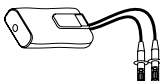

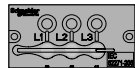
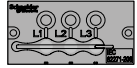
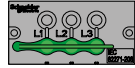
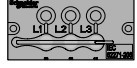
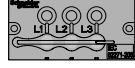
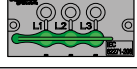
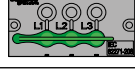
⚠ WARNING

HAZARD OF WRONG FUNCTIONNALITY
 Disable all automation using voltage presence signal before carrying out the phase concordance test.
Failure to follow these instructions can result in death, serious injury or equipment damage.

Check before Phase Concordance Test

Check that VPIS versions on each unit allow the use of the Phase Concordance Unit: See the table below.

Test	
 <p>1</p>	Check that all 3 LED indicator of each VPIS are on.
Result	Action
The 3 light indicators of each VPIS are on.	The 2 functional units are energized, the VPIS units are operating and the check can continue.
The 3 light indicators of one VPIS are off.	The functional unit is not energized: power on the unit. The VPIS is defective: replace the VPIS. If necessary, update VPIS so that both are the same version.
One or 2 light indicators unlit.	The VPIS is probably defective. Replace it. If necessary, update VPIS so that both are same version.
	Checking the Phase Concordance Unit: On the same unit, compare phase L1 and phase L3: <ul style="list-style-type: none"> ■ The LED of the Phase Concordance Unit lits or blinks: you can compare. ■ The LED does not lit: You cannot compare. The PCU is defective. Replace it.

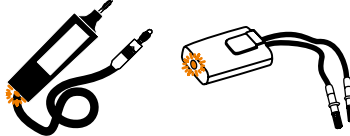
Phase concordance unit	Functional unit 1	Functional unit 2	Compatibility result	Corrective actions
 PCU V1 Ref. 51191954FA	 V1	 V1	OK	
Phase Concordance Unit V1 can be used between 2 VPIS V1 only.				
 PCU V2 without adapter Ref. VPI62421	 V1	 V2 or V3	OK	Use PCU V1 or upgrade both units to VPIS V2 or VPIS V3.
	 V2	 V3	OK	Upgrade unit to VPIS V3.
	 V2	 V2	OK	
	 V3	 V3	OK	



NOTE: Using PCU between 2 VPIS versions for switch is not intended to work. It will result in an indication of phase not in concordance.

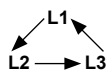
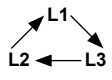
Phase Concordance Test

The 3 indicator lights of the 2 VPIS are lit and the phase concordance unit is correct, meaning that phase concordance test can be performed.

legend



 phase concordance unit LED lit
 LED unlit

	Functional unit n°2			Conclusion regarding phase concordance	
	L1	L2	L3		
Functional unit n°1	L1				Wiring is ok.
	L2				
	L3				
	L1				Swap L1 and L2 MV cable on one of the functional units. L1 ↔ L2
	L2				
	L3				
	L1				Swap L2 and L3 MV cable on one of the functional units. L2 ↔ L3
	L2				
	L3				
	L1				Swap L1 and L3 MV cable on one of the functional units. L1 ↔ L3
	L2				
	L3				
L1				Change the position of each MV cable on one of the 2 functional units. 	
L2					
L3					
L1				Change the position of each MV cable on one of the 2 functional units. 	
L2					
L3					

Unit with Voltage Detecting System (VDS)

NOTE: The Maxeta VDS HR-type does not apply to the RM6 Connected Advanced unit.

Maxeta VDS HR Type

VDS: Voltage Detecting System, unit with connectors used to plug in individual indicators.



Characteristics

The voltage detecting system equipping your RM6 is of the separate VDS type, HR system. It complies with standard IEC 61243-5.

Accessories Usable at the Interface

- Individual voltage indicator for HR system.
- Phase concordance unit as defined in standard IEC 61243-5.

 <b style="font-size: 1.2em;">WARNING
<p>HAZARD OF ELECTRIC SHOCK</p> <ul style="list-style-type: none"> • Use only the accessories complying with standard IEC 61243-5. • Follow the instructions of the accessory manufacturer. <p>Failure to follow these instructions can result in death, serious injury or equipment damage.</p>

Horstmann Wega 1.2 C LRM Type



Optional in RM6 Connected Advanced unit:





The voltage detecting system Horstmann Wega 1.2 C LRM Type is optional in RM6 Connected Advanced unit.

Functional principle

The Wega 1.2 C is used to detect the presence or absence of medium voltages. Use a suitable detection device (for example, Horstmann Orion 3.1 or Orion M1) to test both the interface and voltage and to perform a phase comparison. Connect the detection device to the LRM test sockets.

Display indication

There is a display indication on the front face of the device.

Indication	Definition
	<p>Voltage present</p> <p>Threshold values for voltage presence indication: 0.1 - 0.45 x Service Voltage.</p> <p>INSTALLATION NOTE: the voltage signal is too low when operating the system at nominal voltage.</p> <p>The causes are usually:</p> <ul style="list-style-type: none"> - a wrong ordered service voltage or, - the operation of the switchgear at a nominal voltage which is lower than the one for which the device was originally rated.
	<p>Voltage present and integrated maintenance test passed</p> <p>The current flowing through the indication device complies with the requirements for current monitoring according to IEC 61243-5 (VDE 0682 Part 415), Section 5.28 (maintenance test on the integrated VDS).</p> <p>A maintenance test is not necessary due to the continuous monitoring and indication.</p>
	<p>Voltage present and integrated maintenance test passed, however the voltage signal is too high</p> <p>INSTALLATION NOTE: Voltage signal too high.</p> <p>The cause is usually:</p> <ul style="list-style-type: none"> - a wrong ordered service voltage or, - the operation of the switchgear at a nominal voltage which is higher than the one for which the device was originally rated.
	<p>Voltage not present</p> <p>All symbols are in off-state while the switchgear is de-energized. Presence of voltage <math><0.1 \times \text{Service Voltage}</math>.</p>

Functional test

A functional test is possible while the unit is energized (indication of arrow and dot symbols) or while the unit is de-energized.

Energized state

Perform the functional test by short-circuiting one of the three test sockets with the earth socket. The displayed symbol (L1, L2 or L3) disappears. The short-circuit jumper must be removed after the test.

De-energized state

There are two possibilities to perform the functional test in the de-energized state:

1: Display test

- Press the 'Display' button.
- All symbols on the LCD indication are activated momentarily.

2: Functional test using the "function tester for Wega".

- Connect the measuring leads of the function tester to one of the three test sockets and the earth socket of the Wega 1.2 C.
- Switch on the function tester.
- The appropriate arrow and dot symbols appear (see table above). The wrench tool symbol is not activated.

⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK OR EXPLOSION

- If the specified indication does not appear, the VDS component is defected and has to be replaced.
- Without appropriate voltage detection, access to the cable compartment is forbidden.

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

When the VDS unit is defective it has to be replaced. During dismantling and installation, follow safe electrical work practices.

⚠ ⚠ WARNING
HAZARD OF ELECTRIC SHOCK
<ul style="list-style-type: none"> • DO NOT dismantle or install the VDS while the functional unit is energized. • Make sure that all medium voltage cables of the functional unit are de-energized. • Make sure that the switch of the functional unit is in open position.
Failure to follow these instructions can result in death or serious injury.

Voltage detection

The Wega 1.2 C is designed for continuous operation. The voltage is continuously detected after the installation of the Wega 1.2 C in the switchgear.

The voltage state is displayed for each phase via the LCD indication (see table page 19).

Phase comparison

Perform a phase comparison using a phase comparator for LRM systems available as an option according to VDE 0682 Part 415 (for example, Horstmann Orion 3.1 or Orion M1). Connect the phase comparator's connection leads to one of the three LRM test sockets and the earth socket. The test sockets are accessible once the protective cap has been removed.

- The corresponding indication for the Wega 1.2 C may be weaker or may even go off.
- Attach the protective cap after the phase comparison.

⚠ WARNING
HAZARD OF WRONG FUNCTIONNALITY
Disable all automation using voltage presence signal before carrying out the phase concordance test.
Failure to follow these instructions can result in death, serious injury or equipment damage.

Voltage detection

When testing the cable sheath or during DC tests on switchgears equipped with the Wega 1.2 C, Schneider Electric advises connecting the three measuring sockets for L1, L2 and L3 to the earth socket using short leads (max. 25 cm). The 4-pole Wega short-circuit plug available as an accessory can also be used as an alternative (Order no.51-9904-001).



Short-circuit connector Wega

NOTICE
HAZARD OF COMPONENT DAMAGE
DO NOT perform medium voltage cable testing without connecting the three measuring sockets to the earthing socket.
Failure to follow these instructions can result in equipment damage.

Choosing the HV Fuses for Transformer Protection

The rating of the fuses to be fitted in the RM6 protection function depends on the following factors (among others):

- operating voltage;
- transformer rating;
- fuse technology (manufacturer).

Reference List of the Fuses

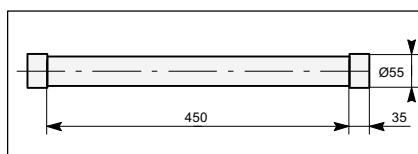
The reference list of fuses which can be used in RM6 is defined according to the medium energy striker as per standard IEC 60282.1.

- Schneider Electric Solefuse type
- Schneider Electric Fusarc CF type
- SIBA HH-DIN type

For installation of fuses of other manufacturers, contact Schneider Electric.

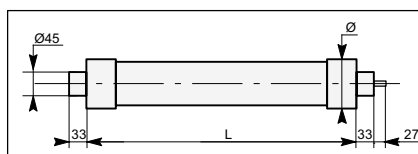
⚠ CAUTION
HAZARD OF MALFUNCTIONING OF THE SWITCH-FUSE COMBINATION
<ul style="list-style-type: none"> • Use only the fuses mentioned in the reference list. • Replace all the fuses if one or two poles of the combination has operated (as per standard IEC 62271-105). Before replacing the fuses, take precautions, as the fuse body can be hot.
Failure to follow these instructions can result in injury or equipment damage.

Dimensions of the Solefuse fuses (as per standard UTE C64-210 and IEC 60282.1)



rated voltage rating (kV)	rating to (A)
7.2 to 24	6.3 to 63

Dimensions of the Fusarc CF and SIBA HH Type fuses (as per standard IEC 60282.1)



rating voltage (kV)	rating to (A)	L (mm)	Ø (mm)
12	10 to 20	292	50.5
	25 to 40	292	57
	50 to 100	292	78.5
	125	442	86
24	10 to 20	442	50.5
	25 to 40	442	57
	50 to 63	442	78.5
	80 to 100	442	86

Selection Table

(rating in A, use without overload at $-25^{\circ}\text{C} < \theta < 40^{\circ}\text{C}$)

(*) SIBA types fuses at 160 A / 12 kV reference 30-020-13.

(") In the case of an external trip system (for example, overcurrent relay), a calculation must be carried out to guarantee coordination with fuse-switches, contact Schneider Electric. For any values included in the table, contact Schneider Electric.

fuse type	operating voltage (kV)	transformer rating (kVA)																rated voltage (kV)
		50	75	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	
Solefuse																		
5.5	16		31.5	31.5	63	63	63	63	63									7.2
10			16	16	31.5	31.5	31.5	63	63	63	63							
15			16	16	16	16	16	43	43	43	43	43	63					24
20			16	16	16	16	16	16	43	43	43	43	43	63				
Fusarc CF and SIBA (*)																		
3	20	31.5	40	50	50	63	80	100	125*	160"								
3.3	20	25	40	40	40	63	80	80	125*	125*	160"							
4.2	20	25	25	40	40	50	63	80	80	100	125*	160"						
5.5	16	20	25	25	40	40	50	63	80	80	100	125*	160"					12
6	16	20	25	25	31.5	40	50	50	63	80	100	125*	160"					
6.6	10	20	25	25	31.5	40	50	50	63	63	80	100	125*	160"				
10	10	10	16	20	25	25	31.5	40	50	50	63	80	100	125*				
11	10	10	16	20	20	25	25	40	40	50	50	63	80	100	125*			
13.8	10	10	10	16	16	20	25	31.5	40	40	50	50	63	100*				
15	10	10	10	10	16	20	25	31.5	31.5	40	50	50	63	80	100*			
20	10	10	10	10	16	16	20	25	25	31.5	40	40	63	63	80	100*		24
22	10	10	10	10	10	16	16	20	25	31.5	40	40	50	63	80	100*		

In case of an overload beyond 40°C, contact Schneider Electric.

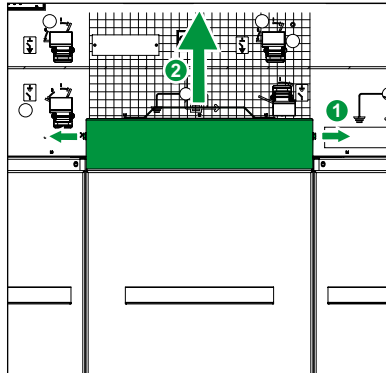
Fitting HV Fuses

⚠ ⚠ WARNING

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Before performing these operations, close the earthing switch.

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

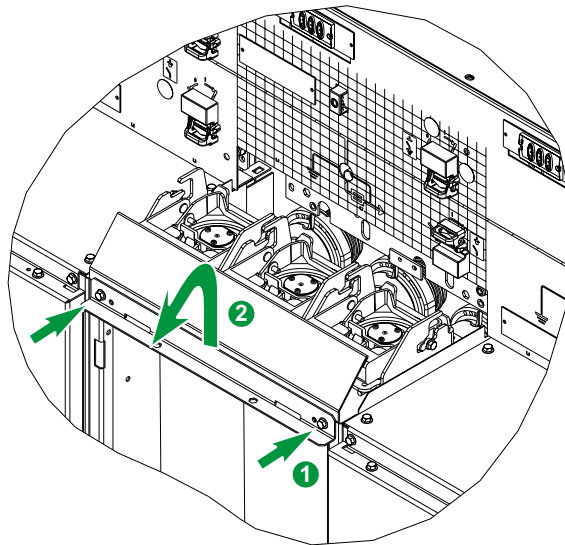


To remove the cover, remove the 2 screws on each side of the cover then lift it and pull it towards you. The instructions are visible on the cover.

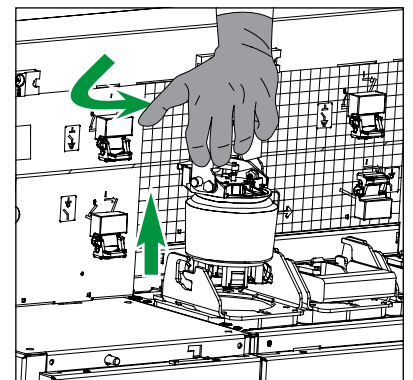
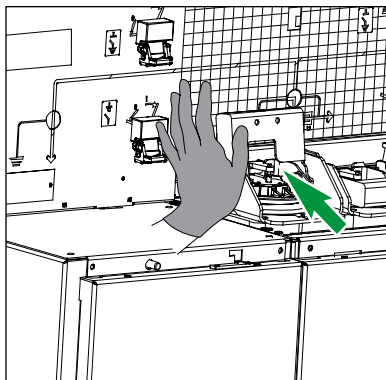


INFORMATION

In the case of an internal arc unit module, it is possible to disassemble the deflector to have a better accessibility. Therefore, remove the 2 screws on each side, then pull it towards you.



Repeat the operations below for all 3 fuses.



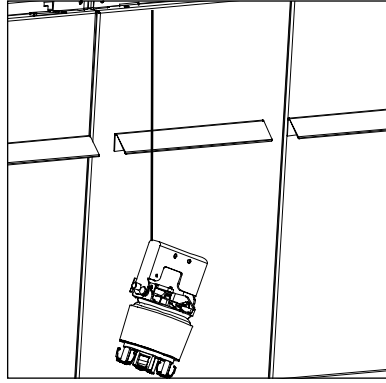
Release the plug and push the extraction handle manually to release the plug (tap with the palm of your hand to detach the plug seal if necessary).

Fit the plug as far as it can go and turn it counter-clockwise to extract it.



INFORMATION

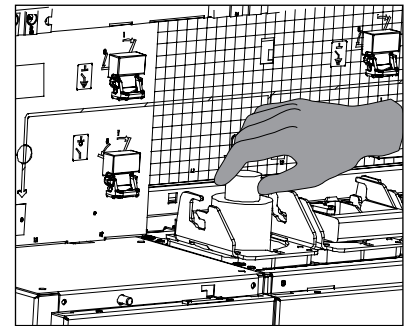
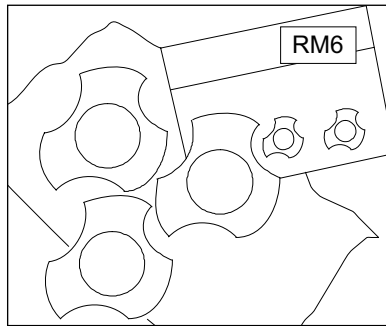
To clean the plugs, consult the preventive maintenance section.



Let the plug hang.
Ensure the plugs are clean before fitting them.

Fitting a DIN fuse (Fusarc CF)

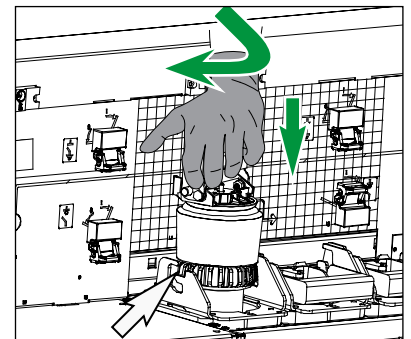
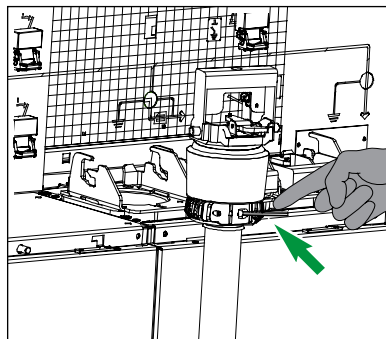
Do not install a fuse that has been knocked. A test prior to installation using a monitor is recommended.



Recover the centring devices in the bag supplied with the cubicle. Insert the fuse in the compartment. Fit the centring device on the fuse. Insert the plug pins in the plinth and turn clockwise.

Fitting an UTE Fuse (Solefuse)

Do not install a fuse that has been knocked. A test prior to installation using a monitor is recommended.



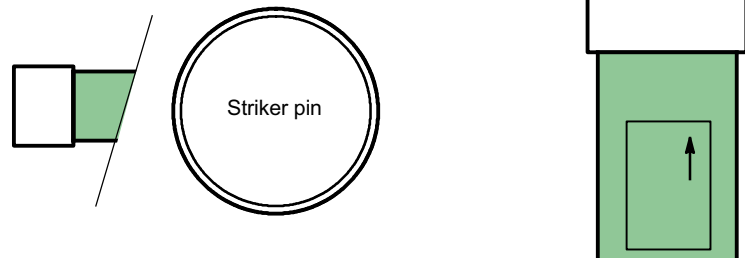
Fix the fuse on the plug using an Allen wrench n°5 and insert the fuse in the compartment. **Tightening torque: 15 N.m.**

Insert the plug and fuse assembly in the compartment. Insert the plug pins in the plinth and turn clockwise. Press to insert the assembly in the downstream clamp.

Direction for Mounting a Fuse with Striker

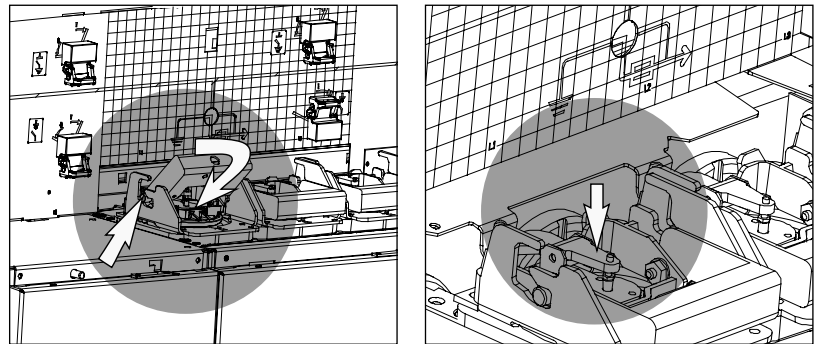
⚠ CAUTION

Fuse blowing releases a striker that causes three-phase opening of the switch and prevents it from reclosing.



The end of the fuse equipped with the striker is marked.
The technical data and mounting direction of the fuse are printed on the body (striker facing upwards).

Locking the Plug

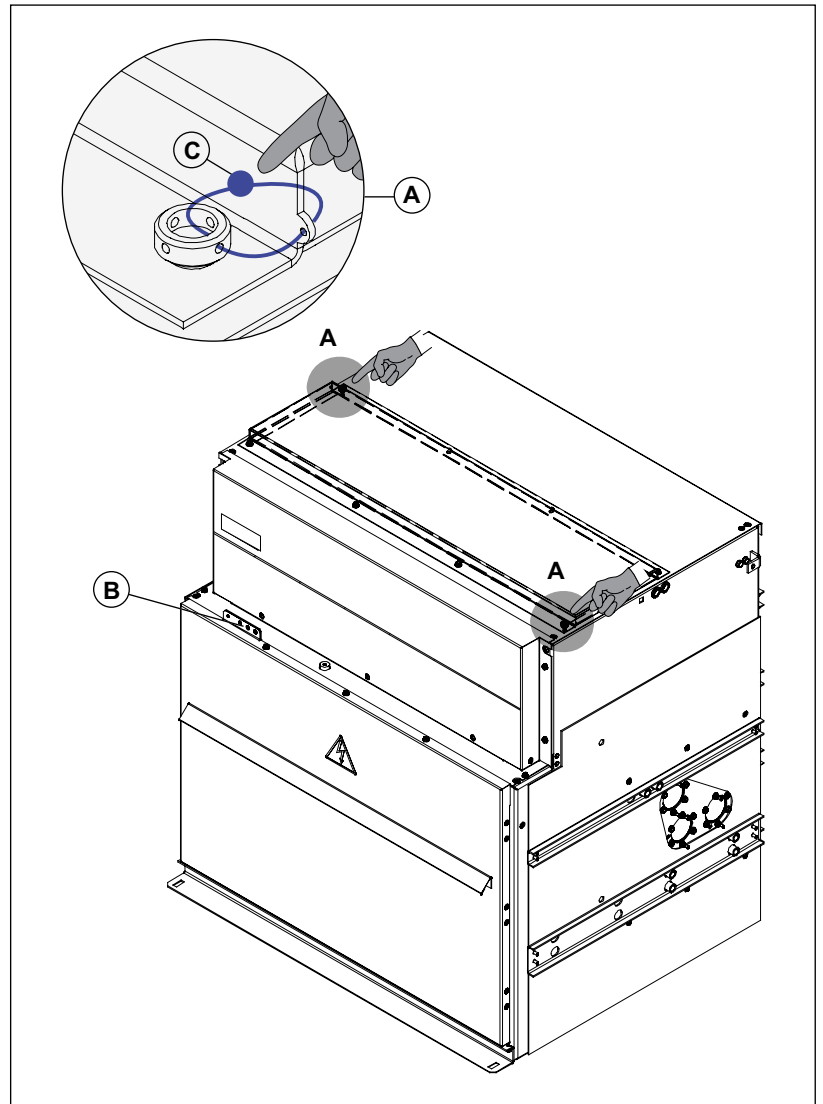


Make sure that the handle trunnions are inserted in the plinth slots, and lock the plug manually by folding down the operating handle. Plug with fuse blowing release, used to cause three-phase opening of the switch. Press down the tipper to position it.

Sealing the DE-Mt Cubicle

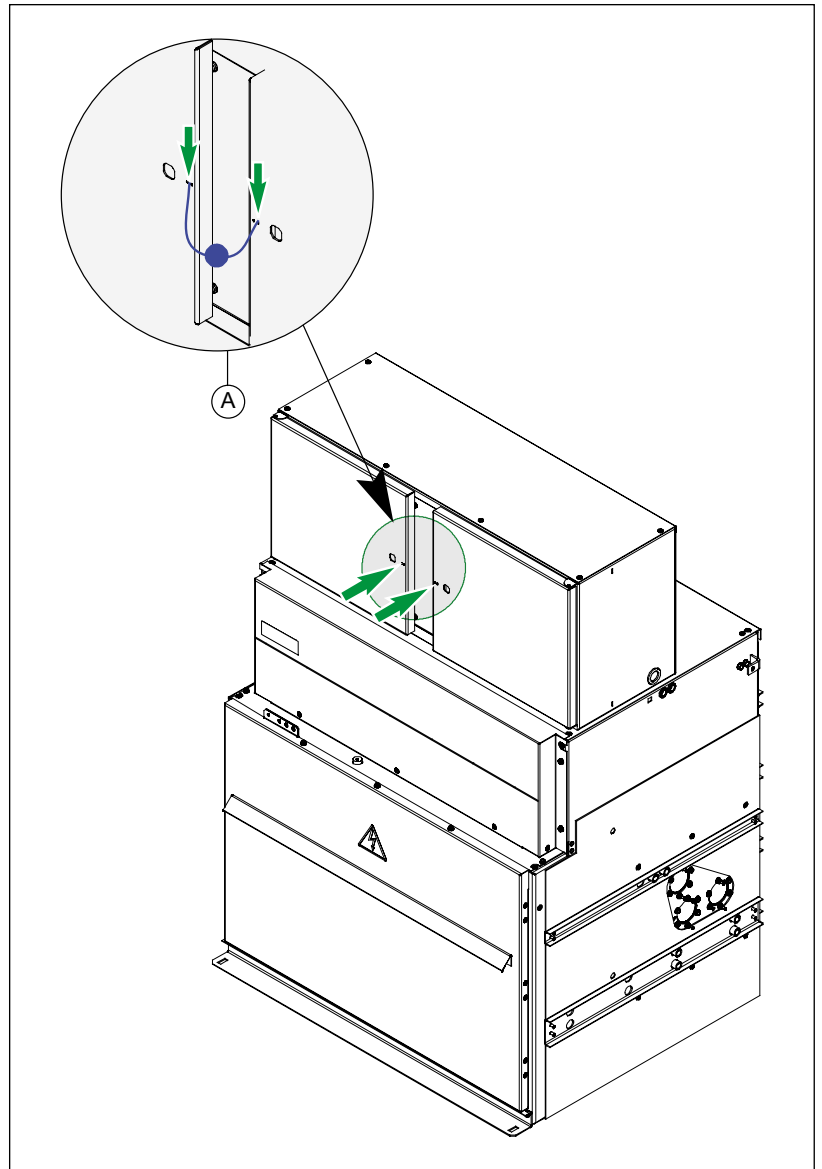
Without LV Compartment

- A: rear sealing
- B: front sealing
- C: steel seal + steel wire



With LV Compartment

A: steel seal + steel wire



Instructions for Putting into Operation the Protection Relay for Circuit-breaker

VIP400 / VIP410

Standard in RM6 Connected Advanced unit:

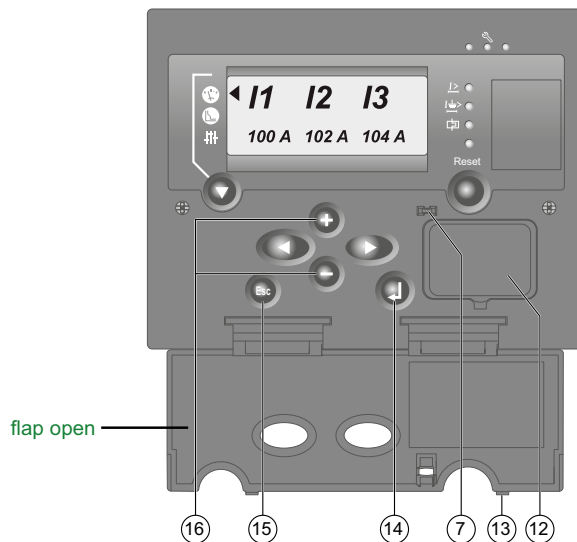
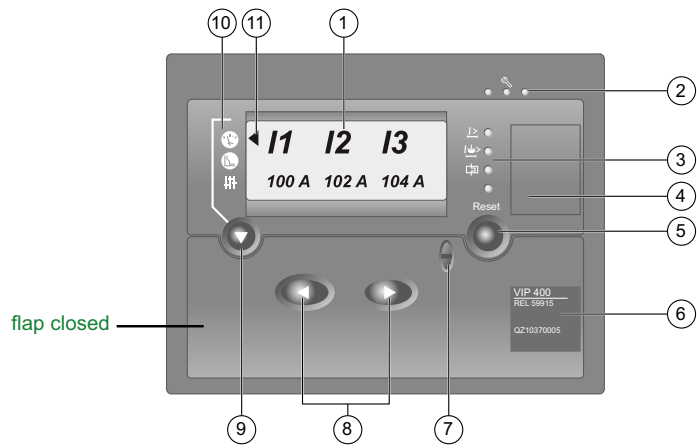
One VIP410 protection relay is installed and connected as standard in RM6 Connected Advanced unit with D-function.

Presentation

The User-Machine Interface (UMI) on the front panel of VIP relays consists of a display, LEDs and keys. A sealable pivoting flap can prevent access to the setting keys by unauthorized persons.

The VIP parameters must be set correctly in order for the circuit-breaker to operate correctly.

- 1: display
- 2: status LEDs
- 3: fault indication LEDs
- 4: zone for a user-customizable label with pictograms of the fault indication LEDs
- 5: acknowledgement key
- 6: identification label
- 7: sealing ring
- 8: selection keys
- 9: key for selecting menus and testing LEDs.
When the VIP is not supplied with power, this key can also be used to start the VIP from the battery in order to enter settings
- 10: menu pictograms
- 11: menu selection pointer
- 12: battery compartment and socket for connecting the pocket battery module
- 13: settings protective flap
- 14: confirm entry key
- 15: abort entry key
- 16: setting keys

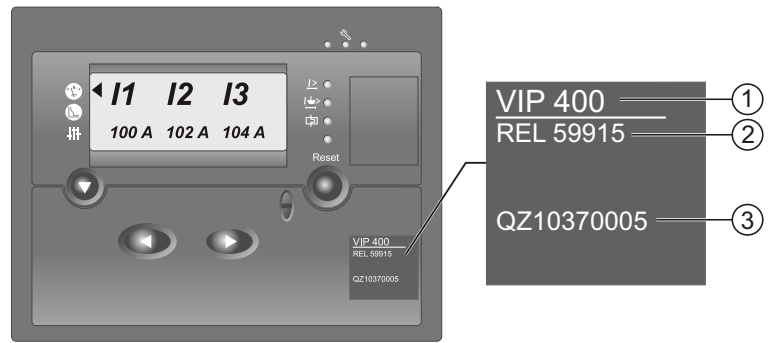


Identification Zone

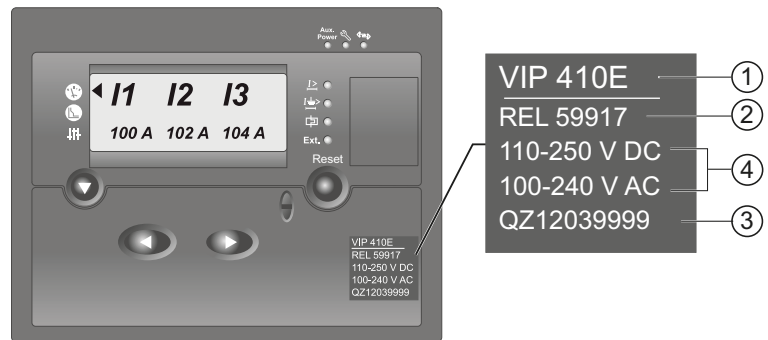
The identification zone on the front panel enables a VIP to be identified.

- 1: identification code
- 2: reference
- 3: supply voltage
- 4: serial number

VIP400



VIP410



Precautions

VIP installed in a cubicle

■ **Transport**

VIP relays can be transported by all suitable means of transport in the usual conditions for cubicles.

Storage conditions should be taken into consideration for a long period of transport.

■ **Handling**

If the cubicle is dropped, check the VIP's condition by visual inspection and energising.

■ **Storage**

Schneider Electric recommends keeping the cubicle protective packaging for as long as possible.

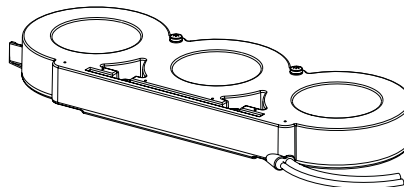
VIP relays, like all electronic units, must not be stored in a damp environment for more than one month. They should be energized as quickly as possible. If this is not possible, the cubicle reheating system must be activated.

Phase Current Sensors

VIPs operate exclusively with dual core CUa (200 A primary) and CUb (630 A primary) current sensors.

These sensors provide:

- the VIP power supply,
- metering of all 3 phase currents and the earth fault current.



The use of dedicated sensors means that the complete protection chain performance (sensor, VIP, Mitop trip unit) can be guaranteed.

It is very easy to connect VIP relays to the CUa or CUb sensors by means of 2 prewired connectors from the sensors:

- 1 x 9-pin SUBD connector for metering the phase and earth fault currents,
- 1 x 6-pin lockable connector for the VIP power supply.

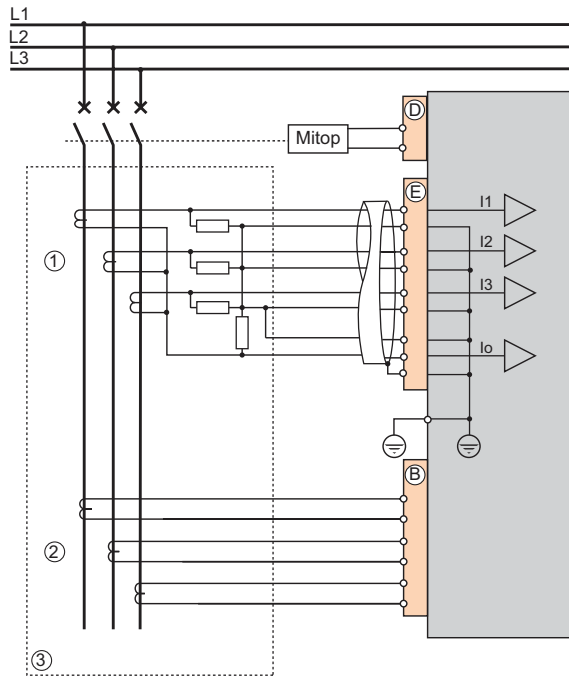
The CUa and CUb current sensors consist of 2 windings per phase:

- one winding providing the VIP power supply,
- the other winding enabling the VIP to measure the phase currents.

The earth fault current is measured by taking the sum of the 3 phase currents inside the sensor.

Current sensor connection block diagram

- 1: metering windings
- 2: VIP power supply windings
- 3: dual core CUa or CUb sensor



Connection precautions

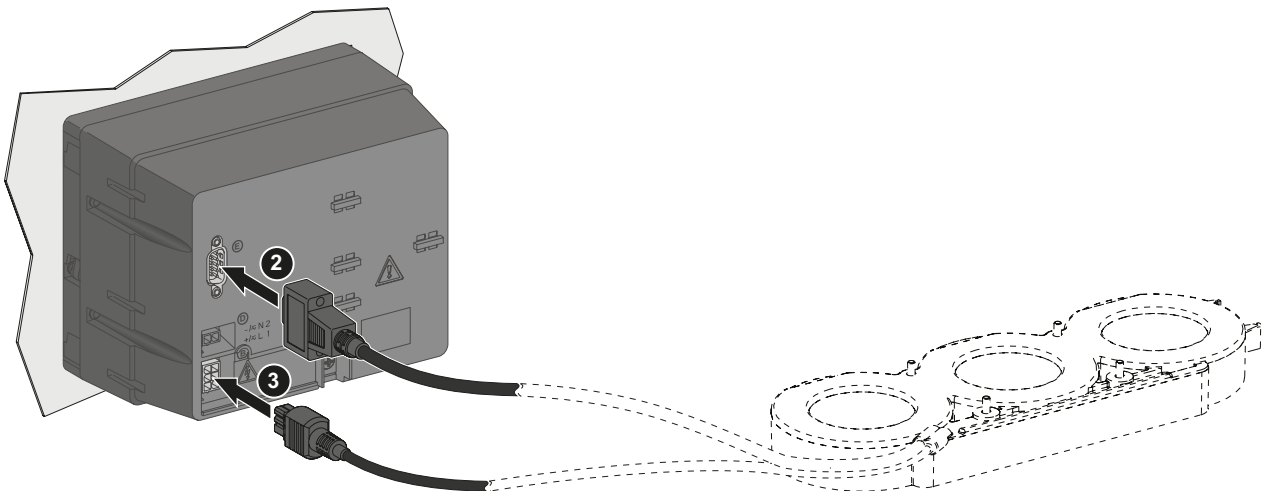
⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, ELECTRIC ARC OR BURNS

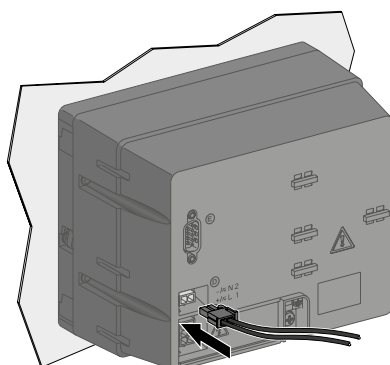
- Never leave the current sensor secondary in open circuit. The high voltage that would result from opening the circuit is dangerous for the operator and for the equipment.
- Never disconnect the VIP protection relay current sensor connectors unless the MV circuit-breaker is in the open position and completely isolated.
- Wear insulating gloves to avoid any contact with a conductor that has accidentally been energized.
- Wear personal protective equipment in compliance with current regulations.
- Screw tight all terminals, even those not in use.

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

- 1 - Check that the MV circuit-breaker is in the open position or is not connected to the electrical network.
- 2 - Connect the 9-pin SUBD connector to connector E on the VIP and tighten the 2 mounting screws.
- 3 - Connect the 6-pin lockable connector to connector B on the VIP.



Connecting the VIP to the Mitop Trip Unit



The VIP protection relay is connected to the Mitop trip unit with a 2-pin prewired connector from the Mitop trip unit. Connect the lockable 2-pin connector to the VIP.

Earthing

⚠ WARNING

HAZARD OF ELECTRIC SHOCK

Connect the VIP to earth. Check the integrity of protective conductor connection before carrying out any other actions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

ref.	wiring	type of terminal	screwdriver	tightening torque
	<ul style="list-style-type: none"> ■ Green-yellow wire 6 mm² (AWG 10) ■ Lug with internal diameter 4 mm (0.16 in.) maximum ■ Length < 0.5 m (20 in.) 	M4 screw	Pozidriv n° 2	1,2...1,5 N.m (10.6...13 lbin.)

Status LEDs

The status LEDs provide information about the VIP general status:

pictogram	function	VIP400	VIP410
	Green LED: auxiliary power supply present	-	■
	Red LED permanently on: VIP unavailable (VIP in the fail-safe position).	■	■
	Red LED flashing: a failure has been detected but does not involve the VIP going into the fail-safe position.	■	■
	Yellow LED flashing: communication active	-	■

Fault Indication LEDs

VIP relays have fault indication LEDs. They flash to indicate a fault, as shown in the table below.

pictogram	fault	VIP400	VIP410
	Detection of a fault by the phase overcurrent protection or in the event of tripping, by the temporary test mode	■	■
	Detection of a fault by the earth fault protection	■	■
	Detection of a fault by the thermal overload protection	■	■
Ext.	Tripping by a volt-free contact connected to the external trip input	-	■

After a trip, the fault indication LEDs are powered by the battery embedded in the VIP or by the VIP410 auxiliary power supply.

Fault indication by the LEDs can be stopped:

- by pressing the Reset key,
- automatically by the reappearance of a current in the network higher than the pick-up current,
- automatically after 24 hours,
- by remote control order via the communication (VIP410).

For the first 3 LEDs, faster flashing may occur before the protection trips, to indicate the following information:

pictogram	overshoot
	Overshoot of the instantaneous set point for phase overcurrent protection (I> or I>> or I>>> pickup outputs)
	Overshoot of the instantaneous set point for earth fault protection (Io> or Io>> pick-up outputs)
	Overshoot of the alarm set point for thermal overload protection

Note

In custom mode, the protection set points may not be assigned to the Mitop trip unit output. In this case, the fault indication LED may be active, without being associated with the circuit-breaker trip. Depending on the application, this can indicate the presence of a fault without tripping the circuit-breaker. The fault indication LED pictograms can be customized by sticking a label to the right of the LEDs.

Display



The display is an LCD unit.

It is only back-lit on the VIP410, when the auxiliary power supply is present.

Each VIP function is presented in a screen consisting of the following items:

- **1st line:** symbols for electrical values or function name
- **2nd line:** displays the values of measurements or parameters associated with the function
- a menu pointer, on the left, points to the pictogram of the selected menu.

Menu Organization

All the data available in the VIP relay is divided between 3 menus:

- the metering menu contains the current measurements, peak demand currents, load history, event records, fault trip counter and the breaking current history.
- the protection menu contains the essential settings for setting up the protection functions.
- the parameters menu contains the parameters that are used to adapt VIP operation to particular applications. When a VIP is new, all the parameters in this menu have a default value. The protection functions are operational even with the parameters menu default values.

Selecting a Screen in a Menu

step	action
1	Press the key to select one of the 3 menus. The menu pointer indicates the selected menu: : Metering menu : Protection menu : Parameters menu
2	Press the or keys to scroll through the screens in the select menu, until the desired screen displayed.

Default Screen

A default screen is displayed automatically 3 minutes after the last keystroke. This default screen is the screen displaying the phase currents.

Operation according to the Power Supply Mode (VIP400)

The VIP400 is a stand-alone protection relay powered by its current sensors. When current is present in the medium-voltage (MV) network, the protections and the display work and it is possible to enter settings and view measurements. The current in the MV network on which the VIP operates is called the 'pick-up current'. When no current is flowing through the circuit-breaker (for example circuit breaker open), or when the current in the MV network is too low, the VIP is off and nothing appears on its display. If current appears, the protection functions are activated and trip the circuit-breaker – or not – according to their settings. The additional time taken by the VIP to start when current appears is called the "pick-up time". More information on the value of the pick-up current and the pickup time are available in the VIP Function Characteristics. Consult the reference **NRJED311207EN**.

Operation according to the Power Supply Mode (VIP410)


The VIP410 is a relay with a dual power supply. It is powered both autonomously by its sensors and by the auxiliary power supply. Like for the VIP400, the self-powered supply allows the protection functions to work even if the auxiliary power supply fails. The auxiliary power supply is used to power functions that do not depend on the current being present in the MV network. These functions are marked in the function table (consult the reference **NRJED311207EN**). The auxiliary power supply must be present in order them to work.

Integral Battery

The VIP has an integral battery. It is used to:

- activate the user-machine interface in order to enter settings when the VIP is not supplied with power.
- illuminate the fault indication LEDs when the VIP is no longer supplied with power after giving the opening order to the circuit-breaker.
- power the internal calendar.

When the VIP is not supplied with power:

Pressing and holding down the key  activates battery-powered operation of the user-machine interface. It is then possible to access the menus in order to enter settings. In this case, the display turns off automatically after 3 minutes of inactivity on the keypad.

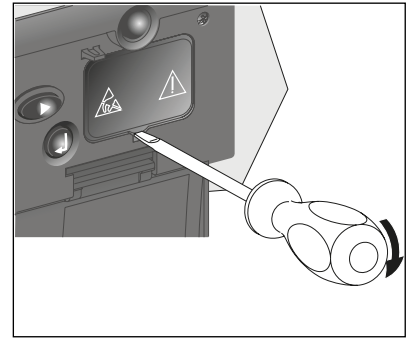
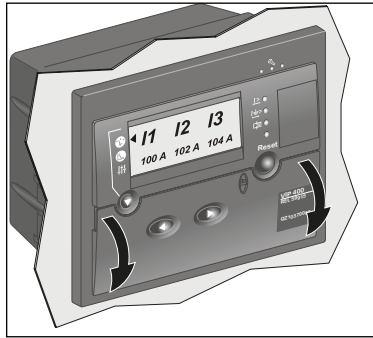
- The protection functions are activated automatically if the current reappears. The integral battery plays no part in operating the protection functions. The protection functions work even when there is no battery.

NOTE:

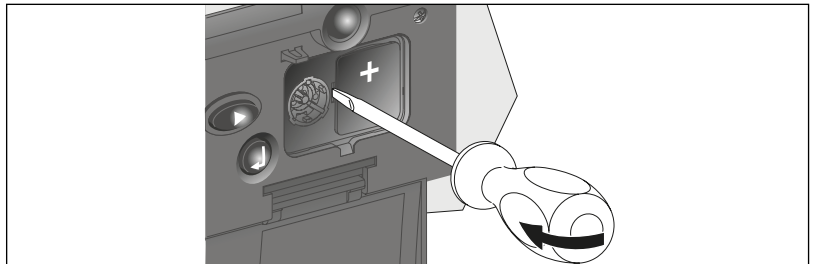
- in battery operation mode, the VIP processor runs with a reduced clock frequency to ensure the battery life is maintained. As a result, the user-machine interface may be slower to react.
- during a setting operation with the VIP powered by its internal battery alone, the clock display is not refreshed on screen. However the internal clock increments normally.

Replacing the VIP Battery

The battery must be removed when depleted and at the end of life of the VIP relay. It can be removed with the VIP energized.



- 1: Open the settings protective flap.
- 2: Lift the removable cover shielding the battery compartment using a flat blade screwdriver.



- 3: Pull the battery compartment forward with the screwdriver.
- 4: Remove the battery.

Battery Recycling

⚠ WARNING

HAZARD OF EXPLOSION

- Do not recharge the battery.
- Do not short circuit the battery.
- Do not crush the battery.
- Do not disassemble the battery.
- Do not heat the battery above 100°C (212°F).
- Do not throw the battery into fire or water.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Battery Characteristics

- 1/2 AA 3.6 V lithium battery
- Model: LS14250 from SAFT
- Storage conditions: as defined in EN 60086-4
- Do not use rechargeable batteries or other types of battery

Replacement Procedure

When depleted, the battery is replaced as follows:

- 1: Insert a battery with the above characteristics, respecting the polarity (+ facing up).
- 2: Re-close the battery compartment.
- 3: Replace the cover shielding the battery compartment.
- 4: Test the battery by pressing the Reset key for 2 to 3 seconds: the LEDs must remain on clearly without fading for the whole time the key is pressed.
- 5: Reset the VIP time if necessary.
- 6: Close the settings protective flap.

Cleaning Product

To clean the product (especially when dusting), simply use a damp cloth.

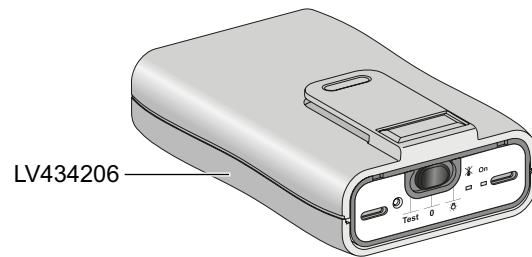
Pocket Battery Module

The pocket battery module is an accessory that can be connected to the front panel of VIP relays. It contains a battery that can be used to power the VIP in order to:

- enter settings if the integral battery is missing and if the VIP is not powered by the current sensors.
- test the VIP. Consult the reference **NRJED311206EN**.
- display the cause of the last trip by the VIP. Consult the reference **NRJED311206EN**.
- more information on connecting the pocket battery module to the VIP is available in the Connection to the VIP. Consult the reference **NRJED311206EN**.

Battery Module

The pocket battery module should only be used during maintenance or commissioning by qualified personnel and must never be left permanently connected to a running VIP.

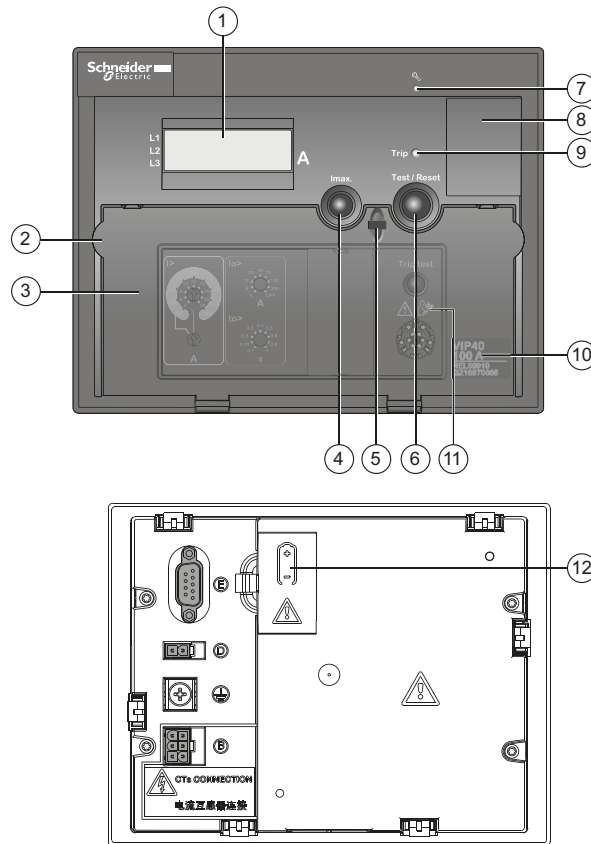


For more information, consult the *VIP400, VIP410 Reference Manual (NRJED311206EN)* available on www.schneider-electric.com or contact Schneider Electric for diagnostics and advice.

VIP40 / VIP45

Presentation

- 1: display
- 2: lugs for opening the transparent protective flap
- 3: transparent protective flap
- 4: I_{max}. peak demand display button
- 5: sealing ring
- 6: Test/Reset button
- 7: status LED
- 8: space for a user-customizable label
- 9: trip fault indication LED
- 10: identification label
- 11: symbol indicating that it is necessary to read the manual
- 12: battery



NOTE: The VIP40 / VIP45 protection relay does not apply to the RM6 Connected Advanced unit.

The user-machine Interface (UMI) on the front panel of VIP relays consists of a display, LEDs and keys. A sealable pivoting flap can prevent access to the setting keys by unauthorized persons.

Identification Label

The identification label on the front panel is used to identify the VIP:

- product name
- product reference
- serial number

Display

The display is an LCD unit.

During operation, the display indicates the value of the current on each phase in succession. Each phase remains displayed for 3 seconds before automatically changing to the next. The display is in amps, on three digits.

If the phase current is less than the pick-up current, consult the reference **NRJED311207EN**. The VIP is not activated and the display is off.

Lugs for Opening the Transparent Protective Flap


To open the flap, pull both lugs simultaneously. The flap pivots open on its 2 bottom hinges.


I_{max}. Button: Peak Demand Display

Pressing the I_{max}. button triggers a sequence displaying the peak demand currents for all 3 phases in succession. After this sequence, the VIP automatically returns to displaying the phase currents.

Test/Reset button

After a trip, pressing this button stops the flashing trip indication. This button can also be used to:

- test the built-in battery. When pressing the Test/Reset button, the fault indication LED lights up immediately to indicate that the battery is OK.
- perform the "lamp test" if the relay is supplied with power. Pressing the Test/Reset button for 5 seconds causes all the display segments and the  status LED to light up, and displays the software version number.

pictogram	color	function
	Red	<ul style="list-style-type: none"> ■ LED permanently on: the VIP has gone into the fail-safe position following detection by the embedded self-tests of the failure of one of its internal components, involving a risk of nuisance tripping. In this case, the VIP is no longer operational. ■ NOTE: this LED may light up briefly when the VIP is energized: this is normal and does not indicate a failure. ■ LED flashing: the VIP has detected a failure not involving a risk of nuisance tripping. In this case, the VIP has not changed into the fail-safe position. Intervention is required as soon as possible (consult the reference NRJED311207EN). The LED stops flashing as soon as the failure disappears.

Space for User-Customizable Label

There is a special space for a user-customizable label for the Trip LED.

Trip LED: Fault Indication


The fault indication LED flashes to indicate that the VIP has sent a trip order to the circuit-breaker. After circuit-breaker opening, when the VIP is no longer supplied with power by its sensor, the built-in battery makes the LED flash.

The LED stops flashing:

- automatically after 24 hours.
- when the current returns, on circuit-breaker closing (if the current is higher than the pick-up current).
- par l'appui sur la touche Test/Reset.
- when the pocket battery module is connected then disconnected.

The VIP built-in battery only supplies power to the fault indication LED and displays the type of fault. It has no role in operating the protection functions.

Symbol: Necessary Reading of Manual

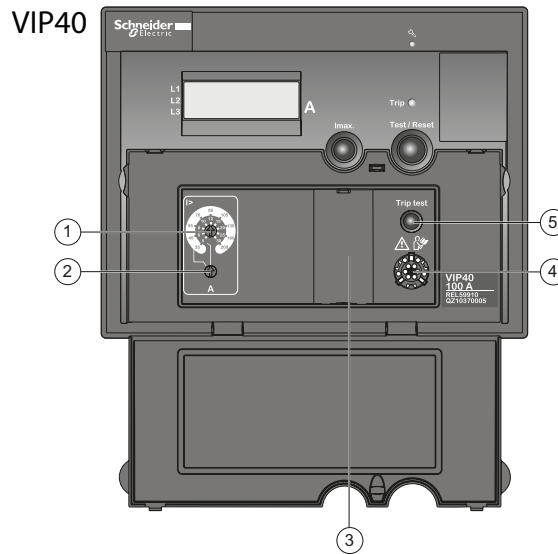
The symbol  indicates that it is necessary to read the VIP reference manual before working on the product.

VIP40/45 Settings

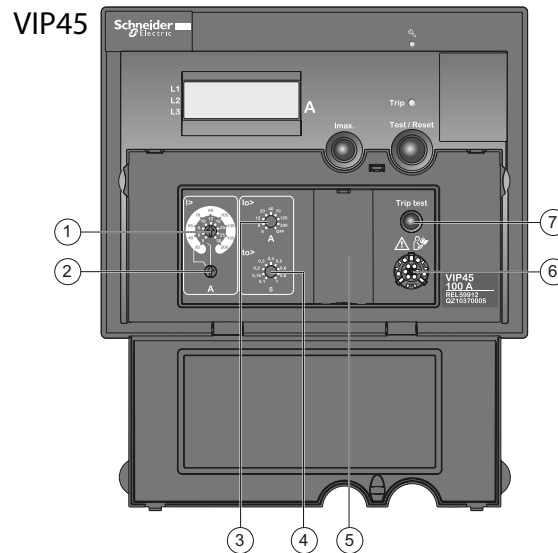
Front Panel

- 1: phase overcurrent protection adjustment dial
- 2: setting range selector switch
- 3: advanced settings protective cover
- 4: connection port for the pocket battery module
- 5: Trip test button

When the protective flap is opened, you can enter the protection settings by means of the rotary switches. To do this, use a 3 mm flat blade screwdriver.



- 1: phase overcurrent protection adjustment dial
- 2: setting range selector switch
- 3: earth fault protection set point adjustment dial
- 4: earth fault protection time delay adjustment dial
- 5: advanced settings protective cover
- 6: connection port for the pocket battery module
- 7: Trip test button



Phase Overcurrent Protection Adjustment Dial

The setting is entered directly in Amps using the 9-position switch (I>). The selector switch has 2 graduated rings. The range is selected using the setting range selector switch.

Earth Fault Protection Adjustment Dial

The set point is set directly in Amps using the 9-position switch (Io>). The time delay setting is entered directly in seconds using the 9-position switch (to>).
NOTE: the earth fault protection adjustment dials are only found on the VIP45.

Temporary Display of the Changed Setting

When VIP relays are energized, they display temporarily the value of the setting after a switch has changed position.

Advanced Settings

To access the advanced settings, remove the advanced settings protective cover. Both settings can be entered using a single selector switch:

- discrimination with the LV CB
- earth fault protection inrush current delay

Connection Port for the Pocket Battery Module

The connector is used to connect the pocket battery module so that the VIPs can be energized and tested. Consult the reference **NRJED311207EN**.

NOTE: the pocket battery module should only be used during maintenance or commissioning by qualified personnel and must never be left permanently connected to a running VIP.

Trip Test Button

The Trip test button is used for testing VIPs. A 5 mm diameter pointed tool is needed to activate it. More information is available in the section describing Commissioning. Consult the reference **NRJED311207EN**.

Frequency

The network frequency (50 Hz or 60 Hz) is a parameter that must be known for operation of the VIP40 and VIP45 signal processing algorithms. They therefore have an automatic frequency recognition system.

The recognized value (50 Hz or 60 Hz) is stored and the VIP works permanently with this value.

This stored value is used each time the VIP starts.

For the VIP to recognize the network frequency and store it, it has to detect a current on phase 1 for a minimum period of 5 seconds in the range 50 Hz +/- 2 Hz or 60 Hz +/- 2 Hz.

This detection happens when the VIP starts.

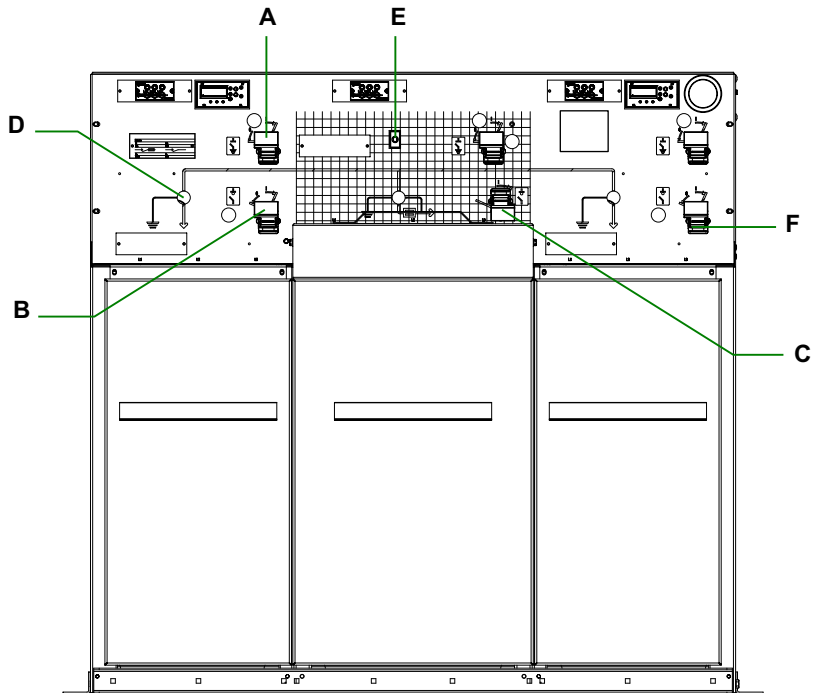
For more information, consult the *VIP40/VIP45 Reference Manual (NRJED311207EN)* available on www.schneider-electric.com or contact Schneider Electric.

Operating Instructions

Operating and Viewing Cubicle Condition

Description

- A: earthing switch operating shaft
- B: switch function operating shaft
- C: fuse-switch combination function operating shaft
- D: position indicator
- E: fuse-switch combination function opening pushbutton
- F: padlocking handle

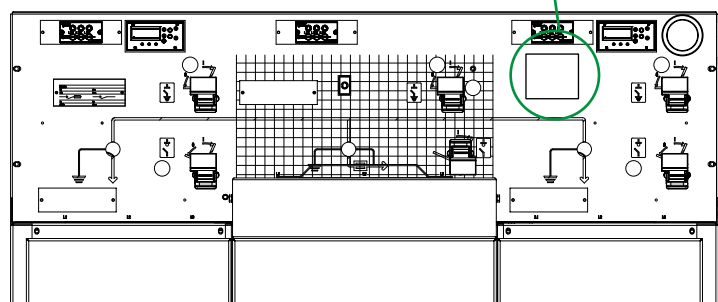
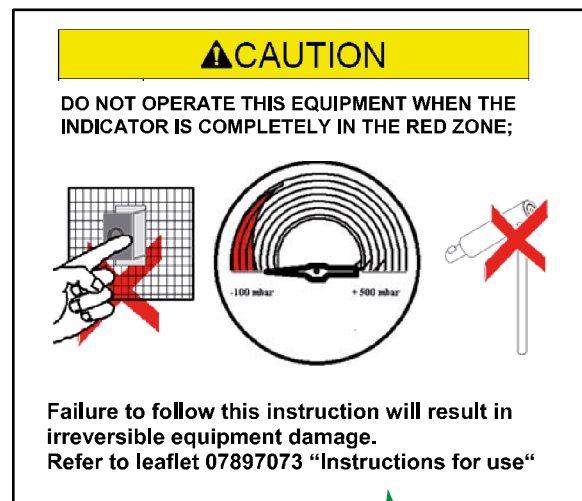


Checking the Pressure

Warning Label

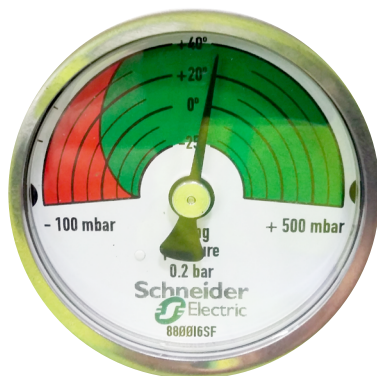
Recalls the Safety Rules

There are two types of devices indicating pressure in RM6: manometer and LCD Density Display. See the image below where those units can be found.



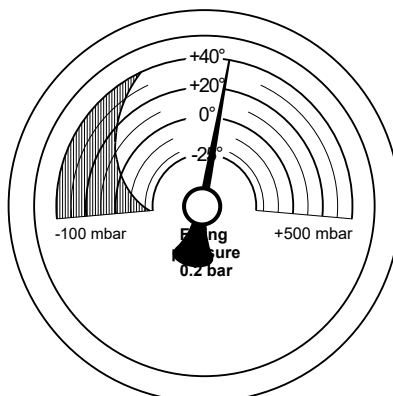
Unit with Manometer

Case 1: Needle in Green Zone



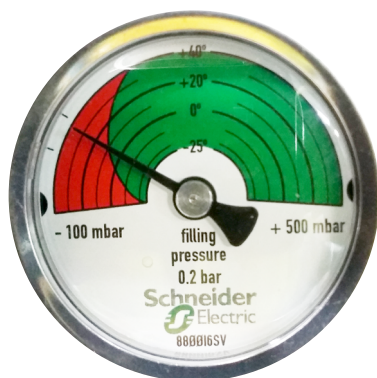
INFORMATION

For a correct reading of the manometer, look at the position of the needle according to the ambient temperature.



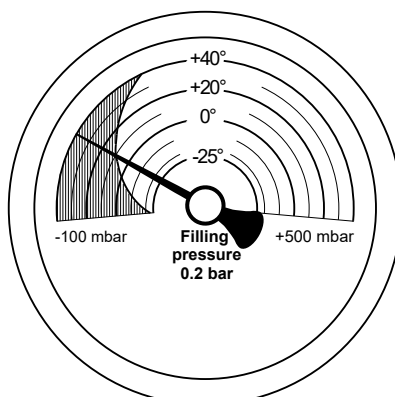
- If the needle is in the green zone, RM6 unit can be operated normally.

Case 2: Needle in Red Zone



INFORMATION

For a correct reading of the manometer, look at the position of the needle according to the ambient temperature.



- If the needle is in the red zone, the RM6 pressure is too low to operate.

⚠ ⚠ WARNING

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- DO NOT make any operation on RM6.
- Contact immediately Schneider Electric service center.

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

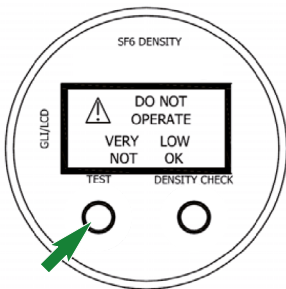
Unit with Pressure Switch

Standard in RM6 Connected Advanced unit:

The pressure switch is installed as standard in RM6 Connected Advanced unit.

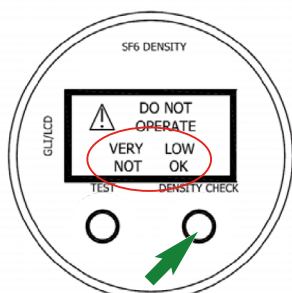
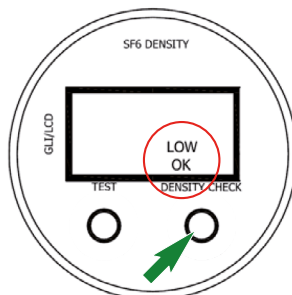
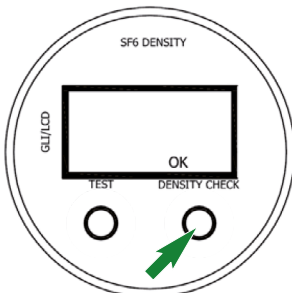
LCD Display Check

Press the "TEST" button. The LCD screen displays:



Pressure Check

Press the "DENSITY CHECK" button. The LCD screen displays:



NOTICE

HAZARD OF WRONG INFORMATION

Every devices emitting waves (for example, GSM, walkie-talkie) must be above a distance of 2 meters of the cubicle while performing density check.

Failure to follow these instructions can lead you to make a wrong action.

- If nothing is displayed, check that the 8-point connector on the pressure switch wiring harness at the rear of the LCD display is correctly connected.
- Contact the after sales service.

NOTE: the LCD display is self-powered by piezoelectric buttons ("TEST" and "DENSITY SWITCH"). Pressing one of these buttons displays a few seconds.

■ Case 1: OK

The RM6 unit is in normal operational status (ready for energizing).

■ Case 2: LOW / OK

The RM6 unit is in degraded operational status. Replacement need to be planned. Can stay energized and can be operated.

■ Case 3: VERY LOW / NOT OK

⚠ WARNING

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

If the LCD screen of the pressure switch displays VERY LOW / NOT OK:

- Do not make any operation on RM6.
- Contact immediately Schneider Electric service center.

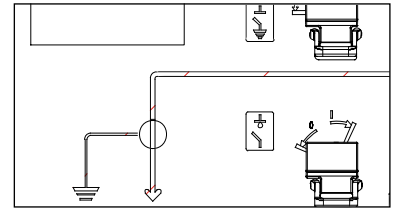
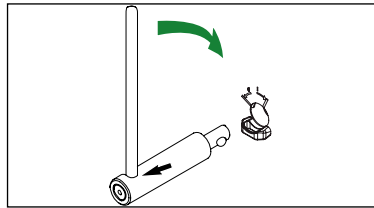
Failure to follow these instructions can result in death or serious injury.

Operating Service

Closing a Switch

Initial state:

- switch open
- earthing switch open

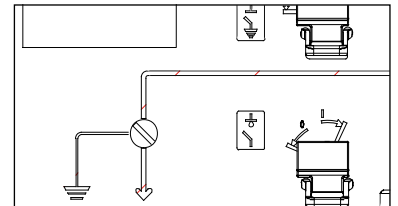
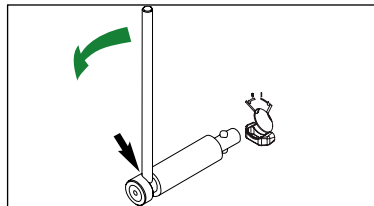


Lift the operating shaft protective cover. Activate the switch operating mechanism to the right. The indicator moves to the closed position, and access to the earthing switch operating shaft is blocked.

Opening a Switch

Initial state:

- switch closed
- earthing switch open

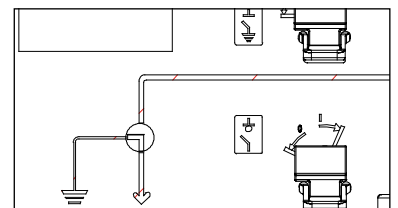
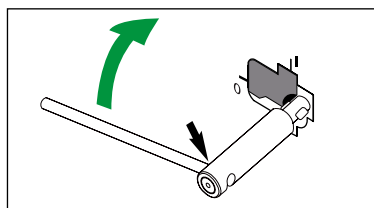


Activate the switch operating mechanism to the left. The indicator moves to the open position, and access to the earthing switch operating shaft is released.

Closing an Earthing Switch

Initial state:

- earthing switch open
- switch or circuit-breaker open



Lift the operating shaft protective cover. Move aside the pallet with the end of the lever, then activate the earthing switch operating mechanism to the right. The indicator moves to the earth position and access to the main switch operating shaft is blocked.

⚠ CAUTION

HAZARD OF EQUIPMENT AGEING

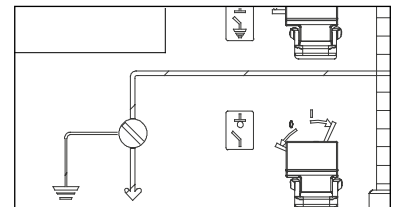
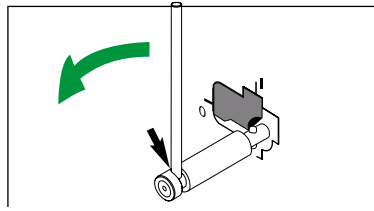
Do not close the earthing switch when the incoming line is powered on.

Failure to follow these instructions can result in injury or equipment damage.

Opening an Earthing Switch

Initial state:

- earthing switch closed
- switch or circuit-breaker open

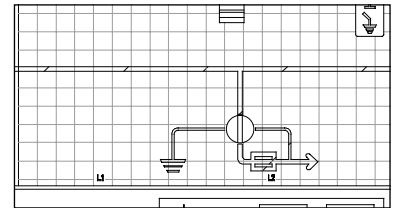
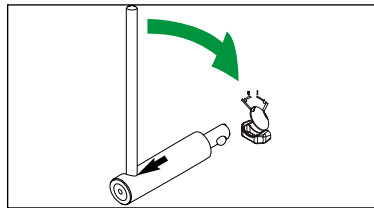


Move aside the pallet with the end of the lever, then activate the switch operating mechanism to the left. The indicator moves to the open position, and access to the switch or circuit-breaker operating shaft is released.

Closing a Circuit-Breaker or Fuse-Switch Combination

Initial state:

- circuit-breaker or fuse-switch open
- earthing switch open



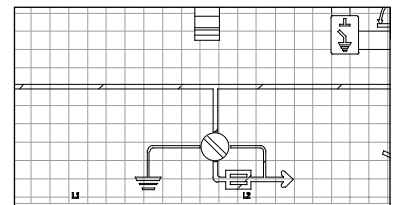
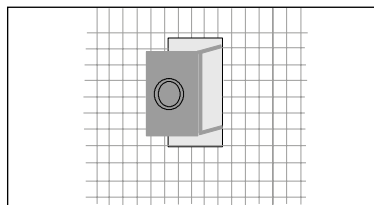
Lift the operating shaft protective cover. Activate the switch operating mechanism to the right. The indicator moves to the closed position, and access to the earthing switch is blocked.

Opening a Circuit-Breaker or Fuse-Switch Combination

<h3 style="margin: 0;">⚠ CAUTION</h3> <p style="margin: 5px 0;">HAZARD OF EQUIPMENT AGEING</p> <p style="margin: 5px 0;">Energize the undervoltage coil before operating the switch.</p> <p style="margin: 5px 0;">Failure to follow these instructions can result in injury or equipment damage.</p>

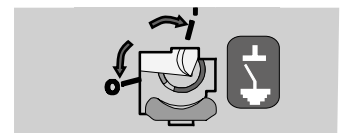
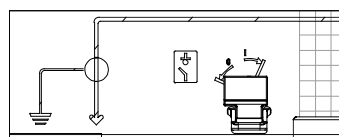
Initial state:

- circuit-breaker or fuse-switch open
- earthing switch open

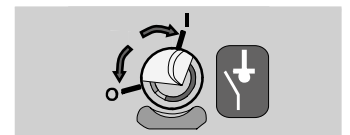
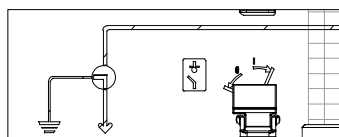


Press the opening pushbutton of the circuit-breaker or fuse-switch combination. The indicator moves to the open position, and access to the earthing switch is released.

Operating Safety

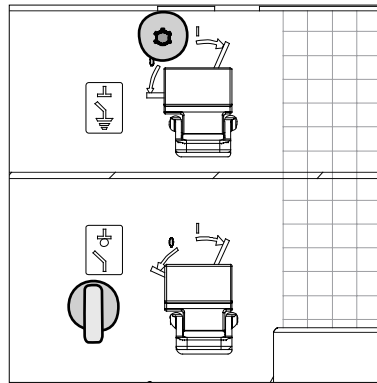


Switch or circuit-breaker closed: the earthing switch is blocked.



Earthing switch closed: the switch or circuit-breaker is blocked.

Key-locking (optional)



The switches and the circuit-breaker are locked in the open position. The earthing switches are locked in position:

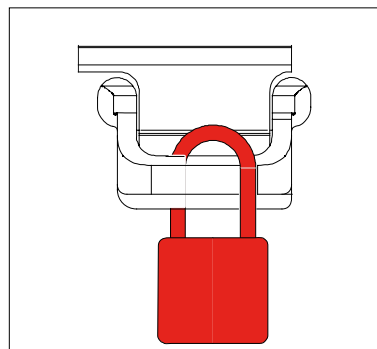
- open
- open/closed

There are various possible locking diagrams.

- network switch and network outgoing circuit-breaker:
 - semi-crossed locking
 - crossed locking
- transformer feeder:
 - RM6 / transformer
 - RM6 / low voltage
 - RM6 / transformer / low voltage

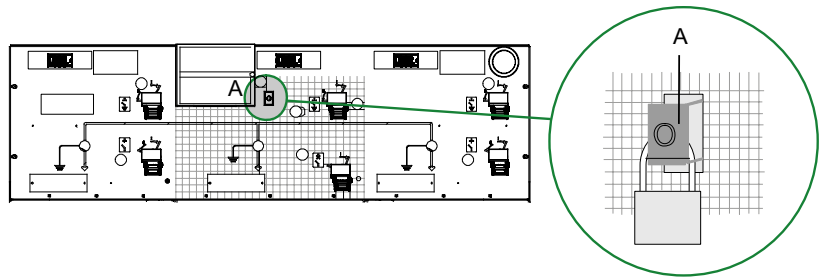
Padlocking

Operating Shaft Padlocking Handle



Switch and earthing switch with a degree of protection IP3X, fit a padlock $6 \text{ mm} < \text{handle diameter} < 8 \text{ mm}$.

Padlocking the Opening Pushbutton

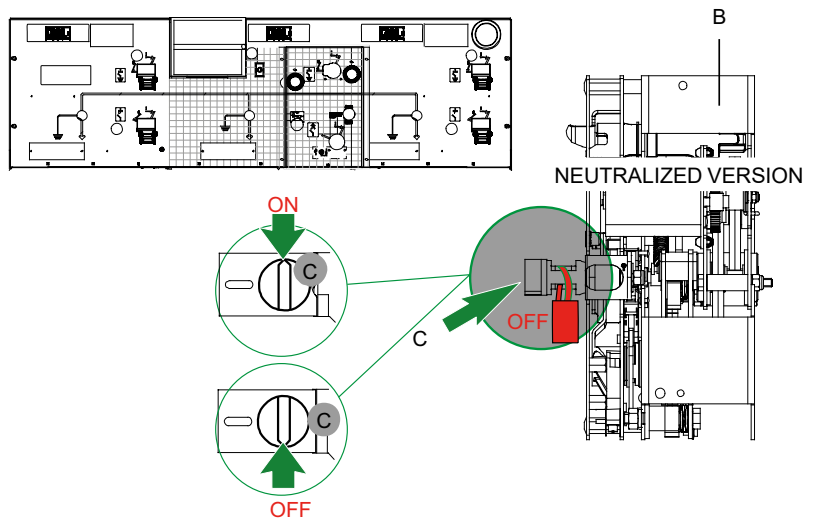


Fit the padlock on the opening pushbutton $6\text{ mm} < \text{handle diameter} < 8\text{ mm}$.
A: fuse-switch combined function or circuit-breaker opening pushbutton.

Motorization Lock

B: circuit-breaker motorized
C: position of the switch

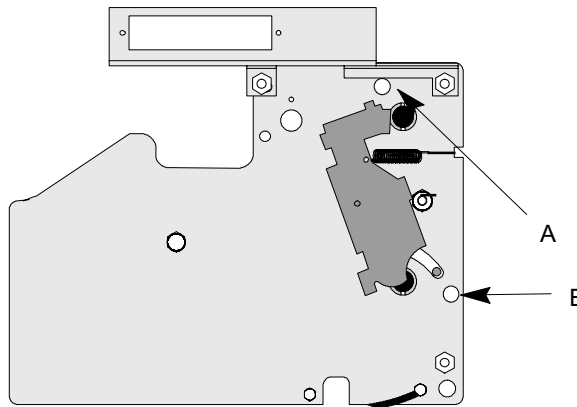
ON: AUTHORIZED ENGINE
OFF: LOCKED ENGINE



Padlocking the Operating Shafts of the Switch with the Operating Mechanism Front Plate Removed

Fit a padlock $6\text{ mm} < \text{handle diameter} < 8\text{ mm}$ in one of the 2 marked holes.

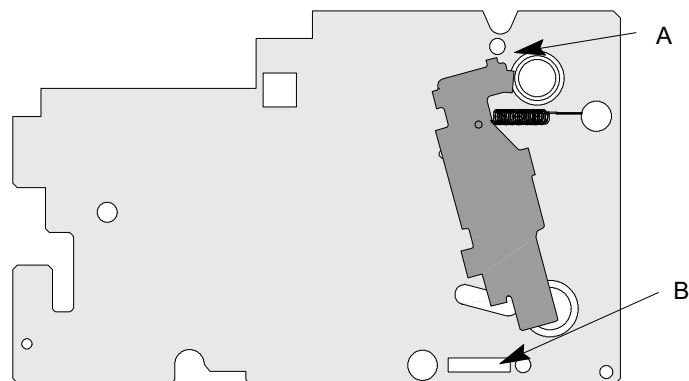
A: padlocking the earthing switch in the open or closed position
B: padlocking the switch in the open or closed position



Padlocking the Operating Shafts of the Circuit-Breaker with the Operating Mechanism Front Plate Removed

Fit a padlock $6\text{ mm} < \text{handle diameter} < 8\text{ mm}$ in one of the 2 marked holes.

A: padlocking the earthing switch in the open or closed position
B: padlocking the switch in the open or closed position



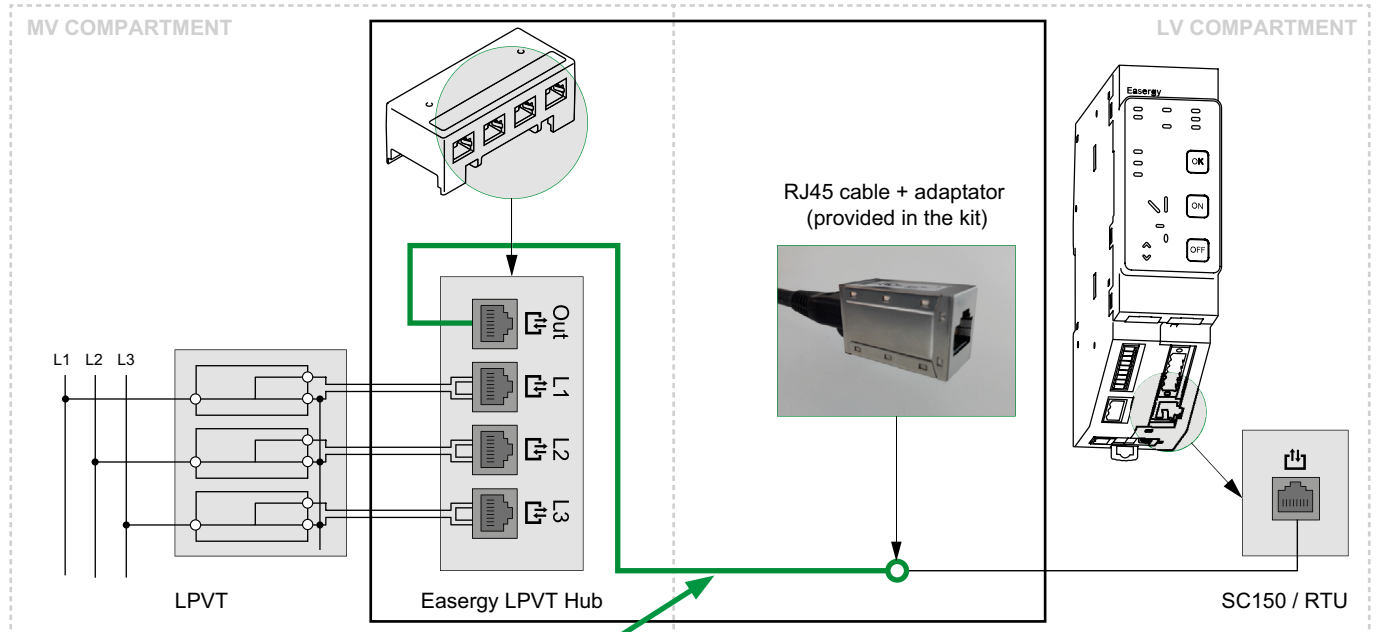
Smart Ready Cubicle

Smart Ready Cubicle is a set of options that enables simpler connection of an RTU.

NOTE: The Smart Ready Cubicle does not apply to the RM6 Connected Advanced unit.

Pre-Wirings for Connection to RTU (Remote Terminal Unit)

RJ45 Cable for Voltage Measurement (LPVT)



RJ45 cable already installed in the cubicle.

To connect RJ45 cable to LPVT hub, you need the kits below.

- Kit EMS40487 (not provided)
- Easergy LPVT Hub EMS59573 (not provided)
- Kit LPVT 03816498N0 (not provided)

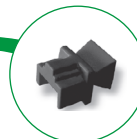
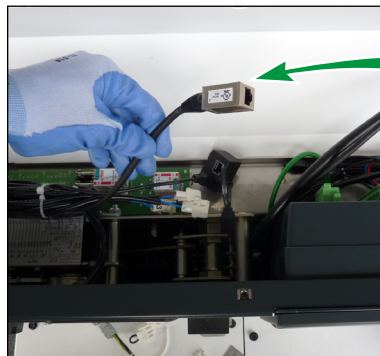
NOTICE

HAZARD OF MATERIAL DEFECT

- Before connecting, remove the protective caps at the ends of the RJ45 cables.
- Before connecting, check the RJ45 connection if there is no corrosion present.

Failure to follow these instructions can lead you to make a wrong action.

LV COMPARTMENT



Remove the protective transport cap before installation.

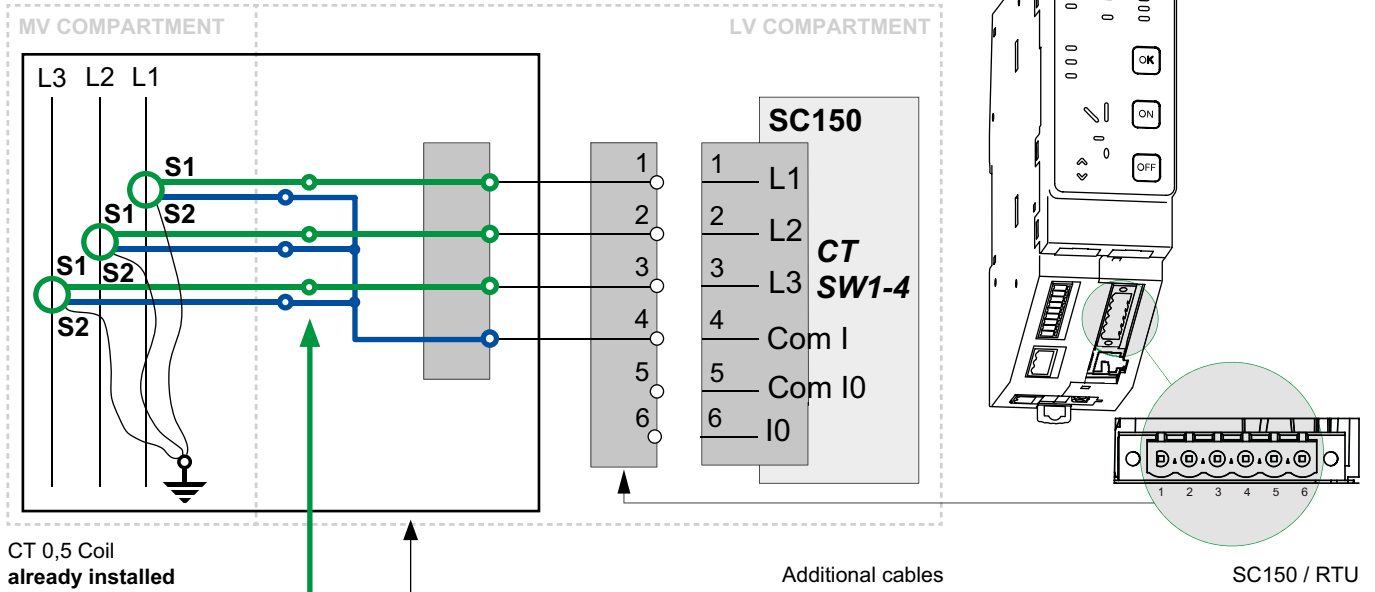
MV COMPARTMENT



Remove the protective transport cap before installation.



Cable for Current Measurement (CT 0.5 Coil)



Kit EMS58541 already installed in the cubicle.
Load Break Switch, CTs are pre-installed on the bushings.

LV COMPARTMENT



Remove the bridges during installation.



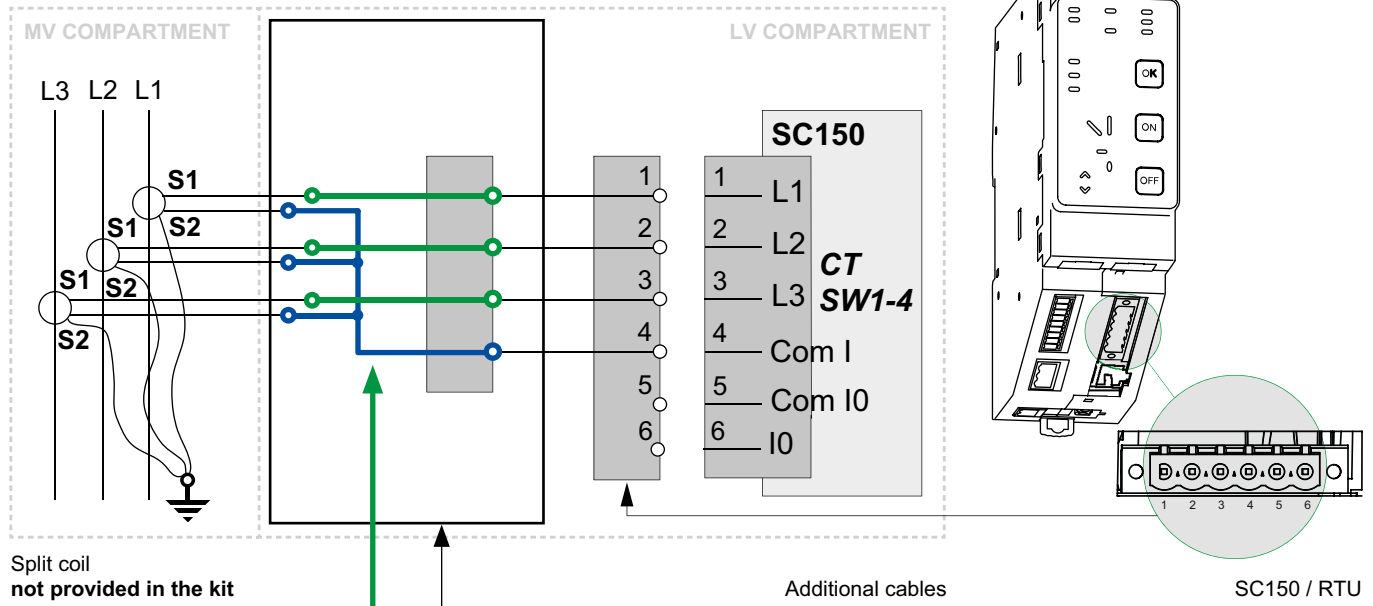
⚠️ ⚠️ DANGER

HAZARD OF ELECTRIC SHOCK

The CT 0.5 Coil cable must always be connected to bridges or SC150 / RTU when the cubicle is energized.

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

Cable for Current Measurement (Split Core CT)



Kit EMS58131 already installed in the cubicle.
 Cable for split core CT.

To connect the cable to the split cores, you need the parts below.

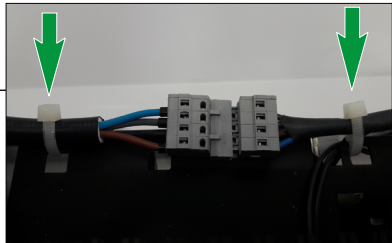
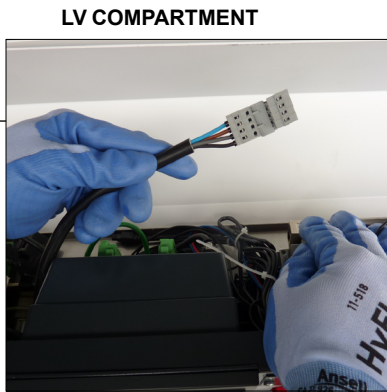
- Set of 3 split cores CT500/1: EMS58175 (not provided).

⚠ ⚠ DANGER

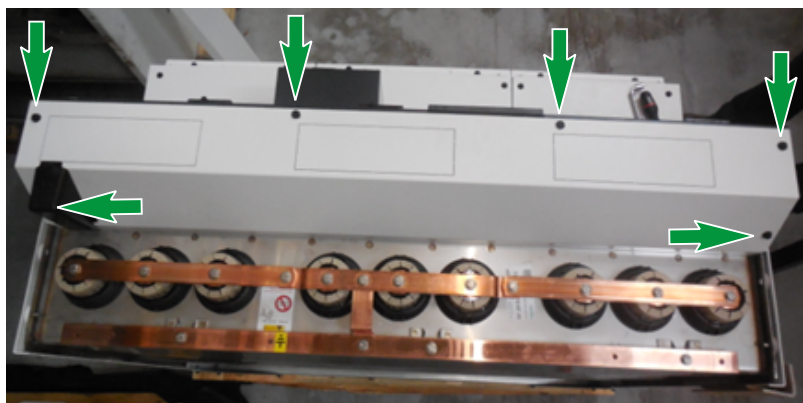
HAZARD OF ELECTRIC SHOCK

- Put 2 cable ties to avoid the constraint on end connection (Wago).
- Make sure that it is not possible to disconnect the Wago at the end of the operation.

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



Pre-cut of the Duct Cover in Case of LV Cabinet on the Top Selected

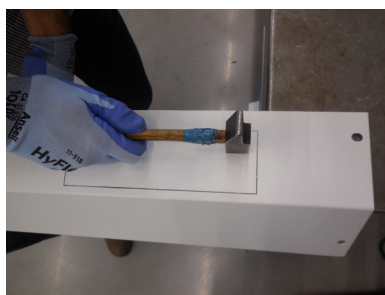


■ Disassemble the duct cover. Remove the 6 screws using a wrench.



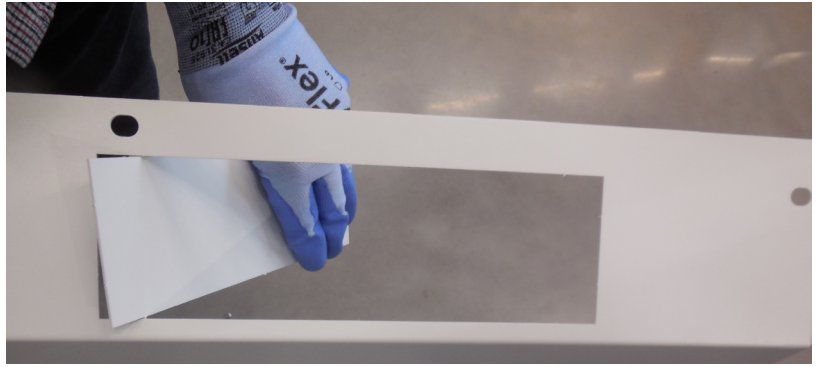
■ Extract the duct cover from the LV compartment.

NOTICE
HAZARD OF EQUIPMENT DAMAGE
DO NOT remove the pre-cut part directly on the cubicle.
Failure to follow these instructions can result in equipment damage.



■ Remove the pre-cut part with a hammer.

i **INFORMATION**
Remove only the necessary pre-cut part, depending on the width of the LV cabinet.



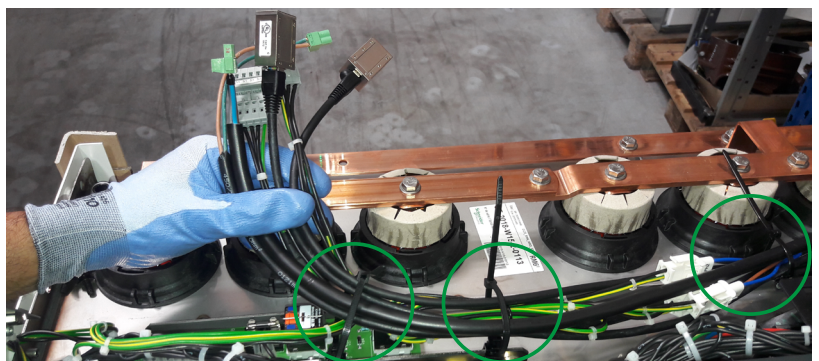
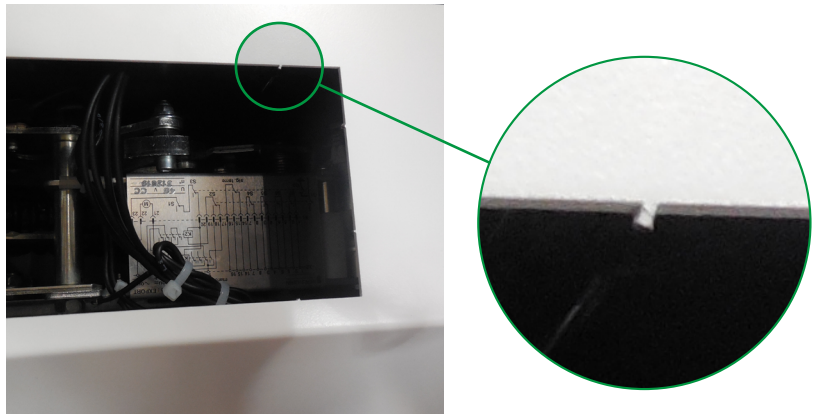
- Recycle the part.

⚠ CAUTION

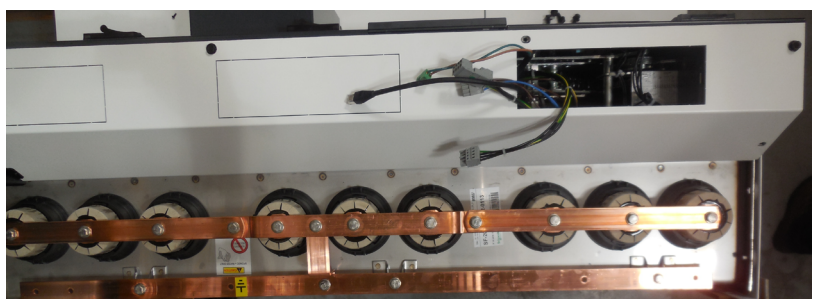
HAZARD OF CUT

- Be careful, the edges of the cut can be sharp.
- Apply appropriate Personal Protective Equipment (PPE) and follow safe work practices.

Failure to follow these instructions can result in injury or equipment damage



- Bring the cables to the cut opening.
- Use the available attachment points in the cubicle to secure the cables.



- Pass the LV wiring through the cut opening.
- Put the duct cover back in place.
- Connect the LV cabinet.

Thermal Monitoring Sensors

Sensors installation procedure : refer to installation guide PHA4365201.

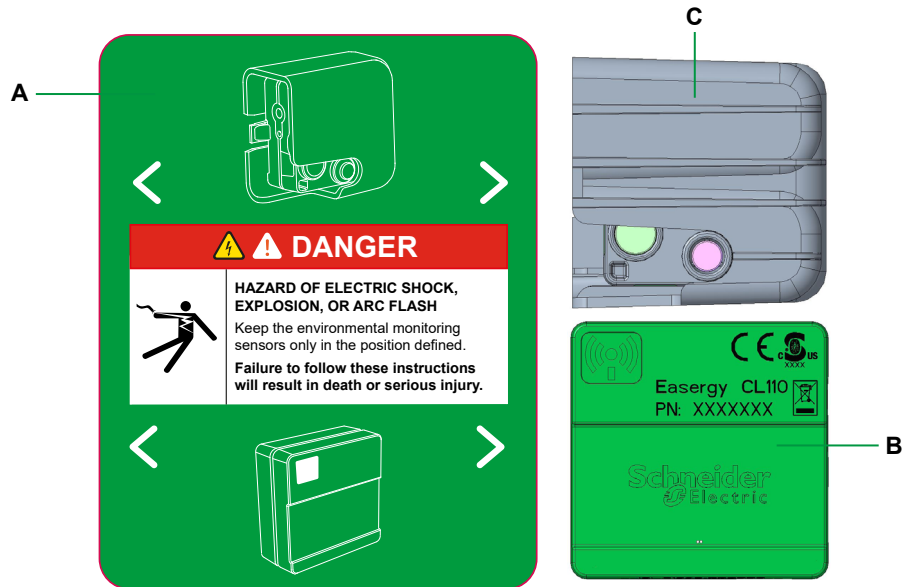
Environmental Monitoring Option

CL110 Sensors

The left function of the RMU is equipped with CL110 environmental sensors. The two sensors are physically identical but one of them is in a support.

If it is impossible to install the CL110 sensors on the left function of the RMU, they can be installed on the right function.

- A: Positioning label
- B: CL110 sensor n°1
- C: CL110 sensor n°2 in its support



Positioning of CL110 Sensors

⚠ ⚠ DANGER

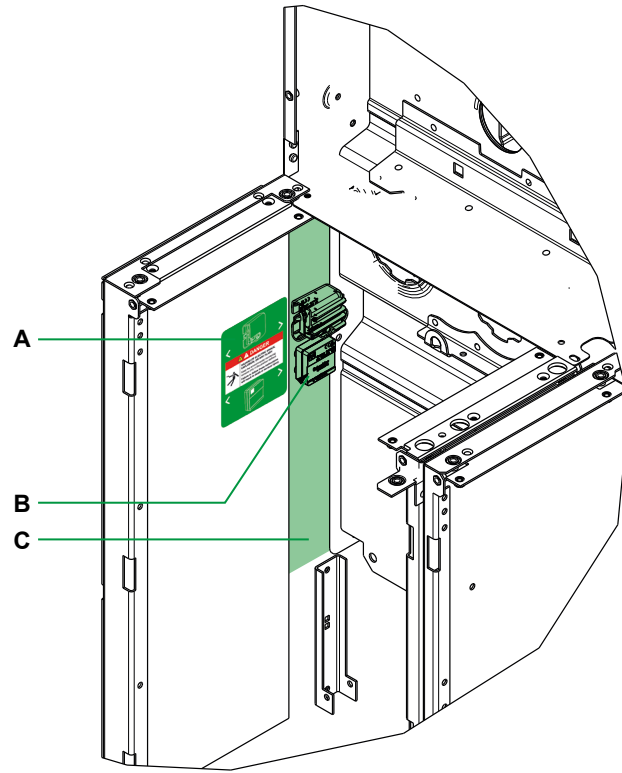
HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Keep the environmental monitoring sensors only in the positioning zone defined.
- No additional cubicle must be assembled on the sensor side.

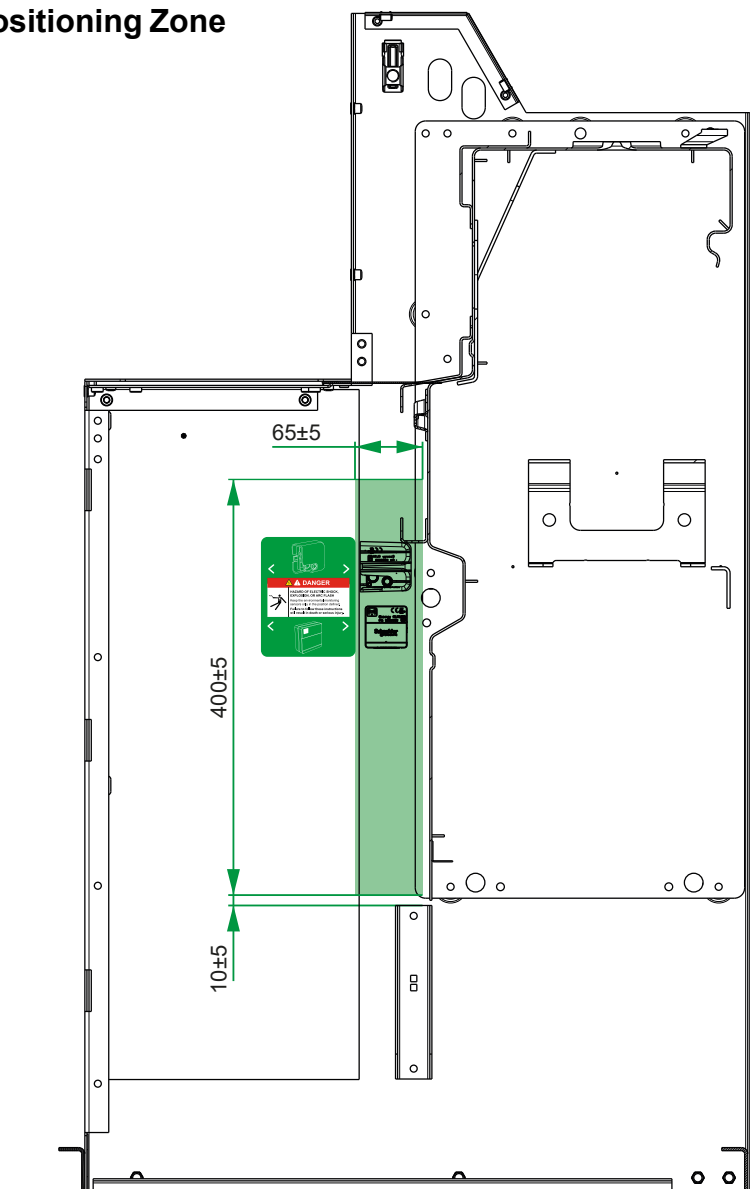
Failure to follow these instructions will result in death or serious injury.

The CL110 sensors are fixed inside the cubicles by magnets. Due to potential risks (dielectric disturbance), changing their positions is not allowed. After each intervention, visually check that all sensors are in the positioning zone.

- A: Positioning label
- B: CL110 sensors
- C: CL110 sensors positioning zone

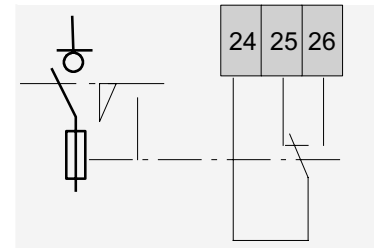
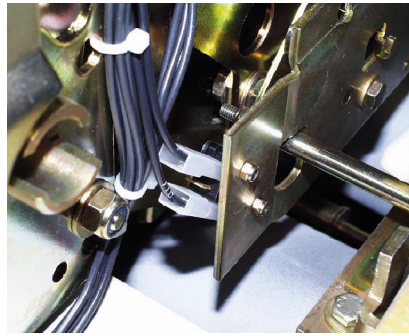


Dimensions of the CL110 Sensors Positioning Zone



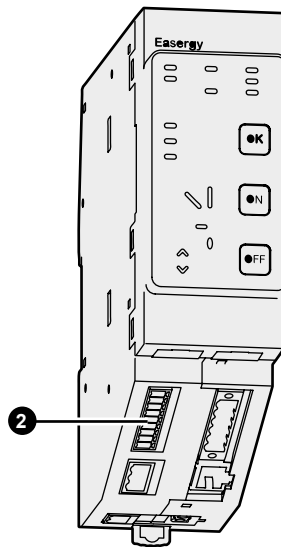
Fuse Blowing Indication (Optional Supply)

Connection Terminal Block



Optional Connection to Easergy T300

Connection to SC150 module on connector 2.
Connect Unassigned digital input n°7 / Common (0V) n°9 to 24-25 or 24-26 terminal block connectors.



2 Switch states

Control by -V
Control by +V

12Vdc < V < 127Vdc or
90Vac < V < 220Vac

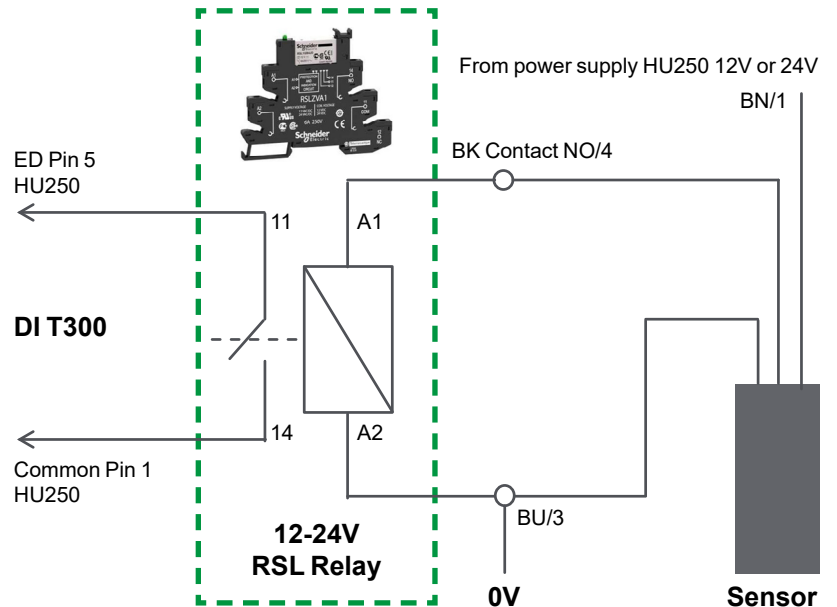
9-pin plug-in screw connectors:

Switch states	
1	Switch open
2	Switch closed
3	Earthing switch open
4	Earthing switch closed
5	Switch interlock closed
6	MV voltage presence
7	Unassigned digital input
8	Unassigned digital input
9	Common (0V)

Flooding Option

Installation Diagram

Connection to HUA250 module on connector 10.
Digital inputs 1: Common (+24VDC) n°1 / Digital input 4.

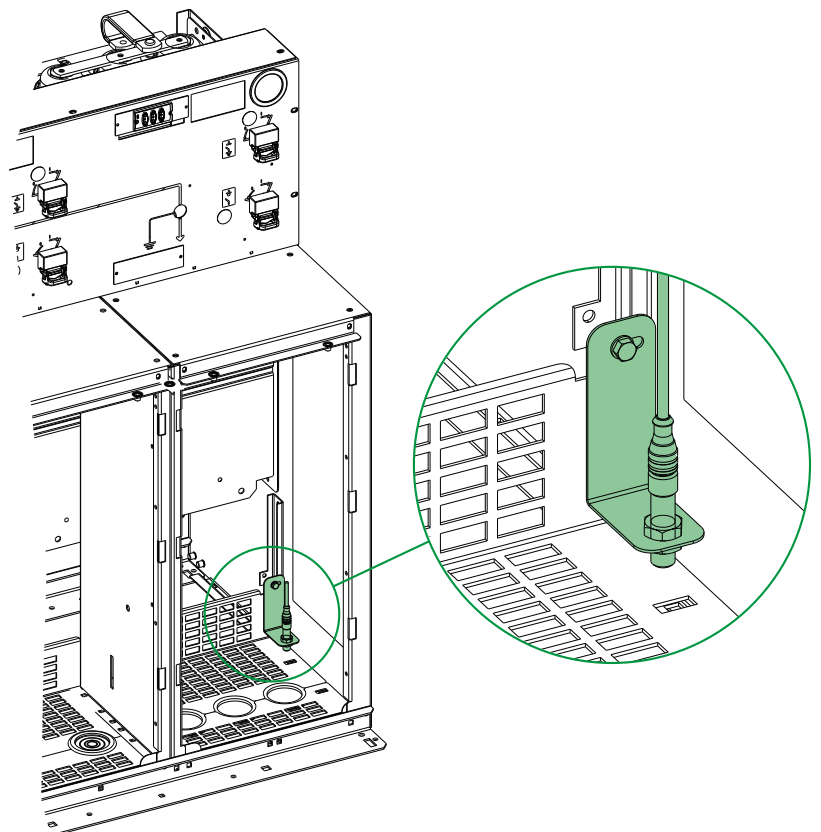
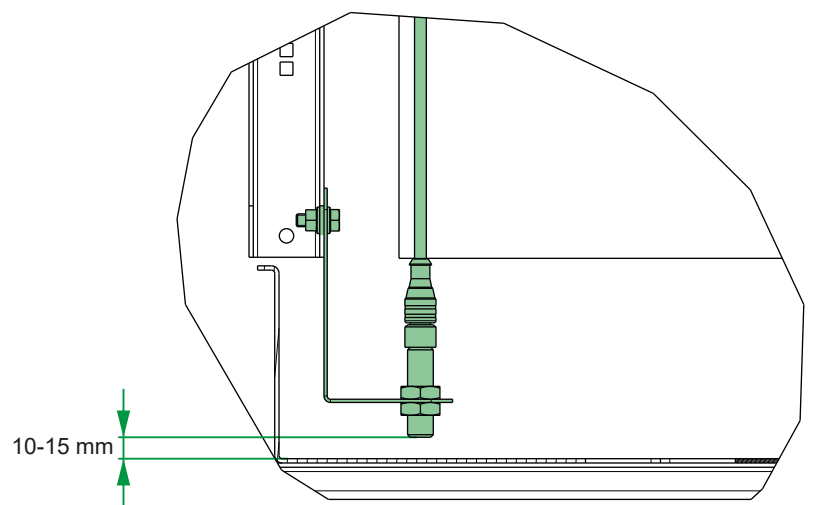


Sensor Sensitivity Adjustment

Using the screwdriver supplied with the sensor, turn the potentiometer to the left stop position to adjust the sensitivity of the sensor to the minimum.

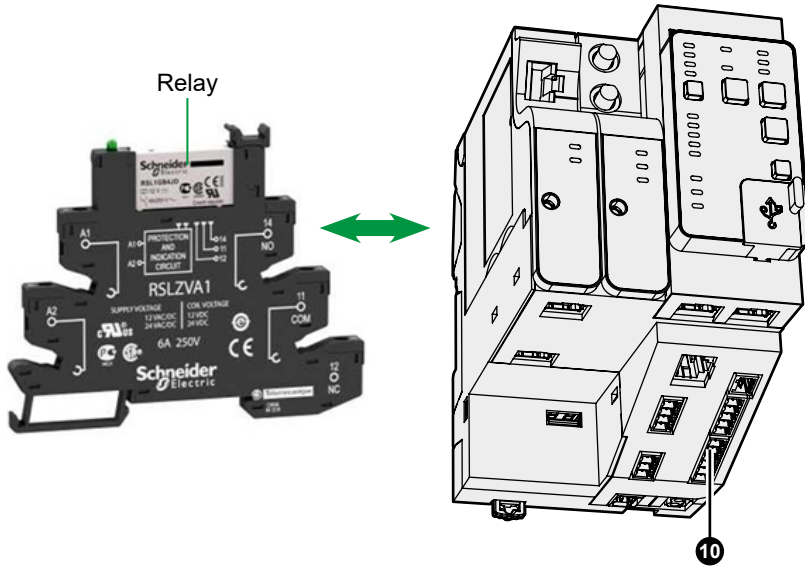


Sensor Installation in the right function



Connection From Relay to Easergy T300

Connection to HUA250 module on connector 10.
Connect Common (+24VDC) (pin 1) / Digital input 4 (pin 5) to 11 and 14 output relay connectors.



10 Digital inputs

DI1	1
DI2	2
DI3	3
DI4	4
	5
V present	1
Door open	2
	3
Local	4
Remote	6

Plug-in screw connectors:

Digital inputs 1	
1	Common (+24VDC)
2	Digital input 1
3	Digital input 2
4	Digital input 3
5	Digital input 4

Digital inputs 2	
1	Common (+24VDC)
2	Voltage presence
3	Door open
4	Common (+24VDC)
5	Local
6	Remote

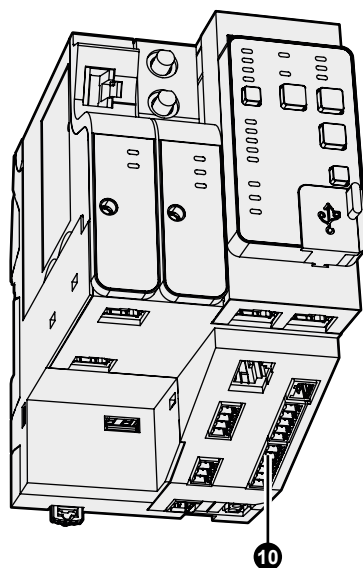
Anti-Intrusion Low Voltage Cabinet

Contact Door for LV Compartment Option



Connection to Easergy T300

Connection to HUA250 module on connector 10.
Digital inputs 2: Common (+24VDC) n°1 / Remote n°6.



10 Digital inputs

DI1	1
DI2	2
DI3	3
DI4	4
	5
V present	1
Door open	2
	3
Local	4
Remote	6

Plug-in screw connectors:

Digital inputs 1	
1	Common (+24VDC)
2	Digital input 1
3	Digital input 2
4	Digital input 3
5	Digital input 4

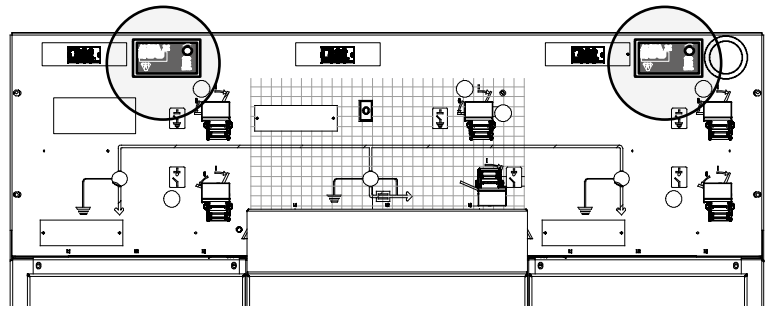
Digital inputs 2	
1	Common (+24VDC)
2	Voltage presence
3	Door open
4	Common (+24VDC)
5	Local
6	Remote

Overcurrent Indicator

NOTE: The overcurrent indicator does not apply to the RM6 Connected Advanced unit.

An overcurrent indicator of the Alpha M or Alpha E type can be optionally fitted on one of the line switch. 4 detection thresholds are possible:

- 400 A
- 600 A
- 800 A
- 1000 A



Alpha M Type Indicator



Operation

If the reaction current exceeds the pre-set threshold, the indicator sends an optical signal on the faulty phase. The signal remains visible until it is manually reset.

- 1: Threshold overshoot optical signal, one for each phase.
- 2: Rotary resetting and operating test button (turn quickly).

Alpha E Type Indicator



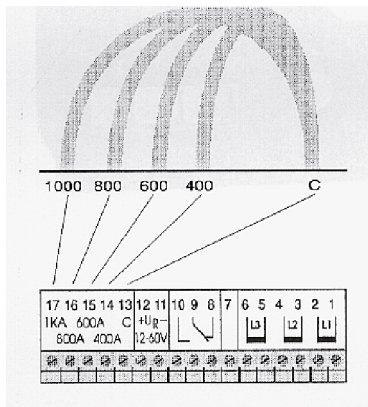
Operation

If the reaction current exceeds the pre-set threshold, the indicator sends an optical signal on the faulty phase. The signal remains visible for a time that can be pre-set. 2 hours or 4 hours.

Manual resetting is possible.

- 1: Threshold overshoot optical signal, one for each phase.
- 2: Time during which the signal remains visible. Resetting is automatic.
- 3: Resetting and operating test pushbutton.

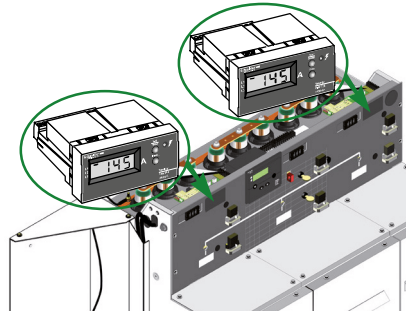
Threshold Change for Alpha M and Alpha E Type Indicator



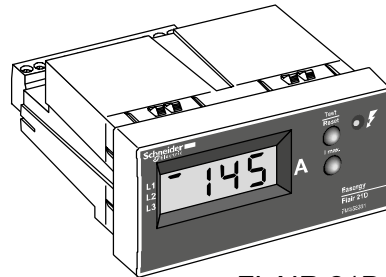
To change threshold, cable appropriately according to the diagram opposite. The terminal block is located behind the device.

LV Connection Indicator Flair 2xD

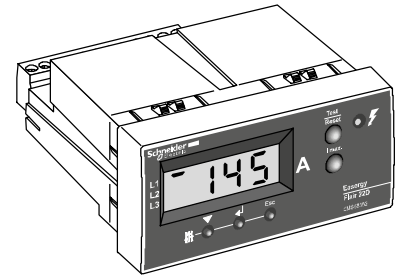
NOTE: The Flair 2xD fault passage indicator does not apply to the RM6 Connected Advanced unit.



The **Flair 21D, 22D** and **23DM** fault passage indicator is self-powered by the measurement sensors. A minimum 2 A current is required in the MV cable to start up the Flair 21D display, an energy storage guarantees a 4-hour minimum autonomy. The Flair devices have an output contact for interfacing with a SCADA system. Flair 22D/23DM can be connected to a voltage presence indicating system (VPIS) provided with a voltage output (VPIS-VO). In this case, for greater reliability, fault detection is confirmed by voltage absence without taking into account the current. Flair 23DM has to be supplied from 24 Vdc to 48 Vdc for a permanent display operating and for the outdoor lamp supply (with a single zero sequence CT, self powering is not possible).



FLAIR 21D



FLAIR 22D et 23DM

Detector Pending Fault

Ammeter Mode

In the absence of a fault, a load current indication is displayed. The amperage of each phase L1 - L2 - L3 is displayed in succession with its reference on the left of the display.

Example:

For a load current of 80 A: 80 for L1
 then 80 for L2
 and 80 for L3

When Flair 22D/23DM is provided with an earth CT (B type mounting), display of L2 and L3 only.

For each phase, if $I > 720$ A display: 888
 if $I \pm 2$ A display: L. P. (Low Power).

Maximeter Mode

To access the maximeter function, press once the “Imax.” button.
For each phase, an indication of the maximum load currents since the last reset is displayed.

Example:
for a maximum current of 500 A in phase 1: **01** then **500**,
followed by L2 and L3.

The maximeters scroll only once.
All the maximeter values are reset by simultaneous actuation of the “Test/Reset” and “Imax.” buttons during scrolling.
When Flair 22D is provided with an earth CT (B type mounting), display of L2 and L3 only.

Detector in Fault Indication

Event A


The current exceeds one of the thresholds set for a period \geq acknowledge time.

Event B


The line current disappears (or absence of U with VPIS-VO option, on Flair 22D/23DM).

Fault indication is active when A is followed by B within a lapse of time of less than 70 s.

■ Phase-to-earth fault detected:

display of **L1** or **L2** or **L3**, (or **10** if earth CT), the indicator lamp  flashes (1 flash every 3 s) and the output contact is activated.

■ Phase-to-phase fault detected:

display of **OC** (Over Current), the indicator lamp  flashes (2 flashes every 6 s) and the output contact is activated.

For these 2 types of faults, the indicator lamp remains flashing until it is reset (Reset), which can be achieved by:

- current recovery $>$ 70 s, configurable time delay on Flair 22D/23DM (Reset active if “Automatic reset” is not on “OFF”);
- U recovery, if VPIS-VO option on Flair 22D/23DM (Reset active if “Automatic reset” is not on “OFF”);
- end of the time delay, (4 hours on Flair 21D, configurable on Flair 22D/23DM);
- a press on external Reset;
- manual actuation of the “Test/Reset” button.

Maintenance

- The Flair 21D fault passage indicator requires no maintenance (no electric cells or batteries to be changed regularly).
- The lithium battery of the Flair 22D indicator should be changed about every 15 years (**For the battery replacement process, call your sales representative who will put you in contact with the closest Schneider Electric group service centre. You can log on to: www.schneider-electric.com**).
- The lithium battery of the BVP option (external indicator unit with incorporated battery) is to be changed every 15 years.

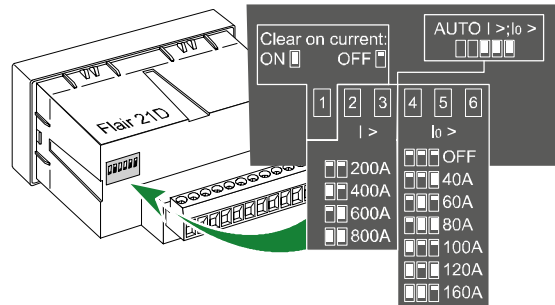
Settings

The Flair devices (>2010) are a fault passage indicator without settings (automatic mode).

However, it is possible to perform specific override settings.

In manual mode, settings are made:

- using the 3 buttons located under the display (Flair 22D/23DM),
- by micro-switches (drawing opposite) (Flair 21D). The changes are taken into account after a press on the "Test/Reset" button.

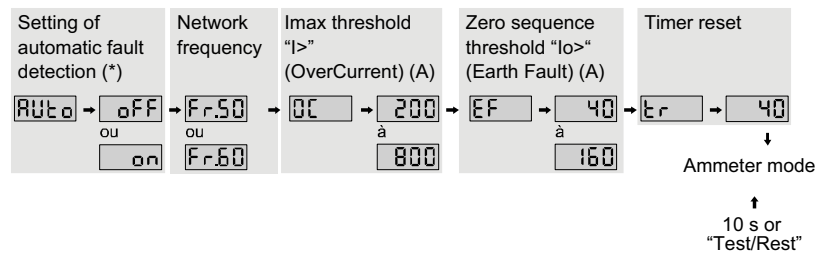


In AUTO mode I>; I0>, the manual settings are not active.

Test Mode

- A press on the "Test/Reset" button activates Test mode.
- The indicator lamp flashes, and the BVP and the "OUT" output are activated until the end of the test.
- The display successively shows: `EEEE` and `Fc I0` and `u WU` (software version).
- Then, all parameters followed by their values scroll and the indicator returns to mode ammeter 10 s after displaying the last value (pressing "Test/Reset" to return immediately to the ammeter mode).

Setting Parameter Scrolling Sequence in Test Mode for Flair 21D (automatic on test mode)



When "Auto" is "ON", Flair 21D uses the following values for fault detection:

- frequency = self-detection
- zero sequence threshold = automatic fault detection for any fault > 20 A
- Imax threshold = automatic fault detection for any fault > 200 A
- acknowledge time = 40 ms
- Inrush = 3 s
- CT type = CT1 (can be changed to CT2 by actualing the buttoms)
- Automatic reset = 70 s (if automatic reset =on)
- Timer reset = 4h

Settings Mode (Flair 22D and Flair 23DM)

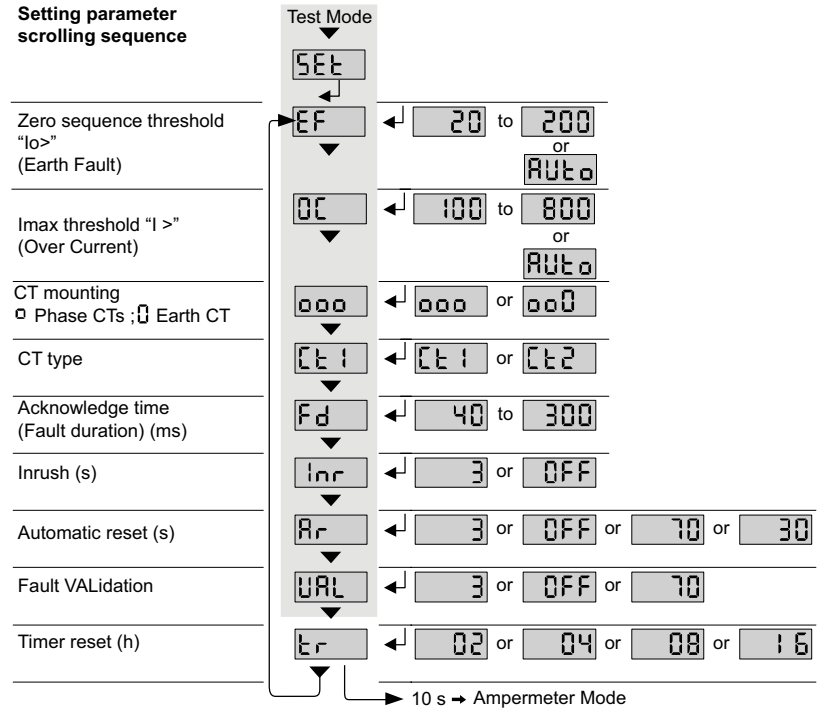
During the Test mode, a press on the ▼ button provides access to Settings mode (display **SEt**).

- 1 - A press on the ↵ button displays the first parameter to be set.
 - 2 - Several presses on the ▼ button scroll the parameters in a loop.
- At this stage, with no actuation of ▼ or ↵ during 10 s, the indicator returns to ammeter mode.
- 3 - Press the ↵ button to display the current value of the selected parameter.
 - 4 - Press the ↵ button again to activate setting of this value: the display flashes for 5 s.
 - 5 - During flashing, press ▼ successively to display the desired value.
 - 6 - Confirm by pressing the ↵ button; without confirmation within a period of 15 s, return to display of the parameters without change in the value.
- Each press on the "Esc" (Return) button takes you back to the preceding stage.

Standard settings:

- Fault detection = self-calibration
- frequency = self-detection
- zero sequence threshold = automatic fault detection for any fault > 20 A
- I_{max} threshold = automatic fault detection for any fault > 20 A
- acknowledge time = 40 ms
- Inrush = 3 s
- CT mounting = Type A
- CT type = CT1
- Automatic reset = 70 s
- Timer reset = 4 h

Setting parameter scrolling sequence



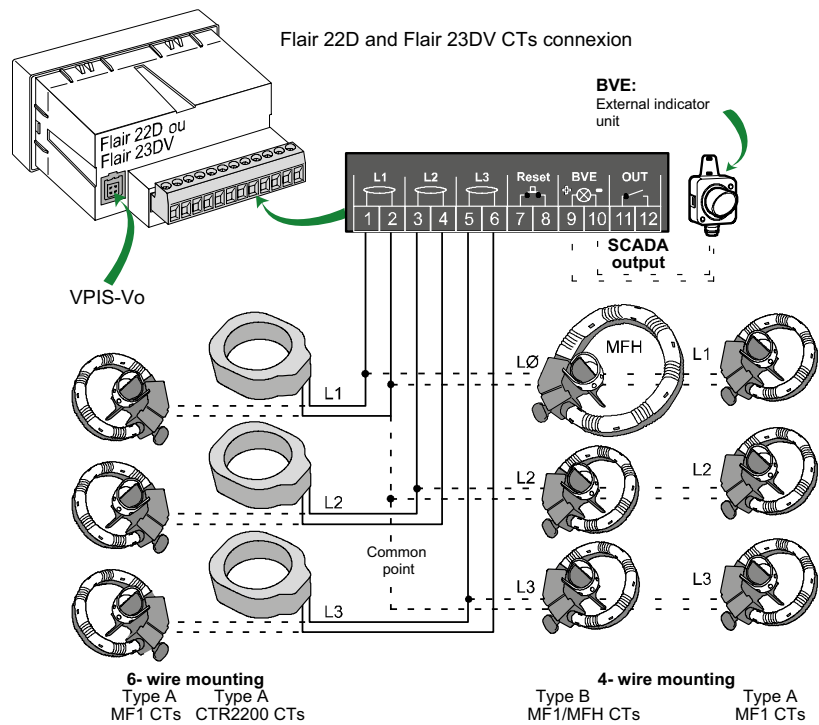
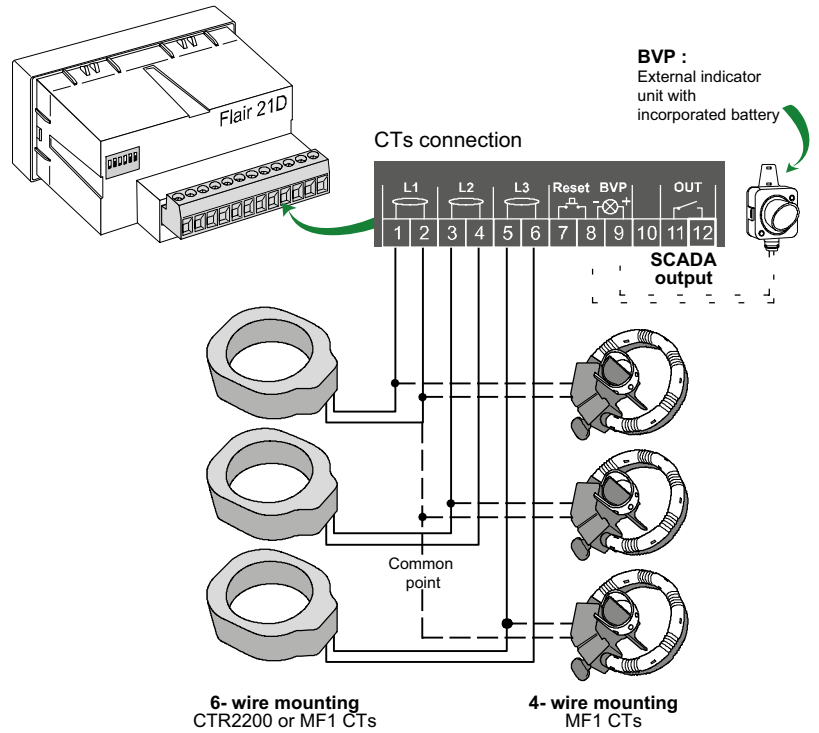
Connection

Connection of CTs to the 3 MV cables

- Cable length: 3 m max.
- Cross section: max. 1.5 mm²
- CTR2200: mounting without common point (6 wires)
- MF1: mounting with or without common point (4 or 6 wires)

IMPORTANT NOTE (for MF1 split core CTs):

- mount the 3 CTs facing in the same direction;
- run the screen earth braid of the MV cable back inside the CT.



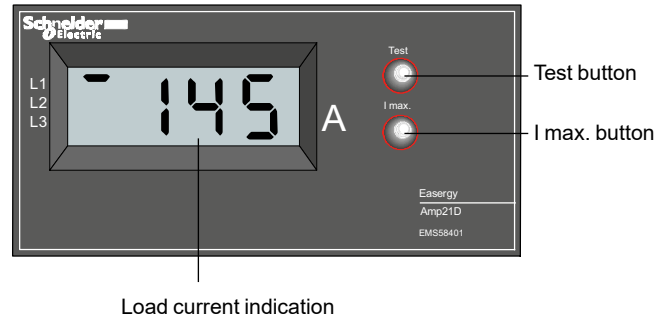
Type C mouting 'single zero sequence CT' possible only with flair 23DV

Type	Ref.	Product	Description
	EMS58351	Flair 21D	Fault passage indicator
	EMS58352	Flair 22D	
	EMS58355	Flair 23DM	
CT1	59925	CTR2200	Phase CT for RM6 cubicle bushing
CT2	59963	MF1	Phase CT for cable (split toroidal core)
	59928	MFC3 (pour MF1)	3 crimp-on connectors for 6-wire mounting (wires not supplied)
	59962	Faisceau MF1	CT connector cable for 4-wires mounting (A or B type)
	59922	BVP	External indicator unit
	59927	MFH	Earth CT (split toroidal core)

Ammeter

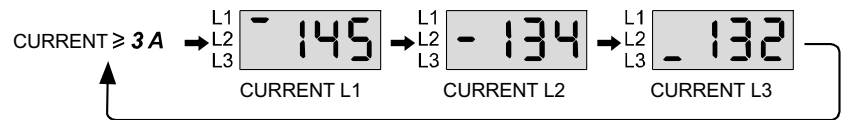
NOTE: The Amp 21D ammeter does not apply to the RM6 Connected Advanced unit.

The Amp 21D is an ammeter, for cubicle, automatic and self-powered. The Amp 21D comes into operation whenever the current is greater than 3 A on the network.



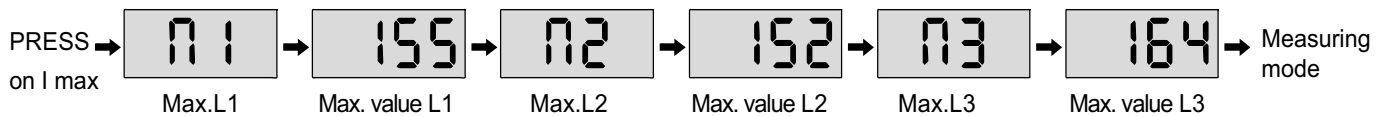
Standard Operating Measuring mode

Equipment's standard operating mode. The AMP 21D ammeter displays in succession, by scrolling, the currents on phases L1, L2 and L3, and saves to memory the maximum values.



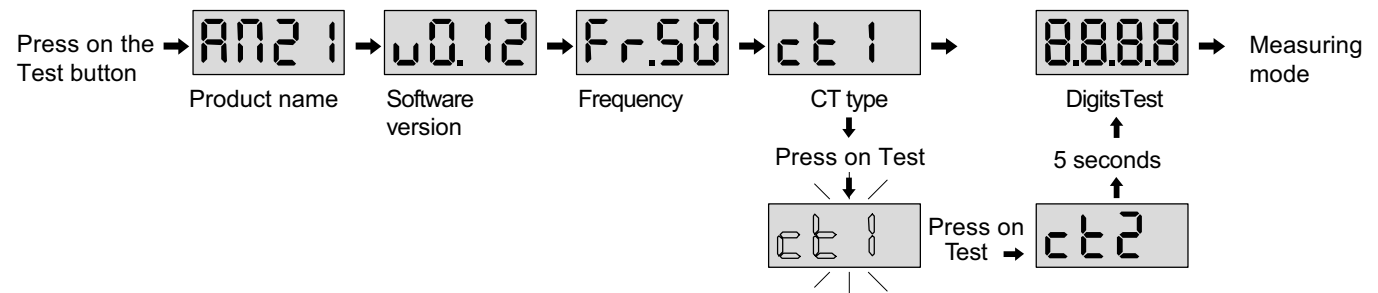
Maximeter mode

A press on the "I max." button activates the Maximeter mode. This mode allows display of the I maximum values occurring on the 3 network phases since the previous initialization.



At the end of the maximeters' display cycle, the Amp 21D automatically returns to Measuring mode. The maximeter is reset by simultaneously pressing the "Test" and "I max." buttons.

Test mode



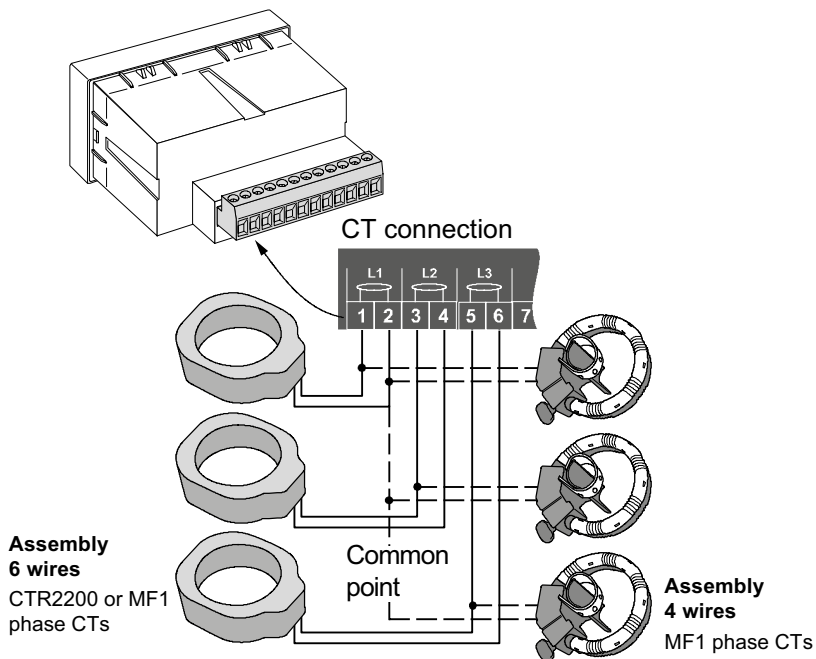
- Choice of CT type:
- the CT1 option corresponds to (ref.59925) phase CTs;
 - the CT2 option corresponds to (ref.59963) phase CTs;
 - factory setting: CT1.

Connection of CTs to the 3 MV cables

- Cable length: max. 3 m
- Cross section: max. 1.5 mm²
- 3 phase CTs without common point on a screw-on terminal block (6 wires)
- MF1: mounting with or without common point (4 or 6 wires)

For MF1 split core CTs:

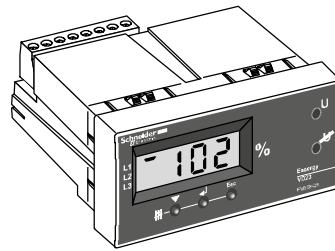
- Mount the 3 CTs facing in the same direction.
- Run the earth braid of the MV cable screen back inside the CT.



Type	Ref.	Product	Description
	EMS58401	Amp21D	MV ammeter
CT1	59925	CTR2200	Phase CT for RM6 cubicle
CT2	59963	MF1	Phase CT for cable (split toroid)
	59928	Set of 3 connectors for MF1	3 crimp-on connectors (wires not supplied)
	59962	Connecting harness for MF1	Connecting harness for MF1 for assembly 4 wires (A or B type)

Voltage Detection Relay

NOTE: The VD23 voltage detection relay does not apply to the RM6 Connected Advanced unit.





The VD23 is a voltage presence and absence detection relay. It uses the VPIS V2-V0 as sensor, and operates with a 24 or 48 Vdc external power supply.

Operation

Calibration

At power up, the VD23 automatically detects voltage presence and the network frequency, and then performs self-calibration.

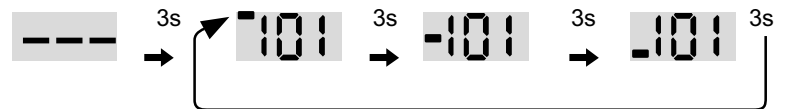
 : automatic frequency detection

 : calibration performed

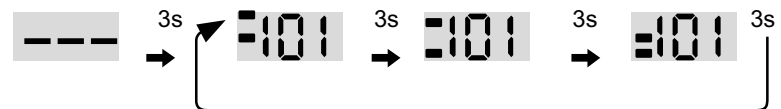
Measuring mode

3 seconds after calibration, the VD23 displays, by scrolling, the percentages of the nominal voltage detected on each phase.

Line- to- neutral voltages



Line- to- line voltages



■ Detection of voltage presence:

When the voltage percentage becomes greater than the set threshold for all the configured phases, then the VD23 lights the voltage presence indicator and activates (or releases in inverted mode) relay R1.

■ Detection of voltage absence:

When the voltage percentage becomes less than the set threshold for all the configured phases, then the VD23 lights the voltage absence indicator and activates (or releases in inverted mode) relay R2.

Detection Sequence

Configuration: voltages V1,V2,V3, direct mode

R1: terminal **15** = relay rest position: voltage loss on at least one of the phases

R2: terminal **18** = relay rest position: voltage presence on at least one of the phases

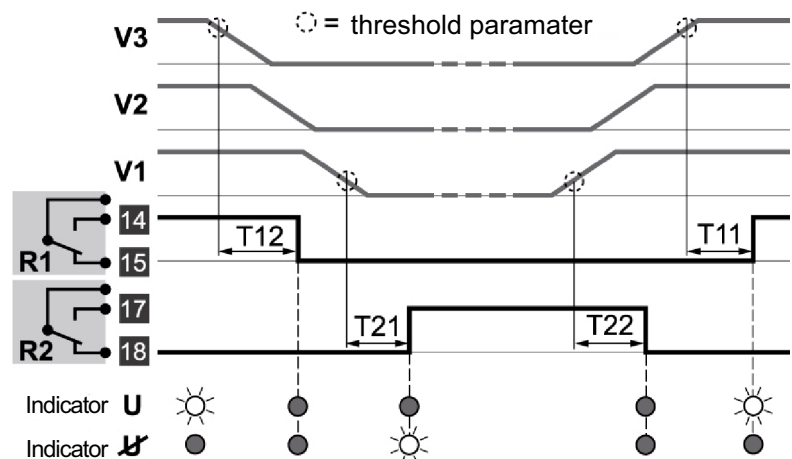
A configurable time delay is applied for control of R1 and R2:

T12 = time delay for R1 changeover upon voltage loss

T11 = time delay for R1 changeover upon voltage recovery

T21 = time delay for R2 changeover upon voltage loss

T22 = time delay for R2 changeover upon voltage recovery



Mode selection

Measuring mode

Test mode

Configuration mode
Parameters defined by micro switches

Parameters setup mode
To set the parameter values, see the section below

Calibration mode

Product name: wd23 3s | Software version: v1.00 3s | Network frequency: Fr.50 ou Fr.60 3s | Digits test: 8888 3s

Type of measurement: LL | Relay output: OUT | Phase 1: L1 | Phase 2: L2 | Phase 3: L3 | Residual voltage: L0

line- to- line | inverted | measured | measured | measured | measured

line- to- neutral | direct | not measured | not measured | not measured | not measured

Phase voltage threshold: 40 to 90 % of nominal voltage (10% increments)

Residual voltage threshold: 30 to 60 % of nominal voltage (10% increments)

Activation time delay R1 (direct): 0 to 3 | 0 to 1 s (0.1s increments) | 1 to 21 s (2s increments)

Release time delay R1 (direct): 0 to 3 | 0 to 1 s (0.1s increments) | 1 to 3 s (0.5s increments)

Phase voltage threshold: 10 to 30 % of nominal voltage (10% increments)

Activation time delay R2 (direct): 0 to 21 | 0 to 1 s (0.1s increments) | 1 to 21 s (2s increments)

Release time delay R2 (direct): 0 to 21 | 0 to 1 s (0.1s increments) | 1 to 3 s (0.5s increments)

Automatic calibration: OFF or On | Set to OFF to retain the last calibration performed

Forced calibration: d0 1s | done | Error in calibration: voltage levels too low

Configuration of Thresholds and Time Delays

The parameter values (white screen in the above diagram) can be modified as follows:

- when the value of the parameter is displayed, a press on the **↵** key causes the display to flash for 5 s
- during flashing, press successively **▼** to display the desired value
- confirm this value by pressing the **↵** button; without confirmation within a period of 15 s, return to display of the parameters without change in the value.

Each press on the “Esc” button takes you back to the preceding stage.

Suggested choice for VD23 settings

Voltage detector	Earthed or impedant grounding	Isolated neutral	Compensated neutral
SW 1 SW 2	3 4 5 6 $\overline{V1+V2+V3+V0}$ $V1.V2.V3.V0$ R1		
SW 1 SW 2		3 4 5 6 $\overline{U12+U13+U23}$ $U12.U13.U23.$ R1	3 4 5 6 $\overline{U12+U13+U23}$ $U12.U13.U23.$

Access to the Cable Compartments

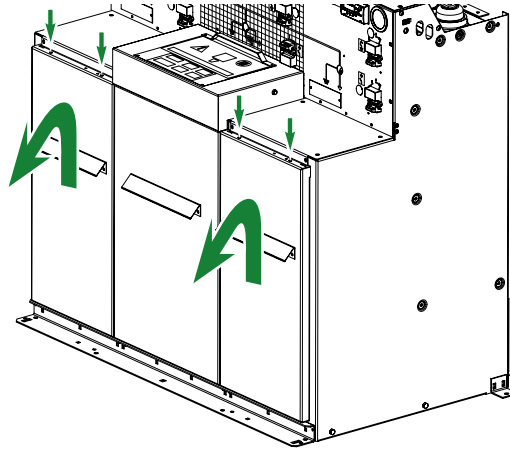
Access to the Cable Connection Compartments without Interlocking

⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

The HV cables must be de-energized to access to the compartments.

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



Open the switch and close the earthing switch. To remove an access panel, remove the 2 upper screws, lift and pull towards you.

Connection on Busbar (O function and T function)

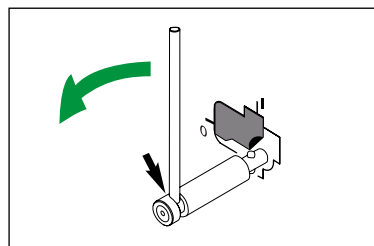
⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- The complete switchboard (all the RM6 connected together) must be de-energized to connect O or T function.
- Open all switches connected to the busbar.
- Close all associated earthing switches.

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

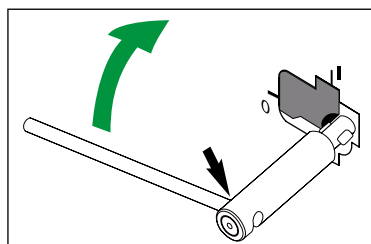
Access to the Cable Connection Compartments with Interlocking (optional)



Functional unit in operation, switch closed. The access panel is locked. Open the switch. The access panel remains locked.

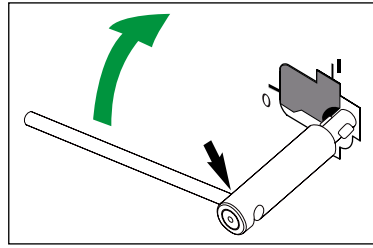
Optionally

Switch and circuit-breaker closing is inhibited if the access panel is removed.

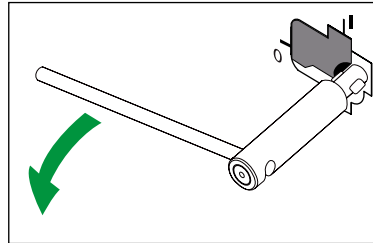


Close the earthing switch. The access panel is released. Access panel removed, the earthing switch can now be re-opened.

Earthing switch open: the access panel cannot be put back. If the connectors so allow, DC current can be injected to monitor cable insulation or search for faults.



Close the earthing switch.



Put back the access panel. Open the earthing switch.

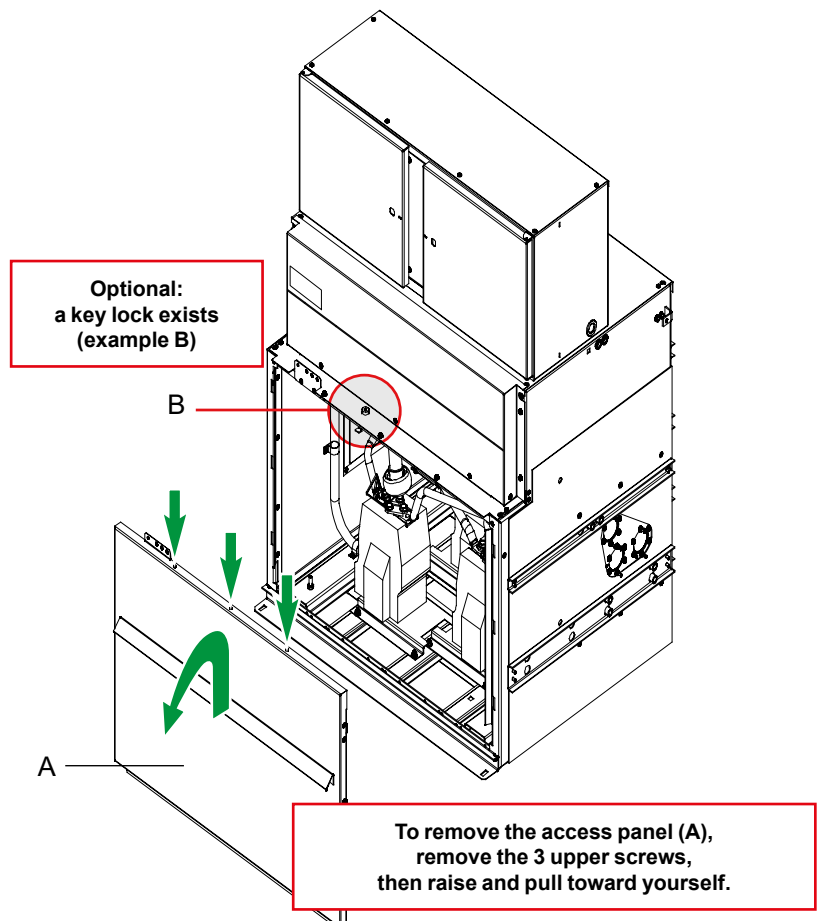
Access to the MV Compartment of the DE-Mt Cubicle

⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Before any intervention inside the DE-Mt cubicle, be sure all upstream connection(s) are locked-out in OPEN position.
- Before any intervention inside the DE-Mt cubicle, be sure all downstream connection(s) are locked-out in OPEN position.
- Before any intervention inside the DE-Mt cubicle, be sure the 3 busbars are grounded, via a temporary connection or via an earthing switch (upstream or downstream).

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



Preventive Maintenance

Standard Operating Conditions

Maintenance Summary Table

description	operation	material
panelling	cleaning	cloth
earthing covers	cleaning	sponge, clear water



SOLVENTS AND ALCOHOL FORBIDDEN



HIGH-PRESSURE CLEANER FORBIDDEN

Panelling

Schneider Electric draws your attention to the risk of using high-pressure cleaning processes.

Schneider Electric cannot therefore guarantee the reliability of equipment that has been cleaned in this manner, even if cleaning has been followed by lubrication.

The main drawbacks of this process are:

- deterioration due to jet pressure and impossibility of relubricating the inaccessible fixing points.
- risk of overheating due to presence of solvent on the contact zones.
- elimination of special protections.

Earthing Covers

This operation can be performed in event of excessive soiling.
Clean using a sponge and clear water. Do not use alcohol or other solvents to clean.

Maintenance Cycle and Operations

This device is designed to operate for 30 years or for 1000 operations in normal conditions of use as per standard IEC 62271-1.

The following are recommended:

- an O/C operation every 6 years for motorized functional units and/or functional units with a latching mechanism (Q and D/B function);
- replacement of batteries is recommended every 4 years;
- inspection every 5 years of the condition of the mechanisms (pollution, corrosion) and the cleanliness of the earthing covers (pollution).

Harsh Operating Conditions

To ensure proper operation of the RM6 in harsh operating conditions, do regular maintenance of the cubicle and its installation.

Recommended inspection frequency: at least once a year.
During the inspection, check the 6 following points:

Illustration for an RM6 Connected Advanced unit:

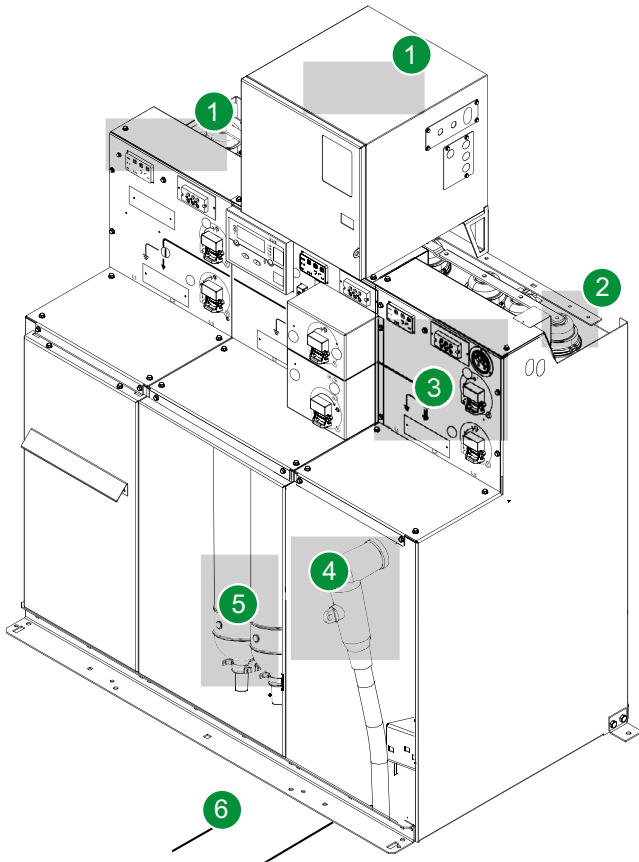
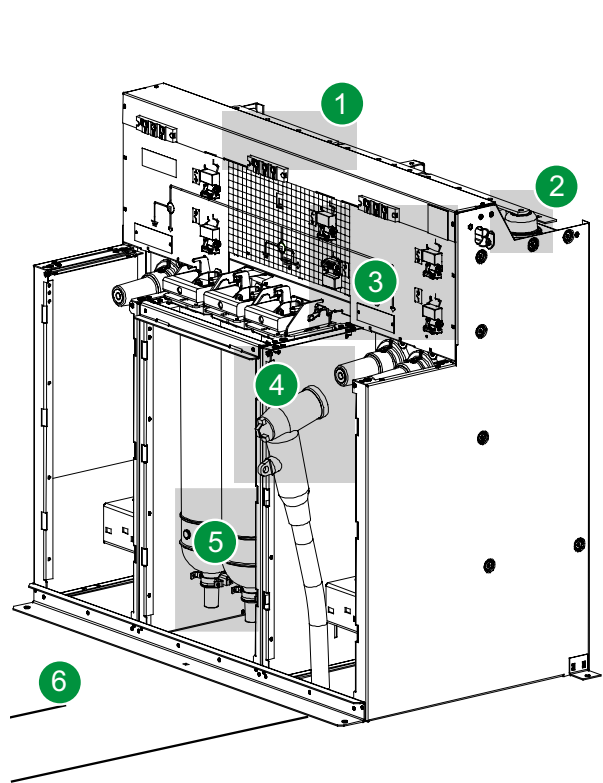


Illustration for an RM6 unit:



1 LV compartment

symptoms: condensation, presence of humidity
check: for rust on the LV electric and electronic parts

solutions:

- dry the environment
- replace the damaged parts

4 MV socket and cable

symptoms: presence of corona discharge or odours
check: connections (may be damaged)

solutions:

- fit new sockets

2 earthing covers

symptoms: humidity, dust
check: surface cleanliness

solutions:

- dry the environment
- clean using a clean cloth and water (no alcohol or solvent)

5 fuse compartments

symptoms: humidity, dust
check: proper operation of the VPIS

solutions:

- clean the outside surface of the fuse compartments using a cloth and clear water

3 operating mechanisms

symptoms: humidity, condensation on live parts
check: for red rust on moving parts

solutions:

- find and treat the origin of condensation phenomena
- follow up the damage
- replace the operating mechanism if required (refer to reference: 07897270)
- fit heating resistances (optional)

6 trench

symptoms: humidity,
check: for presence of water in the trench

solutions:

- pump out water
 - drain the trench (if necessary add sand)
- In case sand is added in the trench, take care that the cables are still fixed correctly and that no additional stress is added to the bushings.

Corrective Maintenance

Foreword

The corrective maintenance operations enable replacement of subassemblies. The operations listed in the following summarising table can be performed by the customer or by Schneider Electric after-sales representatives. After each operation, perform the electrical tests according to current standards.

- On replacement, all the following accessories must be replaced with new equipment:
 - self-locking nut;
 - contact washer;
 - locking rings;
 - mechanical pin.
- To access the various devices:
 - open the switches;
 - close the earthing switches;
 - cut the supply to the LV circuits.

Maintenance Summary Table

	description	realisation
A	replacing a voltage presence unit	Schneider Electric or Customer
B	replacing a fuse (MV)	Schneider Electric or Customer
C	replacing the charging motor	Schneider Electric or Customer
D	replacing a printed circuit	Schneider Electric or Customer
E	replacing the LV contact	Schneider Electric or Customer



Replacing a Voltage Presence Unit

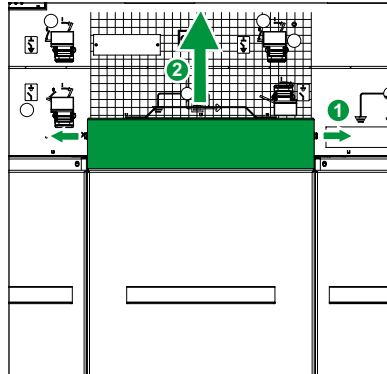
Refer to VPIS installation and maintenance guide reference **NT00395** for details.

B Replacing a Fuse

Removal

Standard IEC 252 paragraph 23.2 recommends replacement of the 3 HV fuses after blowing of one of the fuses.

Before performing the following operations, check that the earthing switch is closed.



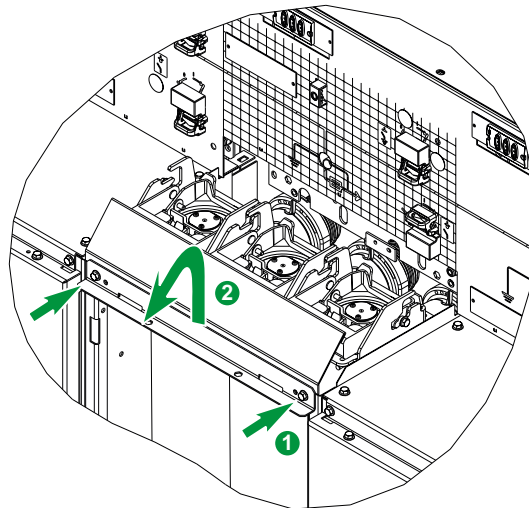
To remove the cover, remove the 2 screws on each side of the cover then lift it and pull it towards you. The instructions are visible on the cover.



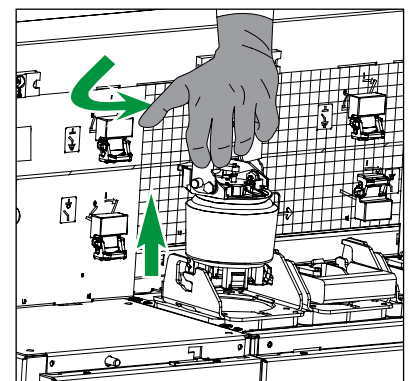
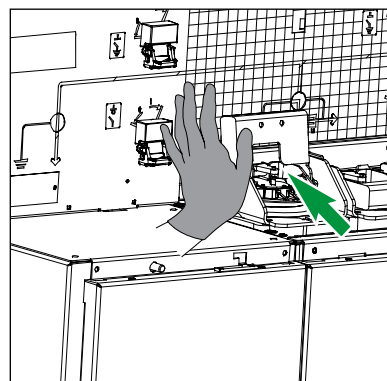
INFORMATION

In the case of an internal arc station, it is possible to disassemble the deflector to have a better accessibility.

Therefore, remove the 2 screws on each side, then pull it towards you.

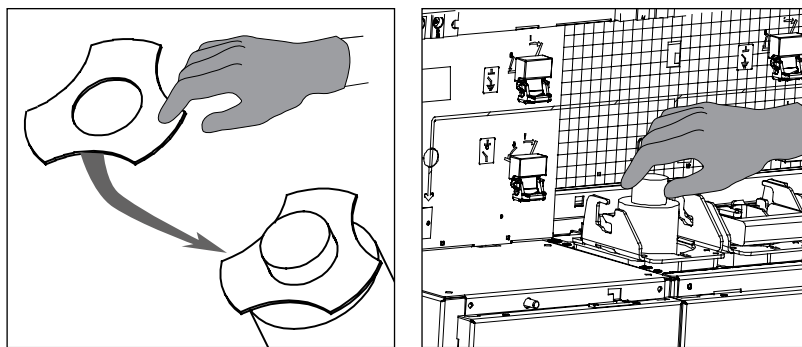


Repeat the following operations for all 3 fuses.



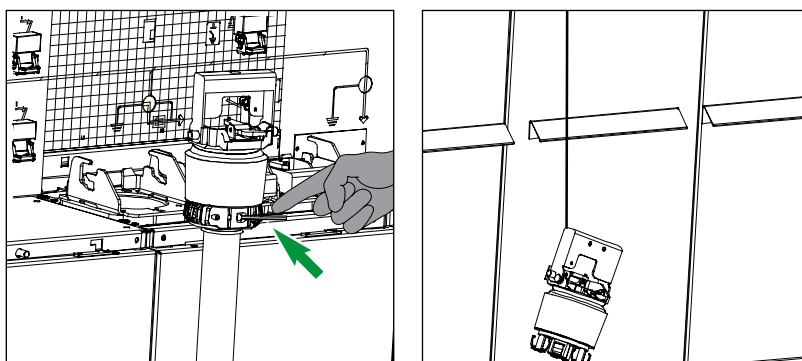
Release the plug and push the extraction handle manually to unlock the plug (tap with the palm of your hand to separate the seal from the plug if necessary). Move the plug up to the limit stop, swivel it towards the left to remove it.

Removing a DIN Fuse (Fusarc CF)



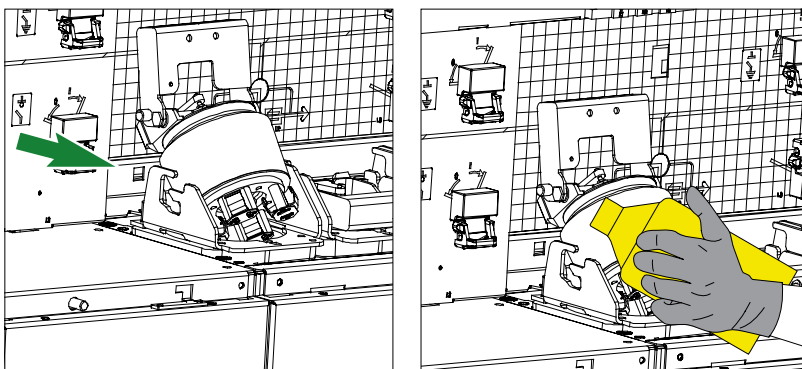
Recover the centring device at the top of the fuse. Extract the fuse.

Removing a UTE Fuse (Solefuse)



Loosen the fuse using an Allen wrench n°5. Let the plug hang down from its supporting string.

Cleaning the Plugs

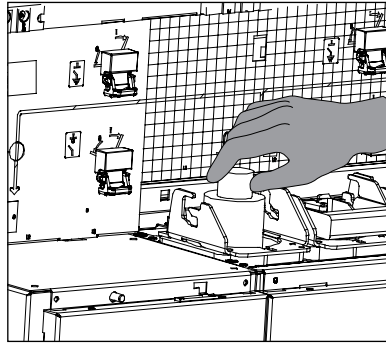


If the fuse plugs are dirty, clean the conical surface using silicon oil. Then wipe it down with a clean cloth to dry it.

Talc the clean surface with natural talc to avoid clinging between the plug and fuse compartment. The surface must appear smooth without lumps.

Fitting a DIN Fuse

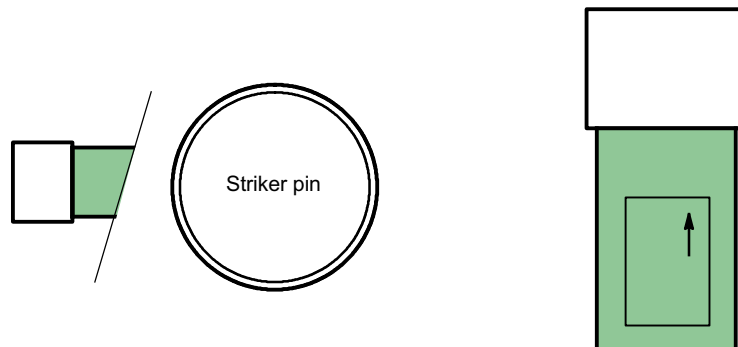
Do not install a fuse that has been knocked. A test prior to installation using a monitor is recommended.



Insert the fuse in the compartment. Fit the centring device on the fuse. Insert the plug pins in the plinth and turn clockwise.

Fitting a Fuse with Striker

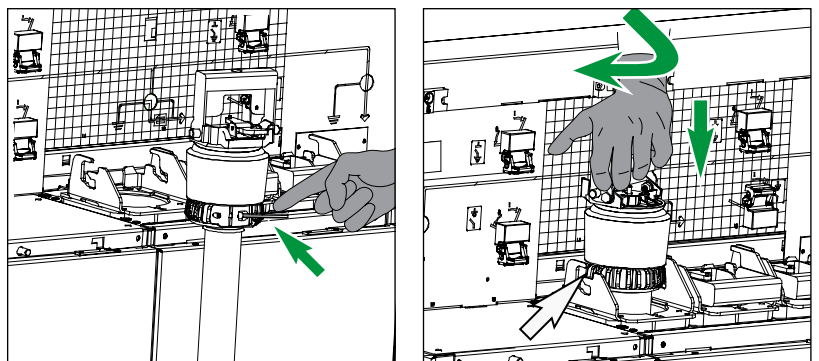
Fuse blowing releases a striker that causes three-phase opening of the switch and prevents it from reclosing.



The end of the fuse equipped with the striker is marked. The technical data and mounting direction of the fuse are printed on the body (striker facing upwards).

Fitting a UTE Fuse

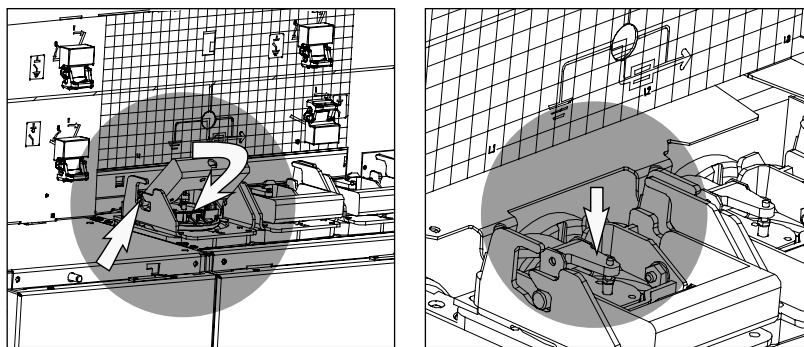
Do not install a fuse that has been knocked. A test prior to installation using a monitor is recommended.



Fix the fuse on the plug using an Allen wrench n°5 and insert the fuse in the compartment. **Tightening torque: 15 N.m**

Insert the plug and fuse assembly in the compartment. Insert the plug pins in the plinth and turn clockwise.

Locking the Plug



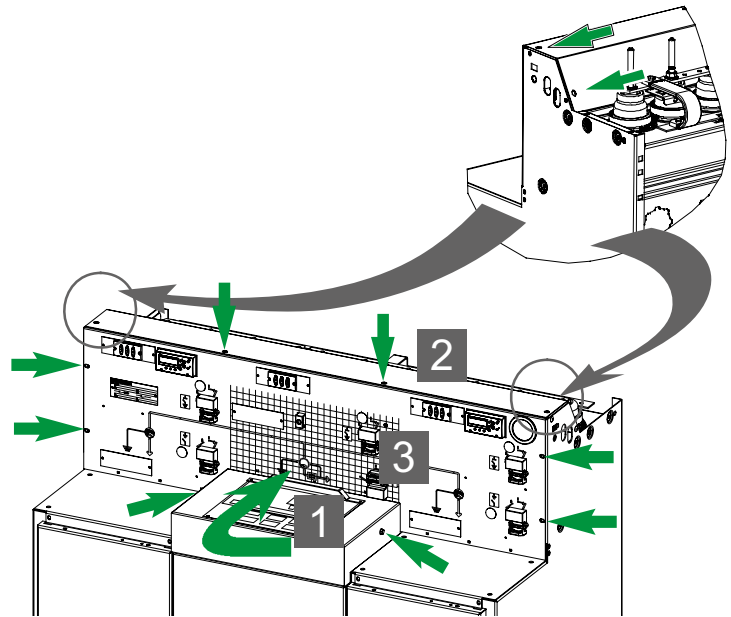
Make sure that the handle trunnions are inserted in the plinth slots and lock the plug.
Never use the operating lever to lock the plug.
For replacement of a fuse that has struck, press the switch to put it back in position.

Replacing a Charging Motor

Access to the LV Compartment



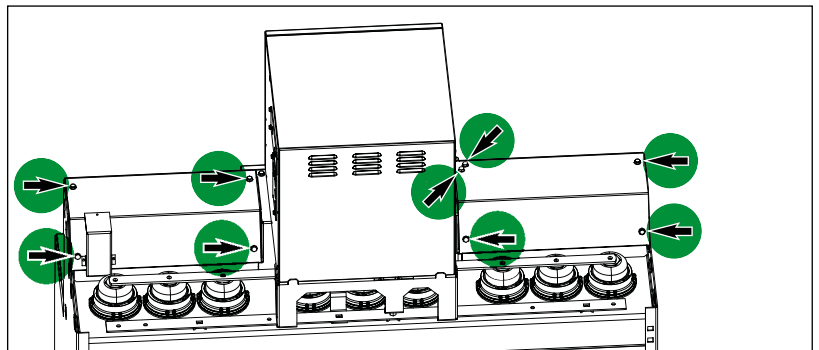
■ Illustration for an RM6 unit:



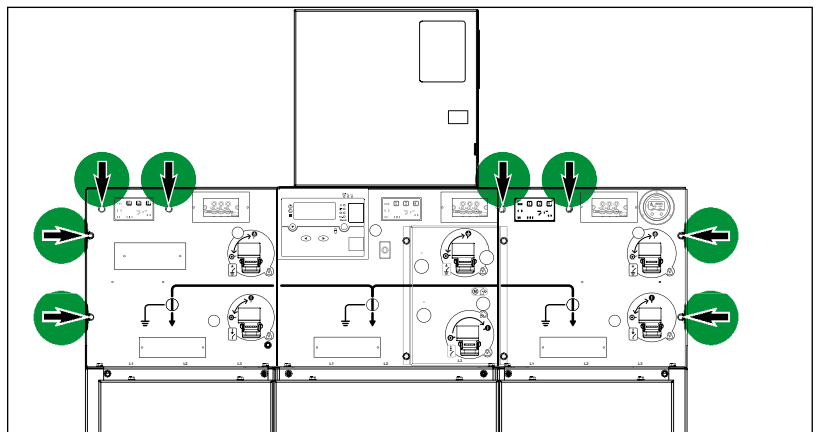
- 1 - Unscrew the 2 screws of the fuse compartment cover then remove it by pulling it towards you.
- 2 - Remove the LV connection access trunking (6 screws HM6x16).
- 3 - Remove the mimic panel front plate (4 screws HM6x16).

Reassemble in opposite order to disassembly.

■ Illustration for an RM6 Connected Advanced unit:



- 1 - Remove the LV connection access trunking (9 screws HM6x16).

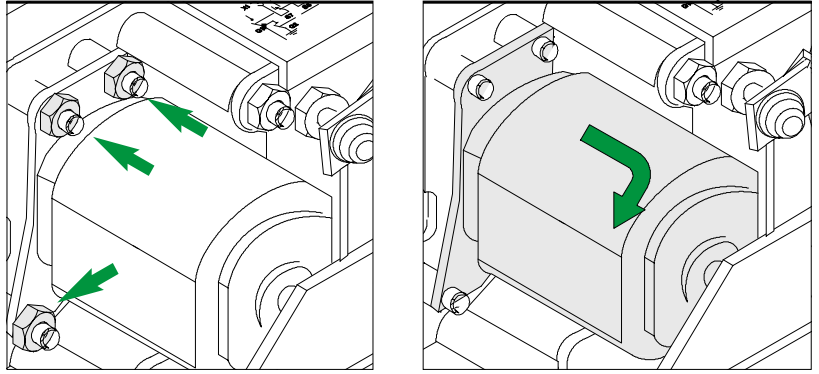


- 2 - Remove the mimic panel front plate (8 screws HM6x16).

Reassemble in opposite order to disassembly.

Removing a Charging Motor

Before removing a charging motor, check that the LV circuit is de-energized.



Remove the 3 nuts fixing the motor support. Disconnect the motor supply wiring.
Remove the motor support by pulling it backwards.

Fitting

Fit the new motor in the opposite order to removal.

Tightening torque: 28 N.m.

Fit the trunking and the cover.

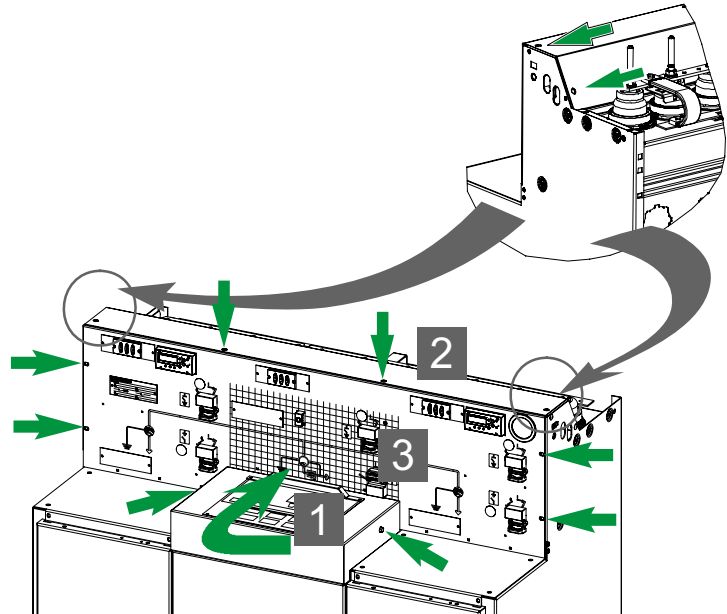
D Replacing a Printed Circuit

Reminder

All the following operations are done without LV.
Auxiliary power supply must be cut off.

Access to subassembly

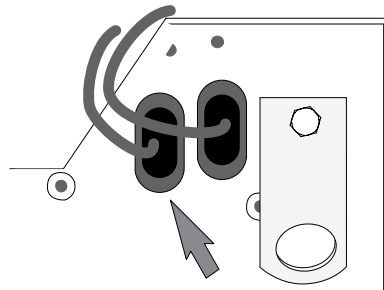
using switch function
Example: for an IPI substation.
■ Open switch
■ Closed earthing switch



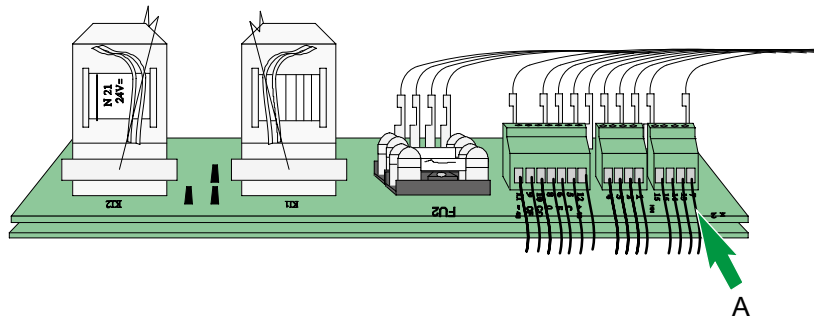
- 1 - Remove the fuse compartment cover (2 x screws pull towards you).
- 2 - Remove the LV cable trough 6 screws (HM6x16).
- 3 - Remove the mimic panel front plate (4 x (HM6x16) screws).

Disconnect the connecting cable

For the corresponding function

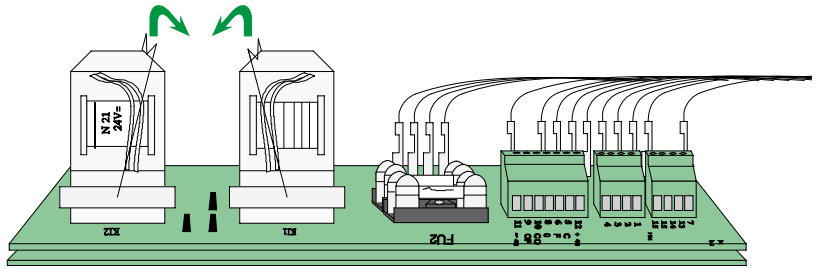


Threading of connecting cables.

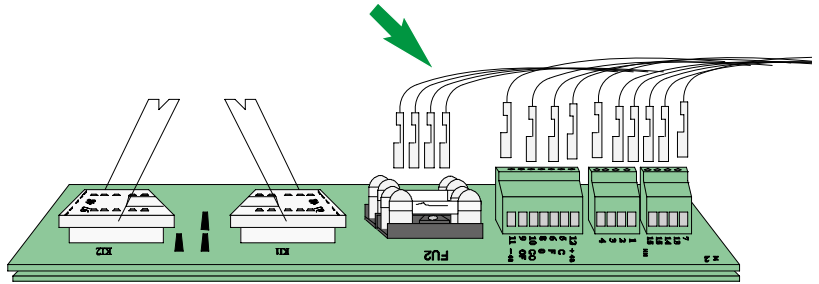


Disconnect the wiring at the printed circuit terminal block A level.

Recover the 2 relays, then the 2 fuses on the front plate to be replaced.

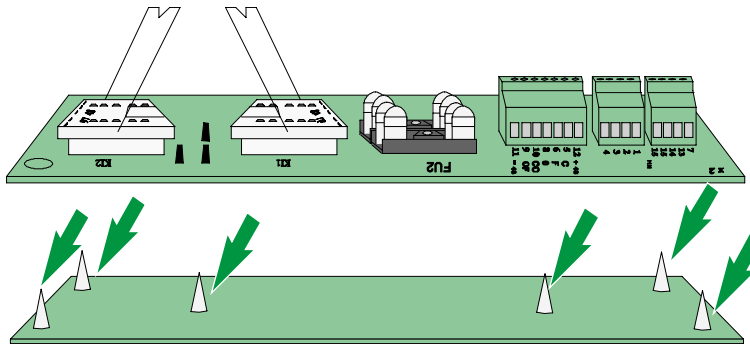


Remove the 2 printed circuit relays.



Disconnect the printed circuit plate wiring.

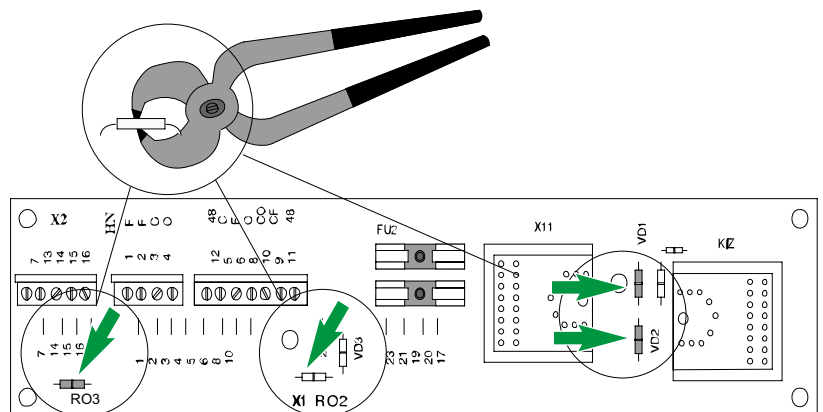
Remove the circuit board plate



Unclip the printed circuit plate. (6 anchoring points).

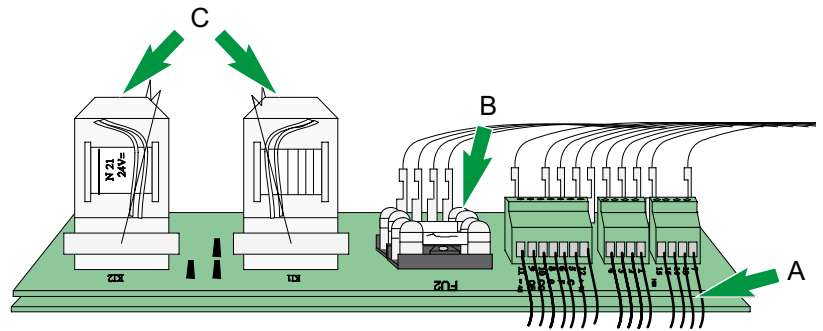
Preparing the new circuit board front plate

Do not forget to cut the 3 diodes (including VD1 and VD) and the printed circuit R03 jumper cable.



Using a wire cutter, locate the diodes and the jumper cable to be eliminated (6 anchoring points). The components cannot be reused.

Placing the new circuit board front plate



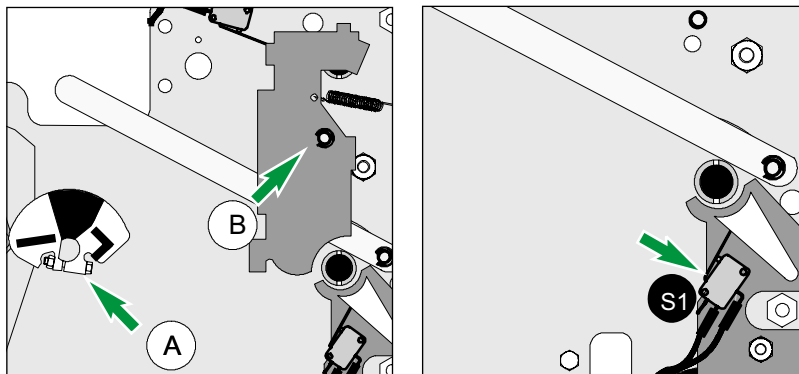
Reassemble the 2 relays **C**, then the 2 fuses **B**. Install the new front plate.
Reconnect the wiring at the printed-circuit terminal block and customer power supply level **A**.

E Replacing the LV Contacts

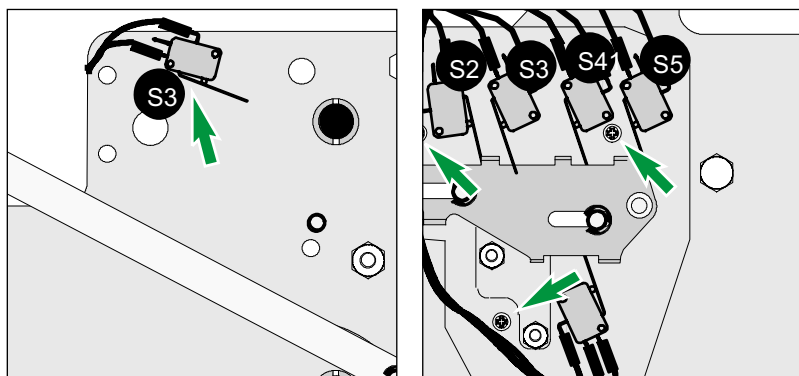
Removal

Check that the LV circuit is de-energized.

Disassemble the pilot light support.

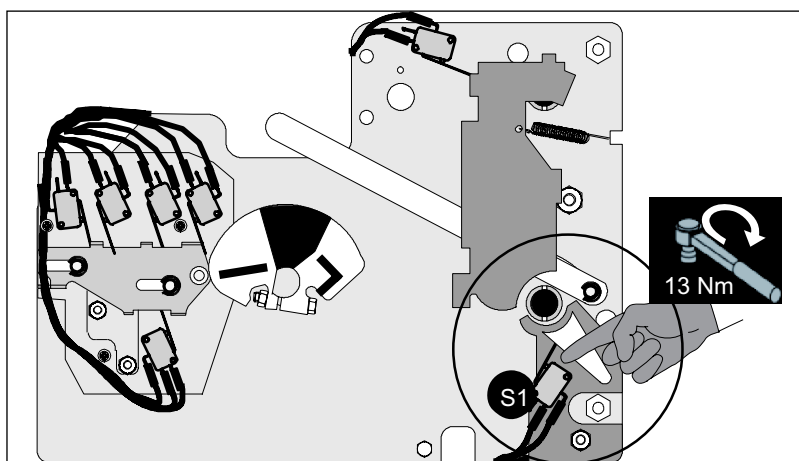


Remove the position indicator **A**. Remove interlocking **B** (elastic ring and spring). Remove contact support **S1** without disconnecting the wiring.



Remove contact **S3** without disconnecting the wiring. Remove the contact support **S2, S4, S5, S6** and **S7** without disconnecting the wiring.

Fitting the Contacts and Wiring Connection



Fit contacts **S1** to **S7** to replace the former contacts. Fit the position indicator and interlocking. Disconnect the contact wiring **S1** disassembled, and connect it to the new contact. Repeat this operation for all the contacts (**S2** to **S7**).

Processing of SF6 Gas when Dismantling the Equipment

Reminder: Disposal of the Equipment at End-of-Life

Pressured gas inside

This equipment contains SF6 gas.
SF6 is a powerful greenhouse gas and is harmful for the environment.

SF6 characteristics

The mass of SF6 is mentioned on a specific label stuck near the filling point.
GWP (Global Warming Potential) of SF6 = 22800, 1 kg of SF6 is equivalent to ~23 tons of CO2.

Process at end-of-life

Prior to disposal of the equipment at end-of-life, the SF6 gas must be recovered in order for it to be recycled, reclaimed or destroyed.

In any case SF6 must not be released to the atmosphere.

According to European regulation (EU 517/2004), people recovering SF6 from this equipment must be certified.

The minimum SF6 recovery vacuum pressure must be < 20 mbar.

The SF6 recovered must be weighed. The mass of SF6 recovered must be the mass indicated on the label.

Schneider Electric offers a complete service to dismantle and recycle Medium Voltage equipment and SF6 gas at end-of-life. This service is compliant with IEC 62271-4 and conforms to local regulations.

Contact Schneider Electric for details.

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www.schneider-electric.com

As standards, specifications and designs change from time to time, please ask for confirmation of the information given in this publication.

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