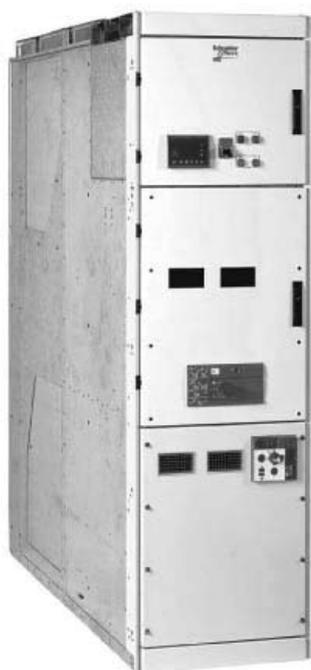


Medium Voltage Distribution

NEX

Air insulated switchboard
Withdrawable circuit breaker 24 kV

Instruction for use
July 2009



Content

Note: the subject of this new version of this user guide is about the annexe "Adaptation/instructions - Replacement of the voltage presence type VPIS 1 by type VPIS 2 and VPIS 2 by VPIS 2", updated on July 2009.

General	3
Glossary	3
Recommendations	3
Standard tightening torques	3
General description	4
IF - Incomer/Feeder cubicle without VT or with fixed VT	4
IF - Incomer/Feeder cubicle with withdrawable VT	5
IF - Incomer/Feeder cubicle with top entry via cables	6
IF - Incomer/Feeder cubicle with top entry via busbars	7
BM - Busbar metering cubicle	8
BC - Busbar coupler cubicle without VT	9
BC - Busbar coupler cubicle with VT	10
RF - Busbar riser cubicle fixed connections	
with withdrawable VT	11
RW - Busbar riser cubicle withdrawable connections	
with withdrawable VT	12
LB - Fuse switch feeder cubicle	13
ID - Incoming direct to busbar cubicle	14
Identification	15
Front panel	16
Symbols	17
Removable part extraction table	18
List of accessories supplied with the switchboard	18
Access to interior of the cubicle	19
Access possibilities to the cubicle	19
Extracting the removable part	20
Installing the removable part	22
Access to the MV cable connection compartment	23
Installation and operation recommendations	26
Long term switchgear performance	26
Tests arrangements	27
Voltage presence on MV cables	27
Checking phase concordance	27
MV cable tests	27

Content

Operating instructions	29
IF-BC-RW cubicles	
Circuit-breaker plug-in procedure	29
Circuit-breaker withdrawal procedure	30
Earthing switch closing procedure	31
Earthing switch opening procedure	32
Voltage transformer plug-in procedure	33
Voltage transformer withdrawal procedure	34
Locking and prevention by 6 to 8 mm diameter padlocks	35
Interlocking by locks (option)	36
Interlocking by electromagnet (option)	36
Interlocking the earthing switch	36
LB Fuse switch cubicle	37
Operation and position indication	37
Earthing switch opening procedure	37
Switch disconnecter closing procedure	38
Switch disconnecter opening procedure	38
Earthing switch closing procedure	39
Fuse indications	40
Padlocking	40
Operating safety	40
Preventive maintenance	41
Trouble shooting	41
Annexe	43
Adaptation/instructions - Replacement of the voltage presence type VPIS 1 by type VPIS 2 and VPIS 2 by VPIS 2	43

Glossary

FU	Functional unit (cubicle + mobile part + relay unit)
IF	Incomer/Feeder cubicle
BC	Bus coupler
RF	Bus riser - Fixed type
RW	Bus riser - Withdrawable type
BM	Busbar metering
LB	Fuse switch feeder cubicle
VT	Voltage transformer
CT	Current transformer or current sensor
VPIS	Voltage Presence Indicating System
LV	Low voltage
MV	Voltage class 24kV
ES	Earthing switch
EVOLIS	Withdrawable circuit-breaker with vacuum breaking which is used in AD and CL cubicles
ET	Extraction table
ID	Incoming direct to busbar cubicle

Recommendations

Installation above the switchboard

All type of equipment installation such as lamp or light are forbidden.

Marking



It is compulsory forbidden to walk on the parts bearing this marking.



It is compulsory forbidden to remove the parts bearing this marking when the equipment is energised.

Standard tightening torques

(Non greased screws and bolts)

Application methods:

The elastic washers placed on the external sides of the pads and busbars ensure better distribution of stress regarding screws tightened to the recommended torques.

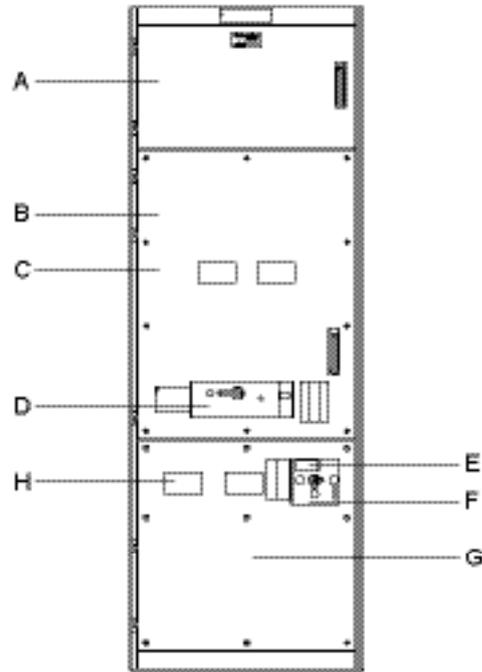
Screw	Torque in Nm
Ø 6	13
Ø 8	28
Ø 10	40
Ø 12	75
Ø 14	120

General description

IF - Incomer/Feeder cubicle without VT or with fixed VT

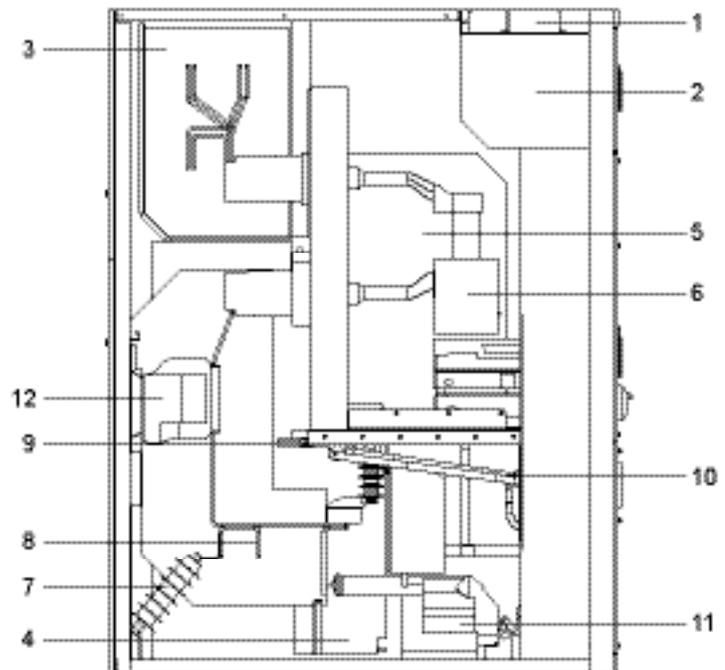
Front panel

- A: LV cabinet access door
- B: removable part compartment door
- C: removable part inspection window
- D: removable part operating and interlocking plate
- E: voltage indicators
- F: earthing switch operating and interlocking plate
- G: MV cable compartment access cover
- H: earthing switch viewing window.



Right-hand view

- 1: LV cable routing duct
- 2: LV cabinet
- 3: busbar compartment
- 4: VT and MV cable compartment
- 5: removable part compartment
- 6: removable part (Evolis circuit breaker)
- 7: surge arrestors (option)
- 8: MV cable connection point
- 9: earthing switch
- 10: earthing switch operating mechanism
- 11: fixed voltage transformer (option)
- 12: MV current transformers.

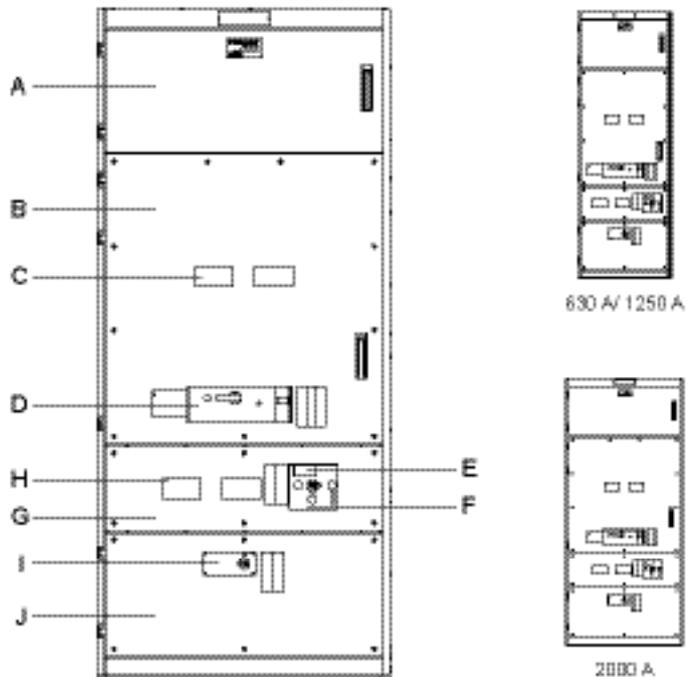


General description

IF - Incomer/Feeder cubicle with withdrawable VT

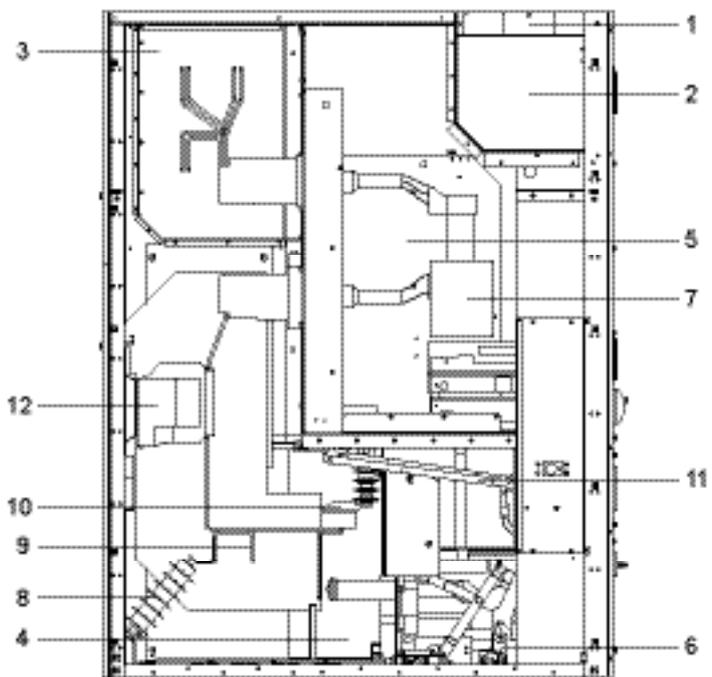
Front panel

- A: LV cabinet access door
- B: removable part compartment door
- C: removable part inspection window
- D: removable part operating and interlocking plate
- E: voltage indicators
- F: earthing switch operating and interlocking plate
- G: MV cable compartment access cover
- H: earthing switch viewing window
- I: withdrawable VT operating plate
- J: VT compartment access cover.



Right-hand view

- 1: LV cable routing duct
- 2: LV cabinet
- 3: busbar compartment
- 4: VT and MV cable compartment
- 5: removable part compartment
- 6: withdrawable VT compartment
- 7: removable part (Evolis circuit breaker)
- 8: surge arrestors (option)
- 9: MV cable connection point
- 10: earthing switch
- 11: earthing switch operating mechanism
- 12: MV current transformers.

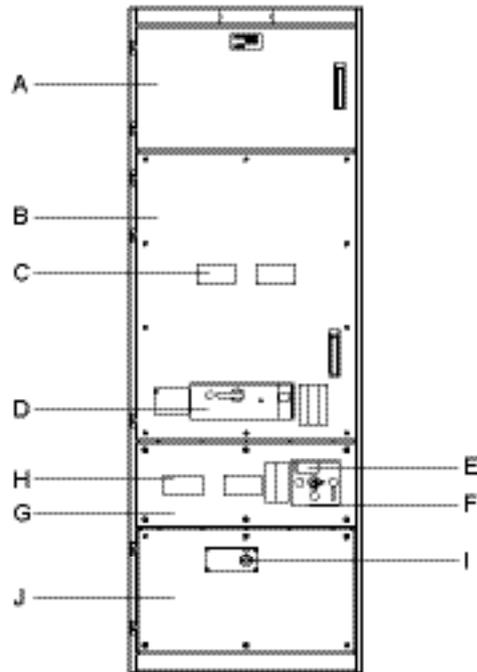


General description

IF - Incomer/Feeder cubicle with top entry via cables

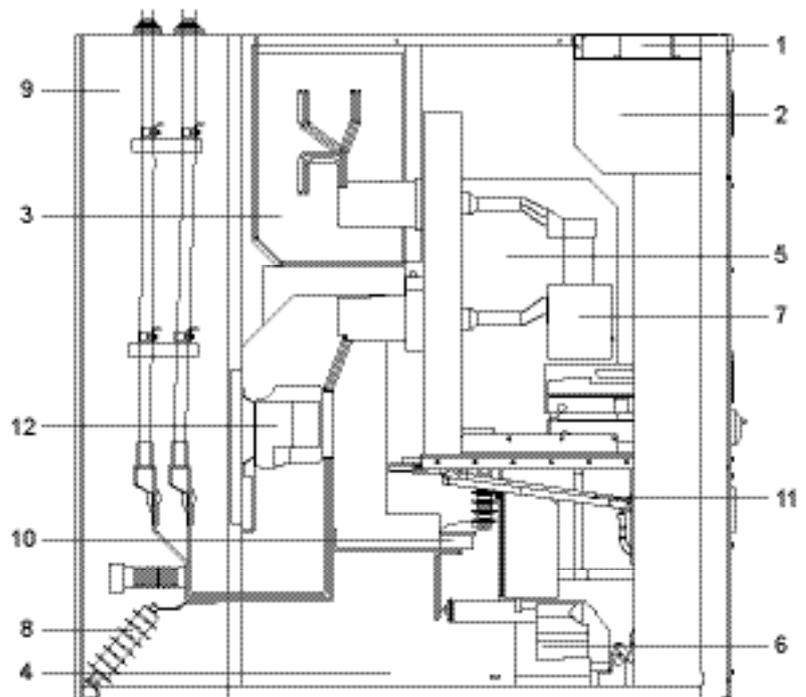
Front panel

- A: LV cabinet access door
- B: removable part compartment door
- C: removable part inspection window
- D: removable part operating and interlocking plate
- E: voltage indicators
- F: earthing switch operating and interlocking plate
- G: MV cable compartment access cover
- H: earthing switch viewing window
- I: withdrawable VT operating plate
- J: VT compartment access cover.



Right-hand view

- 1: LV cable routing duct
- 2: LV cabinet
- 3: busbar compartment
- 4: VT and MV cable compartment
- 5: removable part compartment
- 6: withdrawable VT compartment
- 7: removable part (Evolis circuit breaker)
- 8: surge arrestors (option)
- 9: cables compartment
- 10: earthing switch
- 11: earthing switch operating mechanism
- 12: MV current transformers.

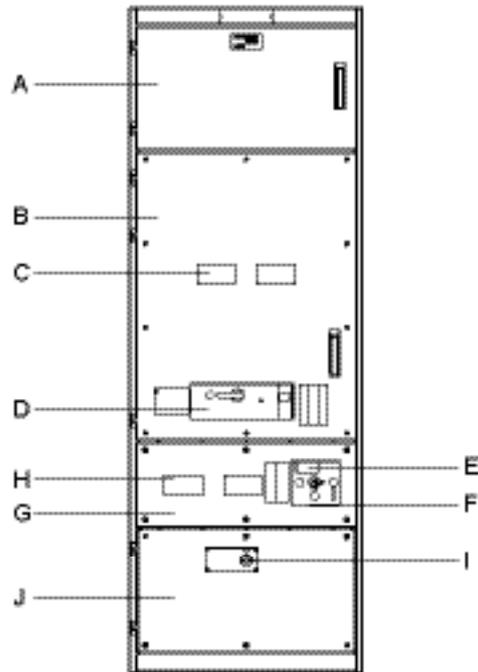


General description

IF - Incomer/Feeder cubicle with top entry via busbars

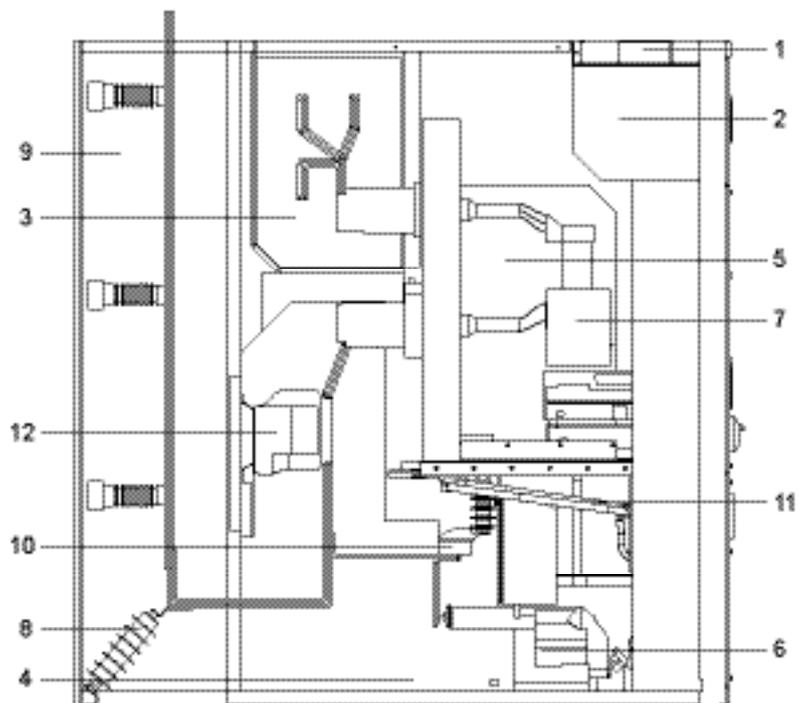
Front panel

- A: LV cabinet access door
- B: removable part compartment door
- C: removable part inspection window
- D: removable part operating and interlocking plate
- E: voltage indicators
- F: earthing switch operating and interlocking plate
- G: MV cable compartment access cover
- H: earthing switch viewing window
- I: withdrawable VT operating plate
- J: VT compartment access cover.



Right-hand view

- 1: LV cable routing duct
- 2: LV cabinet
- 3: busbar compartment
- 4: VT and MV cable compartment
- 5: removable part compartment
- 6: withdrawable VT compartment
- 7: removable part (Evolis circuit breaker)
- 8: surge arrestors (option)
- 9: busbars compartment
- 10: earthing switch
- 11: earthing switch operating mechanism
- 12: MV current transformers.

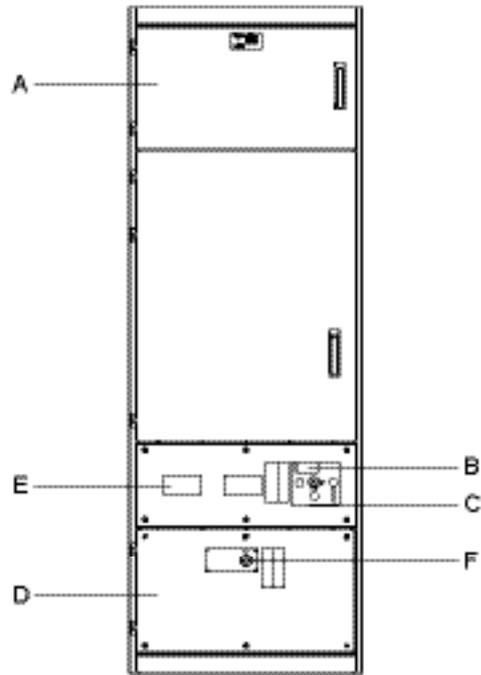


General description

BM - Busbar metering cubicle

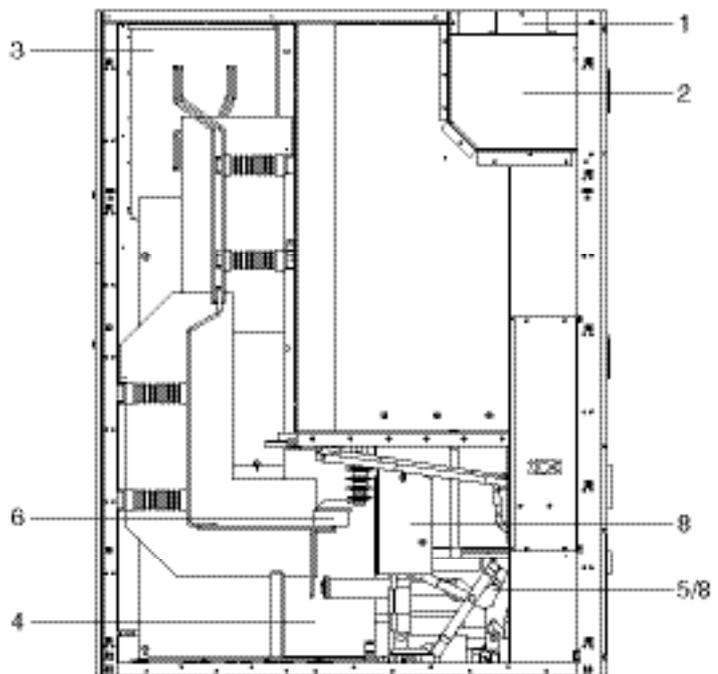
Front panel

- A: LV cabinet access door
- B: voltage indicators
- C: earthing switch operating and interlocking plate
- D: MV cable compartment access cover
- E: earthing switch viewing window
- F: withdrawable VT operating plate (option).



Right-hand view

- 1: LV cable routing duct
- 2: LV cabinet
- 3: busbar compartment
- 4: VT and MV cable compartment
- 5: VT compartment
- 6: earthing switch (option)
- 7: earthing switch operating mechanism
- 8: fixed and withdrawable voltage transformer (option).

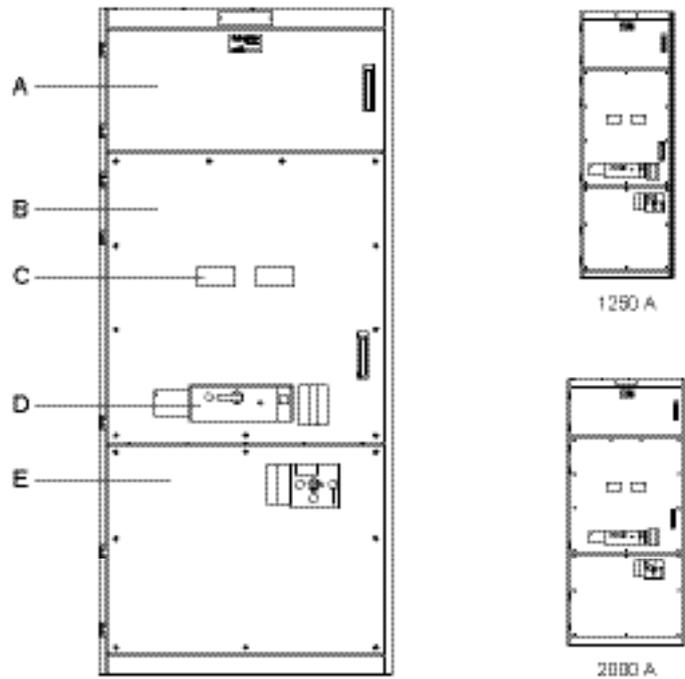


General description

BC - Busbar coupler cubicle without VT

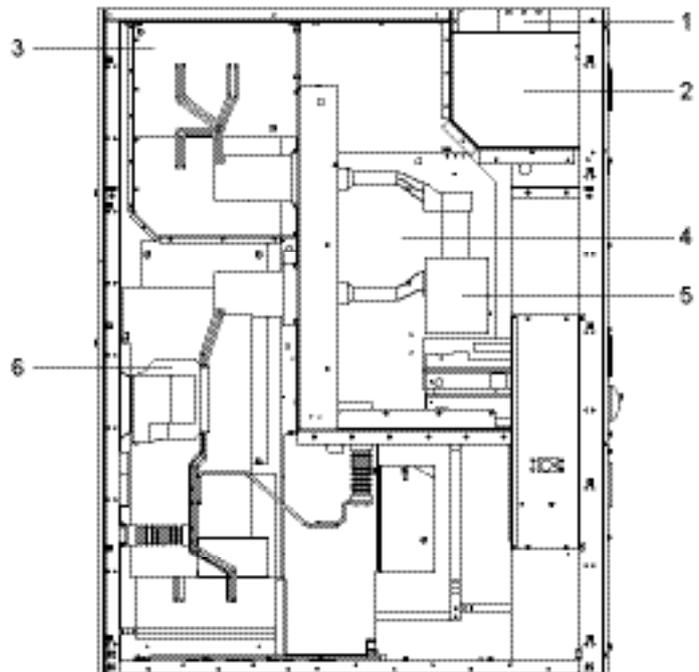
Front panel

- A: LV cabinet access door
- B: CB compartment
- C: inspection window
- D: CB operating and interlocking plate
- E: lower busbar compartment access cover.



Right-hand view

- 1: LV cable routing duct
- 2: LV cabinet
- 3: busbar compartment
- 4: CB compartment
- 5: CB (Evolis circuit breaker)
- 6: MV current transformers.

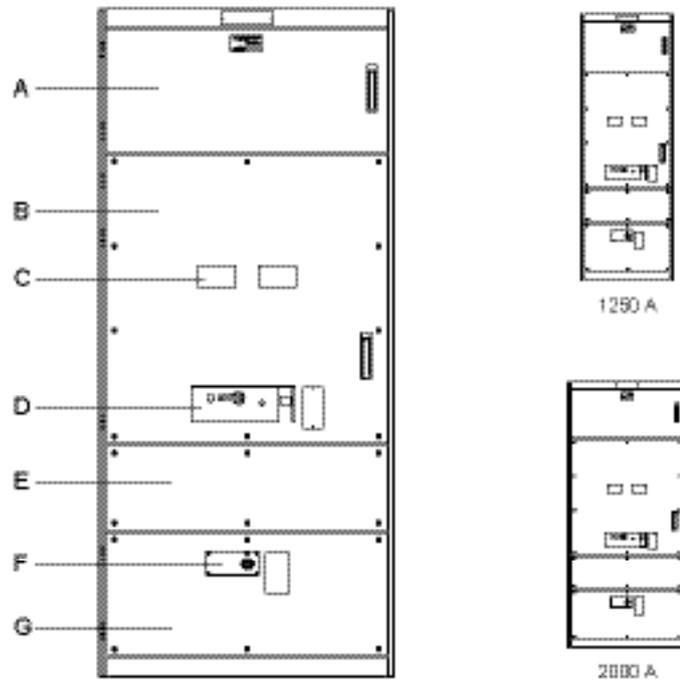


General description

BC - Busbar coupler cubicle with VT

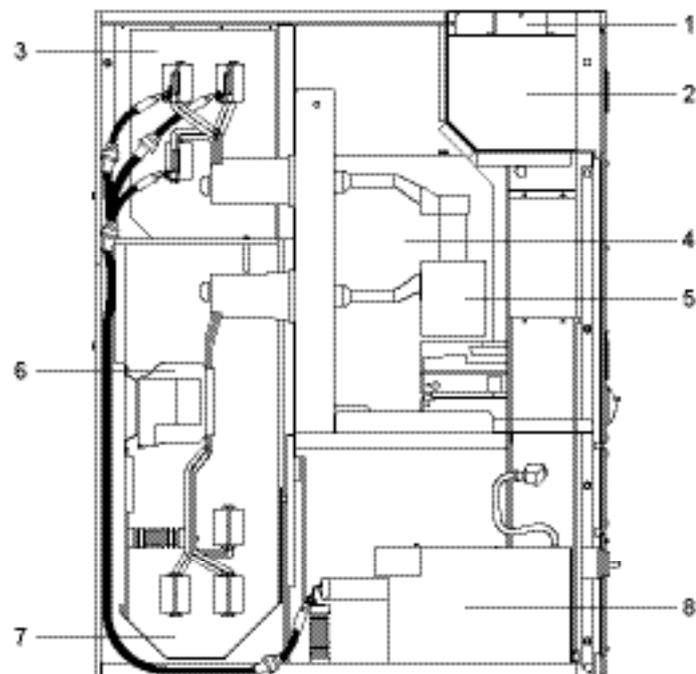
Front panel

- A: LV cabinet access door
- B: CB compartment access door
- C: inspection window
- D: CB operating and interlocking plate
- E: lower busbar compartment access cover
- F: VT operating plate
- G: VT compartment access door.



Right-hand view

- 1: LV cable routing duct
- 2: LV cabinet
- 3: upper busbar compartment
- 4: CB compartment
- 5: CB (Evolis circuit breaker)
- 6: MV current transformers
- 7: lower busbar compartment
- 8: withdrawable VT.

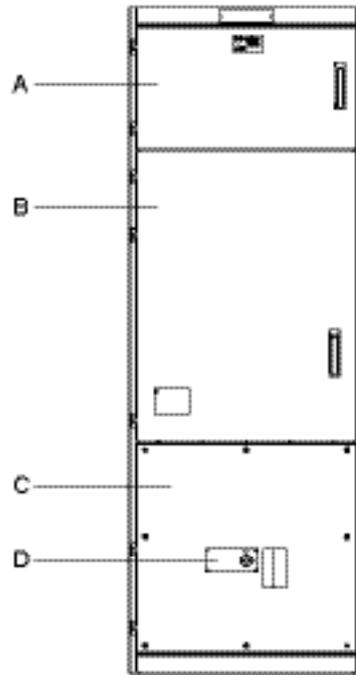


General description

RF - Busbar riser cubicle fixed connections with withdrawable VT

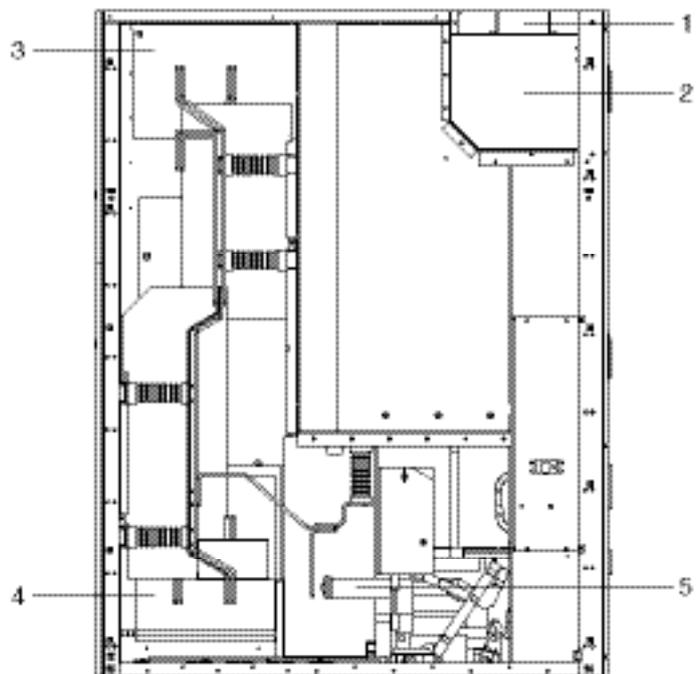
Front panel

- A: LV cabinet access door
- B: CB compartment door
- C: lower busbar and VT compartment access cover
- D: withdrawable VT operating plate.



Right-hand view

- 1: LV cable routing duct
- 2: LV cabinet
- 3: upper busbar compartment
- 4: lower busbar compartment
- 5: withdrawable VT.

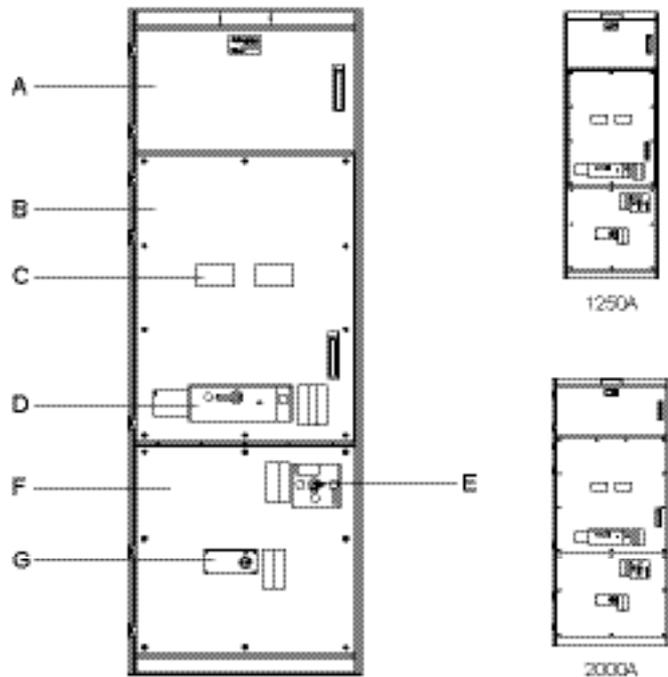


General description

RW - Busbar riser cubicle withdrawable connections with withdrawable VT

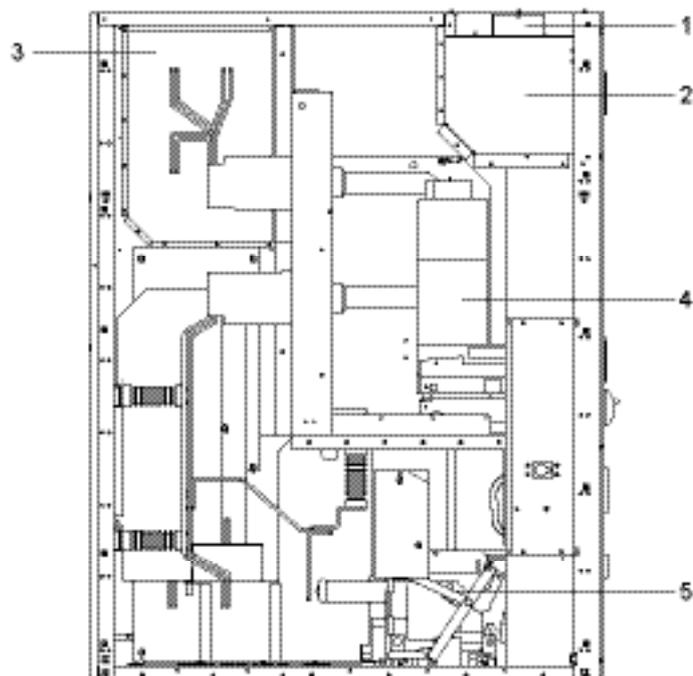
Front panel

- A: LV cabinet access door
- B: access door of the withdrawable part
- C: inspection windows
- D: operating and interlocking plate of the withdrawable part
- E: interlocking
- F: lower busbar and VT compartment access cover
- G: withdrawable VT operating plate.



Right-hand view

- 1: LV cable routing duct
- 2: LV cabinet
- 3: busbar compartment
- 4: withdrawable connections
- 5: withdrawable VT.

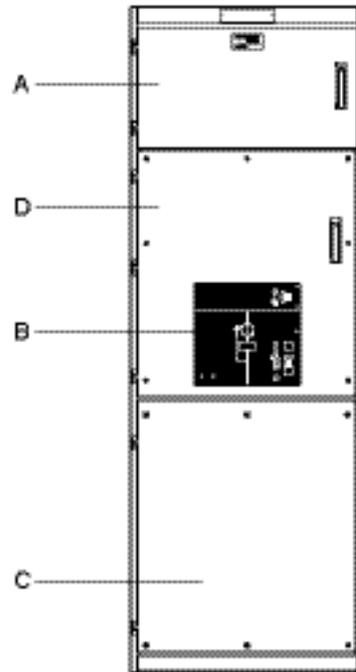


General description

LB - Fuse switch feeder cubicle

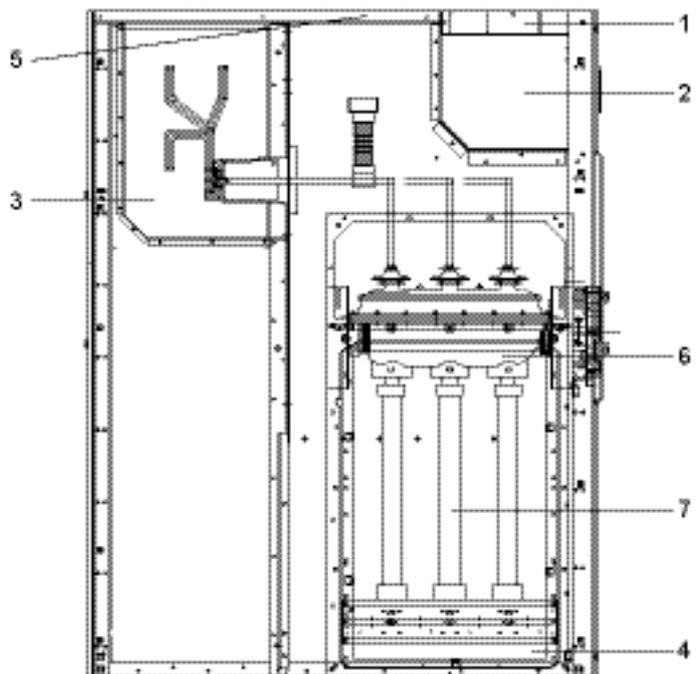
Front panel

- A: LV cabinet access door
- B: voltage indicator
- C: MV cable compartment access cover
- D: switch and fuse compartment access door.



Right-hand view

- 1: LV auxiliary circuits duct
- 2: LV cabinet
- 3: busbar compartment
- 4: MV cable compartment
- 5: gas discharge flaps
- 6: switch and earthing switch
- 7: fuses.

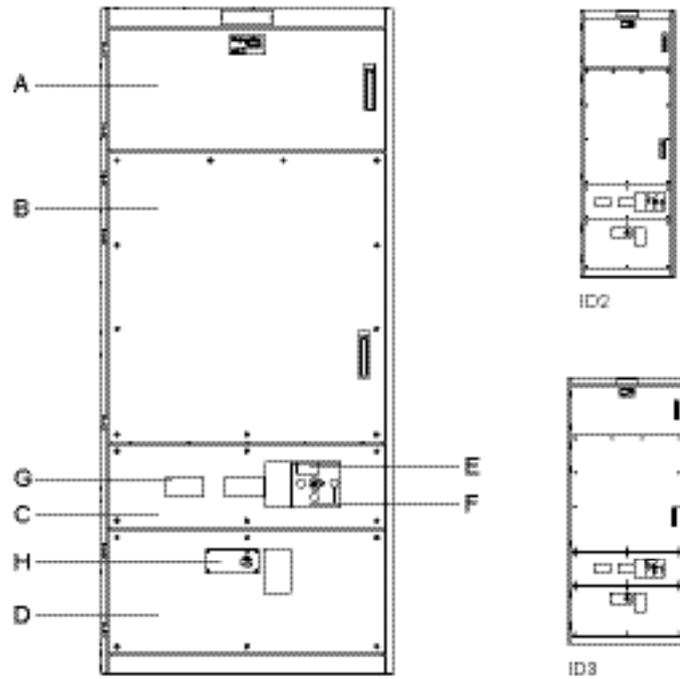


General description

ID - Incoming direct to busbar cubicle

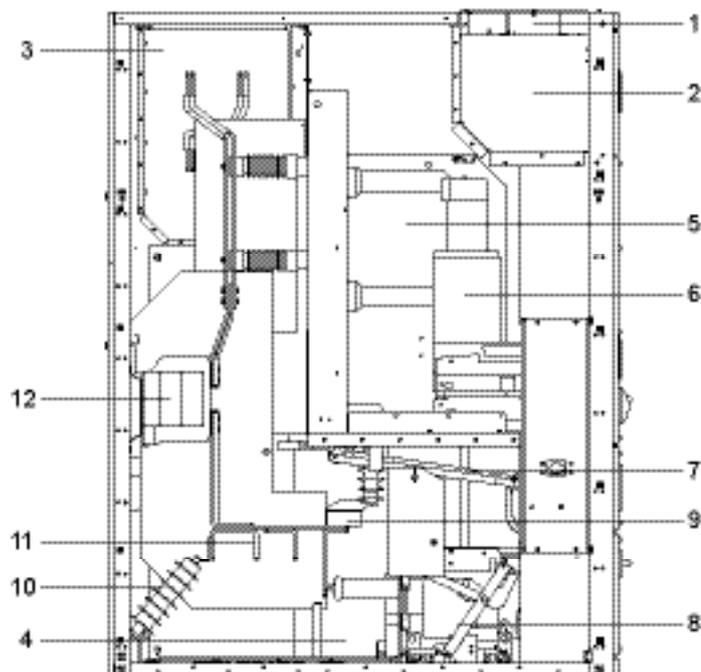
Front panel

- A: LV cabinet access door
- B: removable part compartment door
- C: MV cable compartment access cover
- D: VT compartment access cover.
- E: voltage indicators
- F: earthing switch operating and interlocking plate
- G: earthing switch viewing window
- H: withdrawable VT operating plate.



Right-hand view

- 1: LV cable routing duct
- 2: LV cabinet
- 3: busbar compartment
- 4: VT and MV cable compartment
- 5: removable part compartment
- 6: removable part (Evolis circuit breaker)
- 7: earthing switch operating mechanism
- 8: withdrawable VT compartment
- 9: earthing switch
- 10: surge arrestors (option)
- 11: MV cable connection point
- 12: MV current transformers.

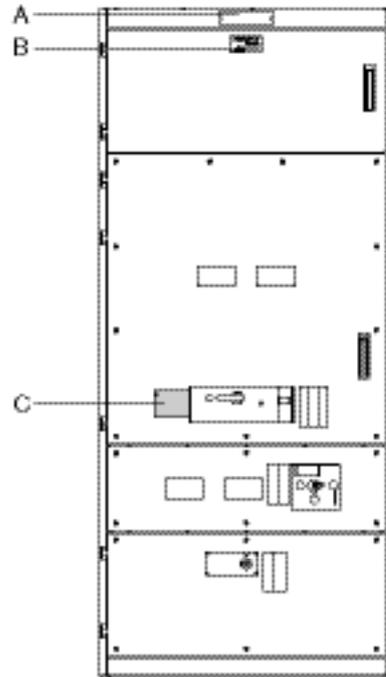


General description

Identification

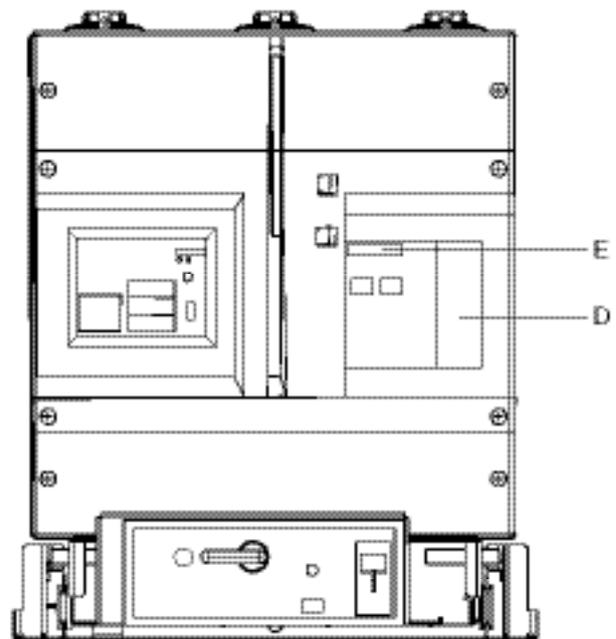
Functional unit

- A: feeder name
- B: manufacturer's plate
- C: name plate (serial number, ratings, etc.).



Evolis

- D: name plate (serial number, ratings, etc.)
- E: manufacturer's plate.

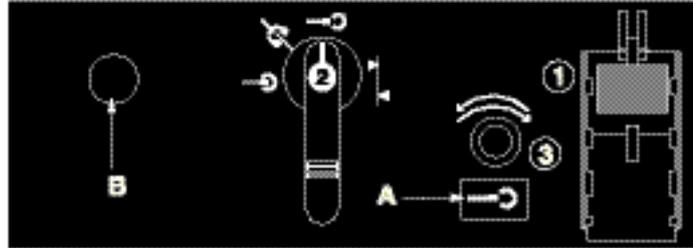


General description

Front panel

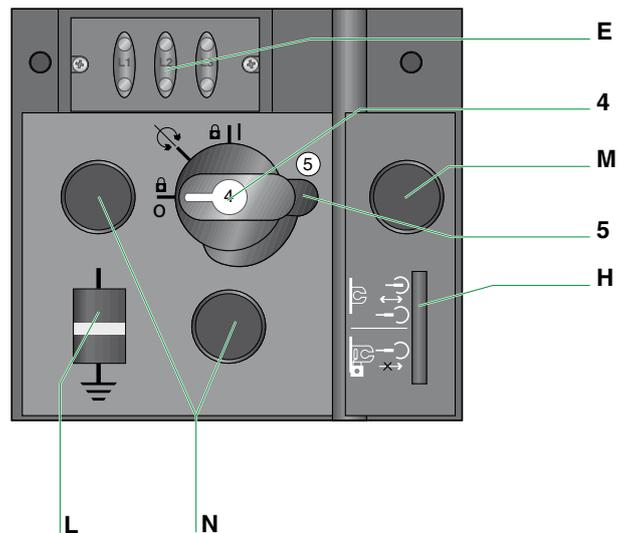
Removable part

- 1: mechanical opening push-button (red)
- 2: circuit-breaker position and handling selector
- 3: hole for inserting the crank to move the circuit-breaker
- A: mechanical indicator of circuit-breaker position
- B: key-lock in service position for sectionalizing trucks (on request for circuit-breaker).



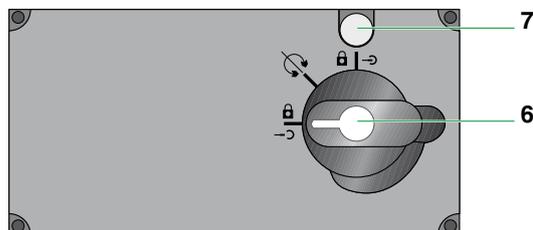
Earthing switch

- 4: earthing switch position selector
- 5: hole for operating handle
- E: voltage indication
- H: plug-in interlock
- L: mechanical indication earthing switch position
- M: provision for plug-in prevention interlock
- N: provision for earthing switch locks.



Withdrawable voltage transformer

- 6: hole for inserting operating handle
- 7: voltage transformer drawout position on selector.



General description

Symbols

Cubicles



Earthing switch open position.



Earthing switch open position mechanical indicator.



Earthing switch closed position.



Earthing switch closed position mechanical indicator.



Position lockable with padlock.

Removable part



"Plugged in" position.



"Draw-out" position.



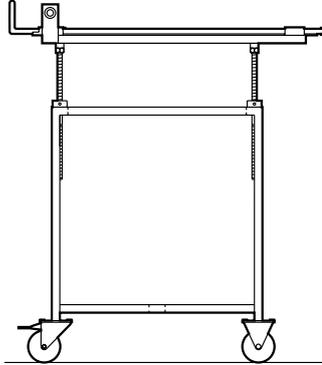
Insertion/extraction position.



Operating position.

General description

Removable part extraction table



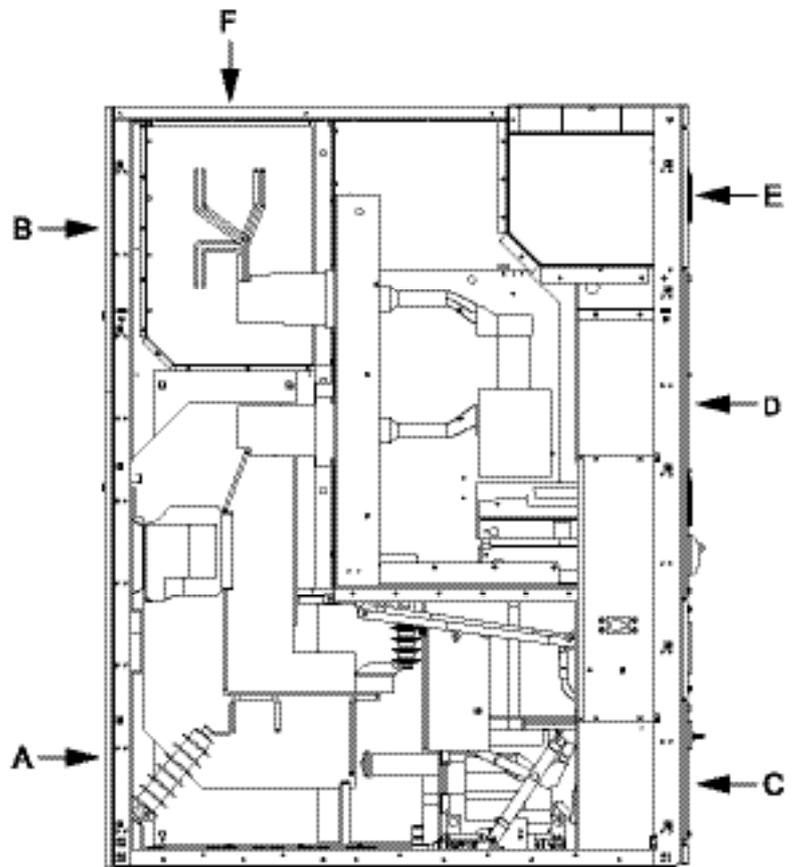
List of accessories supplied with the switchboard

- 1 extraction table
- 1 operating handle
- inspection windows
- end covers
- 1 busbar earthing carriage (optional)
- 1 phase concordance device (optional).

Access to interior of the cubicle

Access possibilities to the cubicle

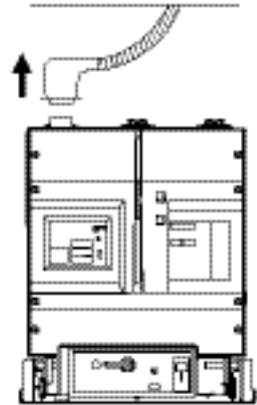
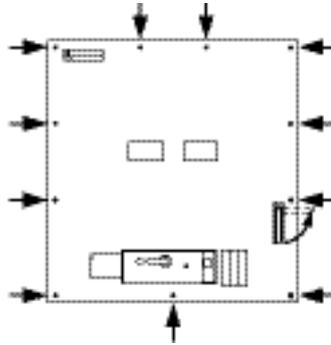
- A: access to the cable terminations
- B: access to the busbar chamber
- C: access to the cable terminations
- D: access to the removable part
- E: access to the low-voltage compartment
- F: access to busbar when intalled against wall.



Access to interior of the cubicle

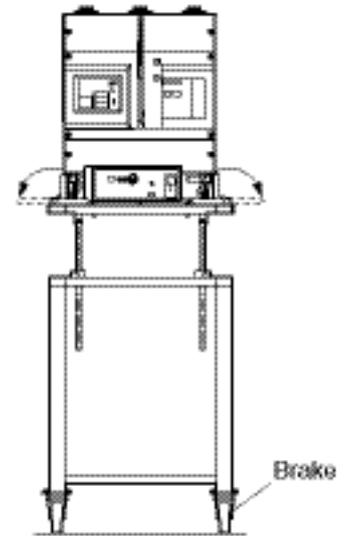
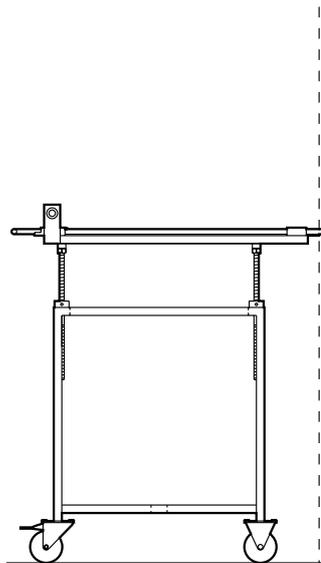
Extracting the removable part

Initial state;
Removable part in test position.



Unscrew the 11 screws and open the cubicle door by pulling out the handle and turning anti-clockwise 90°. If the MV door/ CB position interlock is fitted, the racking selector must be in the isolated position.

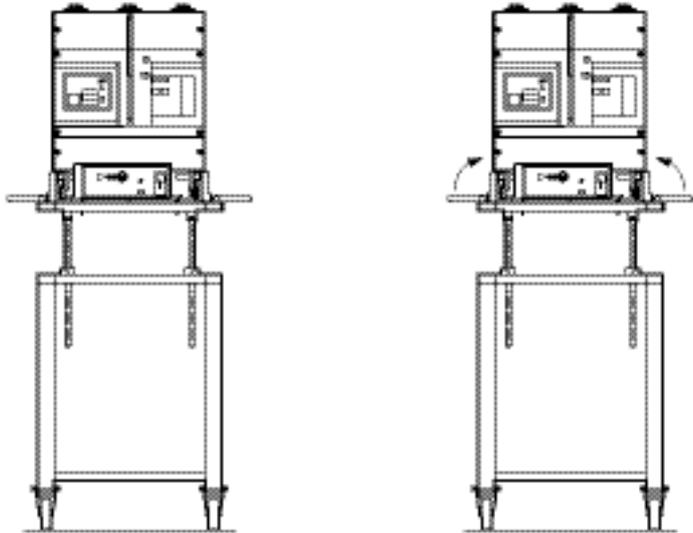
Unplug the LV auxiliaries lead and park the plug under the LV compartment.



Move the ET into position as shown.

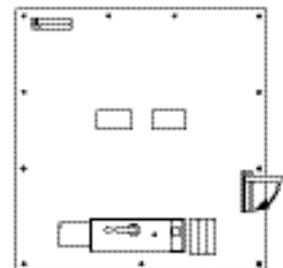
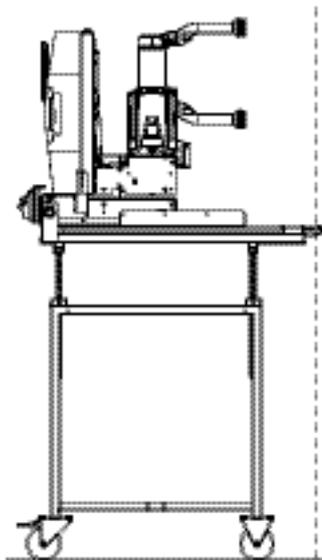
Lock in place by turning the two handles on the ET. Apply the brakes on the 2 castors of the ET.

Access to interior of the cubicle



You must unlock the catch on the front rail prior to extracting the removable part.
Extract the removable part, until it reaches the rear stop on the ET.
Return the selector to the service/test position (manually defeating the interlocks if necessary).

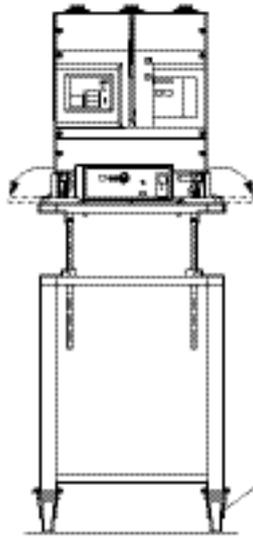
Disconnect the ET by turning the two handles to disengage the cradle.
Release the brakes on the ET castors and withdraw the ET.



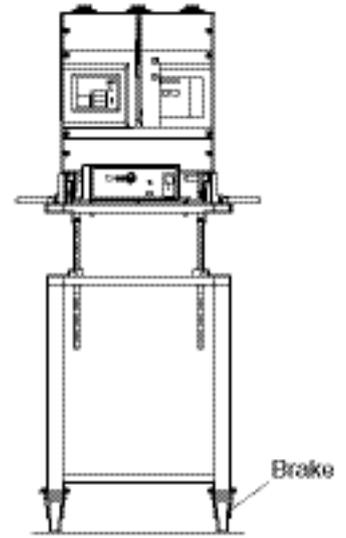
Close the cubicle door.

Access to interior of the cubicle

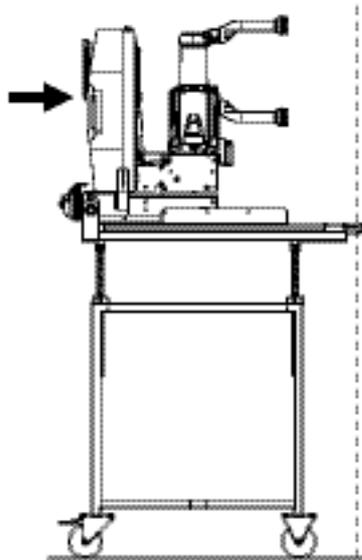
Installing the removable part



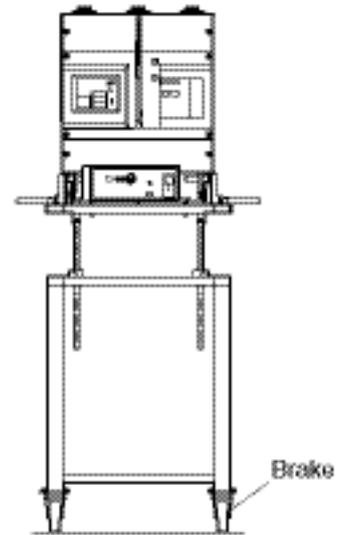
Move the ET into position. Lock in place by turning the two handles on the ET. Apply the brakes on the 2 castors of the ETL.



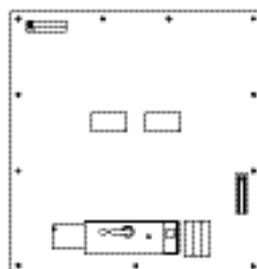
Unlock the CB from the extraction table by turning racking selector clockwise to isolated position.



Push the removable part into the cubicle to the test position. Remove the ET.



Release the LV auxiliaries cover on the CB and fit the LV plug to the CB.



Close the LV door and handle and move the racking selector to the racking position.

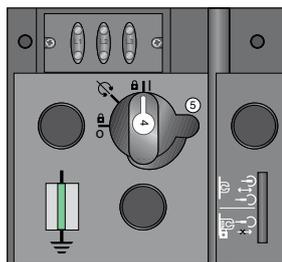
Rack in the removable part.

Access to interior of the cubicle

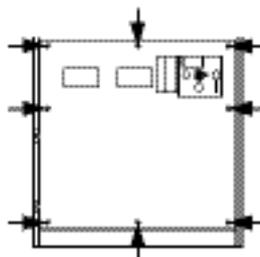
Access to the MV cable connection compartment

Cubicle without VT

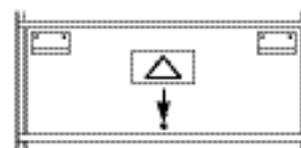
To carry out certain tests, access to the cable compartment is required. The following procedures describe this access.



Close the earthing switch (see chapter "Earthing switch closing procedure").

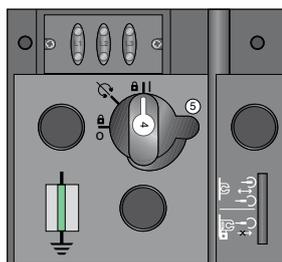


Remove the 8 fixing screws and open the door.

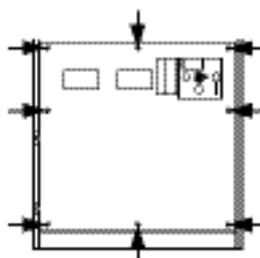


Unscrew the indicated fixing screw, lift up and remove the insulating plate.

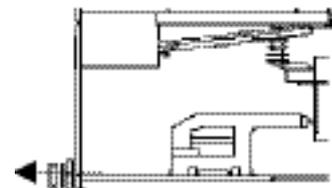
Cubicle with fixed VT



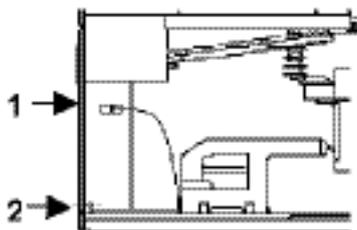
Close the earthing switch (see chapter "Earthing switch closing procedure"). Open the switch protector and VT secondaries.



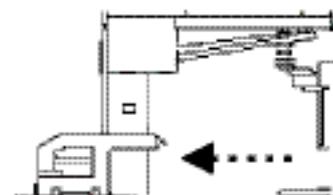
Unscrew the 8 screws and open the door.



Remove the bottom trim and door seal from the cubicle.



Unplug the VT secondary low-voltage plug at the point 1. Remove the VT base plate fixing screw at the point 2.

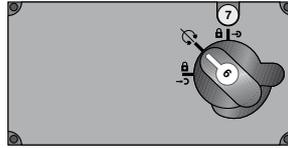


Remove the fixed VT unit on its base plate. Now the access is free to the cable connections.

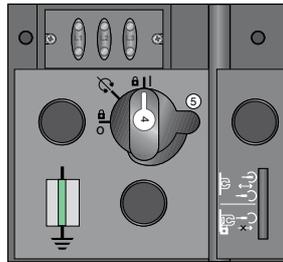
Access to interior of the cubicle

Cubicle with withdrawable VT

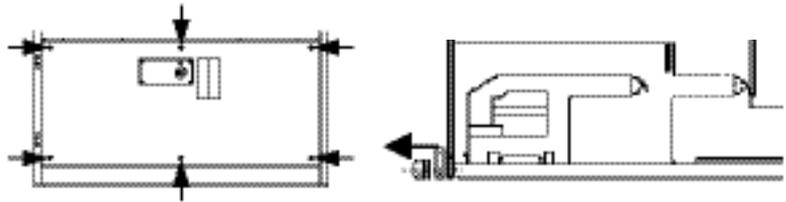
Draw out the VT
(see chapter "Voltage transformer withdrawal procedure").



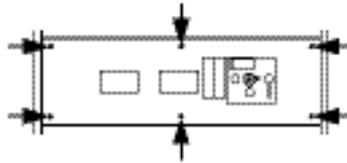
Close the earthing switch
(see chapter "Earthing switch closing procedure").



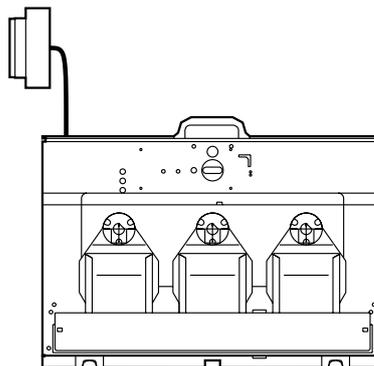
Remove the VT access panel (6 screws) and the front plinth.



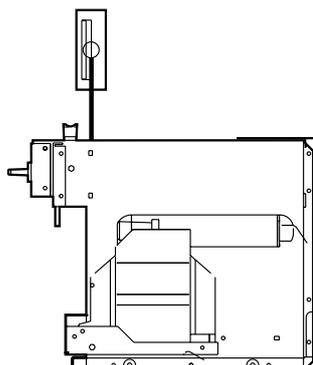
Remove the access panel to the MV cable connection chamber (6 screws).



Unplug the VT secondary low-voltage plug connector.



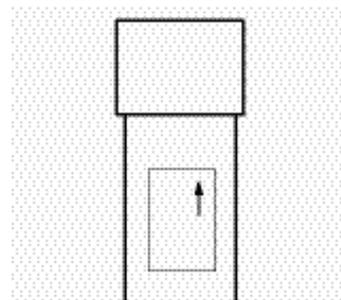
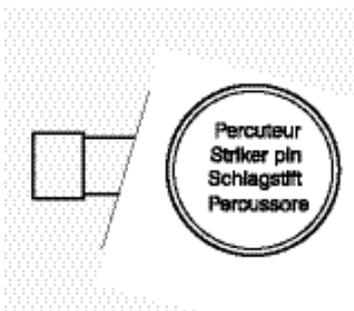
Draw out the VT compartment.



Access to interior of the cubicle

Installation of fuses in a FS cubicle

Install FUSARC type fuses with medium type strikes according to CEI 32 - 3IEC 282-1 and DIN 43-625.



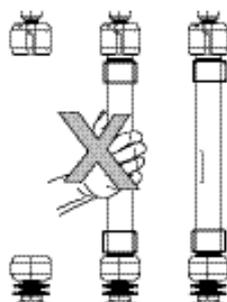
For different types of fuse, please contact Schneider Electric.

- The striker end of the fuse is marked.

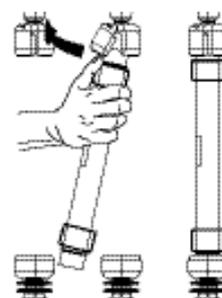
- The fuse characteristics and direction of mounting are printed on the fuse. The striker end shall be the upper one.

- Turn the fuse so that the label is on the front.

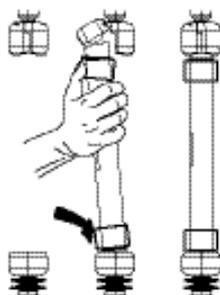
- Open the unit MV compartment.
- Insert the field control rings at both the fuse ends, starting from the inner phase.



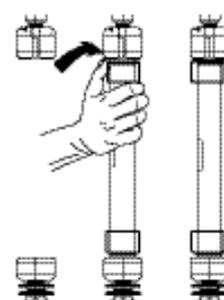
Fuses should never be held in the middle.



Open the upper field control screen by using the top end of the fuse.



- Insert the bottom end of the fuse into the lower fixed contact.



- Then fit the top of the fuse in the upper contact and check that the field screen is properly closed.
- Position the label to the front of the unit.

Installation and operation recommendations

Long term switchgear performance

Long term switchgear performance in an MV substation depends on 3 main factors

The need of proper installation of the MV cables:

The new cold slip-on and retractable technologies offer ease of installation. Their design enables operation in polluted environments with harsh atmospheres.

The influence of the relative humidity factor:

the installation of heating resistors is essential in climates with high humidity and large temperature differences.

Ventilation control:

cubicle ventilation must not be impeded. This is to ensure air circulation within the switchboard cubicles.

Operation

Regular operation:

We strongly recommended that you carry out at regular intervals (at least every year) a few operating cycles on the switching devices.

Outside normal operating conditions (between -5 °C and 40 °C, absence of dust, corrosive atmosphere, etc.) we recommended that you contact our Schneider Electric Service Centre in order to examine the measures to be taken to ensure proper installation and operation.

Specific operation:

After 6 to 12 month operations, we recommend you to check the busbars and MV cableconnection tightening.

It should be done with a calibrated torque spanner, adjust to lower torque compare to values indicated in page 4.

If no problems are detected and if the busbars and cable connections haven't been modified, it will not necessary to do again this check. In case of dismantling, the elastic washers must be change and replace by new ones supplied by Schneider Electric.

Schneider Electric services centres

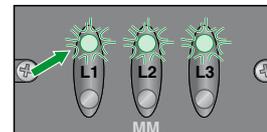
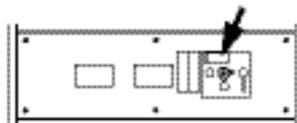
Our service centre is at your disposal at all times:

- to conduct an installation diagnosis
- to suggest the appropriate maintenance operations
- to offer you maintenance contacts
- to suggest adaptations.

Tests arrangements

Voltage presence on MV cables

As soon as the cables are live, the lamps of the voltage indicator should light.



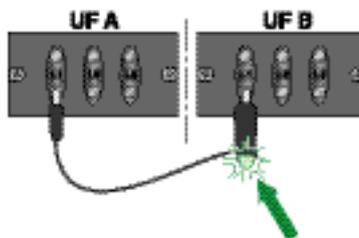
Checking phase concordance

Phases are in concordance:

lamp does not light.

Phases are not in concordance:

lamp lights.



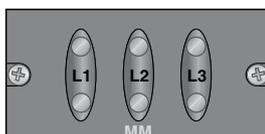
MV cable tests

Test conditions

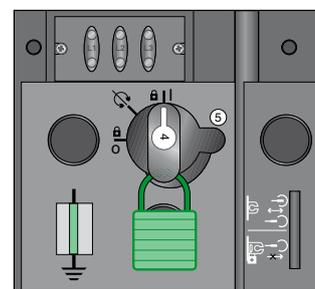
- earthing switch open
- cables connected to injector tools.

Injecting voltage onto MV cable heads

Outgoing cables (without VT).

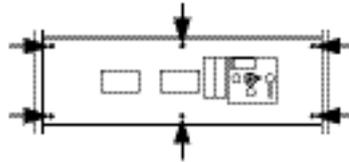


Verify the absence of voltage.
The voltage indicator lamps are off.

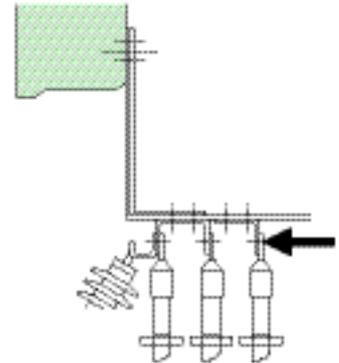


Close the earthing switch
(see chapter "Earthing switch
closing procedure").
We recommend you lock it in this
position (see chapter "Locking and
prevention by 6 to 8 mm diameter
padlocks).

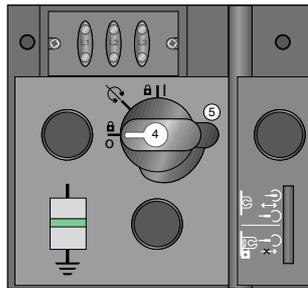
Tests arrangements



Remove the panel (6 screws).
Connect the voltage injector circuit
to the cable lugs.



Connect the voltage injector circuit
to the cable lugs.



Open the earthing switch (see chapter
“Earthing switch opening procedure”)
then carry out the tests.

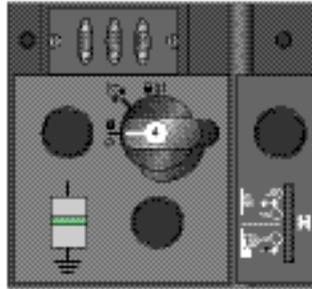
At the end of the tests:

- close the earthing switch
- remove the accessories.

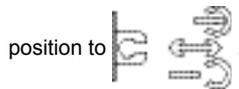
Operating instructions

IF-BC-RW cubicles

Circuit-breaker plug-in procedure



- Door closed.
- Selector switch **4** to **0** (open earthing switch).
- Selector switch **H** in plug-in or drawout



- Lower the protective flap for pushbutton **1**.
- Press and hold down push-button **1** while setting selector **2** to .

This operation trips the circuit-breaker and prevents closing during insertion.

In case of earthing or sectionalizing trucks (option), the key H be required to make the insertion possible.



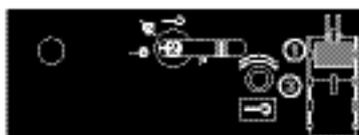
- Insert the crank into hole **3**.
- Move in the circuit-breaker turning the crank clockwise until the position indicator reads



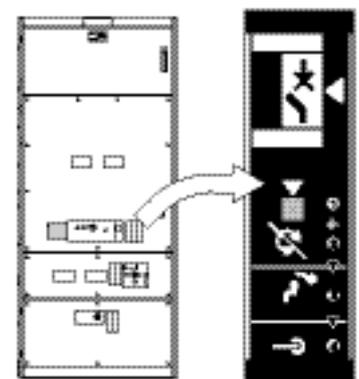
- Set selector **2** to service position .

Note:
Until the selector **2** is set in position , it is not possible to close the circuit-breaker even if this is connected to the main circuit).

Lift the shutter protecting push-button **1**.



- Now it becomes possible to electrically operate the circuit-breaker energizing the connected circuit.



The symbols marked on the black front cover summarize the above-mentioned procedure.

Operating instructions

Circuit-breaker withdrawal procedure



Starting conditions

- Circuit-breaker in service position.

- Lower the shutter protecting push button 1.
- Press and hold down push button 1 while setting selector 2 to .

This operation trips the circuit-breaker and prevents closing during withdrawal.

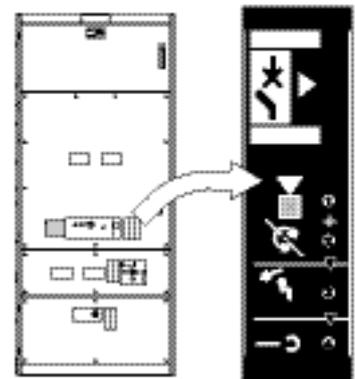


- Insert the crank into hole 3.
- Withdraw the circuit-breaker turning the crank counter-clockwise until the position indicator reads.

- Set selector 2 to disconnected position .
- Lift the shutter protecting push button 1.



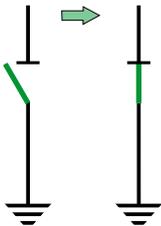
The circuit-breaker is in disconnected/test position.



The symbols marked on the black front cover summarize the above-mentioned procedure.

Operating instructions

Earthing switch closing procedure (yellow background front plate)

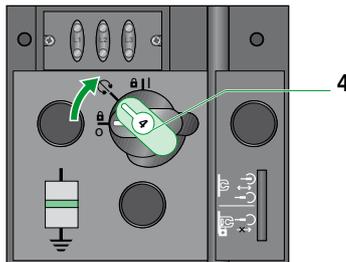


Initial state:

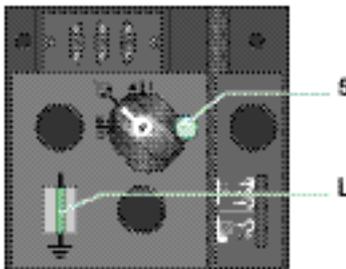
- the removable part in the isolated position or removed from the cubicle.

Check that the voltage indication lamps are off:

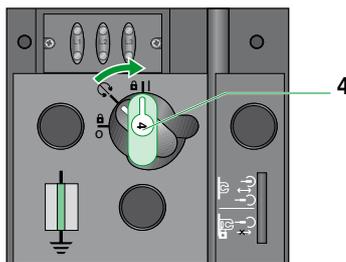
- the locks, if any, should be set to enable operation.



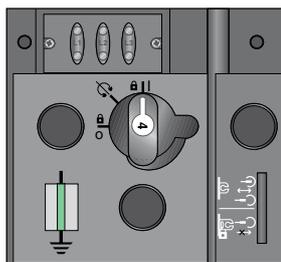
Set the selector (4) to  by pulling it out and then turning it.



Insert the crank handle into the operation shaft (5) and turn the handle clockwise until the position indicator (L) changes state. Closure is accompanied by a distinctive sound.



Set the selector (4) to  by pulling it out and then turning it.



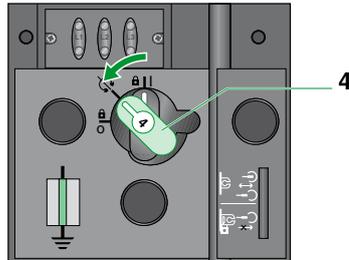
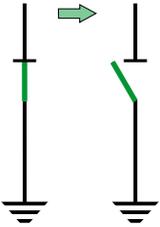
The earthing switch is now in the earthed position. The MV cable connections are now short-circuit and earthed.

Operating instructions

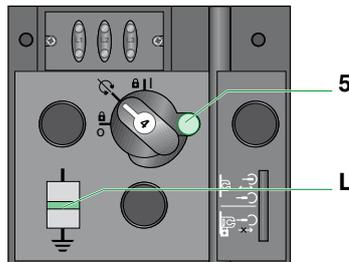
Earthing switch opening procedure (yellow background front plate)

Initial state:

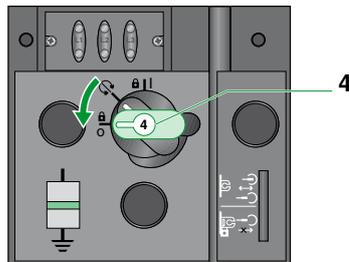
- the earthing switch is closed
- the locks, if any, should be set to enable operation.



Set the selector (4) to  by pulling it out and then turning it.



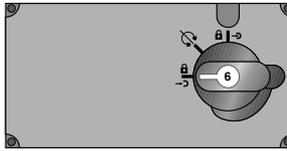
Insert the crank handle into the operation shaft (5) and turn the handle anti-clockwise until the position indicator (L) changes state. Closure is accompanied by a distinctive sound.



Set the selector (4) to  by pulling it out and then turning it. The earthing switch is now in the open position.

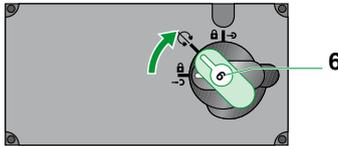
Operating instructions

Voltage transformer plug-in procedure (blue background front plate)

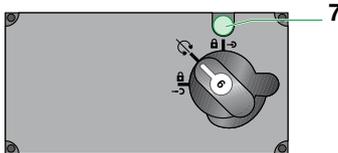


Initial state:

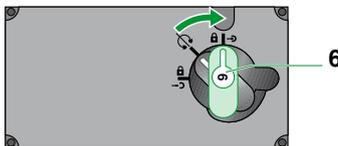
- lower panel mounted
- selector (6) at 



Set the selector (6) to  by pulling it out and then turning it.



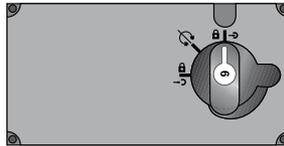
Insert the crank handle into the operation shaft (7) and turn the handle clockwise until the plugging in is complete. Plugging is completed when resistance is felt.



Set the selector (6) to  by pulling out and turning.

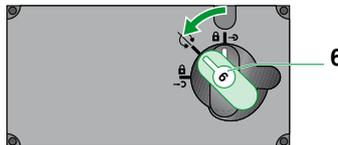
Operating instructions

Voltage transformer withdrawal procedure (blue background front plate)

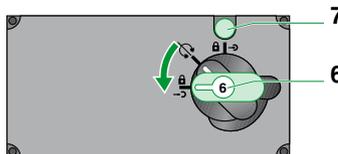


Initial state:

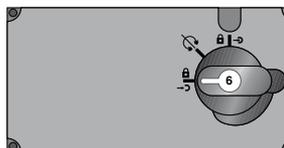
- lower panel mounted
- selector (6) at 



Set the selector (6) to  by pulling it out and then turning it.



Insert the crank handle into the operation shaft (7) and turn the handle anti-clockwise until the withdrawal is complete. Withdrawal is completed when resistance is felt.



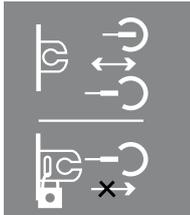
Set the selector (6) to  by pulling out and then turning it (this allows the access panel to be removed).

Operating instructions

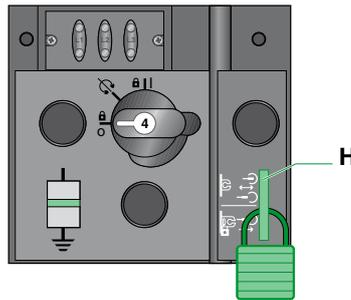
Locking and prevention by 6 to 8 mm diameter padlocks

Number of padlocks on each cubicle

- 2 on the racking in prevention lever
- 3 on the earthing switch operation selector
- 3 on the VT racking in selector
- 3 on the bushing shutter mechanism.



To prevent plugging in of the removable part



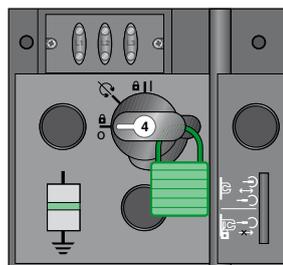
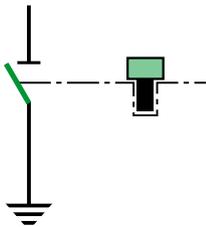
Pull out the lever H and fit the padlock in the oblong hole.

Preventing opening of the bushing shutters

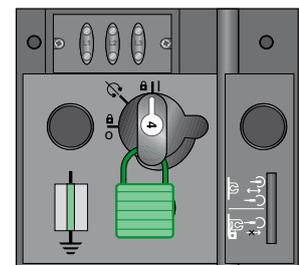
Lock closed

On the bushing shutter mechanism when shutters are closed. The bushing shutter mechanism is inside the cubicle on the right hand side.

Locking the earthing switch in the open or closed position

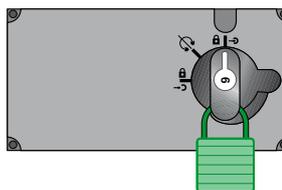


Earthing switch open: fit 1 to 3 locks to the selector (4) to prevent closing.

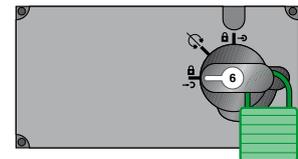


Earthing switch closed: fit 1 to 3 locks to the selector (4) to prevent opening. This also prevents racking in of the withdrawable part.

Locking operation of the withdrawable VT



VT racked in: fit 1 to 3 padlocks to the selector (6) to prevent drawing out. This also prevents removal of the front panel.



VT racked out: fit 1 to 3 padlocks to the selector (6) to prevent plugging in of the VT.

Operating instructions

Interlocking by locks (option)

- removable part in draw out position: 1 lock on the racking mechanism front plate
- (2 O) or (2 C) or (1 O & 1 C): on the earthing switch
- disconnecter truck (drawout busbar bridge)
- 1 lock in plugged in position (on earthing switch).

Interlocking by electromagnet (option)

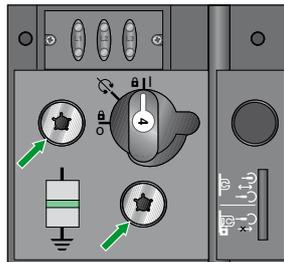
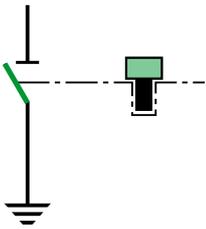
- removable part in drawn out position
- earthing switch.

Locking the removable part in the plugged in position

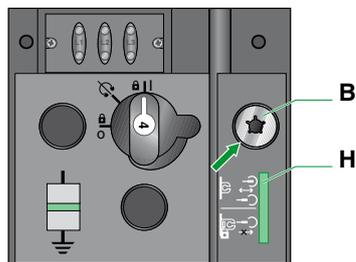
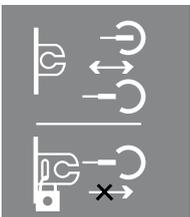
- earthing switch closed
- busbar bridge plugged in.

Interlocking the earthing switch

The key is released only if the earthing switch is locked.



To prevent plugging in of the removable part.



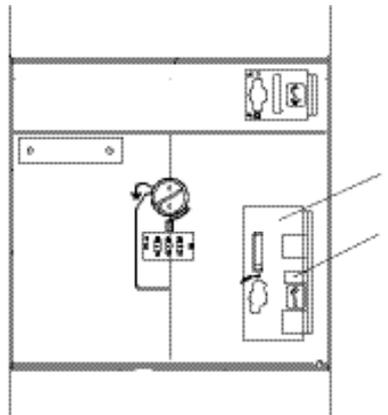
Pull out the level **H** and turn key lock at **B** and remove key.

Operating instructions

LB - Fuse switch cubicle

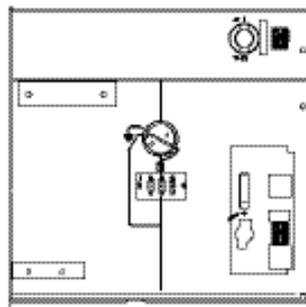
Operation and position indication

I: charged/uncharged indication.

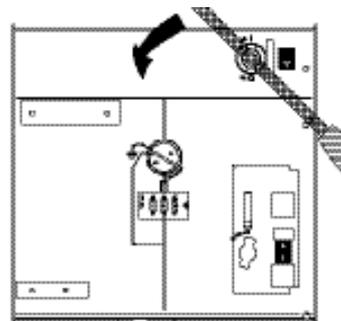


t plate

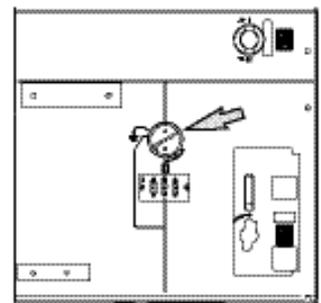
Earthing switch opening procedure



Starting condition: the mimic diagram shows that the earthing switch is closed.



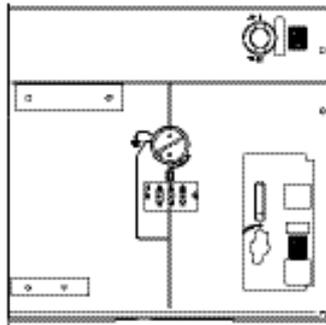
- Close and bolt the MV compartment access door,
- Insert the operating crank into the earthing switch operating mechanism slot,
- Rotate counter-clockwise to open the earthing switch,
- Take out the crank at the end of the sequence.



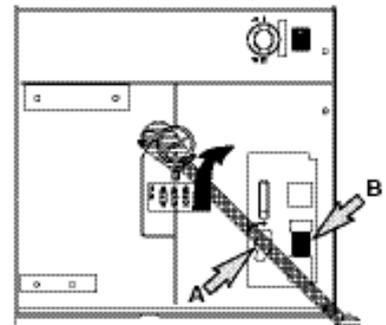
- The mimic diagram shows that the earthing switch is open.

Operating instructions

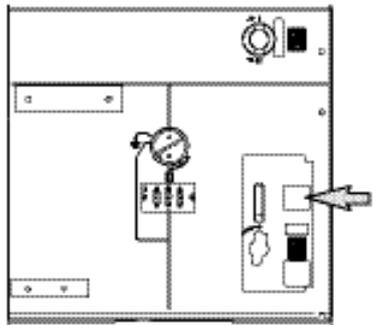
Switch disconnecter closing procedure



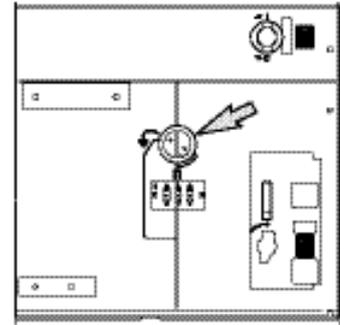
Starting condition:
the mimic diagram shows that the switch disconnecter is open.



Charging the spring:
- Insert the operating crank into the spring charging slot (A) and rotate it clockwise,
- Take out the crank when the mechanical indicator (B) shows the operating mechanism spring charged.

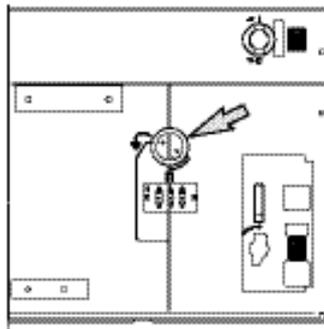


Closing the switch-disconnector by pushing the push button I (indicated in the drawing)



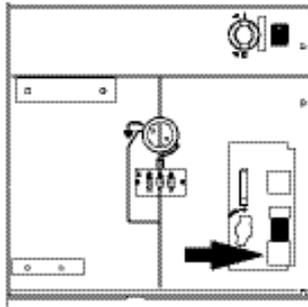
Final condition: the mimic diagram shows that the switch-disconnector is closed.

Switch disconnecter opening procedure

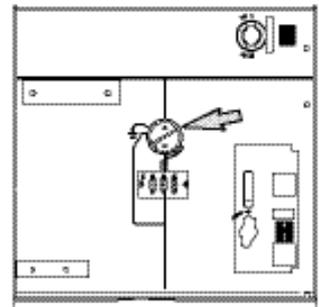


Starting condition:
the mimic diagram shows that the switch is closed.

Operating instructions

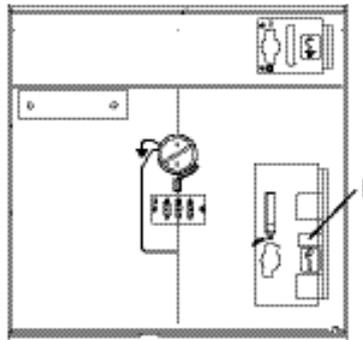


Press the push button 0 (indicated in the drawing)

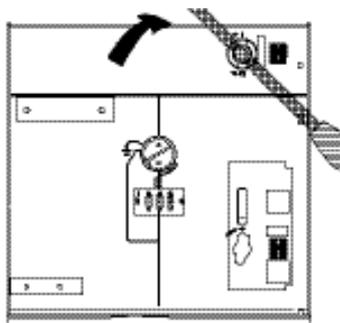


Final condition: the mimic diagram shows that the switch-disconnector is open.

Earthing switch closing procedure

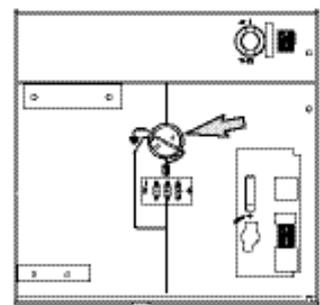


The synoptic diagram shows that the earthing switch is open.



Close the earthing switch after verifying that the MV cables live (see page 23).

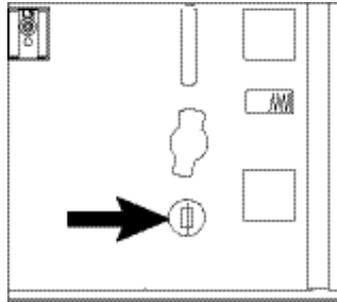
- Insert the operating crank into the earthing switch operating mechanism slot,
- Rotate clockwise to close the earthing switch,
- Take out the crank at the end of the sequence,
- Close the MV cable compartment door.



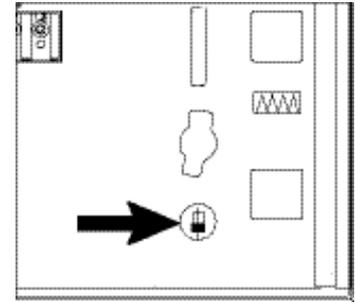
Final condition: the mimic diagram shows that the earthing switch is closed.

Operating instructions

Fuse indications

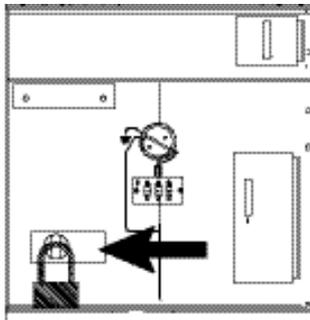


Fuses efficient (white indicator).

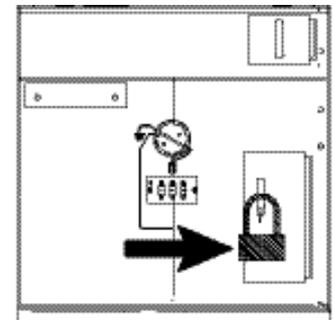


One or more fuses blown (red indicator).

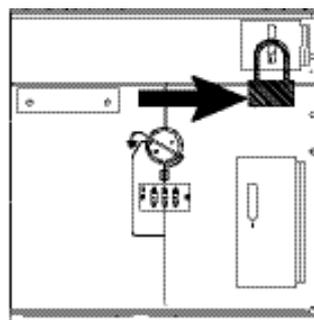
Padlocking



- Padlocking of motor mechanism (option).
- It is possible to discharge the motor mechanism, by locking the electrical charging of the closing spring and carrying out a complete O-C-O cycle.
- Lock out the motor mechanism using a padlock before opening the switch.
- The motor mechanism can be locked in or out using the padlocks.

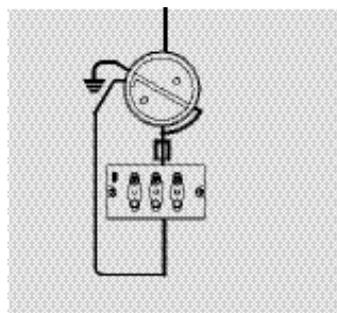


Padlock the switch-disconnector in open or closed position using 1, 2 or 3 padlocks (Ø 8 mm).



Padlock the earthing switch in open or closed position using 1, 2 or 3 padlocks (Ø 8 mm).

Operating safety



The front door must only be opened if the earthing switch is closed.

Preventive maintenance

Trouble shooting

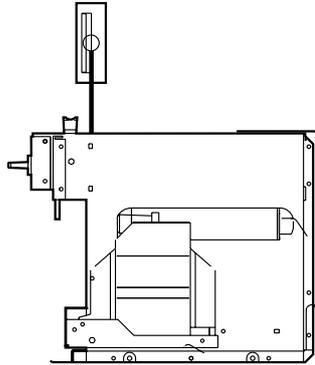
Table for circuit-breaker and cradle

Symptoms	Faulty mechanisms	Probable causes and solutions
<p>The circuit breaker on its truck was just inserted into its cradle. The selector is in the circuit breaker extraction authorisation and removal position: the selector cannot be turned to the rack-in authorised position.</p>	The low voltage plug and the upper front cover of the circuit breaker.	Check that the low voltage plug was connected, the upper cover on the circuit breaker is correctly closed.
	The notching pins of the circuit breaker truck.	Make sure that nothing blocks the notching pins movement on the rails.
	A lock on the cubicle's front door.	Make sure that any possible locks on the cubicle's door do not act against the circuit breaker's truck. Close the cubicle's door.
	The selector and its padlocking function.	The truck selector is ready to receive a padlock. Close the padlock hole.
<p>The circuit breaker is racked-in. The truck selector is in the closing authorised position. The circuit breaker is CLOSED: the selector cannot be turned to the rack-out authorised position</p>	The automatic opening function of the circuit breaker via the selector.	Manually open the circuit breaker using the opening pushbutton. In the case of a cubicle that has a locked door: electrically open the circuit breaker. In both cases contact a Schneider Electric service centre.
<p>The circuit breaker is racked-in The truck selector is in the closing authorised position. The circuit breaker is OPEN: the selector cannot be turned to the rack-out authorised position.</p>	The safety function that prevents rack-in/out of the circuit breaker, if one of the circuit breaker poles remains closed.	One of the circuit breaker's pole has remained closed despite the opening order on the circuit breaker. Contact a Schneider Electric service centre.
	The notching pins on the truck.	The truck notching pins are slightly blocked in the notch holes in the rail. Help disengage the crank notches using a tool. Check the correct operation by re-conducting the manoeuvre.
<p>The circuit breaker on its truck was just racked-in. ■ By using the handle (version using propulsion) Selector rotation to the closing authorised position is not possible.</p>	The circuit breaker is not completely racked-in.	■ Version with propulsion: Re-insert the handle into the truck's rack-in hole and continue to turn until rack-in has been completed.
	The propulsion handle (if there is one).	Selector rotation is impossible with the propulsion handle inserted into the truck. Withdraw the handle.
<p>The circuit breaker on its truck is in the test position after racking-out (selector in the rack-in authorised position): the selector cannot be turned.</p>	The propulsion handle (if there is one).	Selector rotation is impossible with the propulsion handle inserted into the truck. Withdraw the handle.
<p>Truck with propulsion version: The circuit breaker on its truck is in the test position in the cubicle. The selector can be turned to 3 positions: The propulsion handle cannot be inserted all the way into the truck to allow for the circuit breaker to be racked-in.</p>	Interlocking with the cubicle's earthing switch or locked to prevent rack-in stemming from the cubicle.	Open the earthing switch or free the lock to prevent rack-in on the cubicle.

Preventive maintenance

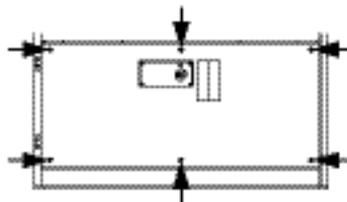
Replacing the withdrawable VT fuses

Initial position VT racked out.



Removal

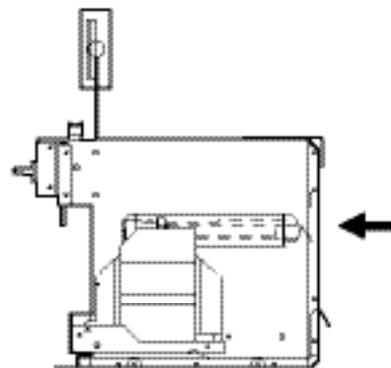
Remove the lower front cover (6 screws).



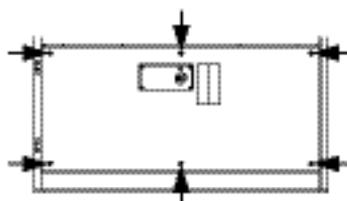
Installation

Remove the VT from the cubicle.
Unscrew the end caps on the VT.
Remove and replace the fuses (s).

Plug in the VT carriage.



Replace the lower front cover (6 screws).
Rack in the VT.



Adaptation/instructions

Replacement of the voltage presence type VPIS 1 by type VPIS 2 and VPIS 2 by VPIS 2

Note: the subject of this new version of this user guide is about the annexe "Adaptation/instructions - Replacement of the voltage presence type VPIS 1 by type VPIS 2 and VPIS 2 by VPIS 2", updated on july 2009.

Adaptation/instructions

Replacement of the voltage presence type VPIS 1 by type VPIS 2 and VPIS 2 by VPIS 2

Symbols and conventions

Caution :

you will find all the symbols below throughout the document, indicating the hazard levels depending on the different types of situation.



As per iso 3864-2

DANGER: failure to follow this instruction **will result in death** or serious injury.



As per iso 3864-2

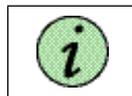
WARNING: failure to follow this instruction **may result in death** or serious injury.



As per iso 3864-2

CAUTION: failure to follow this instruction **may result in injuries.**

This alert signal can also be used to indicate practices that could damage the unit.

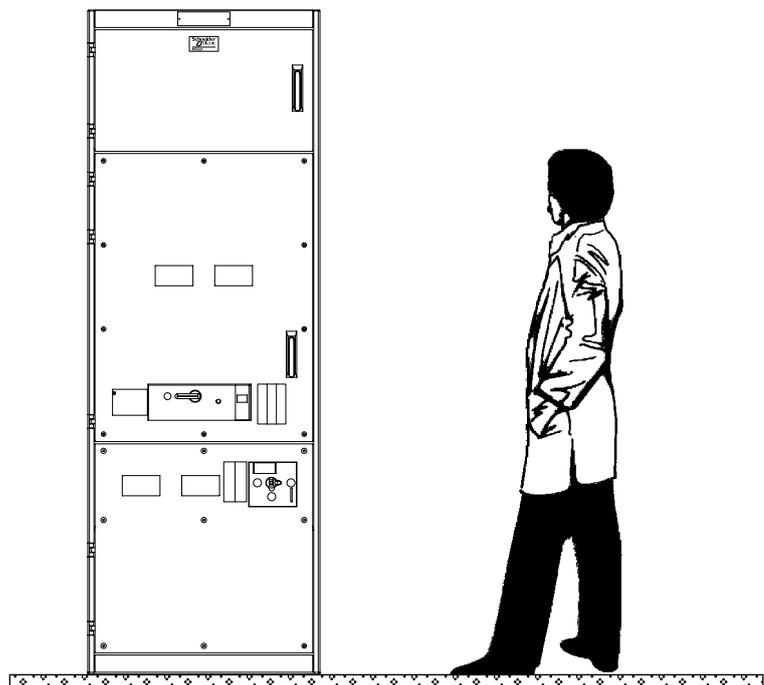


INFORMATION - ADVICE:

we draw your attention to this specific point.

Contact the Schneider Electric service unit for diagnosis and advice

	<p>Call your sales representative who will put you in contact with the closest SCHNEIDER ELECTRIC group service centre.</p> <p>You can log on to: www.schneider-electric.com</p>
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Adaptation/instructions

Replacement of the voltage presence type VPIS 1 by type VPIS 2 and VPIS 2 by VPIS 2

Distribution rules



CAUTION

The aim of this publication is to enable the equipment to be installed correctly.



CAUTION

This document is not a commercial document. It is a strictly technical document drawn up by **Schneider Electric**.

Safety rules



CAUTION

All the operations described below must be performed in compliance with applicable safety standards, **under the responsibility of a competent authority.**



CAUTION

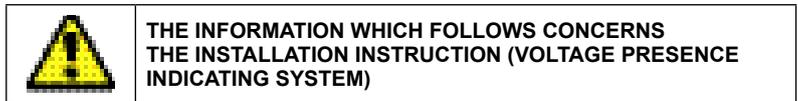
Only undertake the work after having read and understood all the explanations given in this document. If you have any difficulty complying with these rules, please contact **Schneider Electric**.



WARNING

The contractor must be certified and authorised to manipulate and perform work on the equipment.

Information

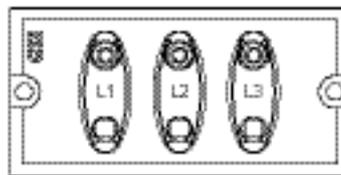


THE INFORMATION WHICH FOLLOWS CONCERNS THE INSTALLATION INSTRUCTION (VOLTAGE PRESENCE INDICATING SYSTEM)

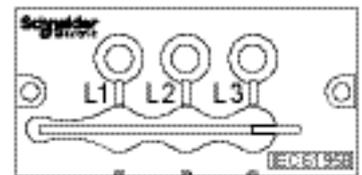
VPIS

Présentation of VPIS-V1 and VPIS-V2

VPIS : Voltage Presence Indicating System, a case with 3 built-in lights.



VPIS-V1:
production until February 2009.



VPIS-V2:
production starting from March 2009.

Characteristics

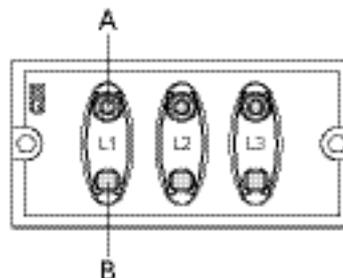
Conforming to **IEC 61958**, relative to voltage presence.

Operating instructions

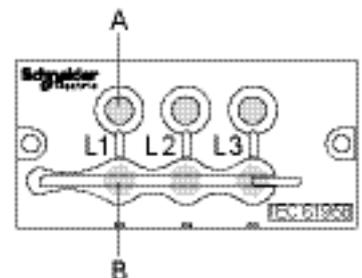


WARNING

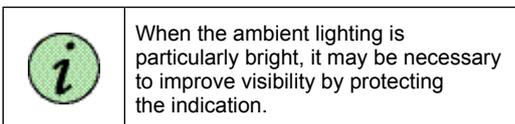
The indication provided by a **VPIS-V1** or **V2**, alone is not sufficient to ensure that the system is de-energised.



A: voltage presence indicator light (one for each phase)
B: connection point designed for the connection of a phase concordance unit (one for each phase)



A: voltage presence indicator light (one for each phase)
B: connection point designed for the connection of a phase concordance unit (one for each phase)



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

Adaptation/instructions

Replacement of the voltage presence type VPIS 1 by type VPIS 2 and VPIS 2 by VPIS 2

Phase concordance unit

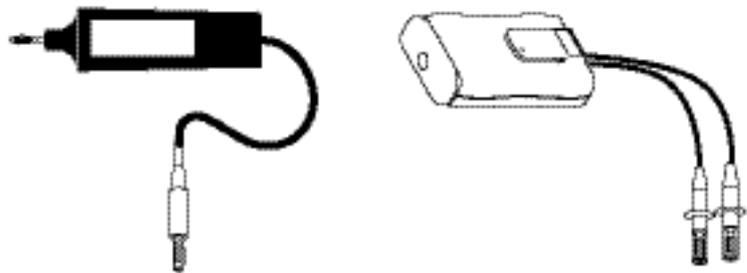
Phase concordance testing for VPIS-V1 and VPIS-V2 must be carried out each time a cable is connected to a functional unit.

It is a way of making sure that all three cables are each connected to the corresponding phase of the substation.

Principle

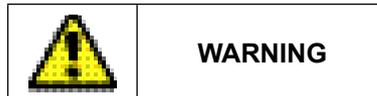
The principle of the phase concordance unit is that it allows a check of the phase concordance between 2 energised functional input units on the same panel.

Reminder of accessories that can be used for phase concordance testing



Phase concordance unit V1-51191954FA Phase concordance unit V2-VPI62421

Rules for the use of phase concordance unit



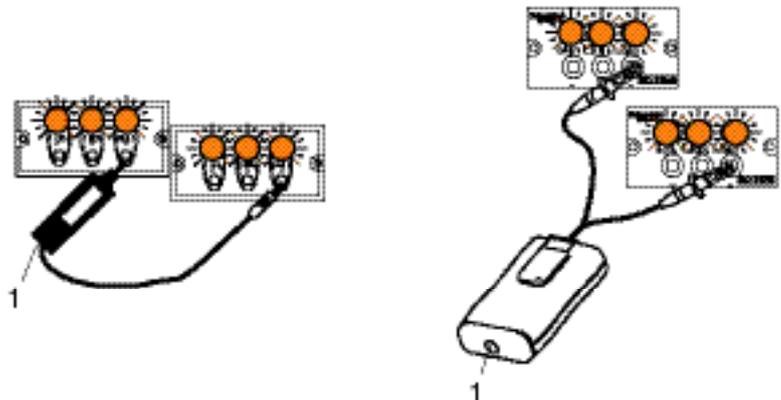
It is impossible to carry out a phase concordance of test with 2 VPIS of different types.

Balanced phase:

- The phase concordance unit light (1) is unlit.

Unbalanced phase:

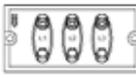
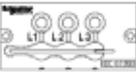
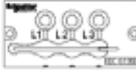
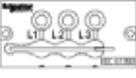
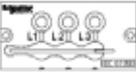
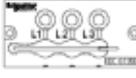
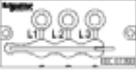
- The phase concordance unit light (1) is lit.



Adaptation/instructions

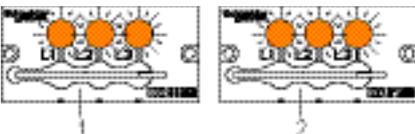
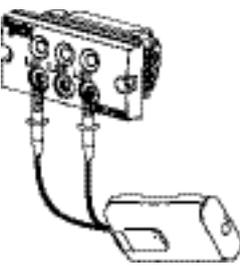
Replacement of the voltage presence type VPIS 1 by type VPIS 2 and VPIS 2 by VPIS 2

Rules for choosing phase concordance unit

Phase concordance unit	Functional unit 1	Functional unit 2	Compatibility result	Corrective actions
	V1 	V1 	OK	
	V1 	V2 	OK	Replace VPIS-V1 by VPIS-V2 Use a phase concordance unit V2
	V2 	V2 	OK	Use a phase concordance unit V2
	V1 	V1 	OK	Replace VPIS-V1 units by VPIS-V2 units OR test with a phase concordance unit V1
	V1 	V2 	OK	Replace VPIS-V1 by VPIS-V2
	V2 	V2 	OK	

Check before phase concordance test

Please refer to the previous chapters in the event of test malfunctioning.

Test	Result	Action
	The 3 indicator lights of each VPIS are on.	The 2 functional units are energised, the VPIS units are operating and the check can continue.
Visual checking of the indicator lights on the VPIS units of functional unit 1 and of functional unit 2	The 3 indicator lights of the VPIS are off. The functional unit is not energised or the VPIS is defective.	Apply power to the functional unit. If VPIS-V1 remains unlit, replaced it by a VPIS-V2.
	1 or 2 indicator lights unlit.	The VPIS is probably defective. Replace by a VPIS-V2.
Phase concordance unit check choice 	Functional unit 1  Functional unit 2 	You can test.
On each functional unit test phases 1 and 3.	 Functional unit 2 	You cannot test them. The choice of the phase concordance unit is wrong or it is not functioning correctly.
	 Functional unit 2 	
	 Functional unit 2 	

Adaptation/instructions

Replacement of the voltage presence type VPIS 1 by type VPIS 2 and VPIS 2 by VPIS 2

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.

Lexique



Phase concordance unit LED lit



LED unlit.



Functional unit 2					
	L1	L2	L3	Conclusion regarding phase concordance	
Functional unit 1	L1				Connection is satisfactory.
	L2				
	L3				
	L1				Reverse the MV cables connected to L1 and L2 and one of the functional units.
	L2				
	L3				
	L1				Reverse the MV cables connected to L2 and L3 on one of the 2 functional units.
	L2				
	L3				
	L1				Reverse the MV cables connected to L1 and L3 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					
L1				Change the position of each MV cable on one of the 2 functional units.	
L2					
L3					

Adaptation/instructions

Replacement of the voltage presence type VPIS 1 by type VPIS 2 and VPIS 2 by VPIS 2

Information



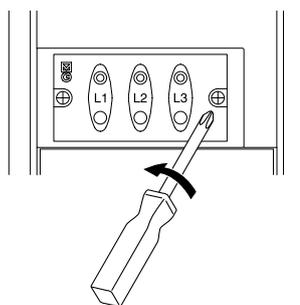
THE INFORMATION WHICH FOLLOWS, CONCERNS
"THE CORRECTIVE MAINTENANCE SECTIONS"
(REPLACE OF THE VOLTAGE PRESENCE UNIT)

Removing the VPIS 1 voltage presence unit

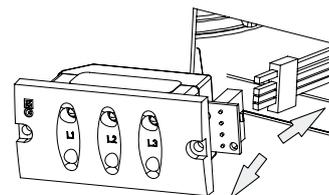


CAUTION

The screws must be retained.



Unscrew the 2 self-tapping screws.



Remove the VPIS 1 type voltage presence unit. Disconnect the VPIS 1 voltage presence unit.

Instructions to be respected

In case of replacement of a VPIS 1 by a VPIS 2, all the VPIS 1 installed on the unit need to be replaced in order to compare phases.

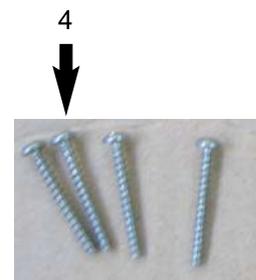
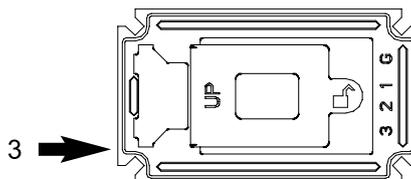
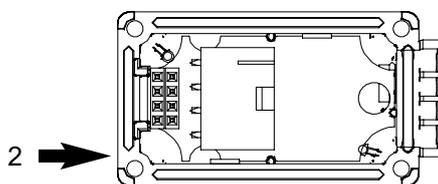
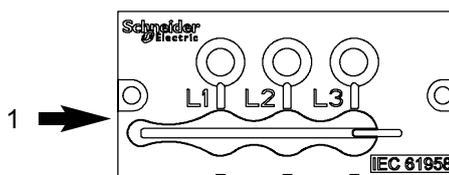
Contents of the kit VPIS 2

- 1: indicator unit
- 2: cable gland seals
- 3: VPIS-V2 safety
- 4: screws (x 4).



CAUTION

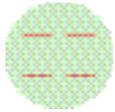
The screws removed earlier are reused (2 self-tapping screws).



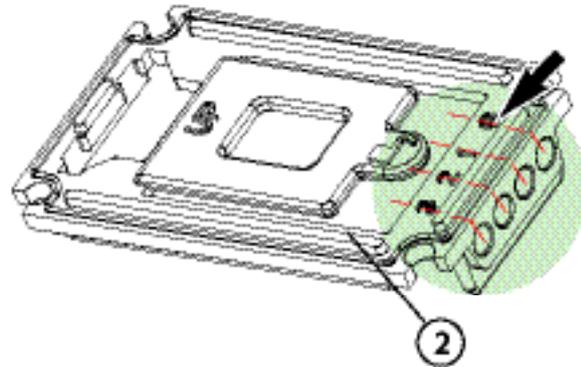
Adaptation/instructions

Replacement of the voltage presence type VPIS 1 by type VPIS 2 and VPIS 2 by VPIS 2

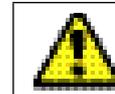
Preparation of the cable gland seal before mounting the voltage presence unit VPIS 2



Follow the dotted line to cut the cable gland.



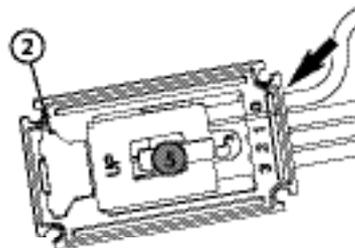
To integrate the cable gland seal (2) onto the wiring harness, the 4 holes must be cut open using a Stanley knife.



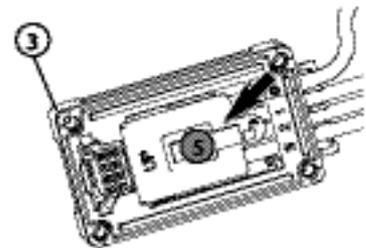
CAUTION

Cut the cable glands in one place ONLY per hole to slide the wires inside.

Mounting the voltage presence unit VPIS 2



Position the cable gland seal (2) on the voltage presence connection (5).



Clip the cable harness connector (5) onto the VPIS V2 safety (3) and fit the seal.

Checks to be made before continuing with the operation

Check the condition of the wiring harness (5) and the VPIS 2 rating using the optional diagnostic tool (VPI62420) (not included in the kit) or see correspondence table below.

Reference	VPI62401 / VPI62411		VPI62403 / VPI62413		VPI62404 / VPI62414		VPI62405 / VPI62415		VPI62407 / VPI62417		VPI62408 / VPI62418	
Value	3.5 μ A		7.4 μ A		10.7 μ A		15.5 μ A		32.5 μ A		47.2 μ A	
Operating voltage range	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
	1 kV	1.9 kV	2 kV	3 kV	3.1 kV	5.9 kV	6 kV	8.9 kV	9 kV	17.9 kV	18 kV	25 kV

Key

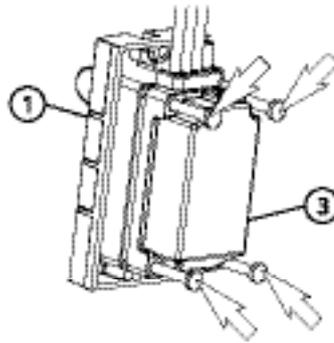
Minimum and maximum operating voltage for usage in 50 Hz and 60 Hz.

Values used in Elonet (ADD) for the choice of VPIS.

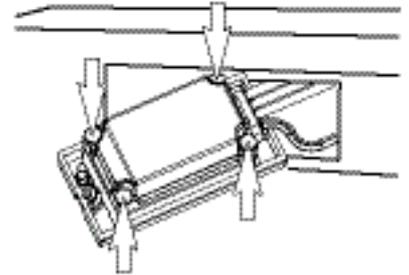
Adaptation/instructions

Replacement of the voltage presence type VPIS 1 by type VPIS 2 and VPIS 2 by VPIS 2

Please refer to the chapter entitled
"contents of the kit"



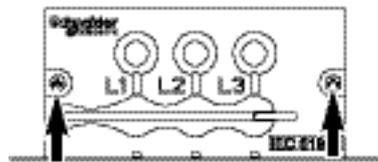
Screw the indicator unit (1) onto
the VPIS V2 protection (3) using
the 4 screws.



Tighten the screws to exert slight
pressure on the cable gland seal
without distorting it.



The screws removed earlier are reused.

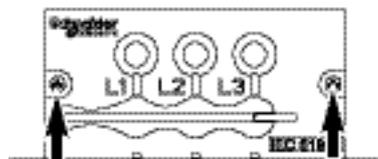


Install the voltage presence unit in
the correct position using the 2
self-tapping screws removed earlier.

Removing the VPIS 2 voltage presence unit



The screws must be retained.



Remove the 2 screws from the front
panel.

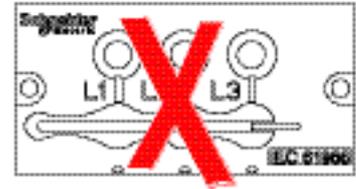
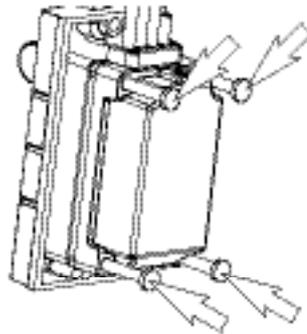
Adaptation/instructions

Replacement of the voltage presence type VPIS 1 by type VPIS 2 and VPIS 2 by VPIS 2

Mounting the new VPIS 2 voltage presence unit

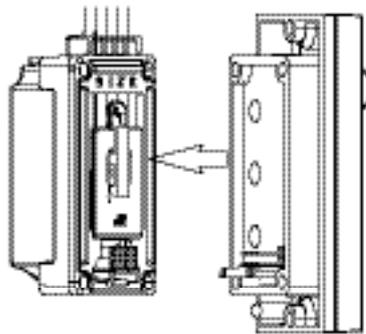


Only the indicator unit is to be changed.
Contact the **Schneider Electric** administration
for recycling products at the end of their service life.

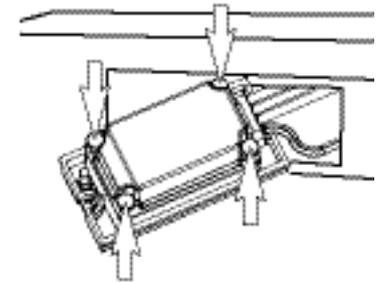


Remove the unit. Remove the 4 screws
from the indicator unit.

Discard the faulty indicator unit.
Leave the existing surge arrester
and seal.



Install the new voltage presence
indicator unit.



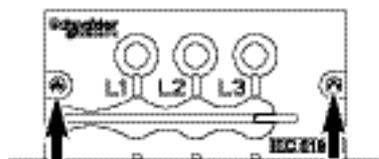
Screw up the 4 screws.



Tighten the screws to exert slight
pressure on the cable gland seal
without distorting it.



The screws removed earlier are reused.



Install the voltage presence unit in
the correct position using the 2
self-tapping screws removed earlier.

Schneider Electric group service centers are there to provide:

- engineering and technical assistance,
- commissioning,
- training,
- preventive and corrective maintenance,
- adaptation work,
- spare parts.

Call your sales representative who will put you in touch with your nearest Schneider Electric group service center or directly call the following telephone number: +33 (0)4 76 57 60 60 Grenoble France.

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