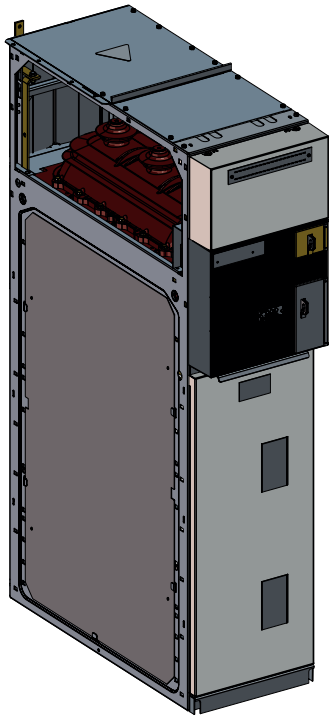
Medium Voltage Distribution

SM6 – 24kV Basic version – Up to 630A, 12.5kA, A-FL

Installation and Commissioning Guide

MFR9323101-03
02/2026



www.se.com

Legal Information

The information provided in this document contains general descriptions, technical characteristics and/or recommendations related to products/solutions.

This document is not intended as a substitute for a detailed study or operational and site-specific development or schematic plan. It is not to be used for determining suitability or reliability of the products/solutions for specific user applications. It is the duty of any such user to perform or have any professional expert of its choice (integrator, specifier or the like) perform the appropriate and comprehensive risk analysis, evaluation and testing of the products/solutions with respect to the relevant specific application or use thereof.

The Schneider Electric brand and any trademarks of Schneider Electric SE and its subsidiaries referred to in this document are the property of Schneider Electric SE or its subsidiaries. All other brands may be trademarks of their respective owner.

Schneider Electric does not grant any right or license for commercial use of the document or its content, except for a non-exclusive and personal license to consult it on an "as is" basis.

Schneider Electric reserves the right to make changes or updates with respect to or in the content of this document or the format thereof, at any time without notice.

To the extent permitted by applicable law, no responsibility or liability is assumed by Schneider Electric and its subsidiaries for any errors or omissions in the informational content of this document, as well as any non-intended use or misuse of the content thereof.

Table of Contents

Foreword

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 documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of this 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.

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 and operation of electrical equipment and its installation, and has received safety training to recognize and avoid the hazards involved.

Safety Precautions

Safety Rules

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- 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.
- Respect the LOTO (Lock Out Tag Out) procedure according to OSHA requirements.
- Always use a properly rated voltage sensing device to confirm that power is off.
- Put all devices, doors, and covers back into place before turning on power to this equipment.
- Beware of potential hazards, and carefully inspect the work area for tools and objects that may have been left inside the equipment.
- Never go behind the cubicle when it is energized.

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

Safety Instructions

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Do not drill into the switchgear.

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

Cleaning Instructions

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Do not use solvents or alcohol for cleaning the equipment.
- Do not use high-pressure cleaner for cleaning the equipment.

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

Disposal of the Equipment at End of Life

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.

⚠WARNING

HAZARD OF INCORRECT DISMANTLING OPERATION

- 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.

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

Penalties may apply according to local regulations and rules (Regulation (EU) No 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 62271-4:2013 and conforms to local regulations.

Contact Schneider Electric for more information.

About the Document

Document Scope

The purpose of this document is to assist in the installation and commissioning of SM6 24 kV cubicles.

Validity Note

This manual applies to SM6 24 kV cubicles.

The information contained in this document could be updated at any time. Schneider Electric strongly recommends that you have the most up-to-date version. You can download updated documentation from www.se.com or contact your local Schneider Electric representative for the latest information about your product.

Product Related Information

See Safety Precautions, page 6.

General Cybersecurity Information

In recent years, the growing number of networked machines and production plants has seen a corresponding increase in the potential for cyber threats, such as unauthorized access, data breaches, and operational disruptions. You must, therefore, consider all possible cybersecurity measures to help protect assets and systems against such threats.

To help keep your Schneider Electric products secure and protected, it is in your best interest to implement the cybersecurity best practices as described in the Cybersecurity Best Practices document.

Schneider Electric provides additional information and assistance:

- Subscribe to the Schneider Electric security newsletter.
- Visit the Cybersecurity Support Portal web page to:
  - Find Security Notifications.
  - Report vulnerabilities and incidents.
- Visit the Schneider Electric Cybersecurity and Data Protection Posture web page to:
  - Access the cybersecurity posture.
  - Learn more about cybersecurity in the cybersecurity academy.
  - Explore the cybersecurity services from Schneider Electric.

Document History

Document reference–revision	Release date	Modifications
MFR9323101-00	09/2019	Document creation
MFR9323101-01	03/2024	New mimics of operating mechanisms, additional cubicles and pictures of the sensor.
MFR9323101-02	06/2025	Monitoring unit T200S replaced with T300 General Cybersecurity Information added Flair DIN Option, VIP40 / VIP45 / VIP400 / VIP410 protection relays removed Addition of Protection, Monitoring and Control chapter
MFR9323101-03	02/2026	Incrementation of the revision number

To find documents online, visit the Schneider Electric download center (www.se.com/ww/en/download/).

Environmental Data

For product compliance and environmental information, refer to the Schneider Electric Environmental Data Program.

Information on Non-Inclusive or Insensitive Terminology

As a responsible, inclusive company, Schneider Electric is constantly updating its communications and products that contain non-inclusive or insensitive terminology. However, despite these efforts, our content may still contain terms that are deemed inappropriate by some customers.

Trademarks

All trademarks are owned by Schneider Electric Industries SAS or its affiliated companies.

Generalities

Handling Instructions

NOTICE
HAZARD OF INAPPROPRIATE HANDLING Strictly follow the handling instructions mentioned below. **Failure to follow these instructions can result in equipment damage.**

Cubicle Identification

A. Indicator plate **(not on TM cubicle)**

B. Characteristics and designation

C. Manufacturer name plate **(not on CM / CM2 / GAM2 / TM cubicles)**

NOTE: The characteristics of the circuit breaker or contactor are given on its plate.

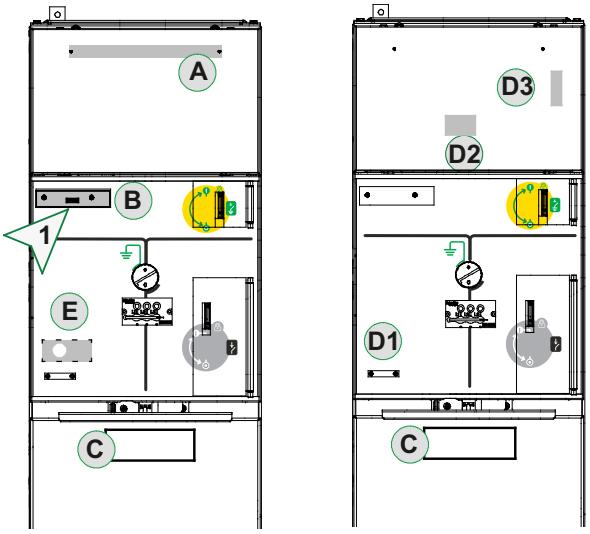
E. **For IM / IMC / IMB / PM / QM / QMC / QMB / NSM cubicles (optional):** motorization plate

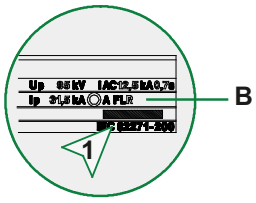
Serial number

D1. Riveted to the operating mechanism

D2. Glued to the back of the low voltage compartment

D3. Glued to the upright of the frame





1. Instruction number

GBC / GBM

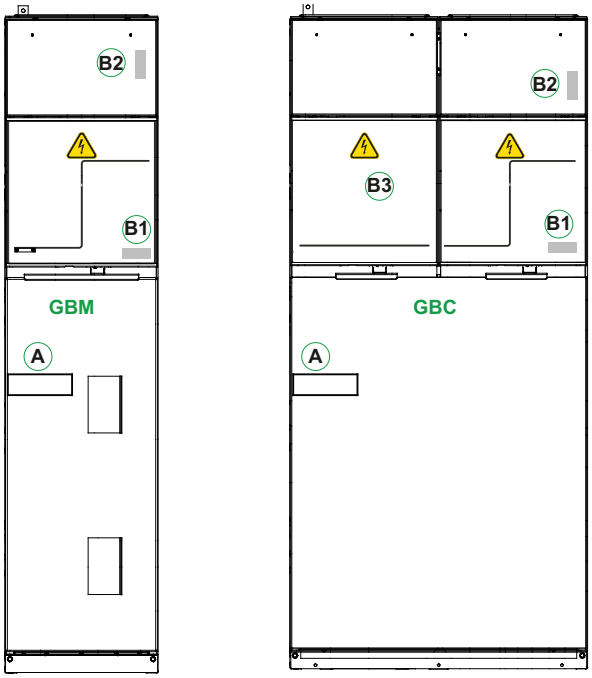
A. Manufacturer name plate

Serial number

B1. Riveted on to upper right compartment panel

B2. Glued on to frame upright

B3. **For GBC cubicle:** glued behind the upper left compartment panel



Accessories List Supplied With the Cubicle

Switchboard Accessories

May vary depending on the switchboard cubicle configuration:

- 1 operating lever
- 2 end panels
- 1 bag of nuts and bolts for the end panels

Accessories Supplied With the Cubicle

For a complete list of cubicle accessories, refer to the document shipped with the switchboard.

Accessories supplied include:

- Intercubicle connection accessories
- Field distributors for busbars
- Bottom plate(s) with fastening accessories
- Cable bushings
- Cable clamps and clamp supports
- Busbar(s)
- Earth bar

Handling Using Slings

Choose the sling to use according to the type of cubicle

Type of cubicle	IM	IMC	IMB	PM, QM	QMB	QMC	QMB	SM	DM1-S	DM1-A, DM1-D, DM1-W	DM1-A, DM1-D, DM1-W, DM1-Z 1250 A
Minimum length of sling (**L**) (mm)	920(2)	1130(4)	920(2)	920(2)	920	1130(4)	920	500	750	1130(2)	750
	375(3)	970(5)	375(3)	375(3)		970(5)				750(3)	
Cubicle width (mm)	375	500	375	375	375	625	375	375	750	750	750
	500			500	500						
Cubicle weight(1) (kg)	120	170	130	150	150	180	130	120	340	400	420
	150		150								

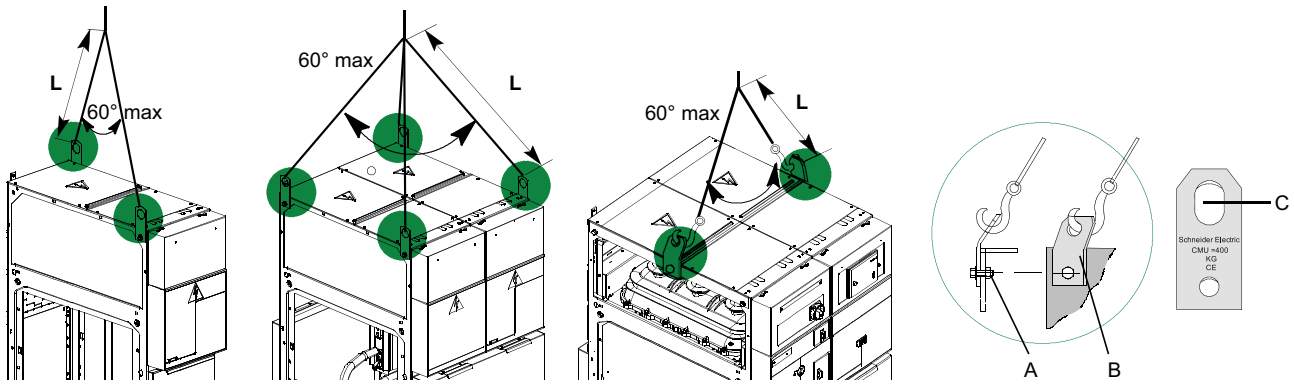
1. Average weight for an equipped cubicle
2. Without low voltage cabinet or wiring duct
3. With low voltage cabinet or wiring duct
4. With 4 handling points
5. With 2 handling points

Type of cubicle	DMV-A, DMV-D	DMVL	CVM	DM2	CM	CM2	TM	GBC-A, GBC-B, IMM	GBM	GAM2	GAM	NSM
Minimum length of sling (**L**) (mm)	750	1130(2)	750	1130(2)	920(2)	970(2)	920(2)	1130	920	920(2)	920	750
		750(3)		750(3)	375(3)	500(3)	375(3)			375(3)		
Cubicle width (mm)	625	750	750	750	375	500	375	750	375	375	500	750
Cubicle weight(1) (kg)	340	400	390	400	190	210	200	290	120	120	160	260

1. Average weight for an equipped cubicle
2. Without low voltage cabinet or wiring duct
3. With low voltage cabinet or wiring duct
4. With 4 handling points
5. With 2 handling points

The handling lugs are reserved solely for handling SM6 cubicles.

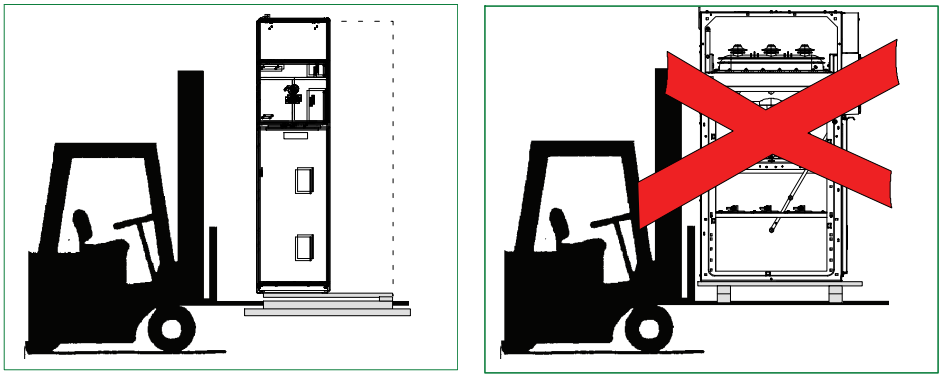
Follow the handling instructions below



A. HM12 nuts and screws
B. Lifting hook
   - Use 2 hooks to lift cubicle with a width of 375 mm
   - Use 4 hooks to lift cubicle with a width more than 375 mm
C. Hole

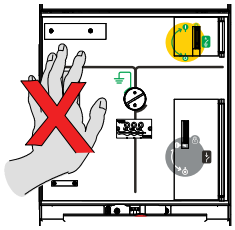
In case of hole deformation (ovalisation), replace the lugs.

Handling Using a Forklift

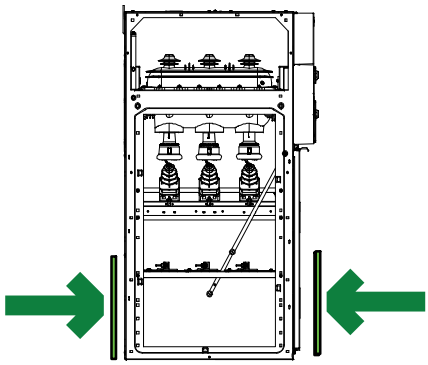


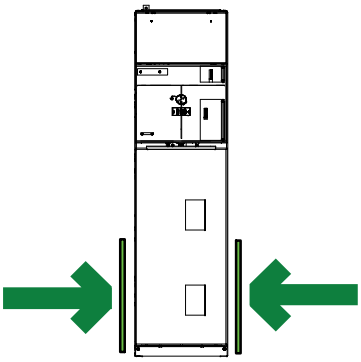
Handling Implementation

Never attempt to move the cubicle by exerting force on the operating mechanism cover.



Handling the cubicle carefully (from the bottom), in order not to cause deformation or degradation of the cubicle.





Storage Conditions

⚠CAUTION

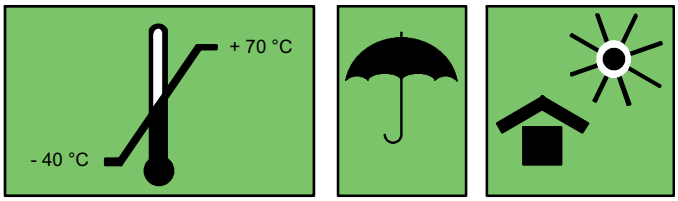
HAZARD OF INAPPROPRIATE STORAGE CONDITIONS

- Respect all the storage instructions when the device has to be stored.
- Keep the device in the original packaging until final installation.
- Never install the device if damaged.

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

To preserve all of the device characteristics when stored for prolonged periods, we recommend storing the device in its original packaging, in dry conditions, and sheltered from the sun and rain at a temperature of between -40 °C and +70 °C.

The maximum storage period is 12 months.

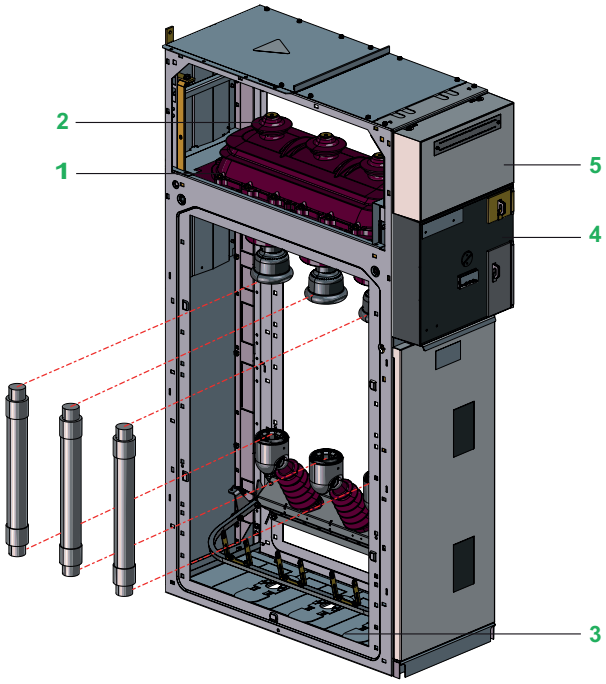


Cubicle Description

Switch and Fuse Protection Cubicles

IM / IMB / IMC / PM / QM / QMB / QMC / SM

1. **Switchgear:** switch-disconnector and earthing switch in an enclosure filled with SF6 and satisfying “sealed pressure system” requirements.
2. **Busbars:** all in the same horizontal plane, thus enabling later switchboard extensions and connection to existing equipment.
3. **Connection:** accessible through front, connection to the lower switch-disconnector and earthing switch terminals (IM cubicles) or the lower fuse-holders (PM and QM cubicles). This compartment is also equipped with an earthing switch downstream from the MV fuses for the protection units.
4. **Operating mechanism:** contains the elements used to operate the switch-disconnector and earthing switch and actuate the corresponding indications (positive break).
5. **Low voltage:** installation of a terminal block (if motor option installed), LV fuses and compact relay devices. If more space is required, an additional enclosure may be added on top of the cubicle.



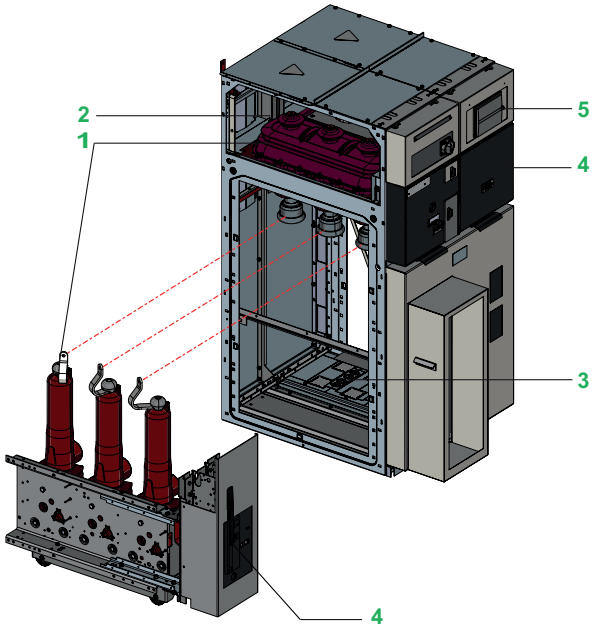
SF6 Circuit Breaker Protection Cubicles

DM1-A / DM1-D / DM1-M / DM1-S / DM1-W / DM1-Z / DM2

1. **Switchgear:** one or several disconnectors and earthing switches, in enclosures filled with SF6 and satisfying “sealed pressure system” requirements.

   One circuit breaker offer is possible:

   - SF1: combined with an electronic relay and standard sensors (with or without an auxiliary power supply).
2. **Busbars:** all in the same horizontal plane, thus enabling later switchboard extensions and connection to existing equipment.
3. **Connection:** accessible through front.
4. **Operating mechanism:** contains the elements used to operate the disconnector(s), the circuit breaker and the earthing switch, and actuate the corresponding indications.
5. **Low voltage:** installation of compact relay devices and test terminal boxes. If more space is required, an additional enclosure may be added on top of the cubicle.

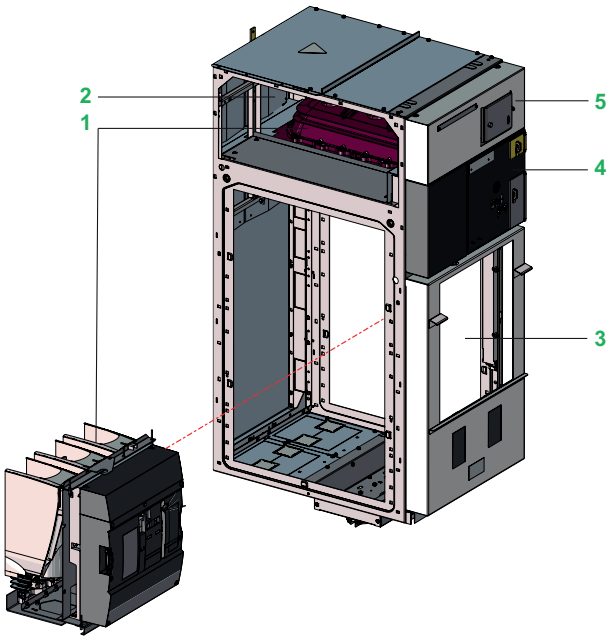


Frontal Vacuum-Type Circuit Breaker Protection Cubicles

DMV-A / DMV-D / DMV-S

1. **Switchgear:** load break switch and earthing switch(es), in an enclosure filled with SF6, and one vacuum circuit breaker, satisfying “sealed pressure system” requirements.

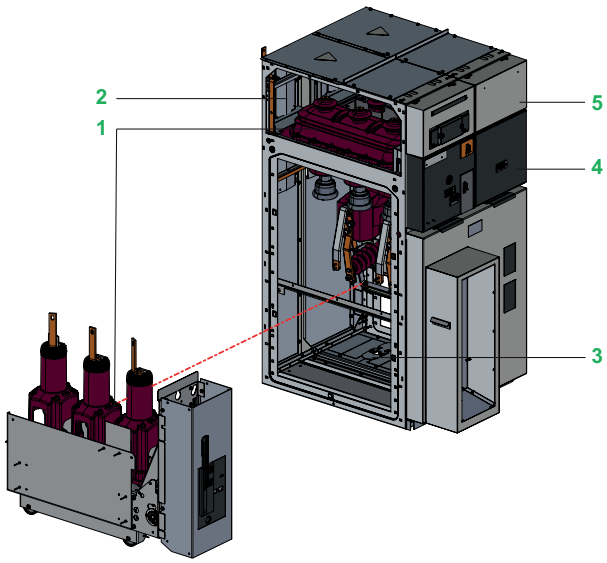
   - Evolis: device associated with an electronic relay and standard sensors (with or without auxiliary source).
2. **Busbars:** all in the same horizontal plane, thus enabling later switchboard extensions and connection to existing equipment.
3. **Connection:** accessible through front, connection to the downstream terminals of the circuit breaker.
4. **Operating mechanism:** contains the elements used to operate the disconnector(s), the circuit breaker, and the earthing switch and actuate the corresponding indications.
5. **Low voltage:** installation of compact relay devices (VIP) and test terminal boxes. If more space is required, an additional enclosure may be added on top of the cubicle.



Vacuum-Type Circuit Breaker Protection Cubicles

DMVL-A / DMVL-D

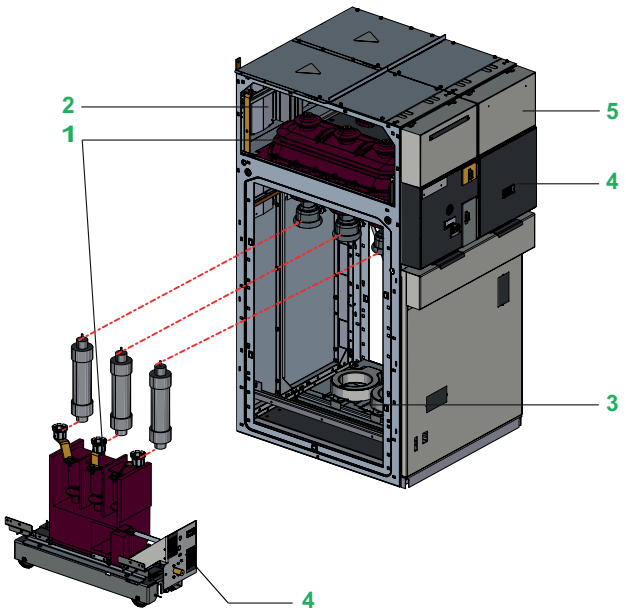
1. **Switchgear:** one or several disconnectors and earthing switches, in an enclosure filled with SF6, and one vacuum circuit breaker, satisfying “sealed pressure system” requirements.
   - Vacuum Circuit Breaker: device associated with an electronic relay and standard sensors (with or without auxiliary source).
2. **Busbars:** all in the same horizontal plane, thus enabling later switchboard extensions and connection to existing equipment.
3. **Connection:** accessible through front, connection to the downstream terminals of the circuit breaker.
4. **Operating mechanism:** contains the elements used to operate the disconnector(s), the circuit breaker, and the earthing switch and actuate the corresponding indications.
5. **Low voltage:** installation of compact relay devices and test terminal boxes. If more space is required, an additional enclosure may be added on top of the cubicle.



Contactor Cubicle

CVM

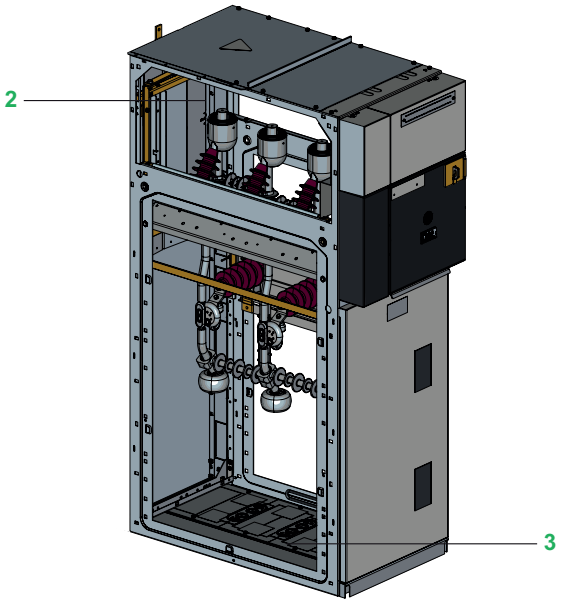
1. **Switchgear:** disconnector and earthing switch in enclosures filled with SF6 and satisfying “sealed pressure system” requirements. Two types may be used for the contactor:
   - Vacuum with magnetic holding
   - Vacuum with mechanical latching
2. **Busbars:** all in the same horizontal plane, thus enabling later switchboard extensions and connection to existing equipment.
3. **Connection:** accessible through front. This compartment is also equipped with an earthing switch downstream. The contactor may be equipped with or without fuses.
4. **Operating mechanism:** contains the elements used to operate the disconnector(s), the contactor, and the earthing switch and actuate the corresponding indications.
5. **Low voltage:** installation of compact relay devices and test terminal boxes. With basic equipment, an additional enclosure is added on top of the cubicle.



Casings Cubicles

GAM / GAM2 / GBM

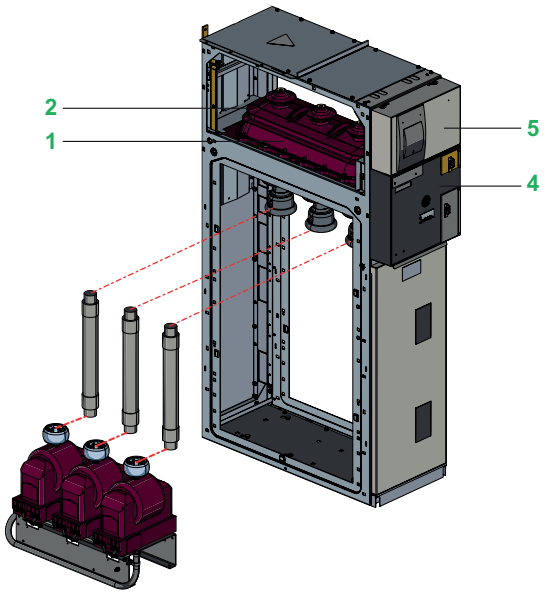
1. **Switchgear:** N/A.
2. **Busbars:** all in the same horizontal plane, thus enabling later switchboard extensions and connection to existing equipment.
3. **Connection:** accessible through front, on the busbars or cables. This compartment may be equipped with an earthing switch downstream.



Metering Cubicles

CM / CM2 / GBC-A / GBC-B / IMM / TM

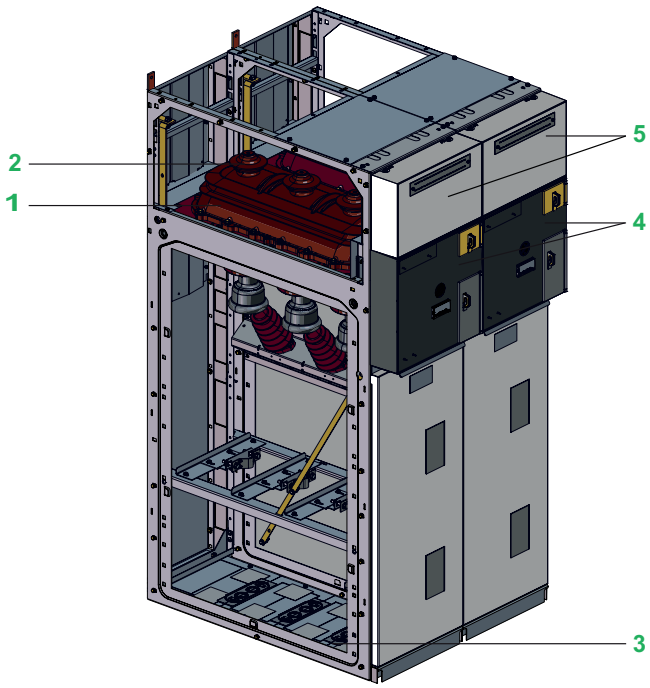
1. **Switchgear**
   - **CM / CM2 / IMM / TM:** switch-disconnector and earthing switch in an enclosure filled with SF6dry air and satisfying “sealed pressure system” requirements.
   - **GBC-A / GBC-B:** N/A.
2. **Busbars:** all in the same horizontal plane, thus enabling later switchboard extensions and connection to existing equipment.
3. **Operating mechanism**
   - **CM / CM2 / IMM / TM:** contains the elements used to operate the disconnector(s), the circuit breaker, and the earthing switch and actuate the corresponding indications.
   - **GBC-A / GBC-B:** N/A.
4. **Low voltage**
   - **CM / CM2 / IMM / TM:** installation of compact relay devices and test terminal boxes. If more space is required, an additional enclosure may be added on top of the cubicle.
   - **GBC-A / GBC-B:** N/A.



Other Cubicles

NSM-cables, NSM-busbars

1. **Switchgear:** switch-disconnector and earthing switch in an enclosure filled with SF6 and satisfying “sealed pressure system” requirements
2. **Busbars:** all in the same horizontal plane, thus enabling later switchboard extensions and connection to existing equipment.
3. **Connection:** accessible through front, on the busbars or cables.
4. **Operating mechanism:** contains the elements used to operate the switch-disconnector and earthing switch and actuate the corresponding indications (positive break).
5. **Low voltage:** contains the device rated voltage sensing VD23. An additional enclosure may be added on top of the cubicle and contains the control unit T300 and its battery.



Basic cubicle view

Installation and Operation Recommendations

Switchgear Ageing Withstand

NOTICE
HAZARD OF NOT COMPLYING WITH THE MAIN FACTORS ALLOWING SWITCHGEAR AGEING WITHSTAND Comply with all the recommendations that enable switchgear ageing withstand in an MV substation. **Failure to follow these instructions can result in equipment damage.**

Perform proper connection implementation: use the new cold slip-on and retractable technologies that offer ease of installation, thereby promoting withstand over time. Their design enables operation in polluted environments with harsh atmospheres.

Avoid the influence of the relative humidity factor: install heating resistors in climates with high relative humidity and large temperature differences.

Control ventilation: check the grids are sized according to power loss in the substation. Place the grids near the transformer, so as to help prevent air circulating on the MV switchboard.

Operation

Schneider Electric strongly recommends that you carry out at regular intervals (at least roughly every 2 years) a few operating cycles on the switching devices.

Outside normal operating conditions (from -25°C to +40°C (from -13°F to 104°F), absence of dust, corrosive gas, for example), contact your Schneider Electric service center in order to examine the measures to be taken to help ensure proper installation operation.

The Schneider Electric service center is at your disposal at all times:

- To conduct an installation diagnosis.
- To suggest the appropriate maintenance operations.
- To offer you maintenance contracts.
- To suggest adaptations.

Installation Instructions

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

Strictly follow the installation instructions.

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

Tightening torque to apply

Use the standard tightening torques below, except where a specific tightening torque is indicated:

- for M6 / HM6 screws: 9 N.m
- for M8 / HM8 screws: 21 N.m

Preparing Cubicles

Images below show a 750 mm cubicle (DMVL) as an example.

State of equipment upon delivery:

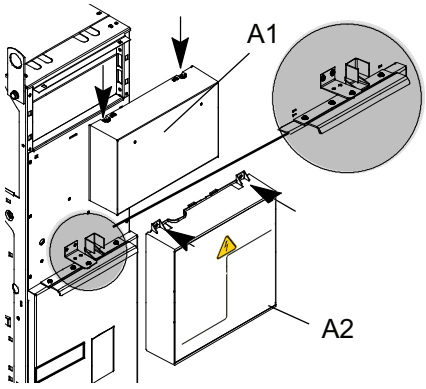
- Circuit breaker open.
- Feeder disconnector in earth position.
- Earthing switch in closed position.

Illustrations used in the procedure below:

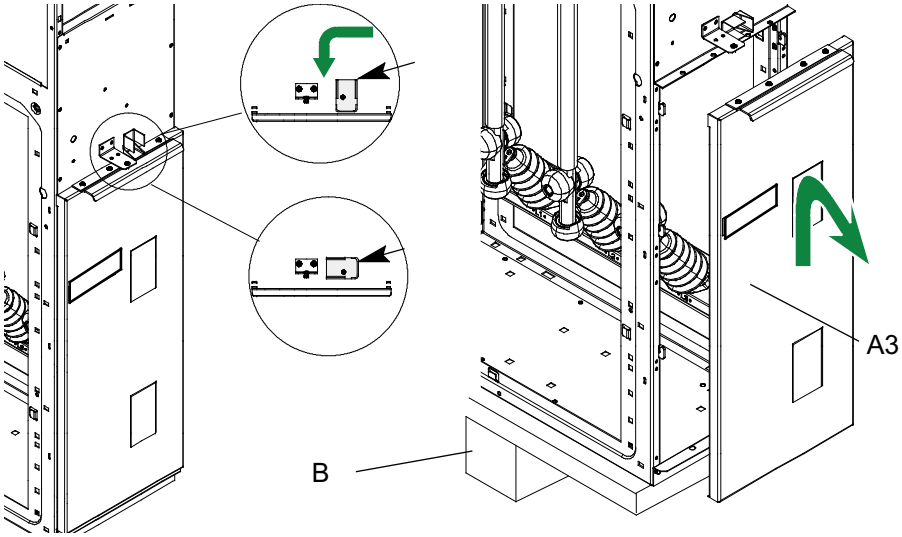
→ Bolt + washer

→ Bolt + washer + nylstop nut

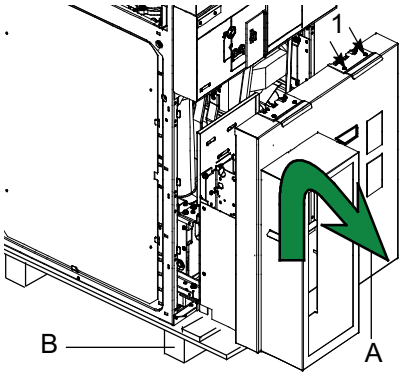
1. **For GBC / GBM / IMM cubicles:** Remove the upper panel (**A1**) and (**A2**) to access the locking angle bracket.



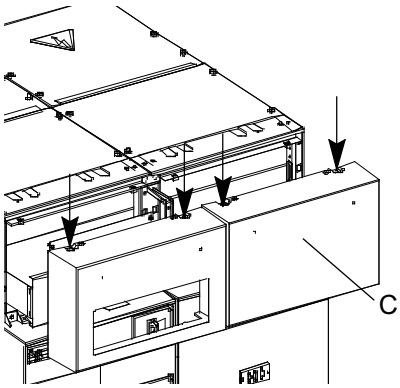
2. Swivel the angle bracket 90° to the left. Remove the front panel (**A3**) and then the pallet (**A4**). The bolts cannot be re-used.



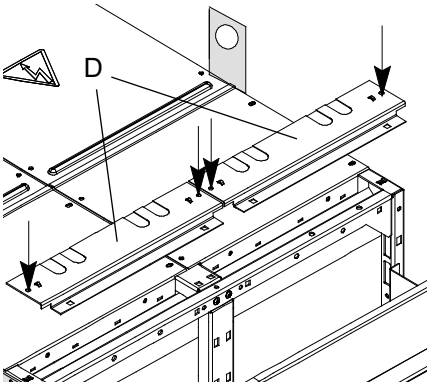
3. Remove the 2 bolts (**1**) (for DM1–D and DM1–Z cubicles) then remove the front panel (**A**) by lifting it and pulling it forward.



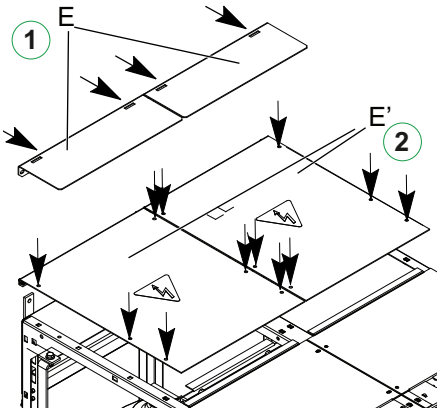
4. Remove the pallet (**B**). The bolts cannot be re-used.
5. Unscrew the bolts fixing the low voltage compartment cover(s) (**C**) (2 bolts per cover) and remove the cover(s).



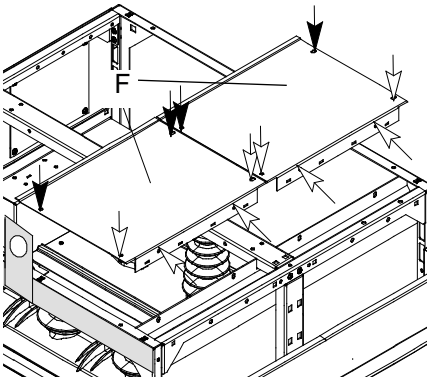
6. Remove the 2 half-cross bars (**D**) of the low voltage compartment (cubicle without low voltage (LV) compartment).



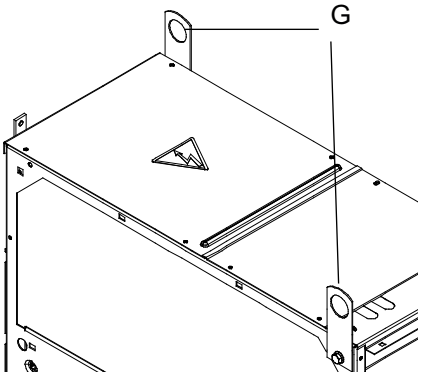
7. Remove the two top plates (**E**), then (**E'**) of the cubicle (8 to 16 bolts depending on the cubicle). Keep screws to reuse them later.



8. Remove the part(s) (**F**) (6 bolts per top plate of cubicle without low voltage compartment).

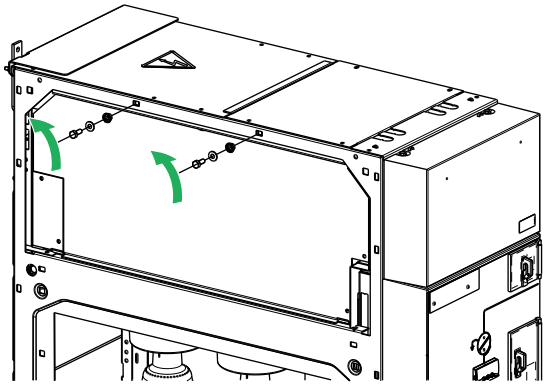


9. Remove the 2 or 4 handling parts (**G**) (cross bars and lifting rings).



Specificities for GBC-A / GBM / IMB / QMB / DMVL-D

1. Before assembling the cubicles together, remove the 2 screws.



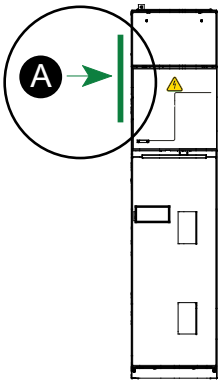
2.

⚠⚠DANGER

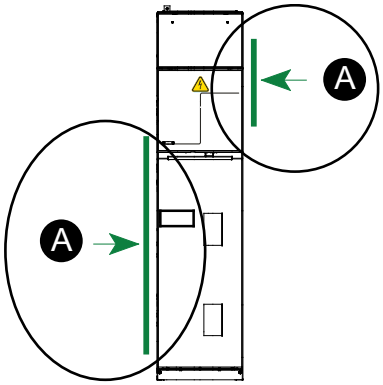
HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

Make sure that the metal partitioning plates are present according to the switchboard configuration.

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



Upper right connection and upper left protection plate, for left cubicle.



Upper left connection and upper right / lower left protection plates, for right cubicle.

A. Protection plate

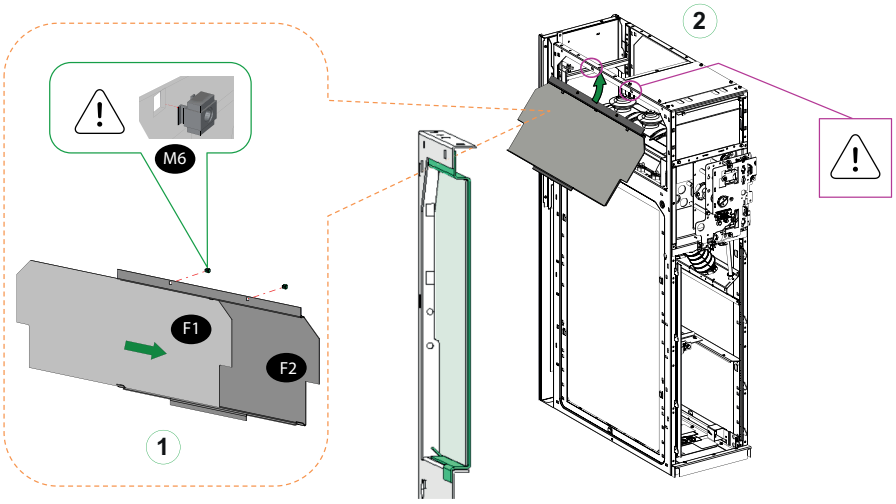
Assembling End Sheet

This section describes the steps for mounting the end sheet on the first and last cubicles of the switchboard.

Assembling the Busbar Protection on the Cubicle

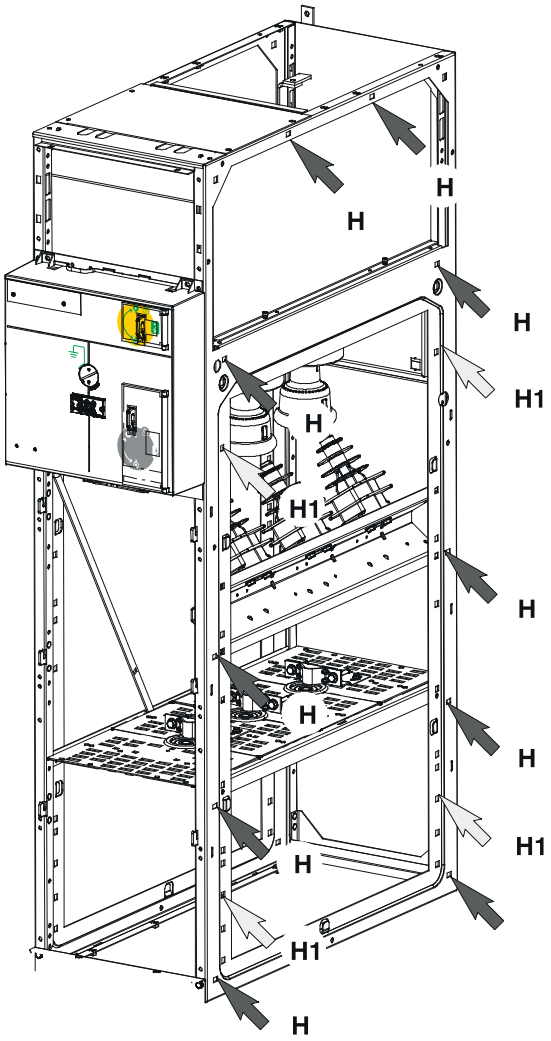
1. Slide the busbar screens protection (**F1**) against the busbar protection (**F2**). Interior assembly of the 2 cage nuts (**M6**).

2. Assemble the 2 busbar protection plates (**F1**) and (**F2**) on the cubicle while aligning the cage nuts with the holes on the cubicle frame.



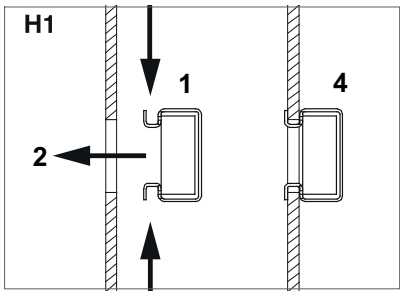
Before Fitting the End-of-Switchboard Metallic Plates

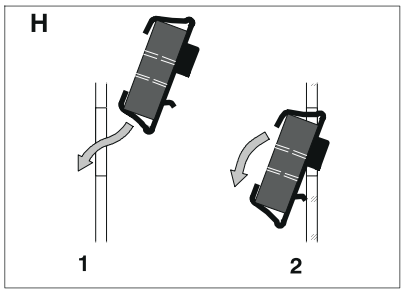
1. Prepare the cubicle at the end of the switchboard and the bag of screws S4 reference 51238949FA.
2. Fit 10 x HM6 cage nuts (**H**) on the cubicle (see mounting below)
   ➡: 10 x HM6 cage nuts (**H**)
3. Mount on the ends of the switchboard by fitting the 4 x HM8 cage nuts (**H1**)
   ⇨: 4 x HM8 cage nuts (**H1**)

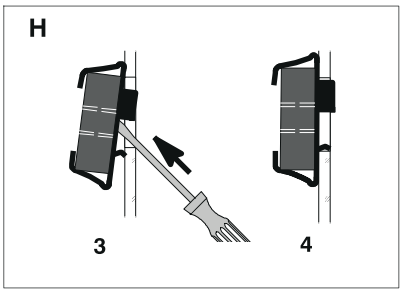


Details for mounting the cage nuts

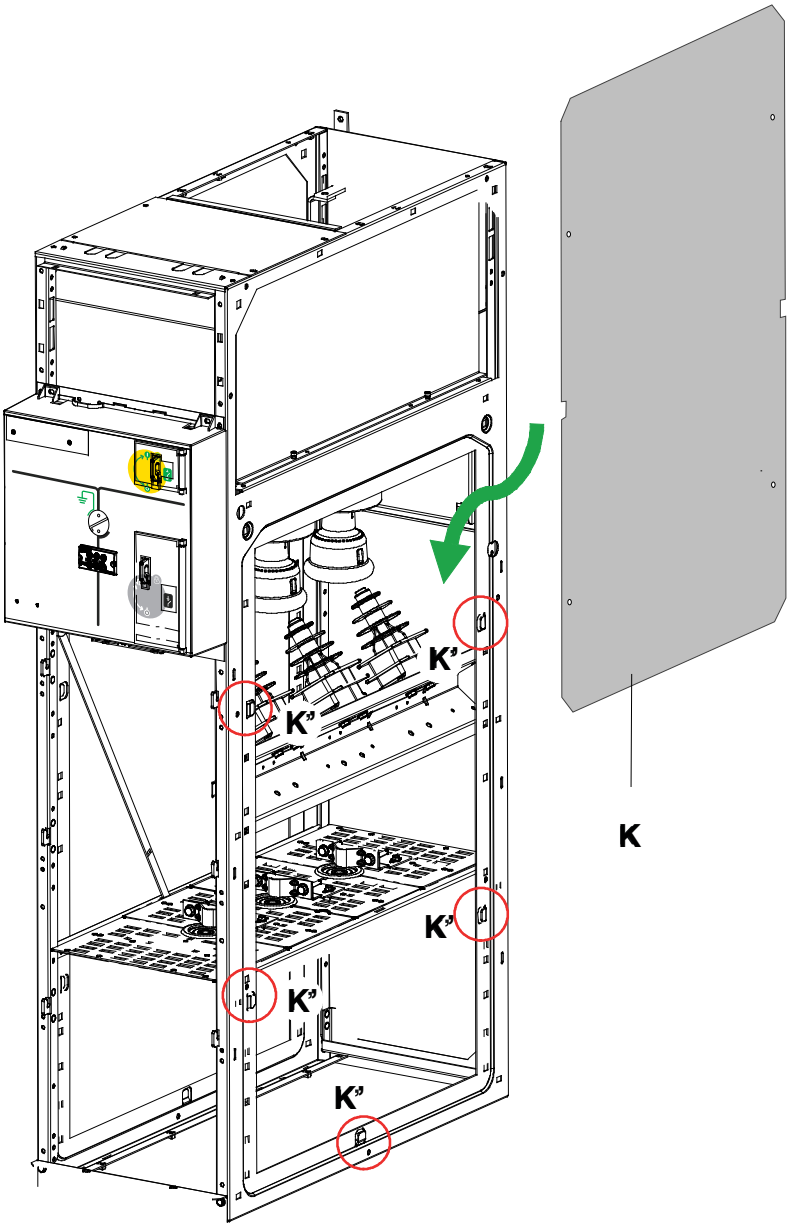
1. Insert the cage nut from outside of the cubicle in the specially provided rectangular hole.
2. Topple the cage nut inside the cubicle.
3. Push the cage nut in the direction of the arrow in order to place the top part of the cage behind the plate.
4. Nut properly placed.





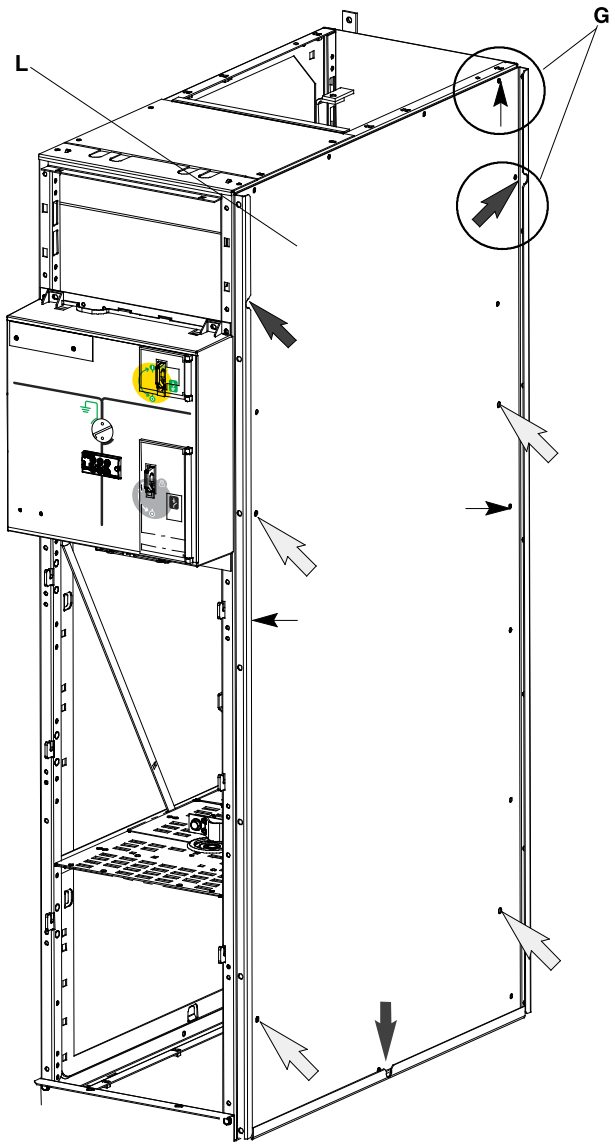


4. Assemble the cubicle separating plate by sliding the plate (**K**) into the 5 cubicle hooks (**K'**).



5. Assemble the end plate as follows:

   a. Position the end plate (**L**).
   Fit but do not lock in position the screws.



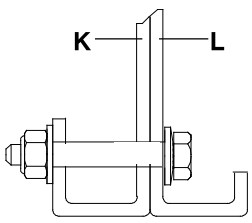
   b. Screw all screws. There are three types of screws:

   : 3 screws HM6x40 + washers + nuts
   Tightening torque: 6 N.m
   Note: When inserting the screw (**G**) in the front upright of the cubicle, take care not to damage the wiring inside this upright.

   : 4 screws HM8x20

   : 3 screws HM6x12 + washers + nylstop nuts
   Tighten the screw at the top right angle of the plate, before putting the roof back into place.

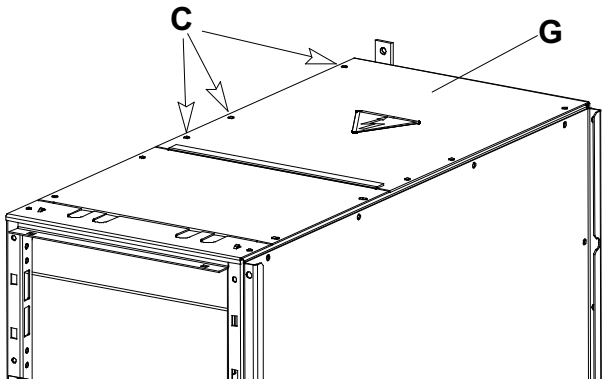
Top view of mounting HM6x40 screws



- K. Inside of cubicle
- L. End plate

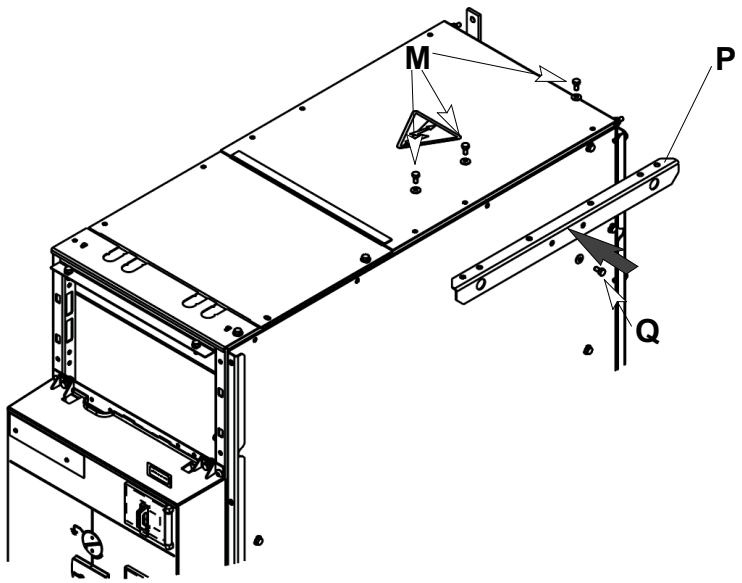
Tightening torque: 6 N.m

6. Reassemble the roof (**G**) by screwing the 3 screws (**C**) that you kept at the cubicle preparation step.



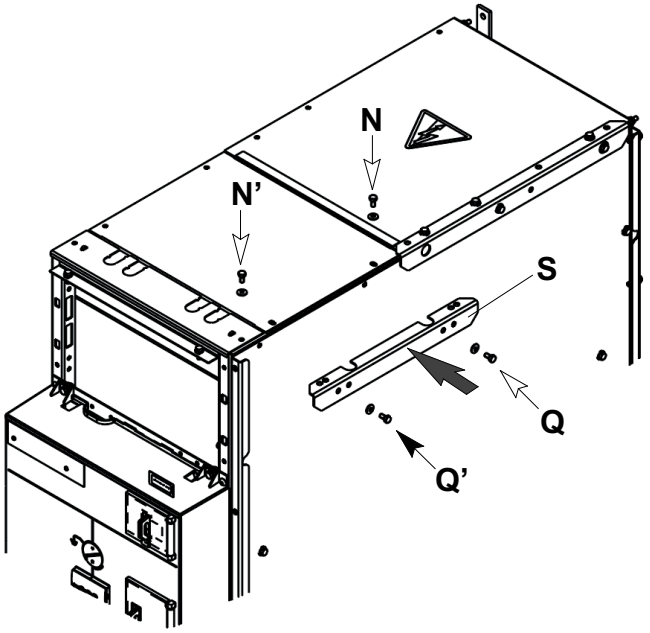
⟶: HM6x12 screws + washers

7. Reassemble the corner pieces:
   a. Place the corner piece (**P**) and screw the 3 HM6x12 screws + washers (**M**).
   b. Place the HM6x12 screw + washer (**Q**).



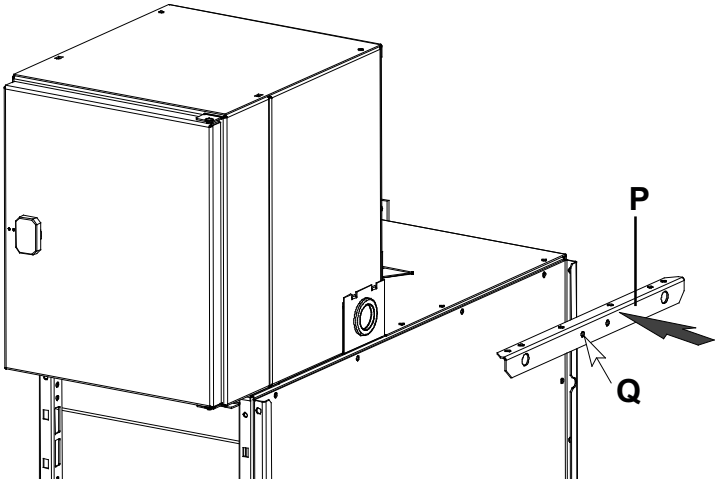
⟶ HM6x12 screws + washers

   c. Remove the HM6x12 screws + washers (**N**) and (**N'**) to place the corner piece (**S**).
   d. Put in and tighten the screws (**N**) and (**N'**).
   e. Screw the HM6x12 screw + washer +nylstop nut (**Q**) and HM6x12 screw + washer (**Q'**).

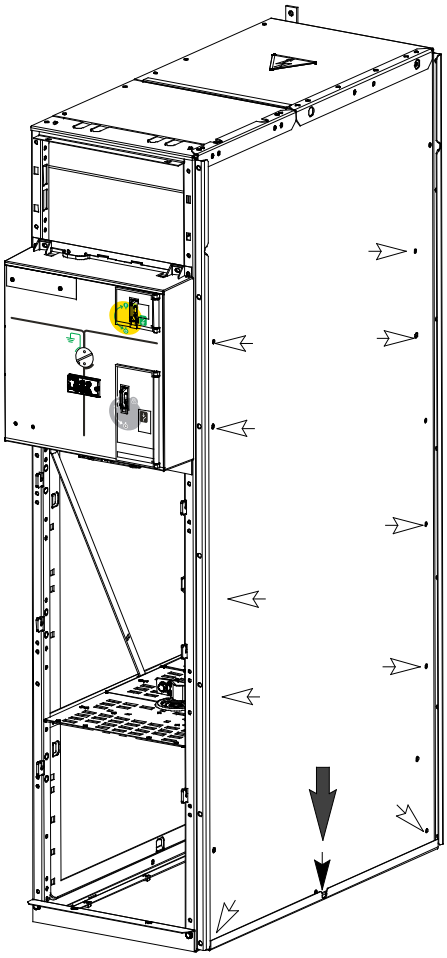


→ HM6x12 screws + washers + nylstop nuts
→ HM6x12 screw + washer

Option: for cubicle fitted with a wiring tray or low voltage compartment, only fit the reinforcement angle bracket (**P**) using HM6x12 screw + washer (**Q**).



8. Fix the end plate screws as follows:
   a. Fix the 10 screws on the end plate.
   b. Assemble the screw and nut at the bottom of the end plate. If you cannot fix the screw and nut on the circuit breaker side, set the plastic rivet.



c. Tighten and check all the screws on the end plate.
Tightening torque: 6 N.m.
⇾ 10 x HM6x12 screws + washers
➔ Plastic rivet
➡ 1 x HM8x20 screw + washer + nylstop nut

9. Assemble the rear plate as follows:

a. Re-install part (**G'**) on all cubicles of the switchboard.
⇾ 2 x HM6x12 screws + washers
Tightening torque: 6 N.m

b. Install the rear vertical reinforcement (**V**):

⚠⚠DANGER

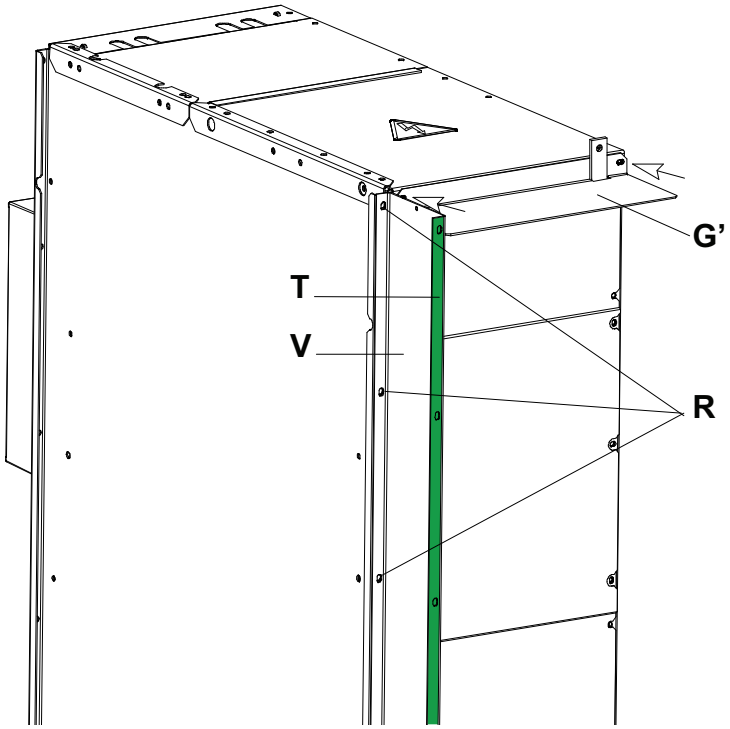
HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

The bend (**T**) of the rear vertical reinforcement (**V**) must be flat and fixed against the wall.

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

7 x HM6x20 screws + washers (**R**).

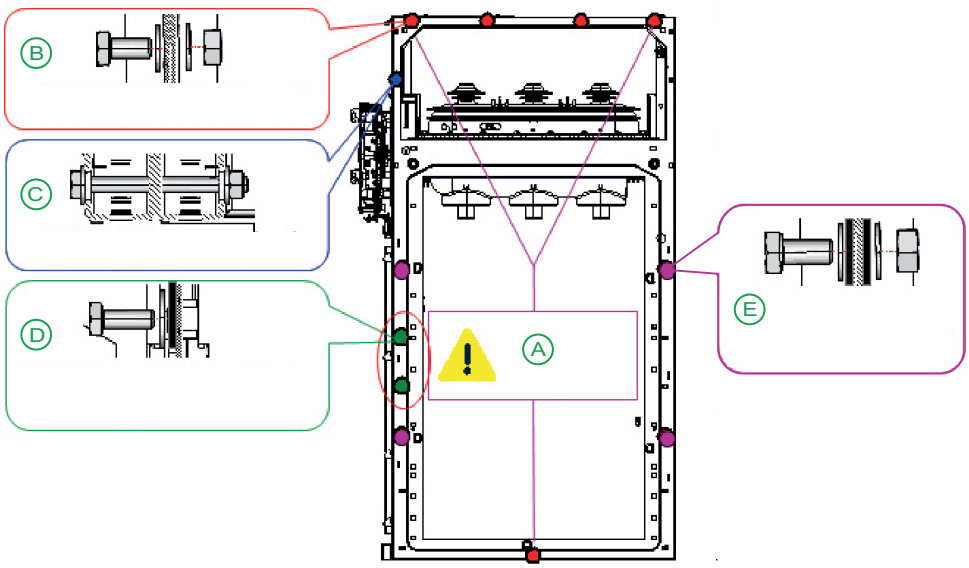
Tightening torque: 6 N.m



c. Check bend (**T**) of the rear vertical reinforcement (**V**), and fix it to the wall.

Assembling the Switchboard

Nuts and bolts in bag S1 (S1B82890).
To fix the cubicles together, follow the fixing steps below. The additional screws are for mounting the earth collector.



1. Assemble these 3 screws first: HM8x16 screws + CS washers + nuts.
2. Assemble the 2 remaining HM8x16 screws + CS washers + nuts out of the 5 indicated.
3. Assemble 1 HM6x60 screw + 2 CS washers + nuts.
4. Assemble 2 HM6x16 screws + CS washers + PL washers + cage nuts.

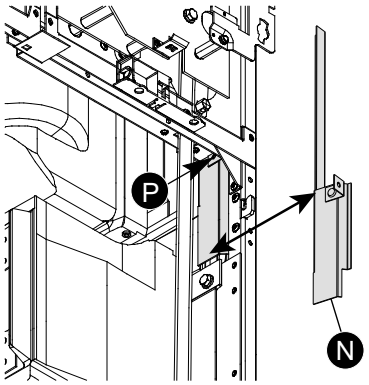
5. Assemble 4 HM8x16 screws + CS washers + PL washers + nuts.

   Tightening torques:

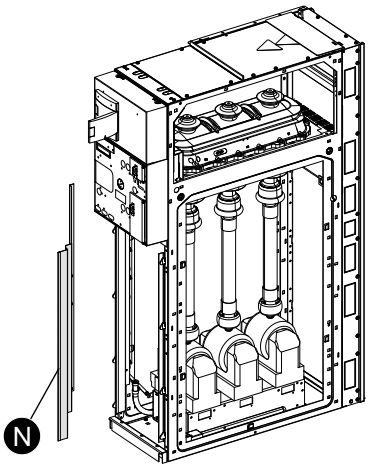
   - M6 screw: 6 N.m
   - M8 screw: 18 N.m

6. **For DM1–A, DM1–D, CM, and TM cubicles:** remove the wiring metallic shield (**N**).

DM1–A and DM1–D cubicles



CM and TM cubicles



7. Fit the bolt (**P**) to assemble the cubicles (take care to LV wires).
8. Re-install the wiring metallic shield.

⚠CAUTION

HAZARD OF INCORRECT WIRE INSTALLATION

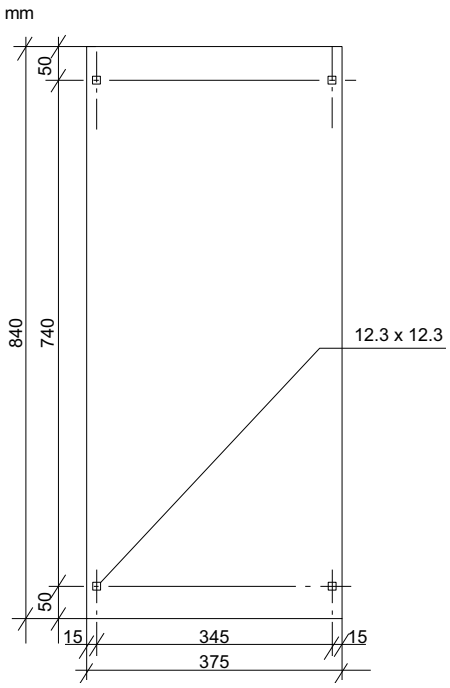
Before re-installing the CM and the TM cubicles, make sure that the wire is protected and is not stuck between the frame and the wiring metallic shield.

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

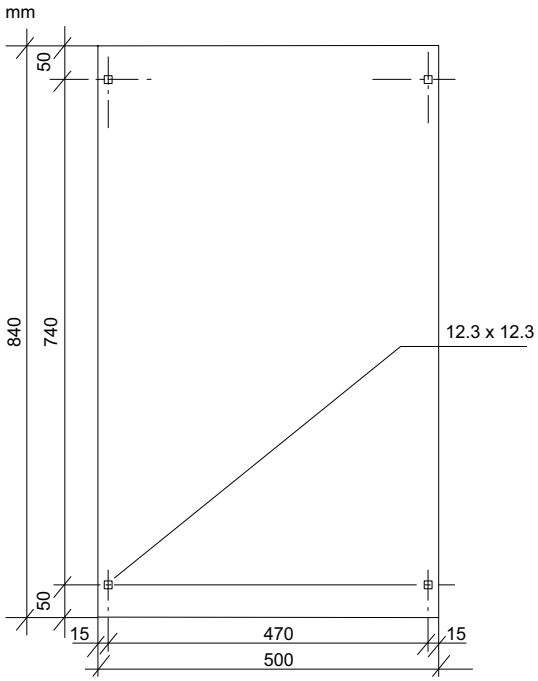
Fixing to the Floor

Nuts and bolts not included.

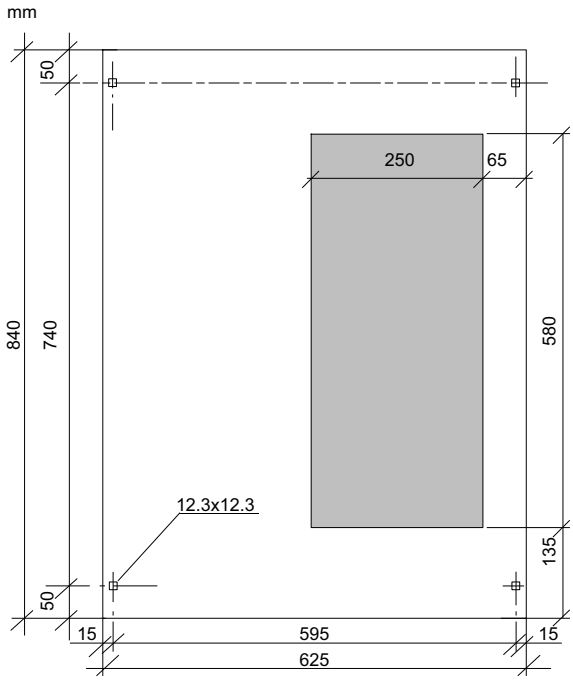
For cubicles equipped with circuit breaker, there is no floor fixation on the circuit breaker side.



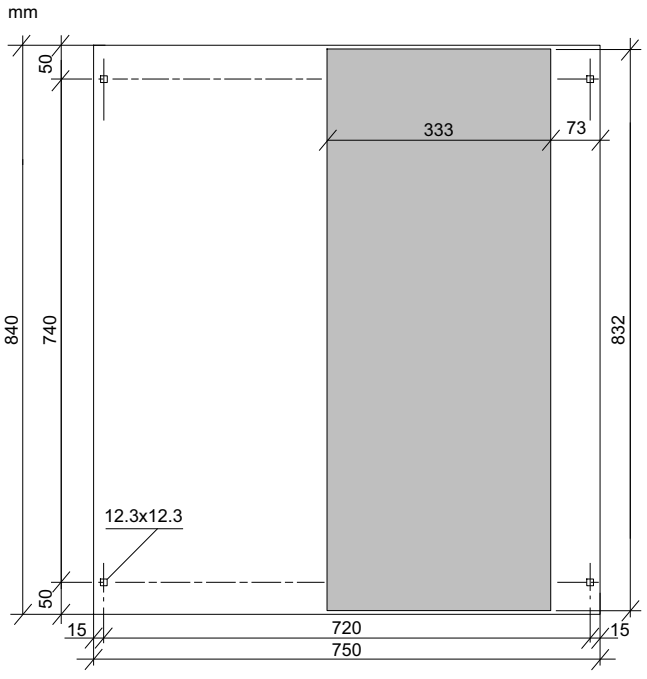
Front of cubicle



Front of cubicle



The shaded part represents the bottom pan underneath the cubicle.



The shaded part represents the bottom pan underneath the cubicle.

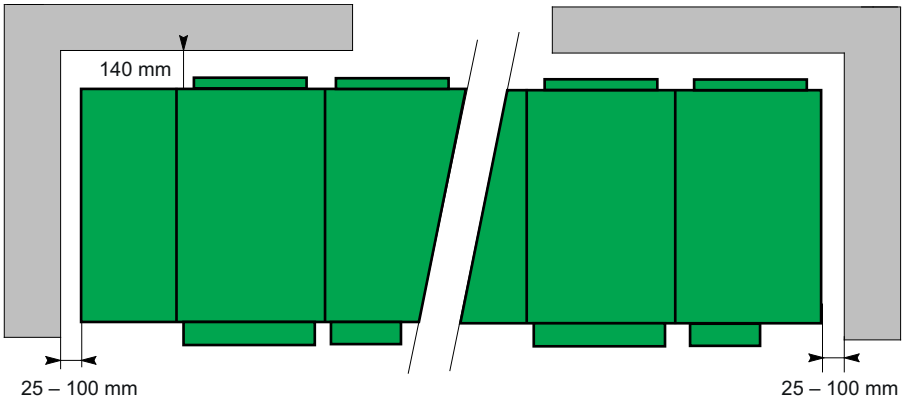
NOTE: For details, refer to the *Civil Engineering Guide / 7897512EN01.*

Layout in the Substation

Dimensions for correct operation of the equipment.

Switchboard installed to the right of the wall

Switchboard installed to the left of the wall



Fitting the Busbars after Installing Cubicles in Final Position

Busbar Connection in 630 A

Standard Busbar Connection

NOTICE
HAZARD OF INAPPROPRIATE ASSEMBLY Make sure that the busbar complies with use of the switchboard for a rated current of 630 A (only), before assembling it. **Failure to follow these instructions can result in equipment damage.**

Accessories:

- Bag S2: 3729742

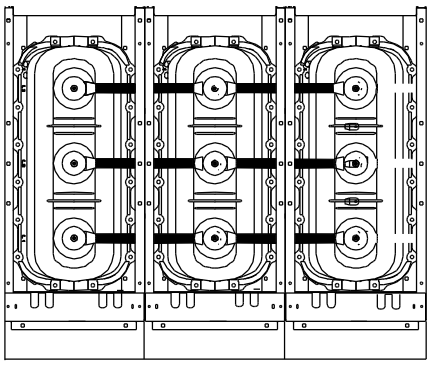
Tools:

- One torque wrench (1 to 50 N.m)
- One 1/4-3/8 adapter
- One 6 mm extension fitting
- One 6 mm male Torx fitting

The following illustrations show the standard busbar connection.

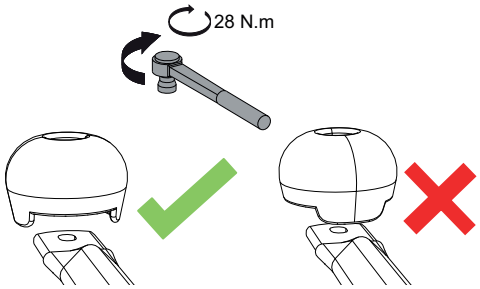
Fitting of busbars:

Top busbar connections



Position of the field distributor

Bag S2: 3729742



If the field distributor is positioned incorrectly, it can be damaged.

Busbar Connection With Silicone Field Distributor (Optional)

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

The silicone field distributor must be replaced by a similar silicone field distributor.

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

NOTICE

HAZARD OF INAPPROPRIATE ASSEMBLY

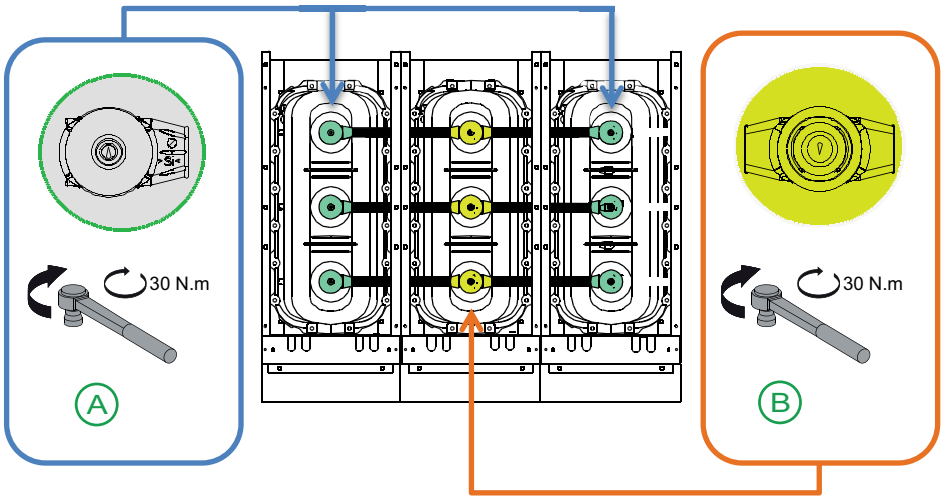
Make sure that the busbar complies with use of the switchboard for a rated current of 630 A (only), before assembling it.

Failure to follow these instructions can result in equipment damage.

Prerequisite (for harsh environment):

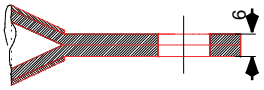
If there is an excess of silicon paste on the core, wipe off the excess with a clean and dry cloth.

The following illustration shows the busbar connection for cubicles operating in severe environmental conditions.

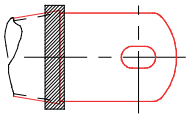


A. Bag BBV10603
B. Bag BBV10523

End busbar connections to use with silicone field distributors:



630 A rating

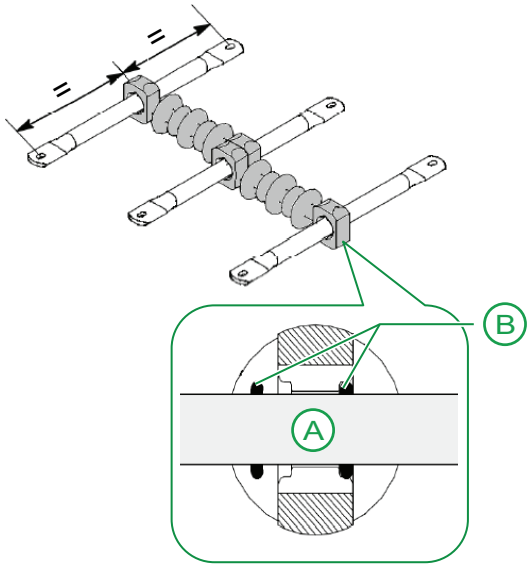


Busbar connection

Additional for Performance Ik/tk 25 kA / 1 s

1. Install the two spacers between the phases at the mid-point of the busbar section.
2. Fit O-rings (**B**) on each side of the spacers.

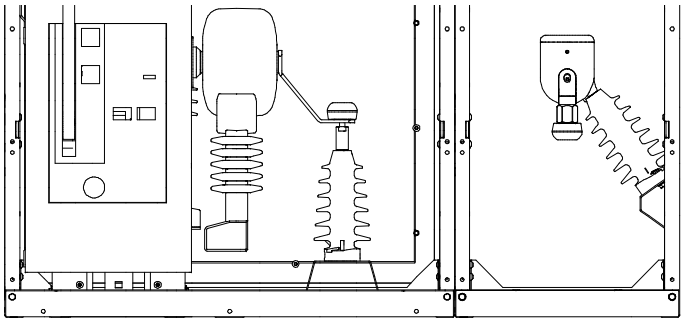
The following illustration shows the cross-sectional view of spacer.



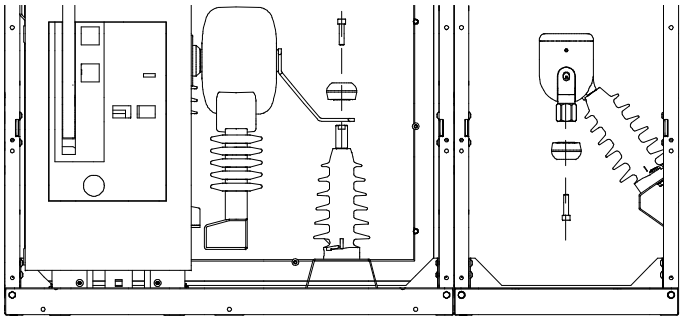
A. Busbar
B. 2 O-rings

Bottom Busbar Connection for DM1-D 630 A Cubicles

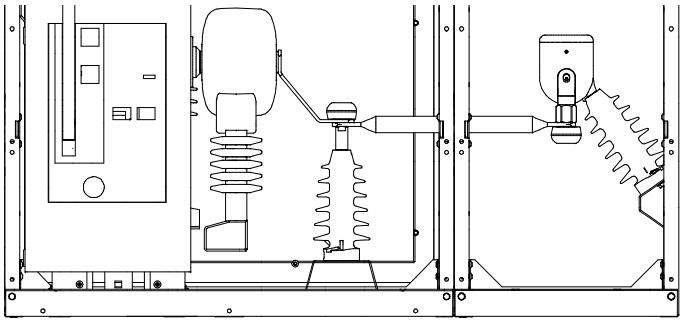
Reception



Removing



Bar connection



Mount the 2 deflectors on the bus riser cubicle as indicated below.

Busbar Connection in 1250 A

Tools

- One torque wrench (1 to 50 N.m)
- One 1/4-3/8 adapter
- One 6 mm extension fitting
- One 6 mm male hexagonal (Allan) fitting (for busbars for voltages >12 kV)
- One 6 mm female hexagonal socket (for busbars for voltages ≤12 kV)

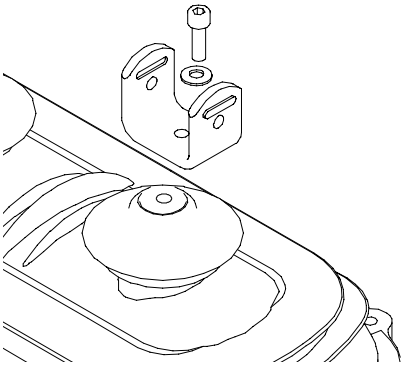
Standard Busbar Connection

The following illustrations show the standard busbar connection.

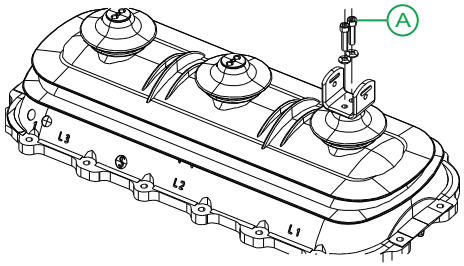
Mounting of U-brackets:

Mount the 3 U-brackets on the supporting insulators using M8x30 female socket screws without locking.

Single-hole U-bracket



Two-hole U-bracket

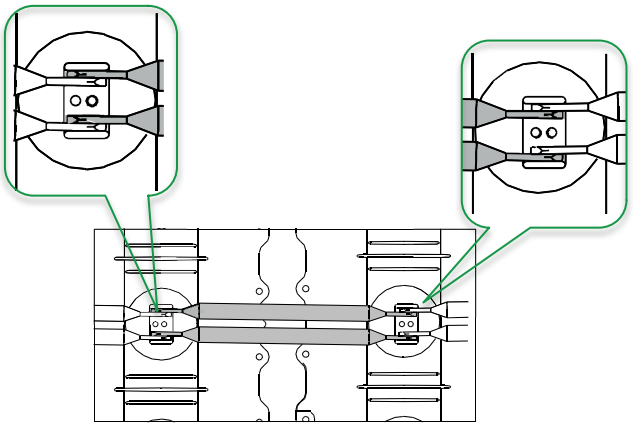


A. Two HM8x30 screws + CS washers

Fitting of busbars:

To be followed exactly.

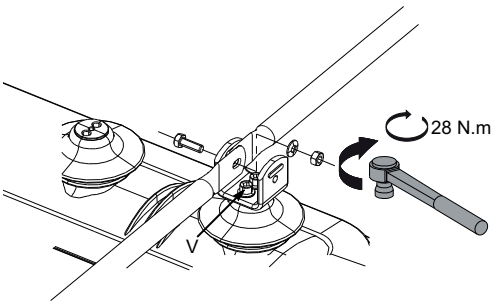
Position the bars as shown below.



Position of the field distributor for a cubicle version ≤12 kV

For each cubicle, proceed as follows:

1. Screw the U with BTR M8X30 bolt (**V**) by hand.
2. Mount the busbars connecting the cubicles only on one side of the U, and tighten to a torque of 28 N.m.



3. Tighten the BTR screw of the U to a torque of 28 N.m.
4. Mount the second busbars connecting the cubicles on the other side of the U, and tighten to a torque of 28 N.m

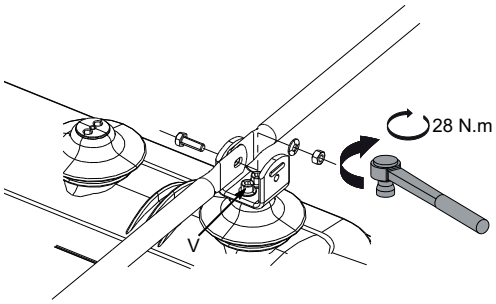
Fitting of busbars: (Continued)

Position of the field distributor for a cubicle version >12 kV

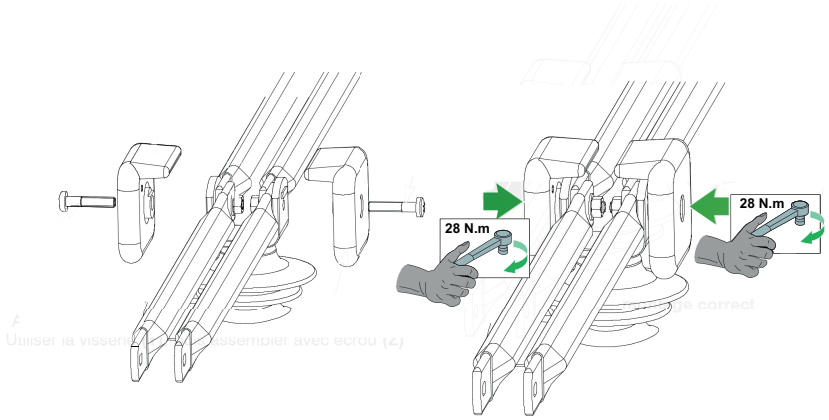
NOTICE
HAZARD OF INAPPROPRIATE ASSEMBLY Make sure the field distributor is correctly positioned. **Failure to follow these instructions can result in equipment damage.**

For each cubicle, proceed as follows:

1. Screw the U with BTR M8X30 bolt (**V**) by hand.
2. Mount the busbars connecting the cubicles only on one side of the U, and tighten to a torque of 28 N.m.



3. Tighten the BTR screw of the U to a torque of 28 N.m.
4. Mount the second busbars connecting the cubicles on the other side of the U, and tighten to a torque of 28 N.m
5. Use locating pins to immobilize the field distributors and help position them correctly on the U-bracket.

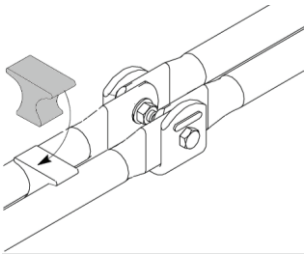


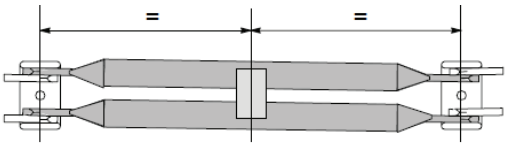
Use the screws and nuts provided to assemble the distributors.

Correct mounting.

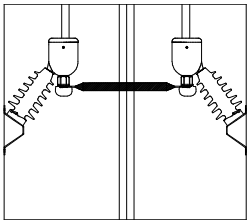
Additional for Performance Ik/tk 25 kA / 1 s

Install the spacer as follows:





Bottom Busbar Connection for GBC / GBM / IMB / QMB Cubicles



Bottom Busbar Connection for DM1-D 1250 A Cubicles and DM1-Z Cubicles

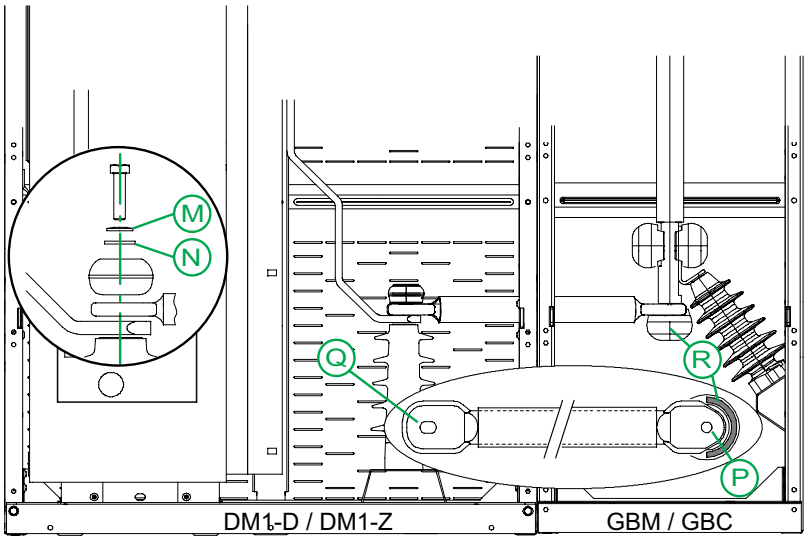
⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Make sure to install the bottom busbars in the recommended direction.

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

- Install the bottom busbars in the recommended direction.



M. Spring washer

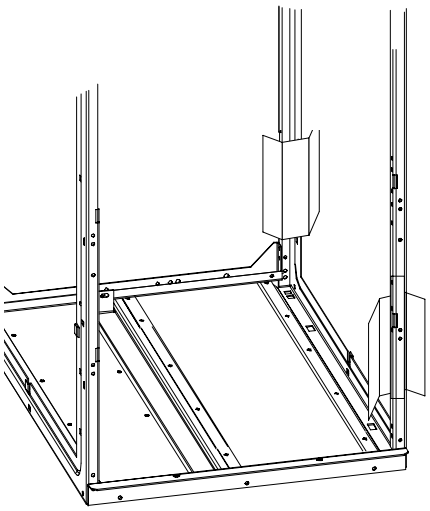
N. Flat style washer

P. 10.2 diameter hole on **GBM / GBC** cubicles

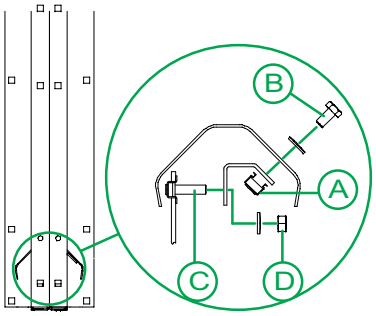
Q. D11x16 oblong hole on **DM1–D / DM1–Z** cubicles

R. Keep to the position of the distributor rib

- Fit the two field distributors on the cubicle after fitting bars as shown above.



Assembling a field distributor (top view)



DM1-D / DM1-Z GBM / GBC

A. Two M6 cage nuts

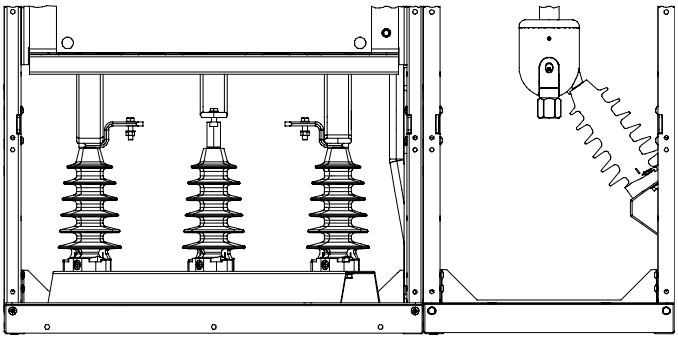
B. Two HM 6x16 bolts + washers

C. Two HM 6x30 bolts

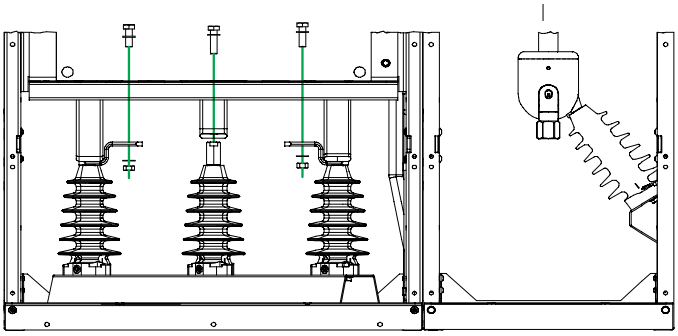
D. Two M6 nuts + washers

Bottom Busbar Connection for DMV-D Cubicles

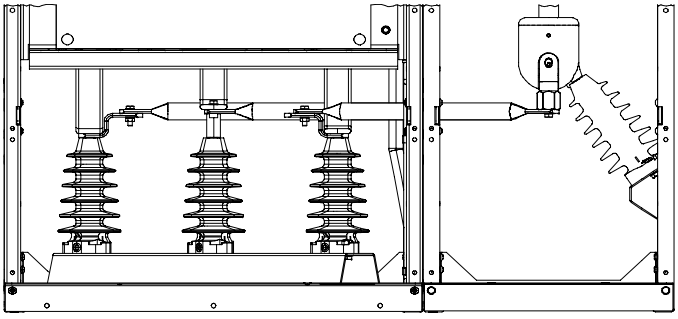
Reception



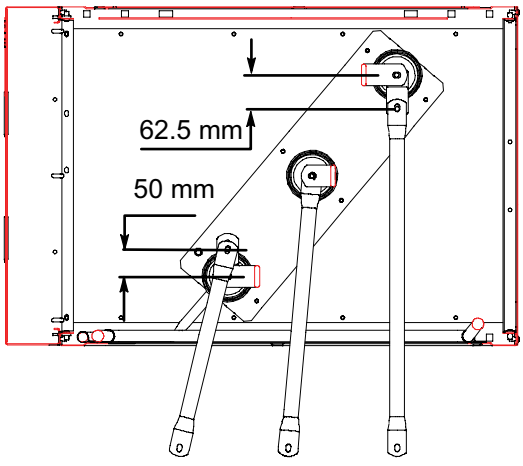
Removing



Bar connection



Check dimensions after connecting the busbars to the right cubicle for angular positioning.



Assembling the Fuses

⚠WARNING

HAZARD OF INAPPROPRIATE OPERATION

Do not re-use fuses that have already been used.

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

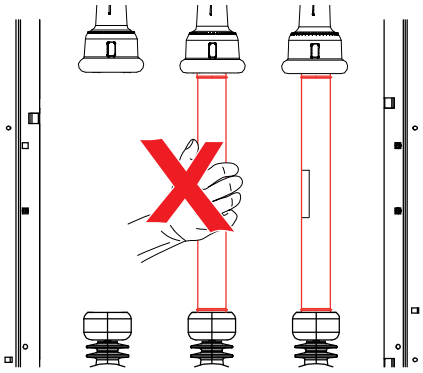
Assembling the Fuses for CM / CM2 / CVM / PM / QM / QMB / QMC /TM Cubicles

NOTICE

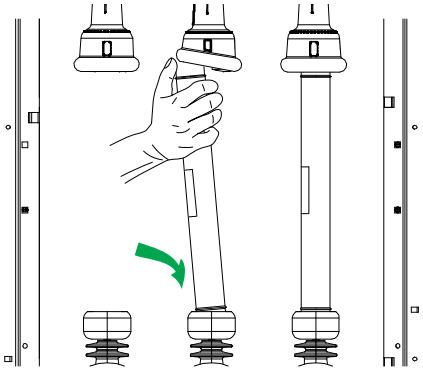
HAZARD OF INAPPROPRIATE OPERATION

Do not hold the fuse in the middle.

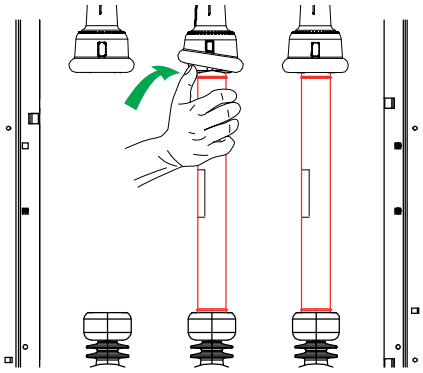
Failure to follow these instructions can result in equipment damage.



- Insert the bottom of the fuse all the way into the lower annular contact.



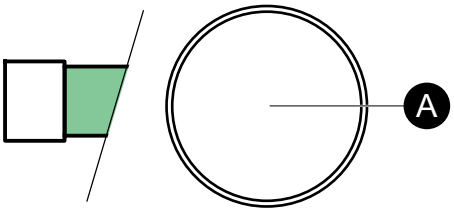
- Then put the top of the fuse in the upper contact
- Check that the upper field repartitor is properly placed.
- Turn the fuse so that the label appears in front.



Striker fuse mounting direction

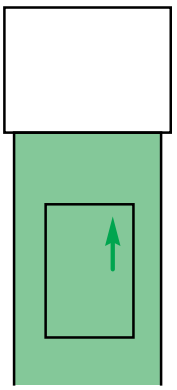
- Install the striker fuses which trip the switch when they blow.

  The end of the fuse with the striker pin (**A**) is marked as shown beside.



- The specifications and the mounting orientation of the fuse are printed on the fuse body.

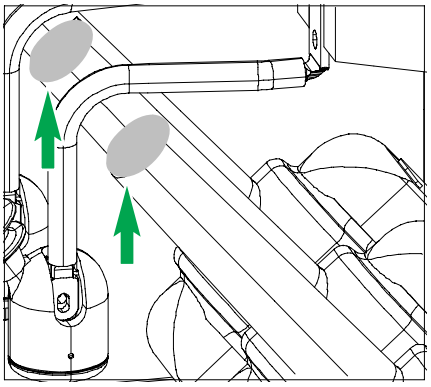
  Turn the label to face the front (striker pin at the top).



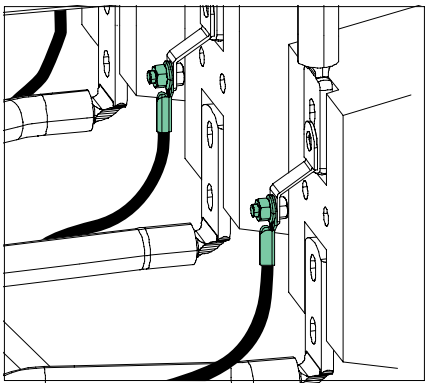
Assembling the Fuses for GBC / IMM Cubicles

For GBC-A and GBC-B cubicles: Assembling the fuses to-earth voltage VT.

- Remove the plugs protecting the fuse chambers.
- Connect a wire to each of the current transformers.

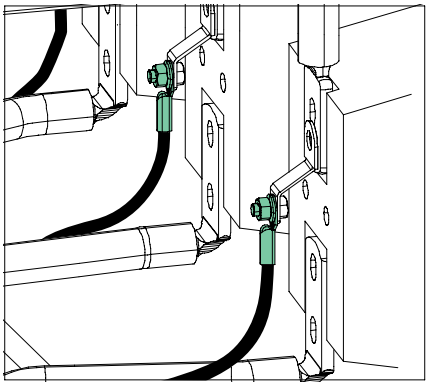


Example: connect on the top

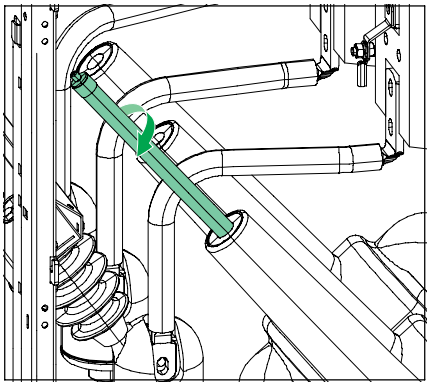


- Connect a wire to each of the current transformers.

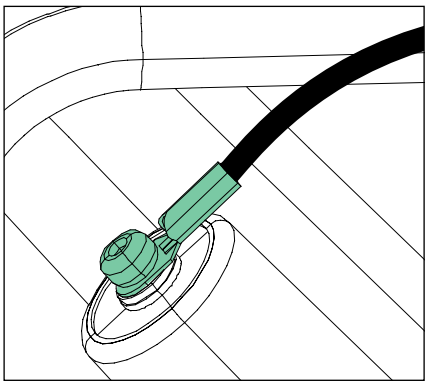
Example: connect on the down



- Screw the fuse into the fuse chamber.



- Connect the wire coming from the current step-down transformer.
- Fit the special nut and tighten it moderately by hand.



Reassembling a Cubicle

Reuse and replace in the same places the nuts and bolts removed during dismantling, except for the nylstop nuts and contact washers.

⚠WARNING

HAZARD OF INAPPROPRIATE OPERATION

Check that nothing has been left inadvertently in the busbar compartment.

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

NOTICE

HAZARD OF INAPPROPRIATE ASSEMBLY

- Do not reuse the removed nylstop nuts and contact washers.
- Replace all the removed components by new ones.

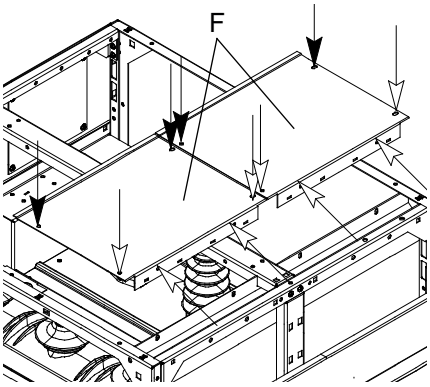
Failure to follow these instructions can result in equipment damage.

Illustrations used in the procedure:

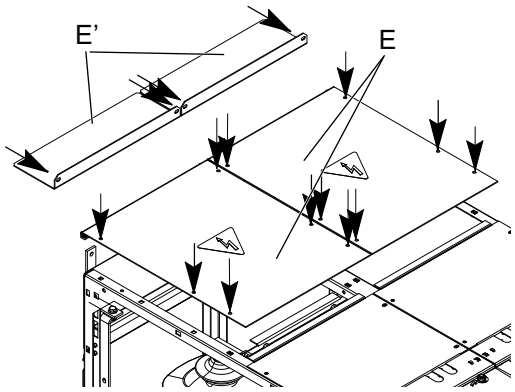
→ Bolt + washer

→ Bolt + washer + nylstop nut

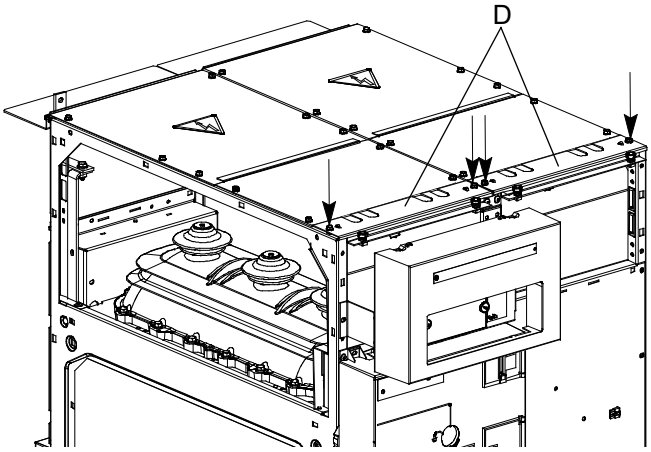
1. Re-install the two front top plates (**F**) (6 bolts per top plate of cubicle without low voltage compartment).



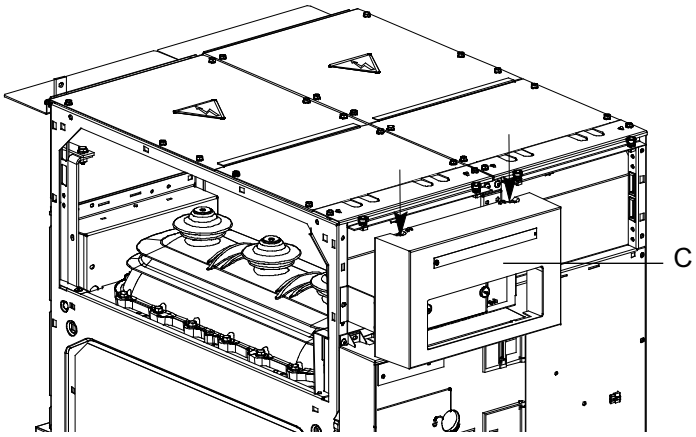
2. Re-install the two rear top plates (**E**) and (**E'**) (8 to 16 bolts depending on the cubicle).



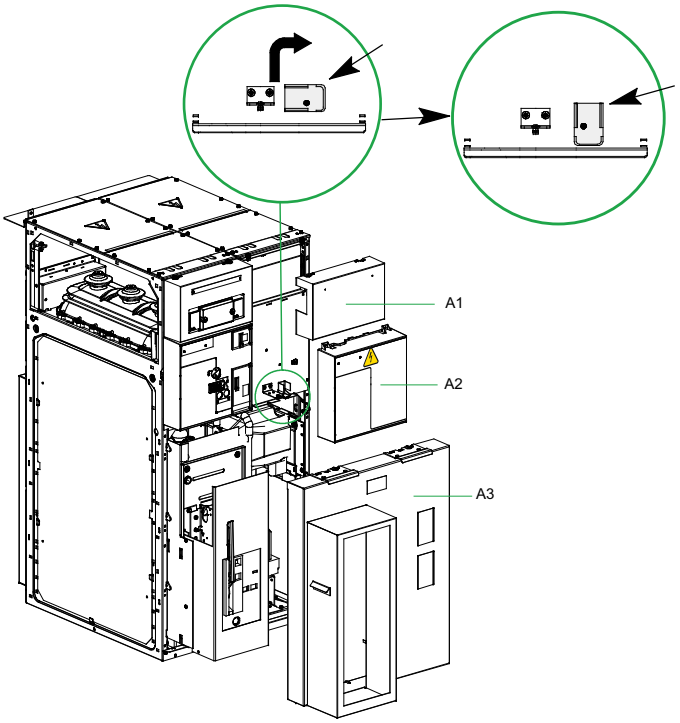
3. Re-install the 2 half-cross bars (**D**) on the cubicle (cubicle without low voltage compartment).



4. Re-install the low voltage compartment cover(s) (**C**) (2 bolts per cover).



5. **(For IMM cubicles)** Re-install the front panel (**A3**) and then swivel the angle bracket 90° to the right. Re-install the upper panels (**A2**) and (**A1**) of the compartment.

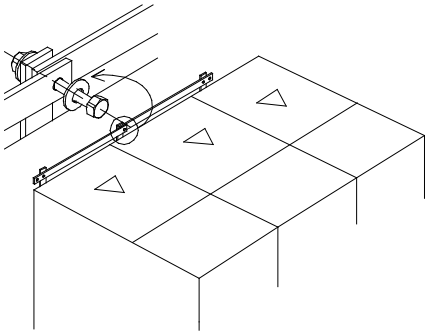


Fitting the Earth Bars

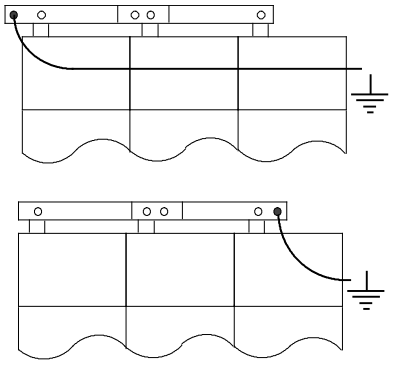
Nuts and bolts in bag S1: 3729745.

1. Connect the earth bars together (HM8 x 30 mm bolts).

   Bar length = 375 or 500 mm (center distances), depending on the cubicle.

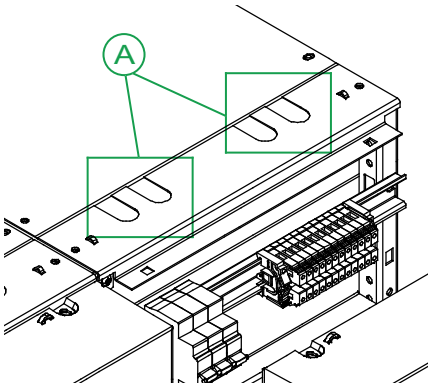


2. Connect to substation earth in either of these two ways.

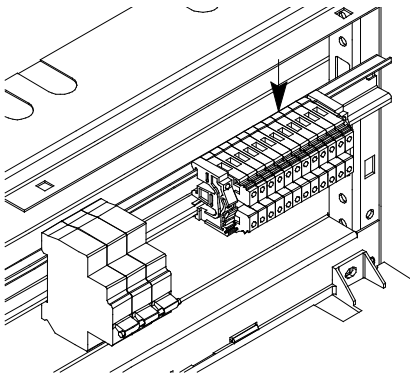


Low Voltage Connections

1. Open the low voltage compartment. Cable entry to the auxiliary terminal block is via holes (**A**) on the top.
2. Remove knock outs.



3. Make the connections to the terminal block according to the low voltage diagram of your installation.



4. Close the low voltage compartment.

Connection of MV Cables

Connection of MV Cables in IM / SM / NSM / GAM2 Cubicles Equipped With TH110 Thermal Sensors

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Make sure there is a 5 mm clearance between the cable lug and the self-gripping tape around the TH110 sensor when tightening.

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

NOTICE

HAZARD OF INAPPROPRIATE ASSEMBLY

Make sure that the self-gripping tape is correctly positioned so that it is not between the cable lug and the connection when tightening.

Failure to follow these instructions can result in equipment damage.

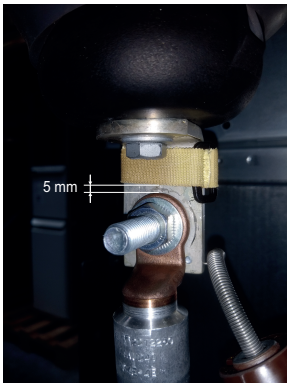
For more information, refer to PowerLogic TH110 Sensor Installation and Operation Manual (reference NVE62740–03).

Checks Before Energizing

Check the space between the sensor and the cable

Fold back the silicon cap to uncover the cable connection.

Make sure there is a 5 mm clearance between the cable lug and the self-gripping tape around the TH110 sensor.



Unfold the silicon cap to cover the cable connection.

For more information, refer to PowerLogic TH110 Sensor Installation and Operation Manual (reference NVE62740–03).

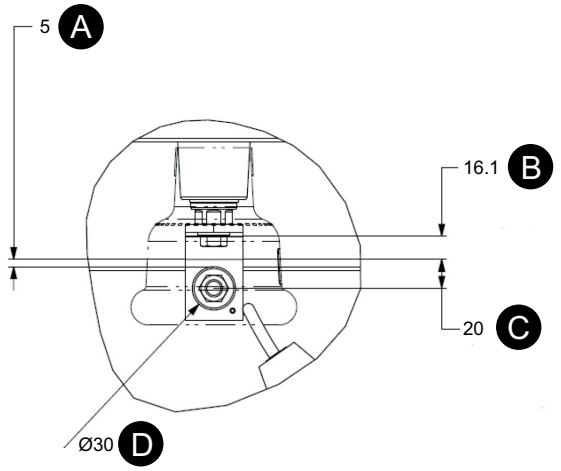
Installation Diagram

For IM375 / IM500 / SM / NSM cubicles

A. Gap between connector and self-gripping tape
B. Width of the self-gripping tape installed over the sensor.

NOTICE
HAZARD OF INAPPROPRIATE ASSEMBLY Place the buckle of the self-gripping tape on the sensor. **Failure to follow these instructions can result in equipment damage.**

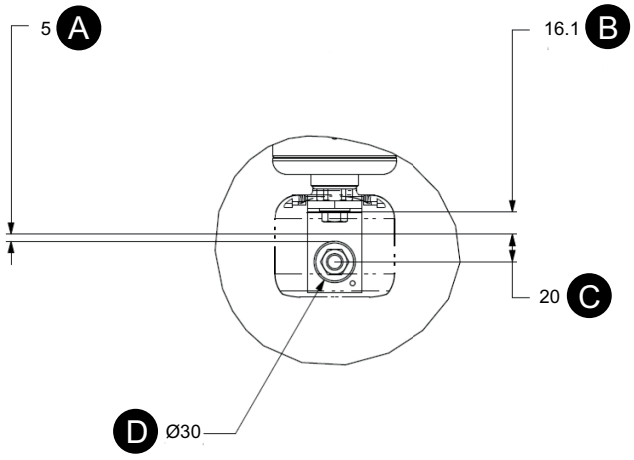
C. Minimum position of the self-gripping tape from M12 screw (use a jig for positioning)
D. Diameter of cable connector. Schneider Electric specifications: cables from 50 to 240 mm² maximum



Only for GAM2 cubicle

A. Gap between connector and self-gripping tape
B. Width of the self-gripping tape installed over the sensor.

   IMPORTANT: Place the buckle of the self-gripping tape on the sensor.
C. Minimum position of the self-gripping tape from M12 screw (use a jig for positioning)
D. Diameter of cable connector. Schneider Electric specifications: cables from 50 to 240 mm² maximum



For more information, refer to TH110 sensor Installation Manual in the corresponding cubicle (reference: PHA3434*).

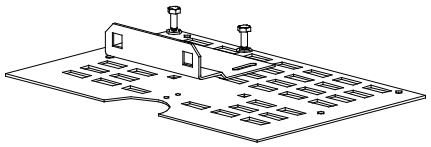
Connection of MV Cables in IM / SM / PM / QM Cubicles

1. Mount the cable clamp supports except for PM and QM cubicles when they are equipped with fuses.

   NOTE:

   Nuts and bolts in bag S3: 3729741.

   The remaining nuts and bolts are for cable clamping.



2. Mount the first bottom plate.
3. Fit the cable bushing.

4. Connect the cable to the bolt provided on the phase **L1** connector.
5. Use a torque wrench and a 19 mm socket to tighten the cable to this bolt.
6. Clamp the cable to the clamp support on the bottom plate (HM8 x 50 bolts).
7. Mount the second bottom plate.
8. Mount phases **L2** and **L3** using the same procedure as for phase **L1**.
9. Connect the cable in either of these 3 ways.

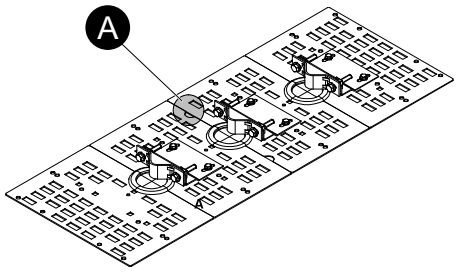
   NOTE: The bolts are already installed.

Mounting Possibilities

- **A:** Without toroids

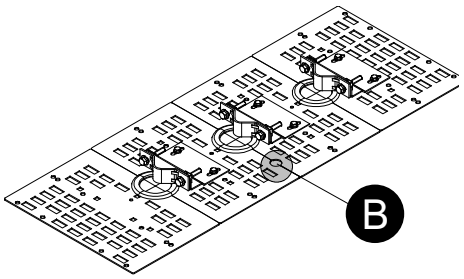
  NOTE: If the assembly (**A**) is not equipped with toroids, the degree of protection IP2X is not observed.

  Remind: IP2X: degree of protection following standard IEC 60529.

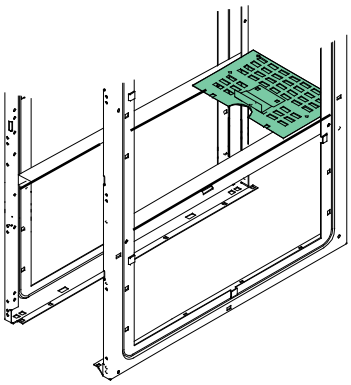


Front

- **B:** With toroids



Mount the first bottom plate.



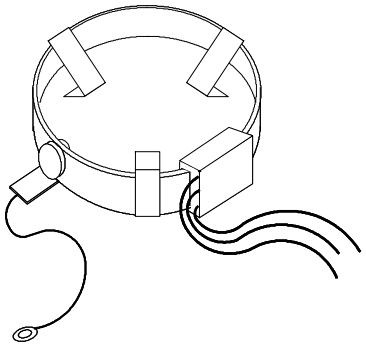
Installing the Fault Detection Toroids for 1 Cable

Instructions suggested by Schneider Electric.

For IM cubicles only.

Follow the instructions of the toroid manufacturer.

1. Prepare the toroids outside the cubicle.



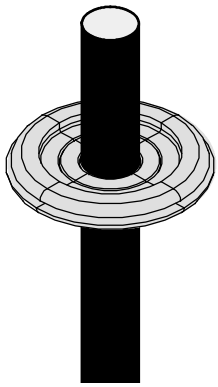
⚠CAUTION

HAZARD OF INAPPROPRIATE ASSEMBLY

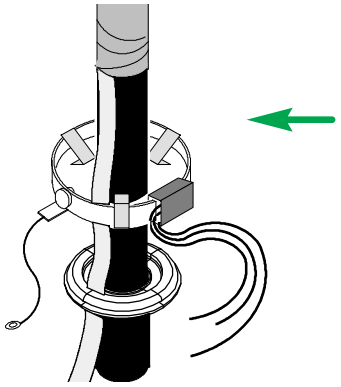
Place the isolated earthing braid of the cables through the toroids.

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

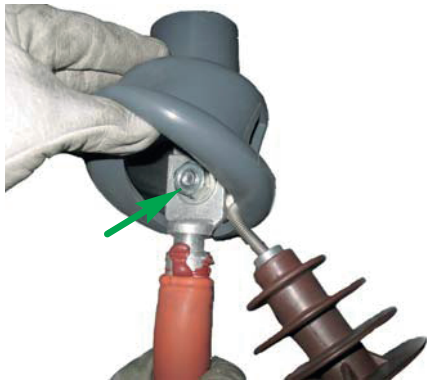
2. Fit the cable bushing.



3. Position and fix the toroid on the cable.

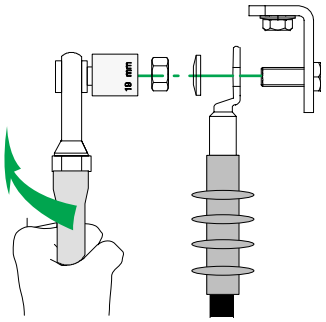


4. Connect the cable to the bolt provided on the phase **L1** connector.

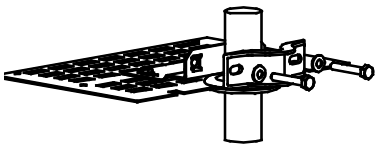


5. Use a torque wrench and a 19 mm socket to tighten the cable to this bolt.

Tightening torque: 50 N.m.

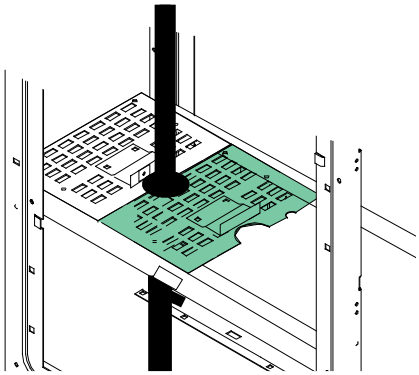


6. Clamp the cable to the clamp support on the bottom plate (HM8 x 50 bolts).

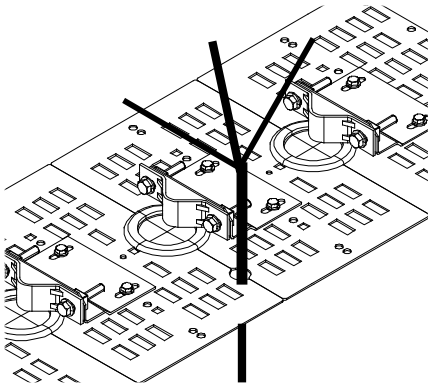


7. Mount the second bottom plate.

8. Mount phases **L2** and **L3** using the same procedure as for phase **L1**.

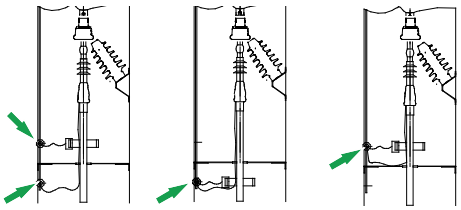


Example of low voltage routing: cables pass through the opening.



9. Connect the cable and toroid earthing braids in either of these 3 ways.

NOTE: The bolts are already installed.



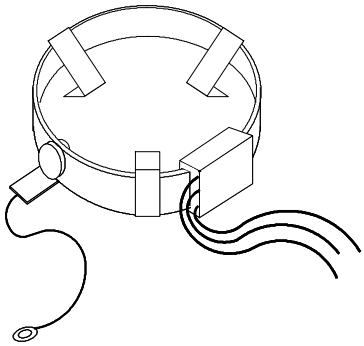
Installing the Fault Detection Toroids for 2 Cables

Instructions suggested by Schneider Electric.

For IM cubicles only.

Follow the instructions of the toroid manufacturer.

1. Prepare the toroids outside the cubicle.



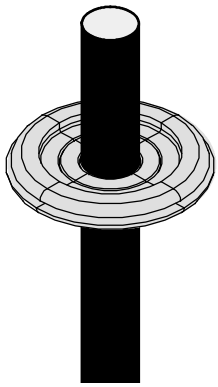
⚠CAUTION

HAZARD OF INAPPROPRIATE ASSEMBLY

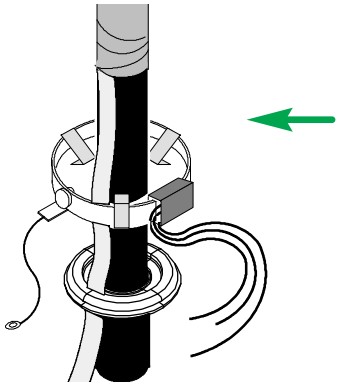
Place the isolated earthing braid of the cables through the toroids.

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

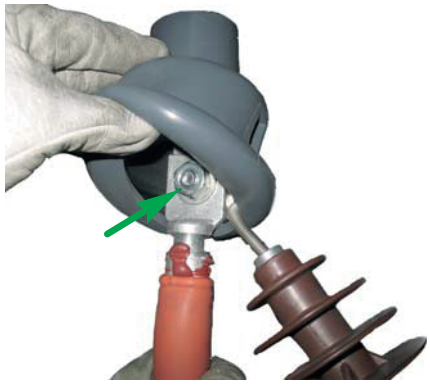
2. Fit the cable bushing.



3. Position and fix the toroid on the cable.



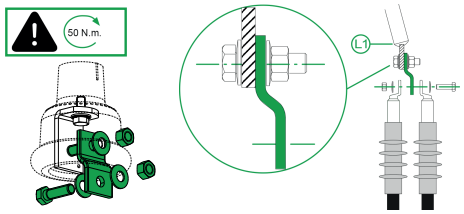
4. Connect the cable to the bolt provided on the phase **L1** connector.



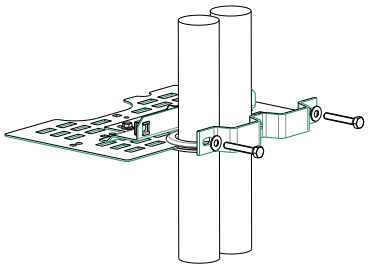
5. Two cables version cubicle

Use a torque wrench and a 19 mm socket to tighten the cable to this bolt.

Tightening torque: 50 N.m.

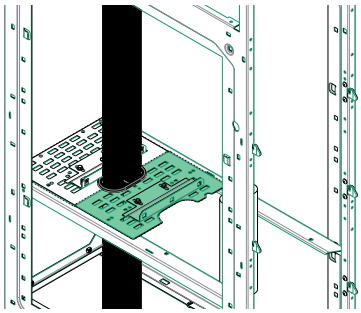


6. Clamp the cable to the clamp support on the bottom plate (HM8 x 50 bolts).

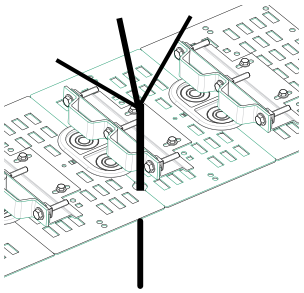


7. Mount the second bottom plate.

8. Mount phases **L2** and **L3** using the same procedure as for phase **L1**.

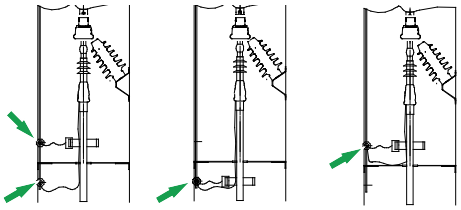


Example of low voltage routing: cables pass through the opening.



9. Connect the cable and toroid earthing braids in either of these 3 ways.

NOTE: The bolts are already installed.



Specific Operations for PM / QM Cubicles

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- The MV cables connection must be done with the downstream earthing switch in earth position.
- When connecting the MV cables, be careful not to bend the mobile contact. A twisted mobile contact can cause an unexpected behavior of the SMALT.

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

NOTICE

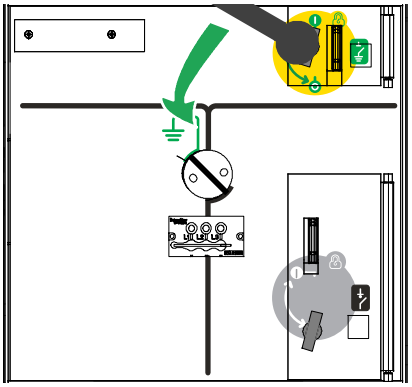
HAZARD OF INAPPROPRIATE ASSEMBLY

Do not use the cable clamp supports when the cubicle is equipped with fuses.

Failure to follow these instructions can result in equipment damage.

Nuts and bolts in bag S5: 3729743.

1. If the switch is not in earth position, close the earthing switch (**A**) using the operating lever.



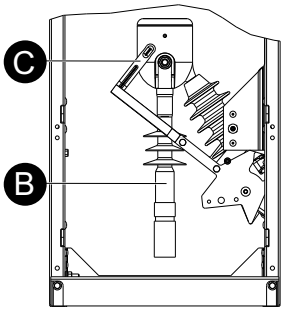
The downstream earthing switch closes simultaneously.

2. Fit the cables **(B)** in the same order as for the **IM cubicle**.

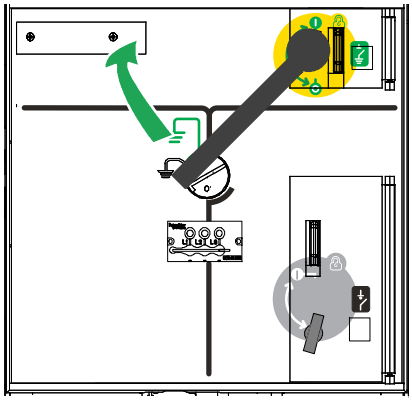
   Be careful not to damage the mobile contacts **(C)**.

   Use a torque wrench and a 16 mm socket to tighten the bolts.

   Tightening torque: 50 N.m.



3. Open and close the earthing switch (**A**) to check the good operation of the downstream earthing switch. Perform a visual inspection to certify that the mobile contacts are not deformed.

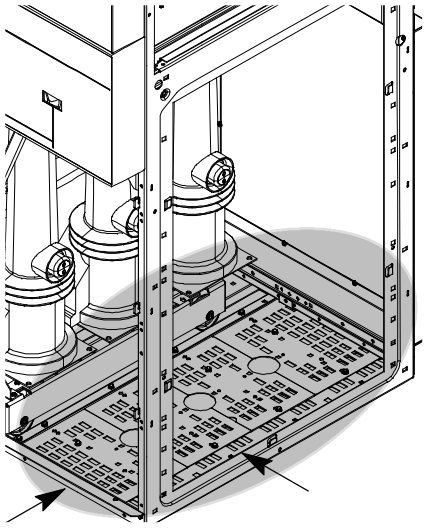


Connection of MV Cables in DM1-A 630 A Cubicles

One Cable Version Cubicle

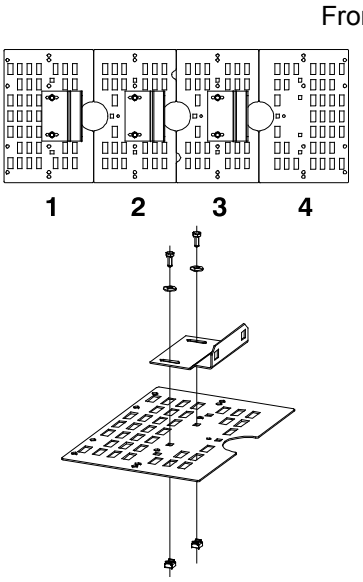
Nuts and bolts in bag S7: 3731664

- Remove the plinth (4 bolts).
- Remove the bottom plates.

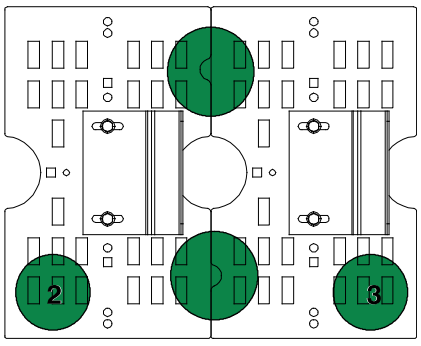


- Mount the cable clamps on the 3 bottom plates (**1**), (**2**), and (**3**) (HM6x16 bolts).

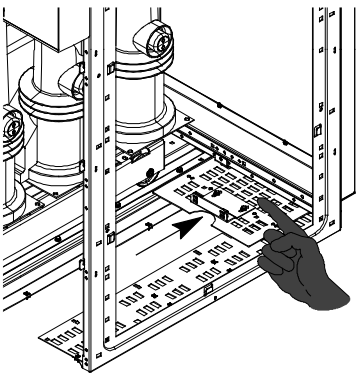
  NOTE: The remaining nuts and bolts are for cable clamping.



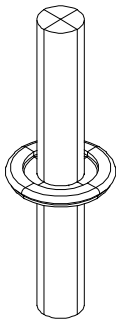
- Fix plates (**2**) and (**3**) as shown beside.



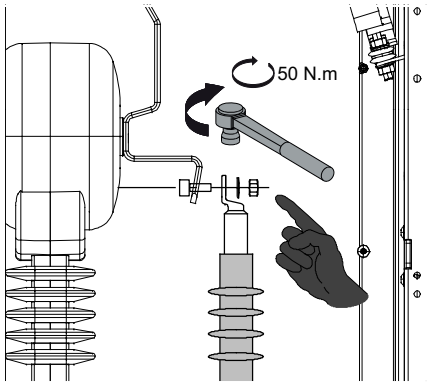
- Mount the first bottom plate (for phase **L1**) in the back of the cubicle.

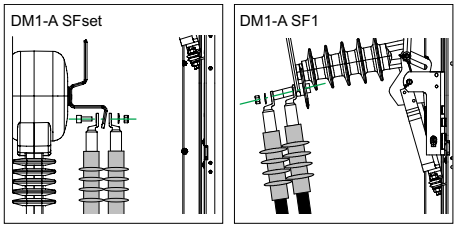


- Fit the cable bushing.

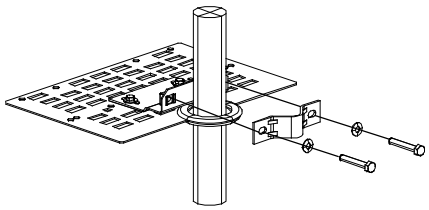


- **DM1-A cubicle with SFset circuit breaker:** Make sure the head of the bolt of the cable connection is on the sensor side.

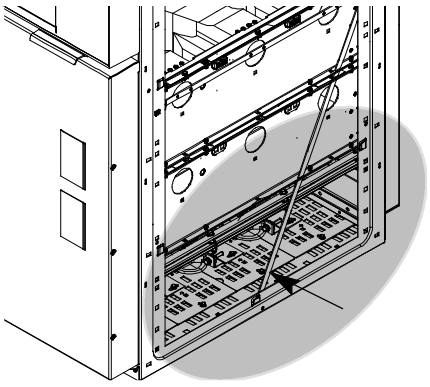




- Assemble the first cable on the first sheet metal floor then, place the second sheet metal floor (HM8x50 bolts).
- Assemble the **L2** and **L3** phases the same way as **L1** phase.



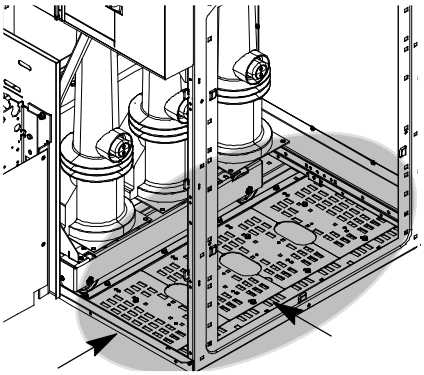
- Assemble the earthing braids to the earth bar.



Two Cables Version Cubicle

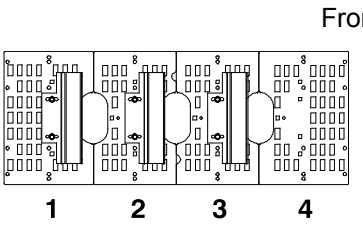
Nuts and bolts in bag S7: 3731664

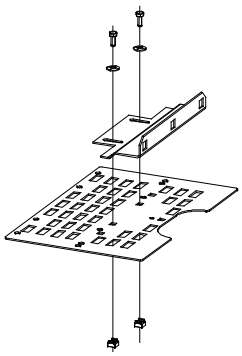
- Remove the plinth (4 bolts).
- Remove the bottom plates.



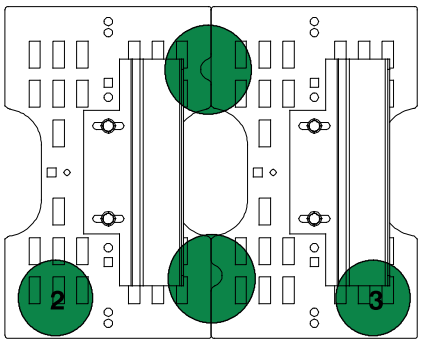
- Mount the cable clamps on the 3 bottom plates (**1**), (**2**), and (**3**) (HM6x16 bolts).

  NOTE: The remaining nuts and bolts are for cable clamping.

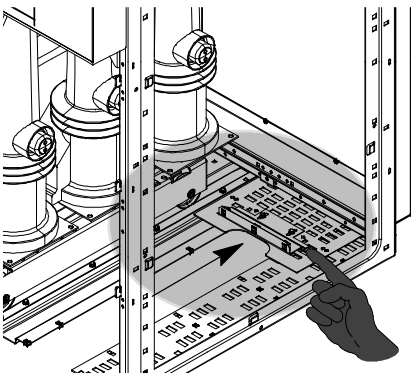




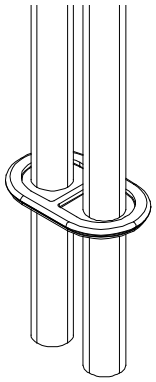
- Fix the plates (**2**), and (**3**) as shown beside.



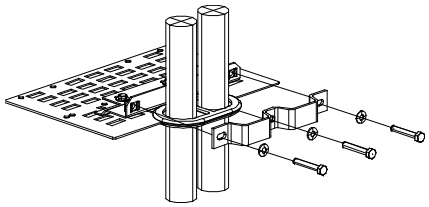
- Mount the first bottom plate (for phase **L1**) in the back of the cubicle.



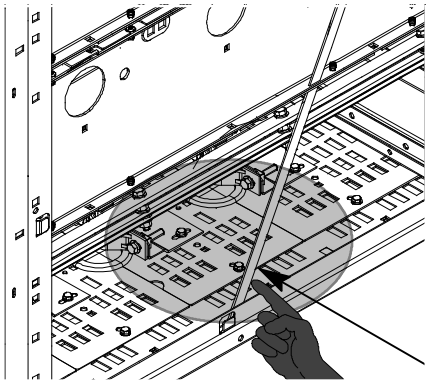
- Fit the cable bushing.



- Clamp the first cable then, mount the second bottom plate (HM8x50 bolts).
- Assemble the **L2** and **L3** phases the same way as **L1** phase.



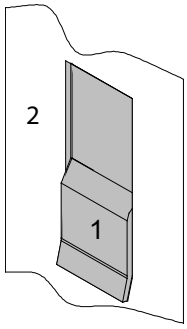
- Assemble the earthing braids to the earth bar.



Connection Alternative 1 Three-Pole Cable in a DM1-A Cubicle

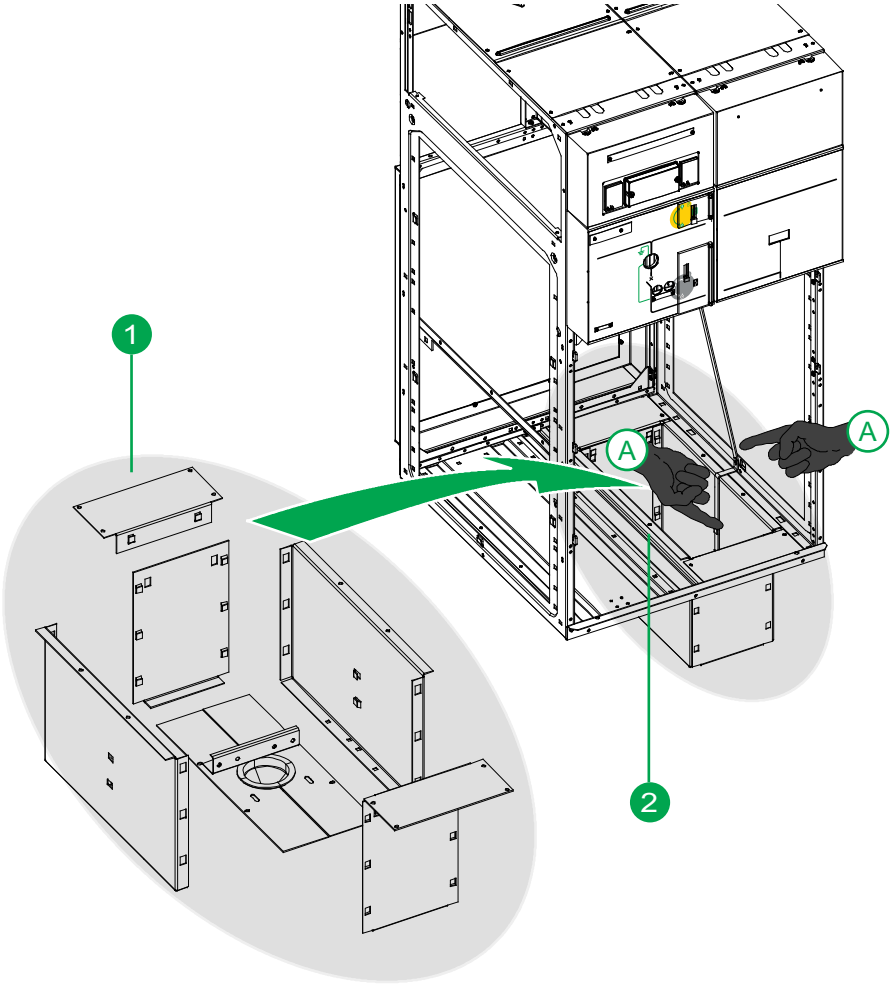
Clamping

- The tab of part (**1**) helps secure part (**2**).



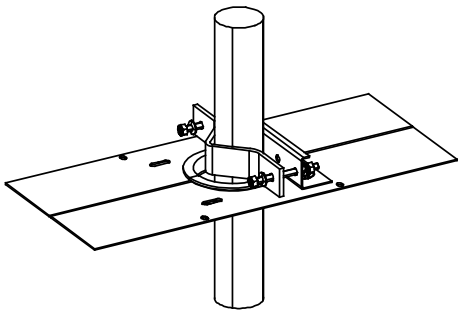
Assembling the Connection Basin

1. **Assembling the connection basin:**
   - Fasten together the various plates making up the basin kit.
   - Fit the cage nuts to fix the bottom plates.
   - Fit the flange support and the cable gland.
2. **Fitting the basin and the earth bar:**
   - Install and fix the basin (10 screws).
   - Position the earth bar (**A**) on the right hand side of the basin (2 clips) and fix it to the earth bar already placed in the cubicle (HM6 x 30 screws).



Installing the Cable

Cut out the cable gland and flange the cable to the bottom of the basin.

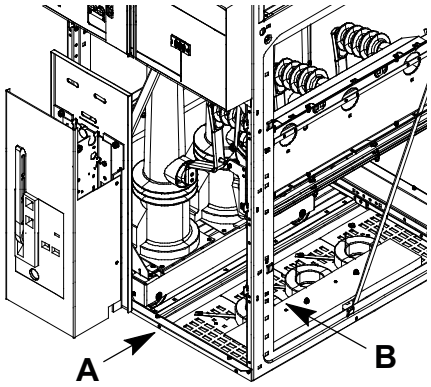


Specificity

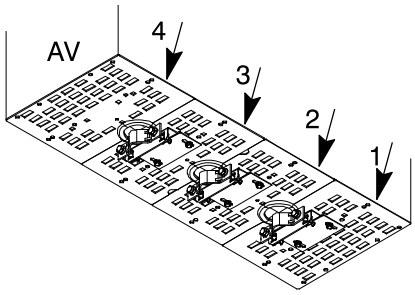
Mount the bolt so that the head of the bolt is on the sensor side.

Connection of MV Cables in DM1-S 630 A Cubicles

- Disassemble plinth (**A**) (4 screws).
- Disassemble the toroid wiring protection plate (**B**).
- Cut the toroid provisional fixing bindings.
- Place the toroids on their side.
- Disassemble the bottom plates.



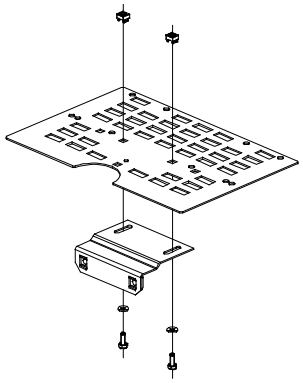
- View of the 4 bottom plates: the clamps supports are mounted under the bottom plate.



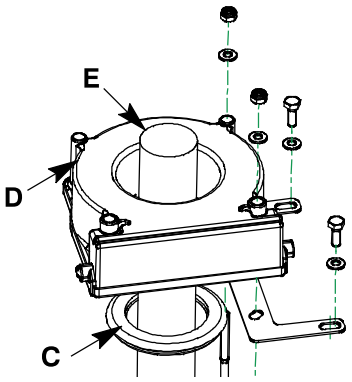
Bottom view

- Mount the flange supports under the three plates **1**, **2**, and **3** with the HM6x16 screws.

  The remaining screws are intended for cable flanging.

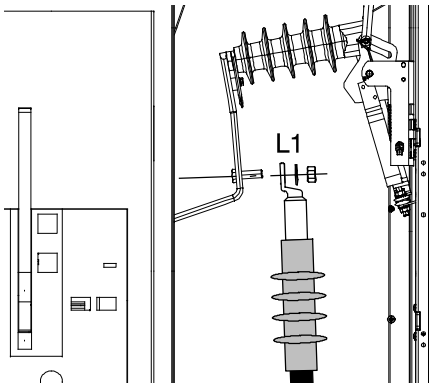


- Install the cable bushing (**C**) and pass the toroid (**D**) around the cable (**E**).



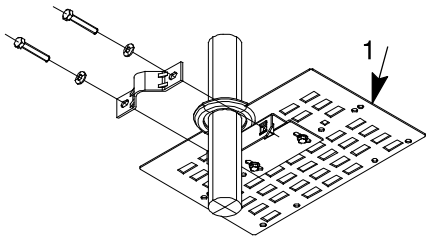
- Connect the cable to phase **L1**. The screws are already fitted.

  Tightening torque: 50 N.m

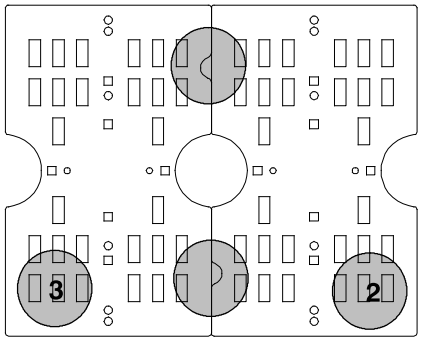


- Place the clamp on the clamp support, without tightening (HM8x50 screws).
- Fix plate **1** at the bottom of the cubicle.

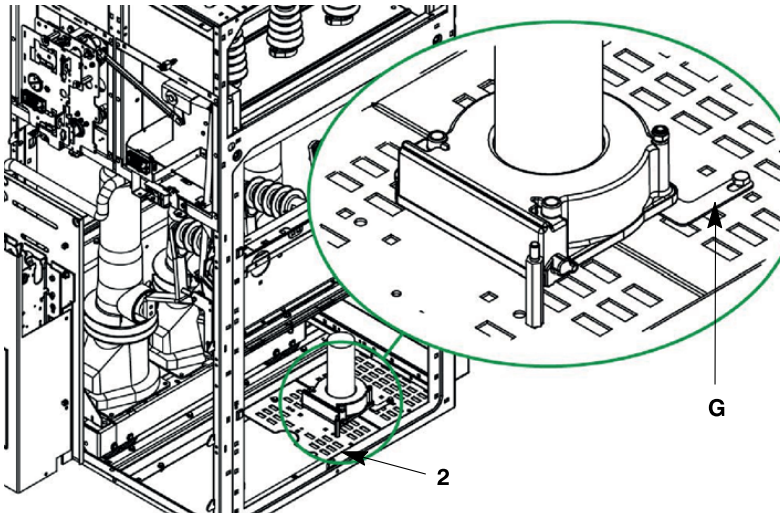
  Check that the toroid is inside the cubicle, and the cable bushing in place on the plate.
- Tighten the clamp.



- **NOTE:** Fix plates **2** and **3** as shown.

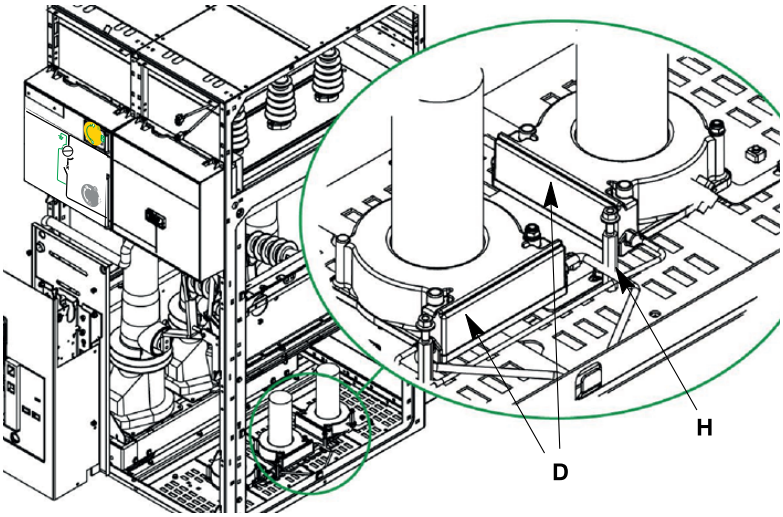


- Fix plate **2** having first mounted the fixing support (**G**) on it.
- Mount phases **L2** and **L3** following the same instructions as for phase **L1**.

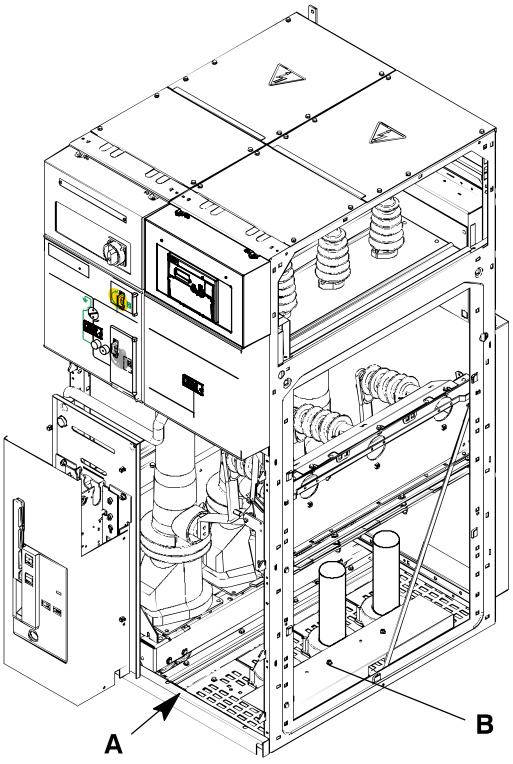


- Fix the toroids (**D**) by folding back the fixing metal foils (**H**).

  Tightening torque: 8 N.m

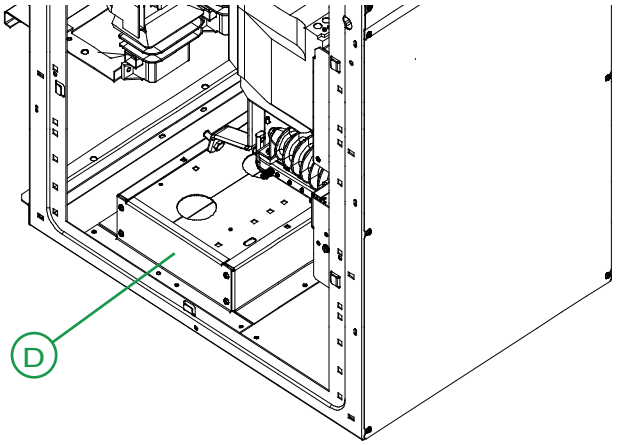


- Put back the toroid wiring protection plate (**B**).
- Put back plinth (**A**).



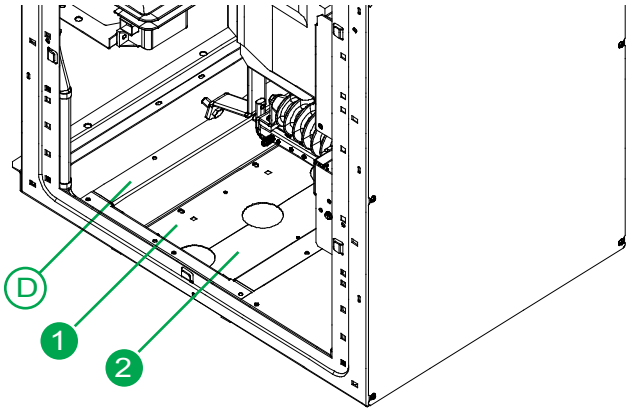
Connection of MV Cables in DMV-A 630 A Cubicles

- Disassemble the basin (**D**) (6 screws).

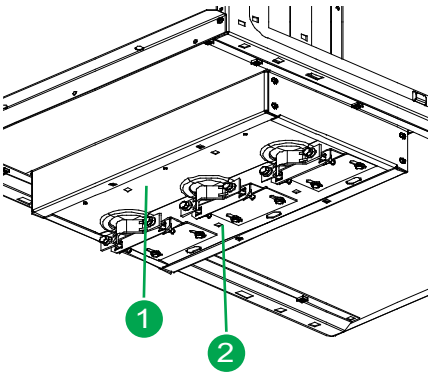


- Turn over and reassemble the basin (**D**). Use the same screws.
- Disassemble the bottom plates (**1** and **2**).

These operations can be performed before putting back the basin.

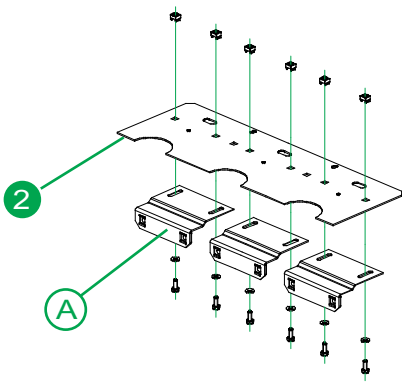


- View of the 2 bottom plates (**1** and **2**), the flange supports are mounted beneath the bottom plate.



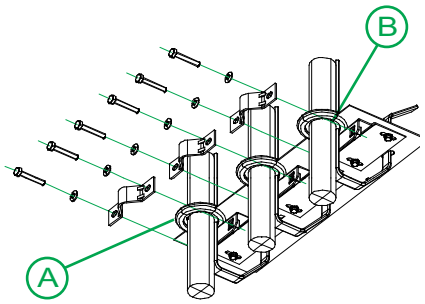
- Mount the flange supports (**A**) under the plate (**2**) with the HM6x16 screws.

  The remaining screws are provided for cable flanging.

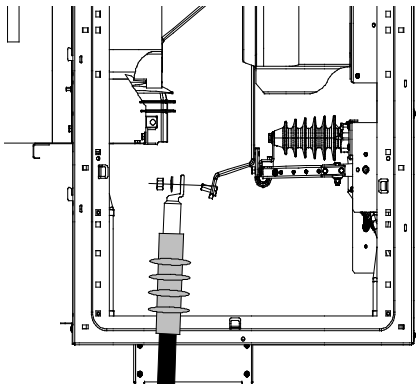


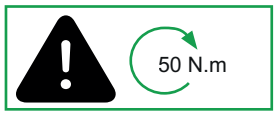
- Install the cable bushing (**A**).

  Pass the cable braid (**B**) in the toroid and in the cable bushing.

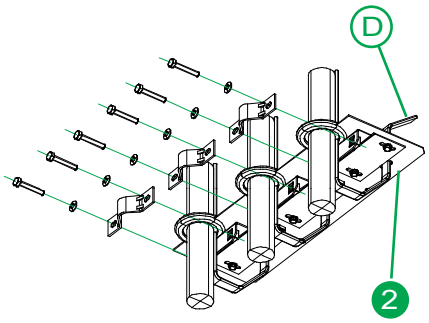


- Connect the cables. The screws are already in place.





- Place the 3 flanges on the flange supports, but do not tighten them (HM8X50 screws).
- Fix the plate (**2**) at the bottom of the basin.



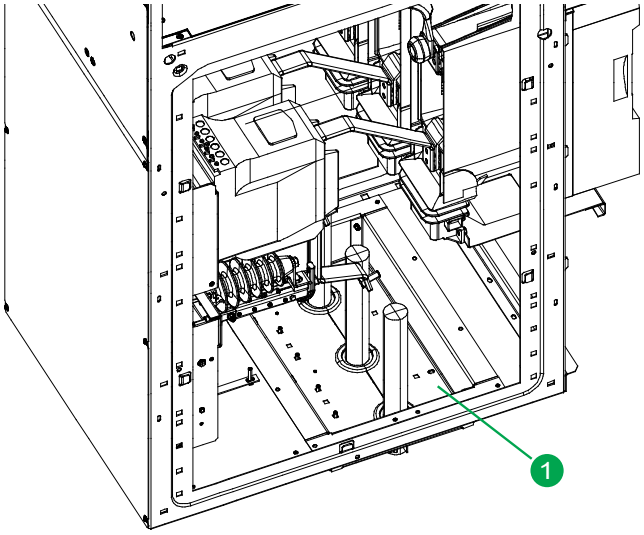
NOTICE

HAZARD OF INAPPROPRIATE ASSEMBLY

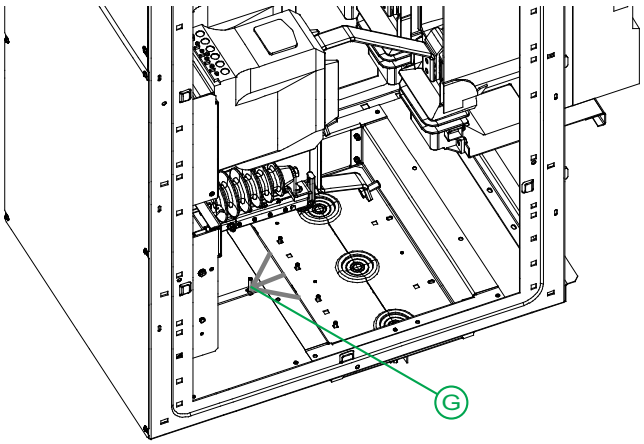
Make sure the cable bushing is in the correct position on the plate.

Failure to follow these instructions can result in equipment damage.

- Tighten the flange.
- Insert the cable braids (**D**) in the oblong holes of the plate (**2**).
- Fix the plate (**1**).



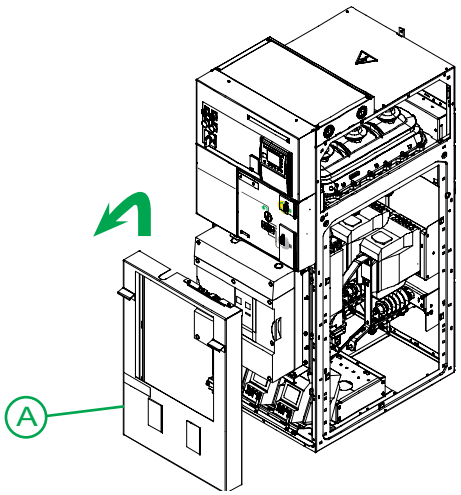
- Fix the cable earthing braids on the earth bar (**G**).



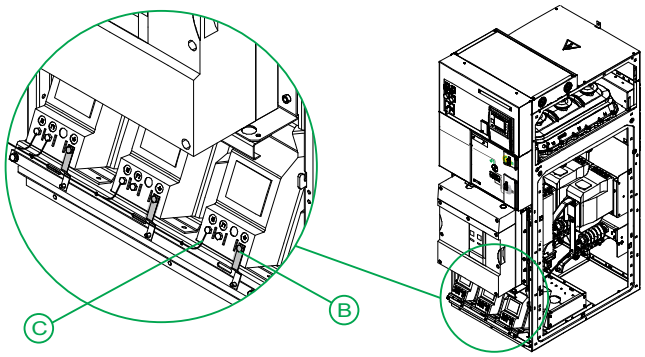
Connection of MV Single-Pole Cables for DMV-A Cubicles with VT (Option)

VT disassembly instructions for DMV-A cubicles

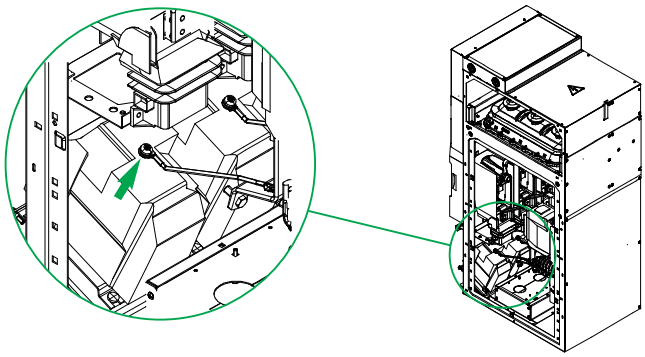
- Remove the panel (**A**) on the front face.



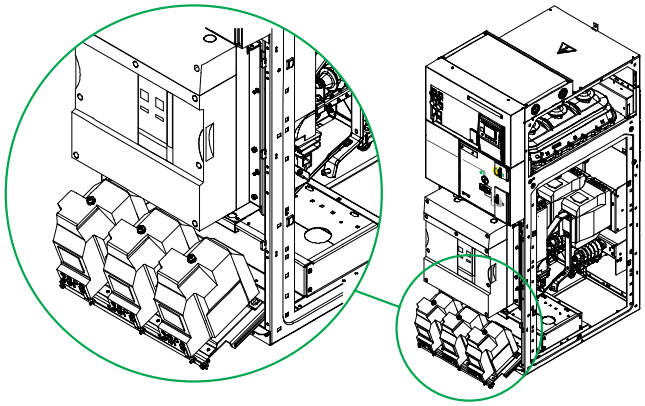
- Disconnect the metal foils (**B**) and the wires of the VT secondaries (**C**).



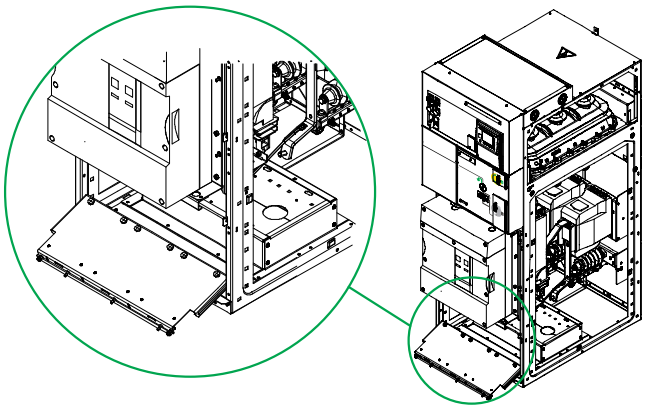
- Disconnect MV cables by unscrewing the VT screws.



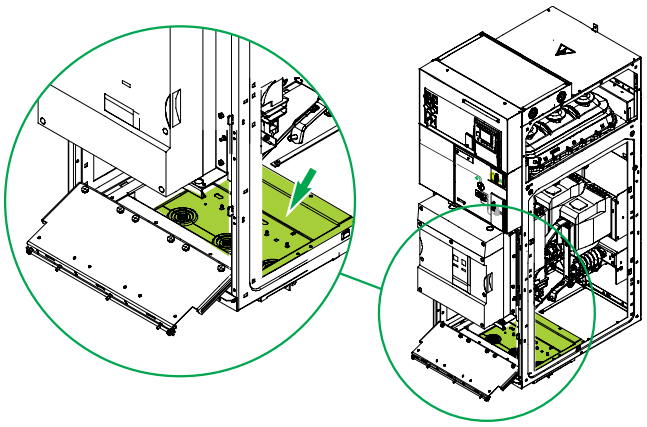
- Slide the VT beam outside the cubicle and rest it on the floor or on a base positioned at the same level as the bottom of the cubicle.



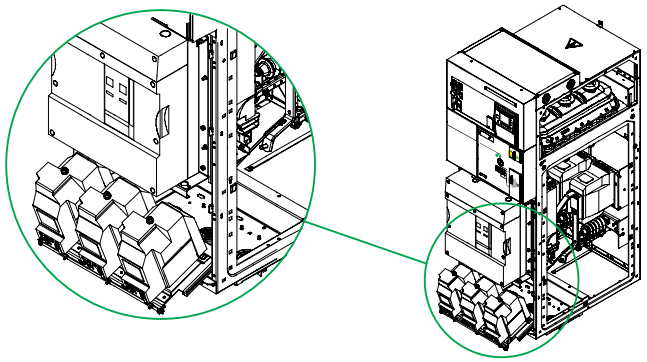
- Remove the VTs from the support beam.



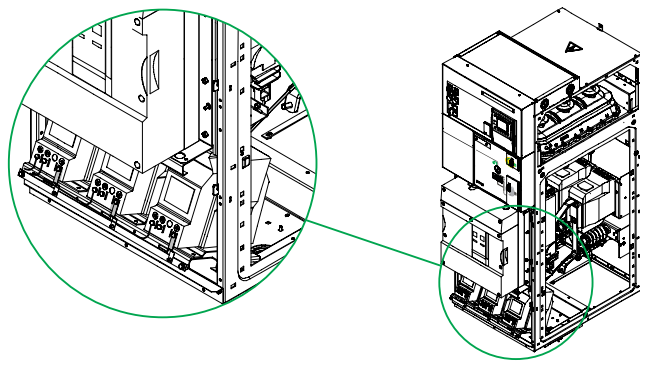
- Fit the tank and MV cables (see connection of MV single-pole cables in the installation instructions).



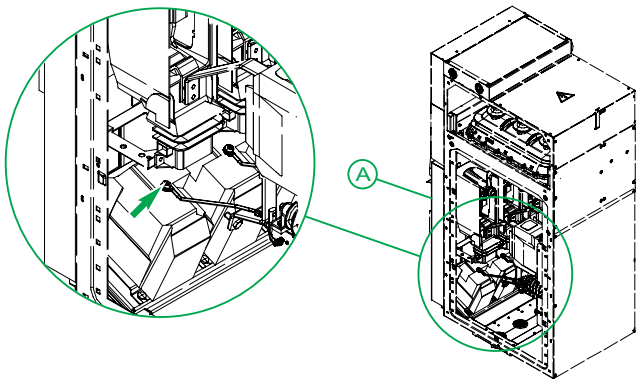
- Once the tank is in position and MV cables connected, put the VTs back on the support beam.



- Put the VT beam back inside the cubicle.
- Reconnect the metal foils and the wires of the VT secondaries.



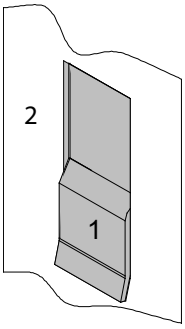
- Reconnect the VT MV cables.
- Put the front face panel (**A**) back in position.



Connection of MV Cables in DM1-A 1250 A Cubicles

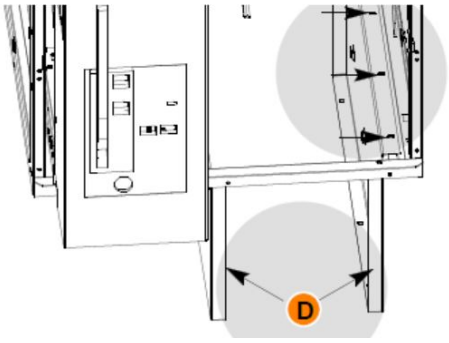
Clamping

The tab of part (**1**) helps secure part (**2**).

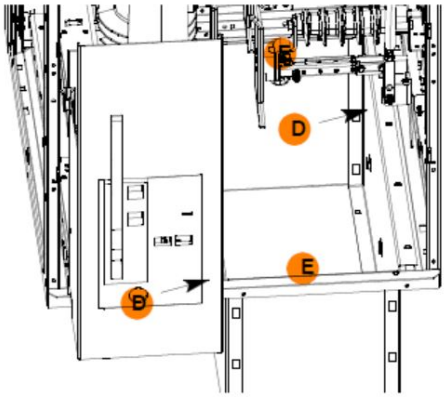


Assembling the Cable Connection Basin

- Mount the 2 side panels (**D**) on the bottom panels using the 8 bolts without locking.

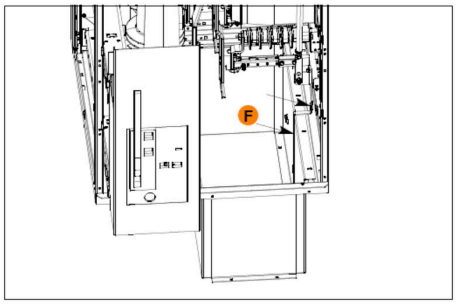


- Clamp the 2 front and back panels (**E**) on panels (**D**).



Fitting the Earth Bars

- Place the earth bar (**F**) on the right side of the bottom pan (2 clamps) and fix it to the earth bar already in the cubicle (HM6x30 bolts).

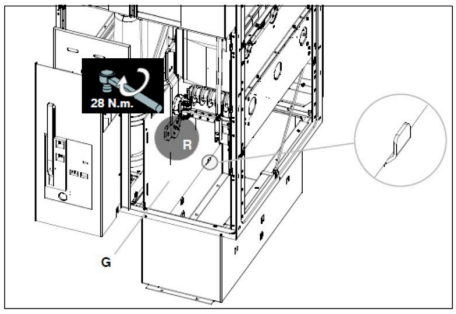


Fitting the Cables in a 2-Cable Version Cubicle

2 cables version + fitting insulating shields

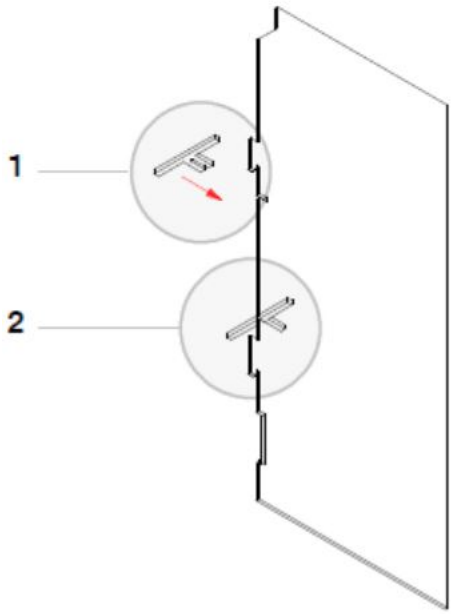
1. Install the 2 connection cables (**R**).

   Tightening torque: 28 N.m.
2. Install the cable-bushings on the cables.
3. Install the insulating shield support (**G**) by clamping.
4. Fix the clamp supports under the bottom plates.

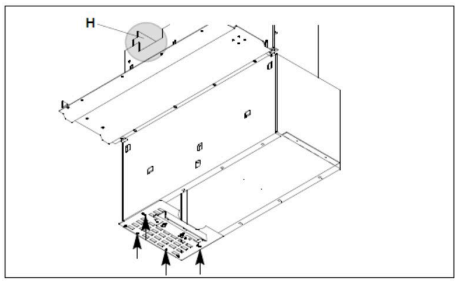


Installation of fixings

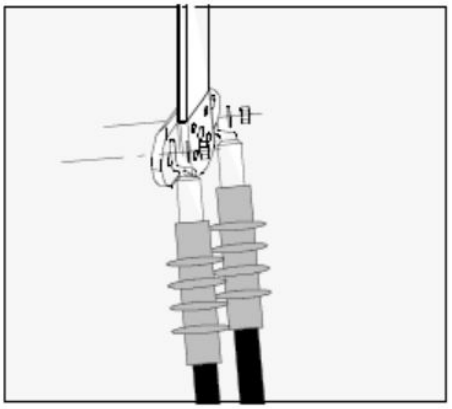
1. Position to be followed for a correct assembly
2. Fixing in place



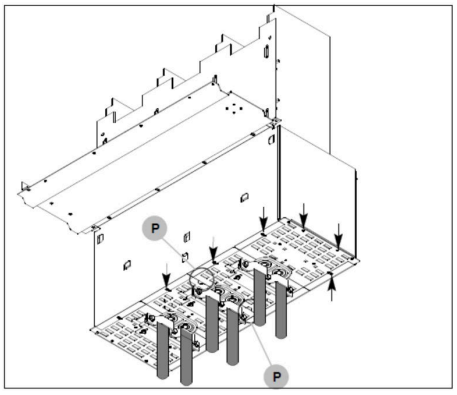
- Place the first bottom plate (**phase 1**) (4 bolts) as well as the shield (**H**).



- Fasten the first 2 cables to the connection pad.
- Install the cables of **phases 2 and 3** in the same way, as well as the shields.

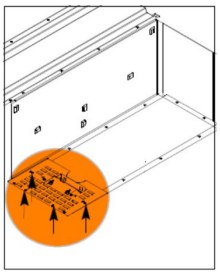


- Place the bottom plates so that the notches (**P**) are not opposite each other.
- Install and fix the 3 cable clamp supports.

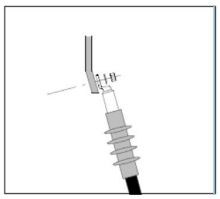


Fitting the Cables in a 1-Cable Version Cubicle

- Install the cable-bushings on the cables.
- Fix the clamp supports under the bottom plates.
- For insulating shield fitting see the 2-cable version.

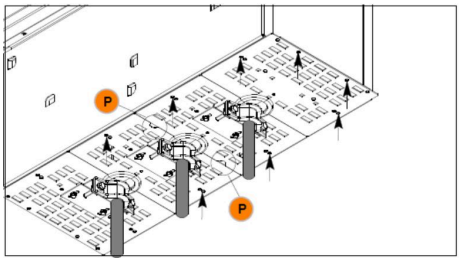


Mount the first bottom plate (**phase 1**) (4 bolts).



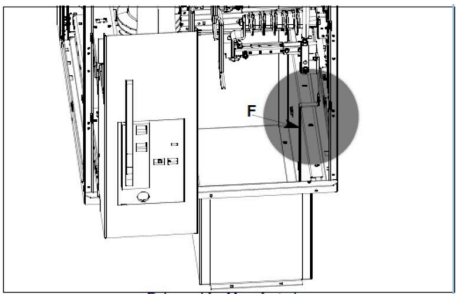
Fix the first cable on the connection pad.

- Position the cable-bushing.
- Proceed in the same way for **phases 2 and 3**.
- Install and tighten the 3 cables clamps.
- Place the bottom plates so that the notches (**P**) are not opposite each other.



Connection of Earthing Braids

- Connect the earthing braids to earth bar (**F**) at the bottom of the pan (HM6x30 bolts).



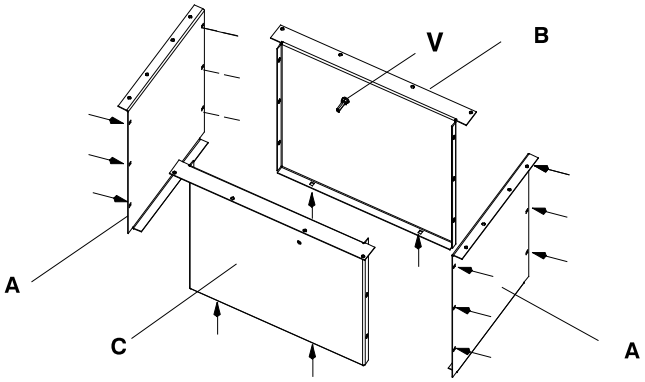
Connection of MV 1 P Cables in DMV-A / DMV-D Cubicles 1250 A

Accessories:

- Basin kit delivered on cubicle pallet: 51238290FA
- Bag of screws (1 or 2 cable version): 51238314FA
- Bag of 3P cable screws: 51238357FA

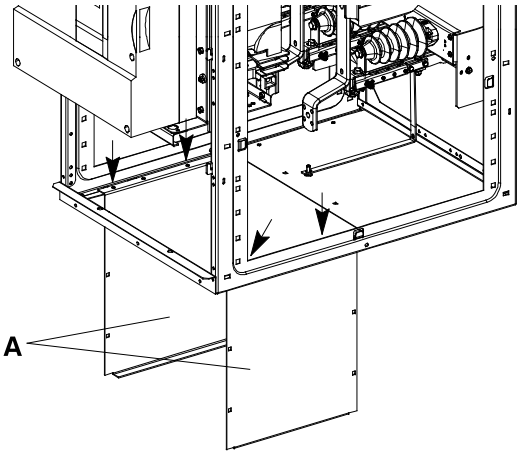
Preparing the Basin Plate

- Side plates (**A**):
  - Fit the cage nuts to fix the basin plates.
- Rear plates (**B**):
  - Fit the cage nuts to fix the rear bottom plates.
  - Fit HM8X40 screws+ M8 nut (**V**) to fix the cable earthing braid earth bar.
- Front plate (**C**):
  - Fit cage nuts to fix the front bottom plates.

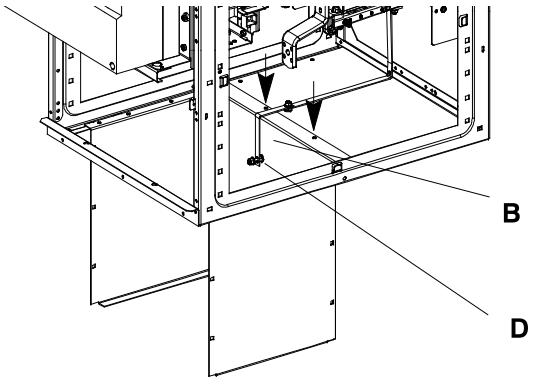


Mounting the Basin on the Cubicle

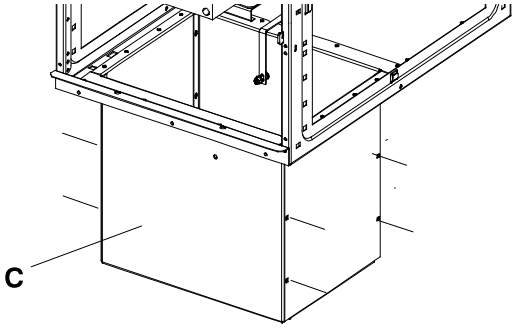
- Fit the 2 side plates (**A**) on cubicles (fixing four M6 x 16 screws).



- Fit the rear plate (**B**) and fix it by 2 screws (M6 x 16). Fit the earth bar (**D**).



- Fit the front plate (**C**) and fix all the plates to one another by 12 screws (M6 x 16).



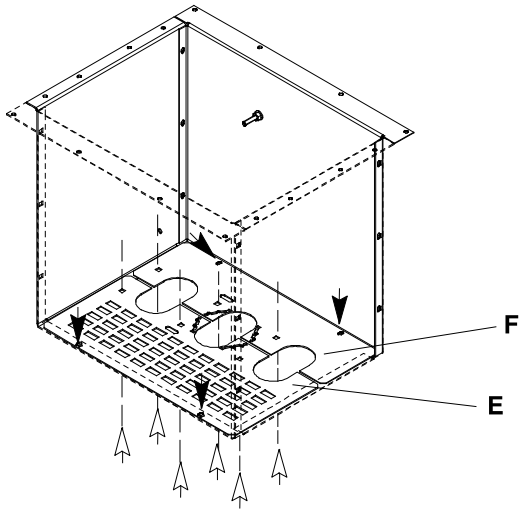
1P Cables (1 or 2 Cable Version)

Preparing and mounting the bottom plate

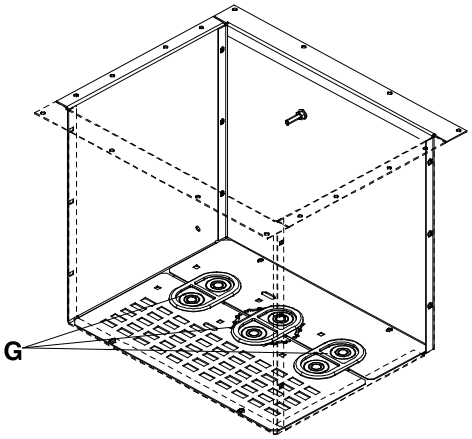
→ Screw + washer

⇾ Cage nuts

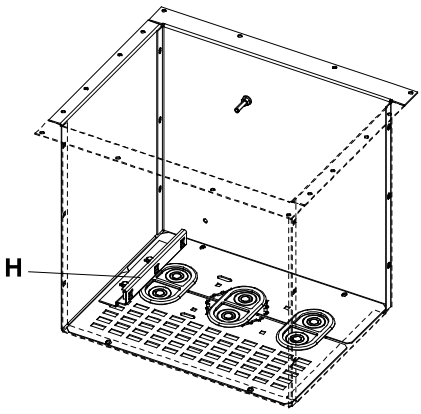
- On the front bottom plate (**E**), fit 3 cage nuts.
- On the rear bottom plate (**F**), fit 3 cage nuts.
- Fix the bottom plates (**E**) and (**F**) by 4 screws (M6 x 16).



- Fit the 3 cable glands (**G**) (1 or 2 cable version)

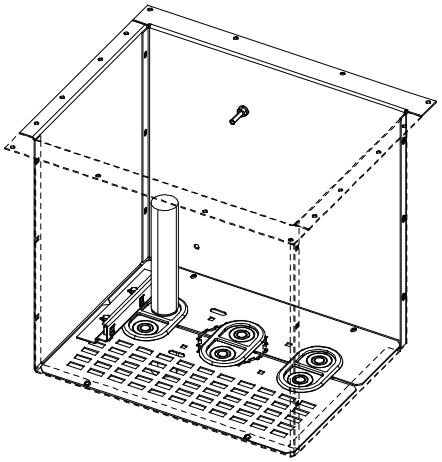


- Fit the cable flange brackets (**H**) phase 1 (1 or 2 cable version).
- Fix by 2 screws (M6 x 16).
- Fit by three M8 cage nuts on the cable flange bracket (**H**).



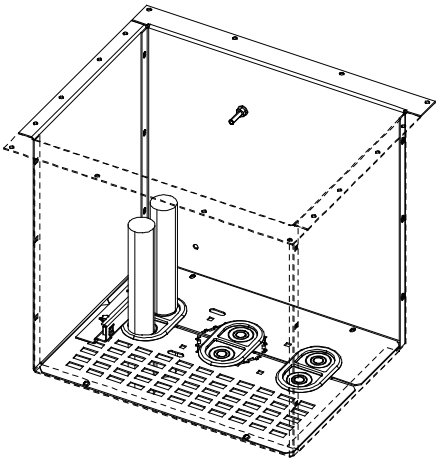
1 cable version

Installing 1 cable.



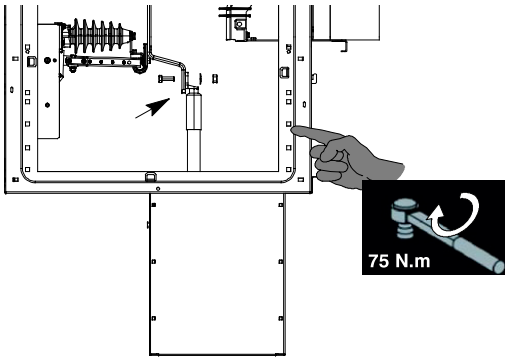
2 cable version

Installing 2 cables.



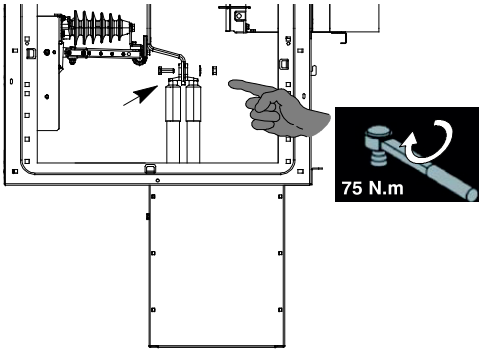
1 cable version

Connecting the **L1** phase cable.



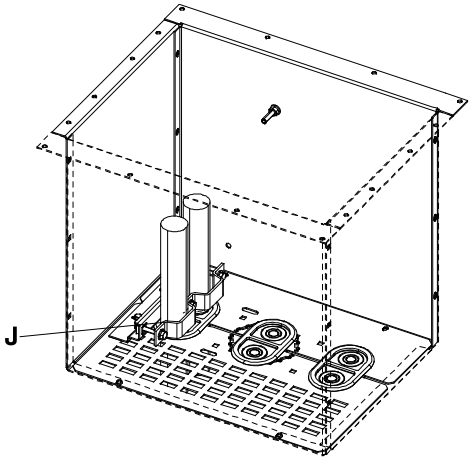
2 cable version

Connecting the **L1** phase cables.

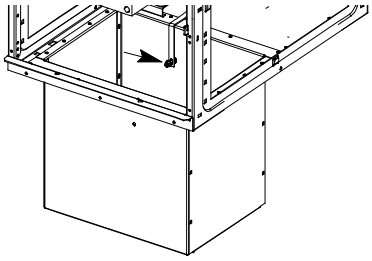


1 or 2 cable version

- Fit the cable flange (**J**) (three HM8 X 60 screws).
- Fit phases **L2** and **L3** as per the same instructions as phase **L1**.

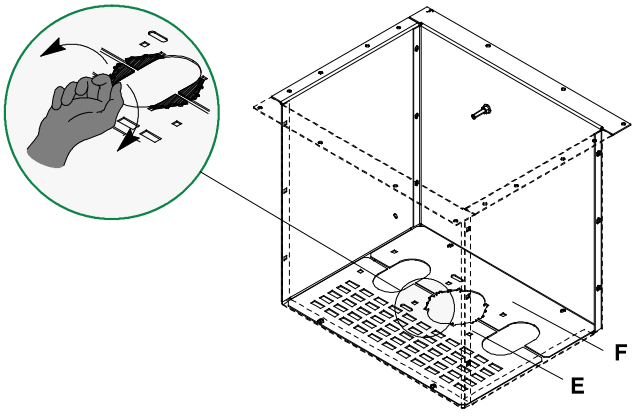


Fix the cable braids on the earth bar.

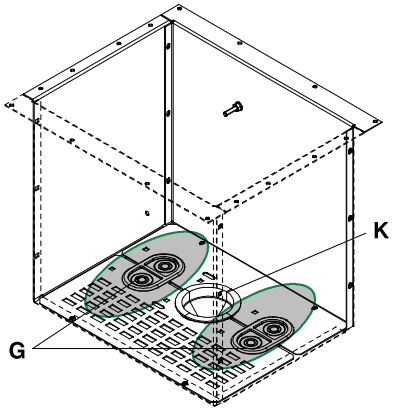


Installing the 3P Cable

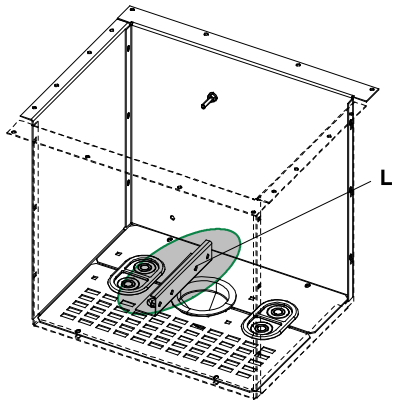
- On the bottom plates (**E**) and (**F**), cut or break the edges of the middle phase for 3P cable.
- Fix the plates (**E**) and (**F**) with 4 screws (M6 x 16).



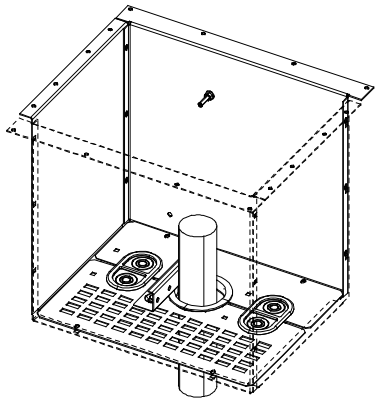
- Fit the 2 cable glands (**G**).
- Fit the cable gland (**K**).



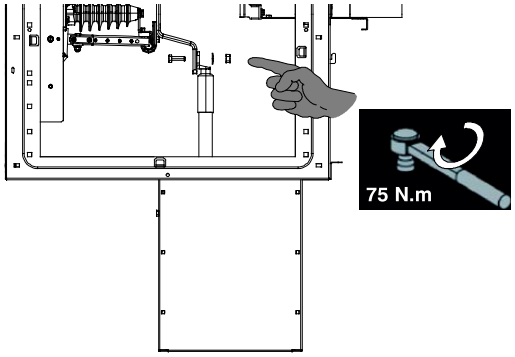
- Fit the cable flange bracket (**L**) with HM8 screws.



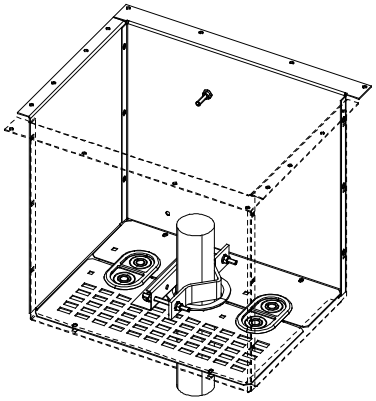
- Installing the 3P cable.



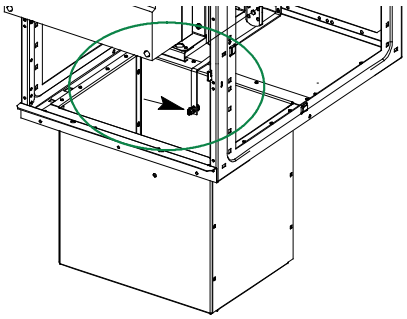
- Connect the strand of phase **L1** then **L2**, and **L3**.



- Fit the cable flange (M8 screws).



- Fix the cable braid or braids on the earth bar.



Environmental Monitoring Option

Two functional units inside the switchboard are equipped with environmental sensors CL110:

- One unit equipped in the cable compartment.
- One unit equipped in the busbar compartment.

⚠WARNING

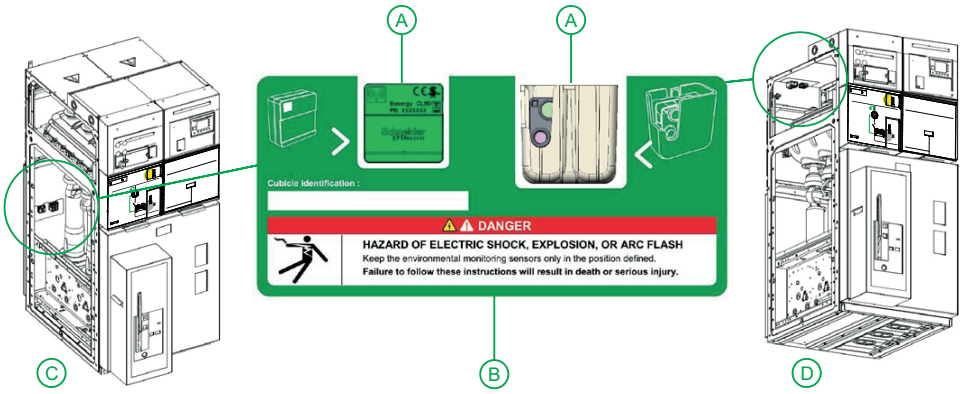
HAZARD OF INAPPROPRIATE ASSEMBLY

- Check the sensors are not swapped.
- Strictly follow the instructions on the positioning label.

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

In each unit there are two sensors, that are physically identical. However their assembly and software configuration is different, therefore sensors must not be swapped.

The positions of CL110 sensors are the same in all functional units and always marked with positioning label.



A. CL110 sensors

B. Positioning label

C. The position of pair of CL110 sensors in the cable compartment with the positioning label. Example of DM1-A functional unit.

D. The position of pair of CL110 sensors in the busbar compartment with the positioning label. Example of DM1-A functional unit.

The CL110 sensors are fixed inside the cubicles by magnets. Due to potential risks (dielectric perturbation), their positions must not be changed. After each intervention, visually check that all sensors are on their designed positions.

⚠⚠DANGER

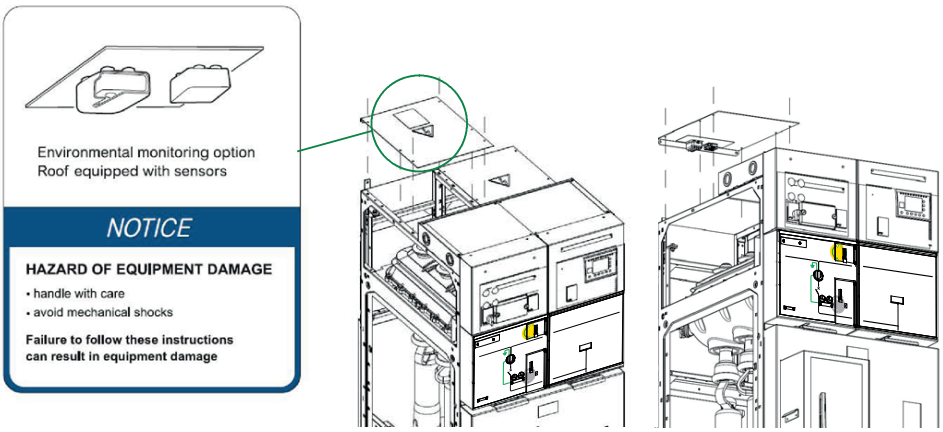
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Keep the environmental monitoring sensors only in the defined position.
- Avoid any shocks on the roof during commissioning or any maintenance operations on that functional unit.

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

Handle carefully the roofs, which are equipped with environmental sensors.

That roofs are marked with a sticker on top (shown below).

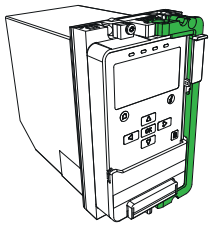
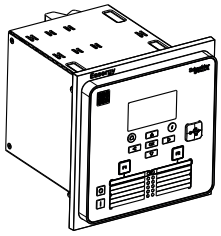
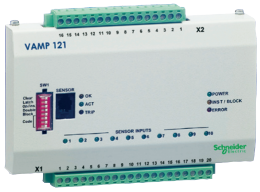


Start-up and Operating Instructions

Protection, Monitoring and Control

Cubicles can be equipped with various optional equipment for protection, monitoring and control. The tables below provide a non-exhaustive list of these options. For more information, refer to the references in the tables below, and the Schneider Electric website.

Protection

		Document reference
PowerLogic P5		User Manual P5/EN M/44A For more information, refer to the catalog NRJED313567EN.
PowerLogic P3		For more information, refer to the catalog NRJCAT17764EN.
SEPAM		For more information, refer to the catalog SEPED303005EN-08.
PowerLogic VAMP		User manual VAMP 221: V221/EN M/B021 User manual VAMP 321: V321/EN M/D011
VIP Relays: VIP 40/45 and VIP400/410	 	User manual VIP 40/45: NRJED311207EN User manual VIP 400/410: NRJED311206EN

Monitoring and Control

		Document reference
PowerLogic TH110		Quick Start Guide MFR7128801 Installation and Operation Manual NVE62740
PowerLogic CL110		Installation and Operation Manual QGH40088
PowerLogic T300		User Manual NT00378
PowerLogic Flair 2xD		Data sheet GDE70881 providing links to user manual

Automation System for NSM Cubicles

Identifying the Control Mechanisms on NSM Cubicle

A. Switch operating locking flap

B. Position of switch operating lever

C. Switch position indicator

D. Electrical charging locking button

E. Indication of operating mechanism status*

F. Voltage presence lamp

G. Earthing switch locking flap

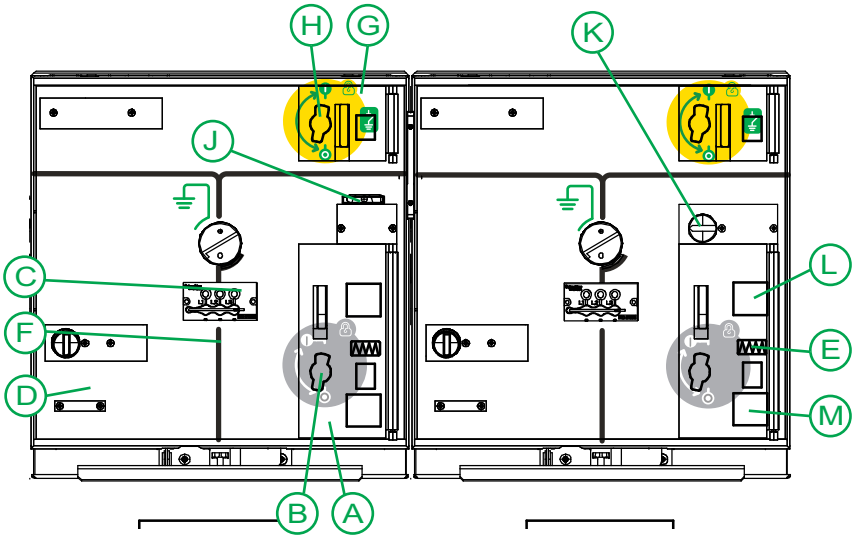
H. Position of earthing switch operating lever

J. Switch manual closing selector

K. Selector for parallel-connection authorisation by mechanical push-button

L. Switch closing push button

M. Switch opening bush button



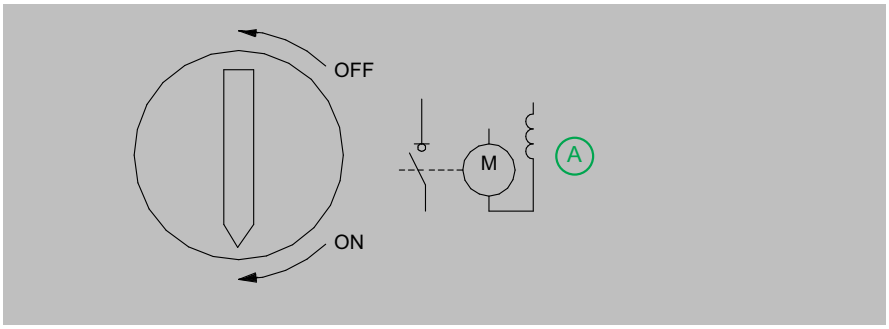
*Uncharged

Black and yellow status bar

*Charged

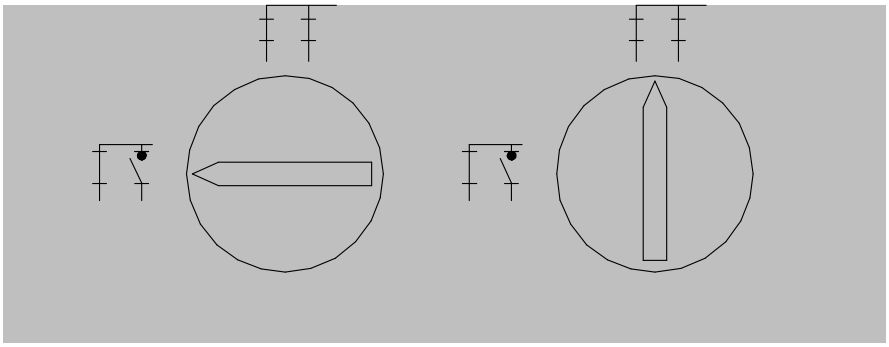
Red and white status bar

- Detail of button (**D**) (electrical charging locking)
  - ON position: electrical charging by motorized reduction gear.
  - OFF position: manual charging.



A. Electrical operated mechanism

- Detail of button (**K**) (selector for parallel-connection authorisation)



Button in normal operation position

Button in no-break manual switching position

Checking Cubicles Before Energizing

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

Check that nothing has been left inadvertently in the connection compartment.

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

Checking IM /SM Cubicles

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Respect the 5 mm clearance between the cable lug and the self-gripping tape around the TH110 sensor when tightening.

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

NOTICE

HAZARD OF INAPPROPRIATE ASSEMBLY

Make sure that the self-gripping tape is correctly positioned so that it is not between the cable lug and the connection when tightening.

Failure to follow these instructions can result in equipment damage.

For more information, refer to PowerLogic TH110 Sensor Installation and Operation Manual, reference NVE62740.

Make sure to unfold the silicon cap.

Fold back the silicon cap to uncover the cable connection.

Unfold the silicon cap to cover the cable connection.

Checking DM1-W Cubicles

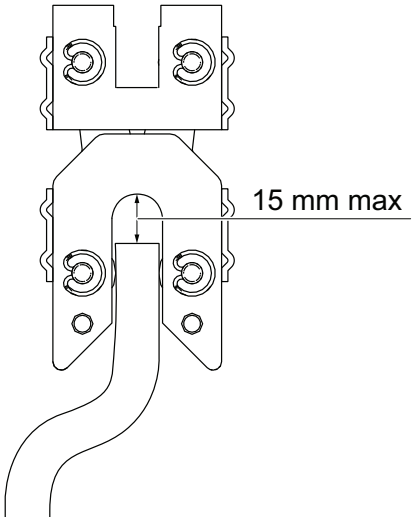
⚠CAUTION

HAZARD OF HEATING, OR INTERNAL ARC

Respect a 15 mm maximum distance between the plugs and the circuit breaker connection.

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

NOTE: If the 15 mm distance cannot be respected, call the Services Representative.



Checking CM / CM2 / CVM / PM / QM / QMB / QMC / TM Cubicles

⚠CAUTION

HAZARD OF HEATING, OR INTERNAL ARC

Check for each phase that:

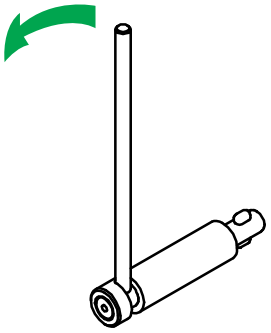
- The fuse has been properly fitted.
- The field distributor has been properly positioned.

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

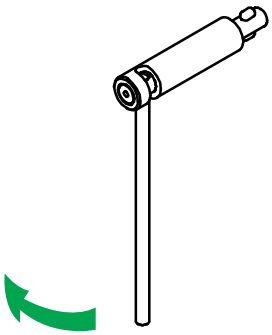
Operating the Equipment

Operating Lever

Position the lever as indicated for downward (opening) operations.

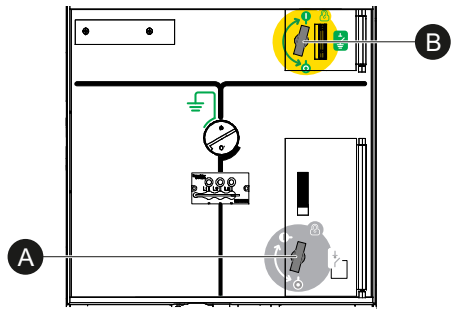


Position the lever as indicated for upward (closing) operations.

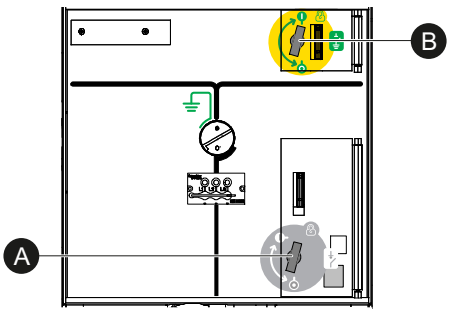


Mechanism Overview

- **CIT** operating mechanism front plate.

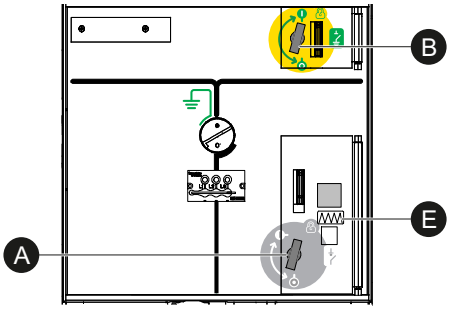


- **CI1** operating mechanism front plate.



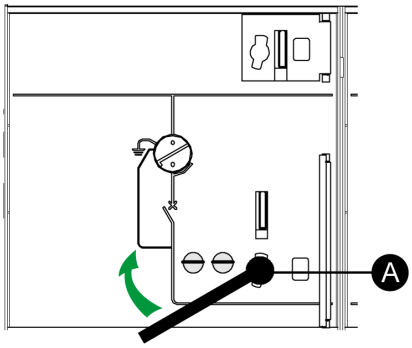
- **CI2** operating mechanism front plate.

  E. Arming indicator

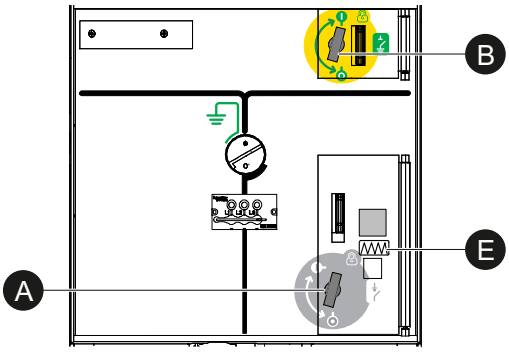


Charging the spring

1. Place the key in **(A)**.
2. Turn the key clockwise.

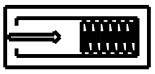


Charging status: indicator (E)



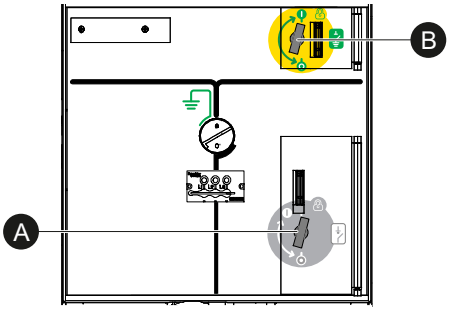
White indicator: spring discharged

Yellow indicator: spring charged



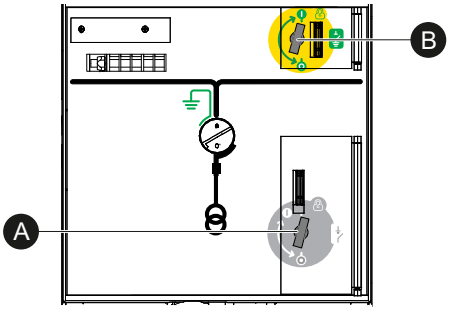
IM / IMC / QM / QMC Cubicles

Operate the switch **(A)** and the earthing switch **(B)** three to five times.



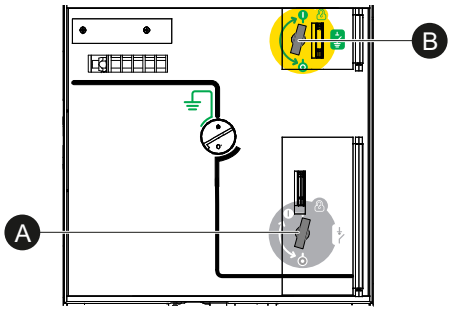
CM / CM2 / CVM / GBC / TM Cubicles

Operate the disconnector **(A)** and the earthing switch **(B)** three to five times.



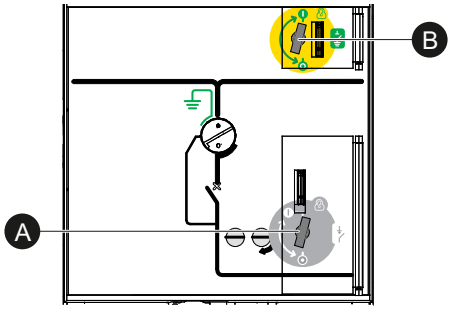
IMB / IMM Cubicles

Operate the switch **(A)** and the earthing switch **(B)** three to five times.



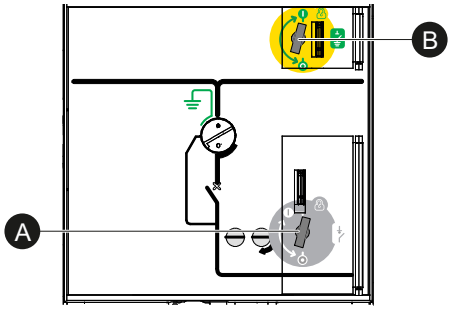
DM1 / DM2 / DMVL Cubicles

Operate the disconnector **(A)** and the earthing switch **(B)** three to five times.



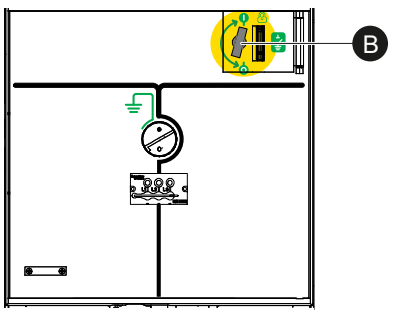
DMV Cubicles

Operate the switch **(A)** and the earthing switch **(B)** three to five times.



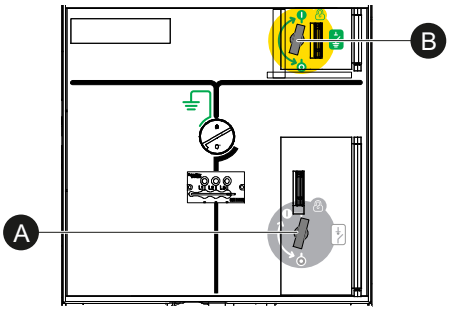
GAM Cubicles

Operate the earthing switch **(B)** three to five times.



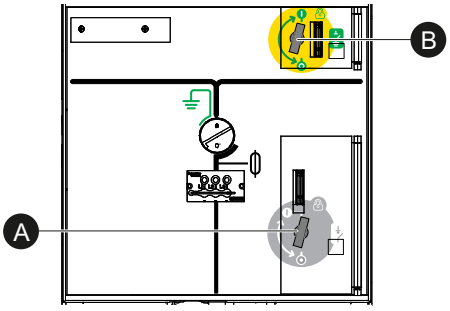
SM Cubicles

Operate the disconnector **(A)** and the earthing switch **(B)** three to five times.



PM Cubicles

Operate the switch **(A)** and the earthing switch **(B)** three to five times.



NSM Cubicles

Initial conditions:

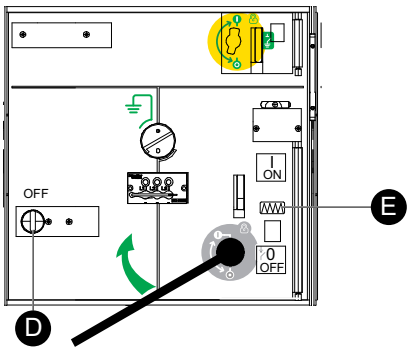
- The automation is out of operation.
- The earthing switch is in open position.

Charging the operating mechanism

Initial conditions:

- The button **(D)** in the **OFF** position.
- The mecanism is open discharged.

Charge the spring, page 89.

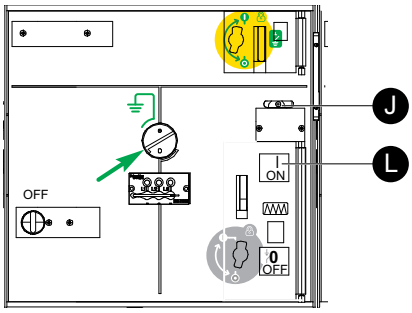


The arming indicator **(E)** changes status.

Closing a switch after charging the operating mechanism

1. Select the switch to be operated using finger **(J)** (right or left side).

2. Close the switch by pressing the **I/ON** button **(L)**.



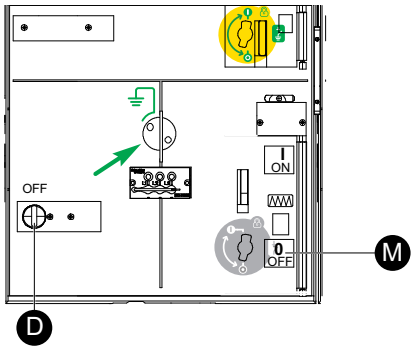
The switch is closed.

Opening a switch

Initial conditions:

- The button **(D)** in the **OFF** position.

Open the switch by pressing the **0/ OFF** button **(M)**.



The switch is open.

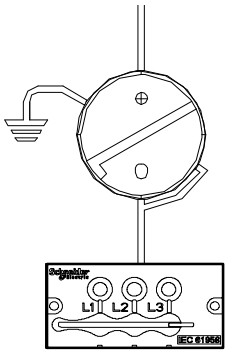
Before Energizing the MV Incoming Cables

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

The devices must be in the open position.

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



VPIS/VDIS

VPIS/VDIS Presentation

VPIS (Voltage Presence Indicating System) / **VDIS** (Voltage Detecting and Indicating System): provides indication of MV voltage presence with 3 built-in LEDs.

Identify the **VPIS**/**VDIS** version installed in the unit.

VPIS-V2 / VPIS-V2-VO

VPIS-V3 / VPIS-V3-VO

VDIS / VDIS VO

VPIS: complying with IEC 62271-206, relative to Voltage Presence Indicating Systems.

VDIS: complying with IEC 62271-213, relative to Voltage Detecting and Indicating Systems.

⚠⚠DANGER

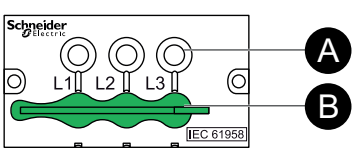
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Do not rely only on the indication provided by a VPIS/VDIS to check that the system is de-energized.

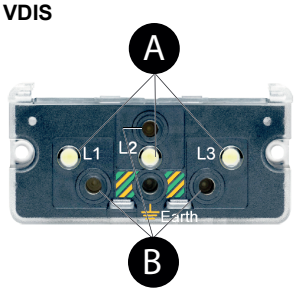
Failure to follow these instructions will result in death or serious injury.

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

VPIS



VDIS



A. Voltage presence indicator light (one for each phase)

B. Connection point designed for phase concordance unit (one for each phase)

VPIS/VDIS Installation

Refer to VPIS Installation document (JYT3626301):

Voltage Presence Detection and Phase Concordance

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

Check voltage presence detection with one of the following devices:

- A VPIS, by following the test procedure NT0021401 – VPIS Phase Concordance Unit and Test Notice.
- A VDIS, by following the test procedure PKR8700602 – VDIS Phase Concordance Unit and Test Notice.

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

NOTICE

HAZARD OF INAPPROPRIATE OPERATION

Check correct phase concordance according to one of the following devices:

- A VPIS, by following the test procedure NT0021401 – VPIS Phase Concordance Unit and Test Notice.
- A VDIS, by following the test procedure PKR8700602 – VDIS Phase Concordance Unit and Test Notice.

Failure to follow these instructions can result in equipment damage.

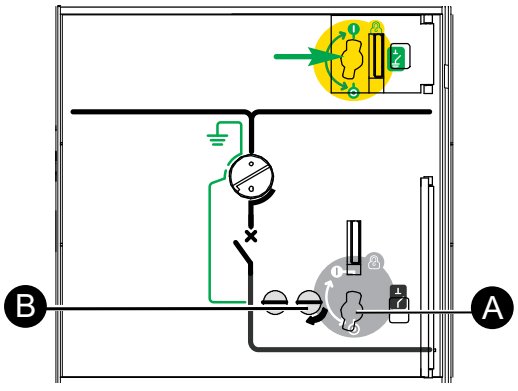
Off–Load Operations

Circuit Breaker Off-Load Operations for DM1 / DM2 / DMV / DMVL Cubicles

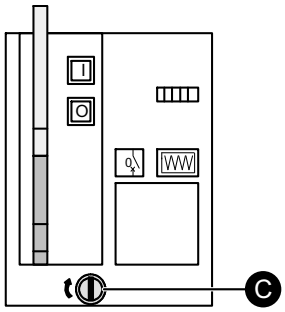
Initial conditions:

- The line disconnector is in closed position.
- The circuit breaker is closed.

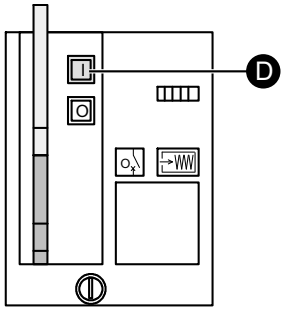
1. Lock the lever entry **(A)** of the line disconnector with the key in **(B)**.



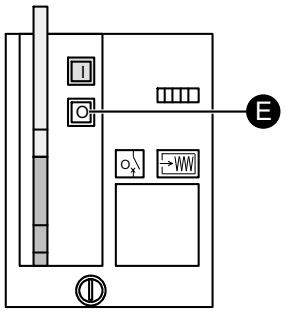
2. Remove the key from **(B)** then place it in **(C)**.



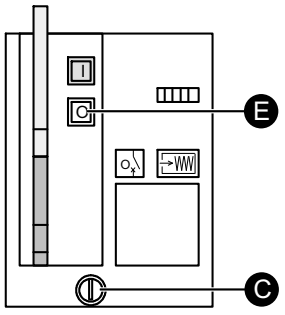
3. Release then charge the circuit-breaker.
4. Close the circuit breaker by pressing the push-button **I (D)**.



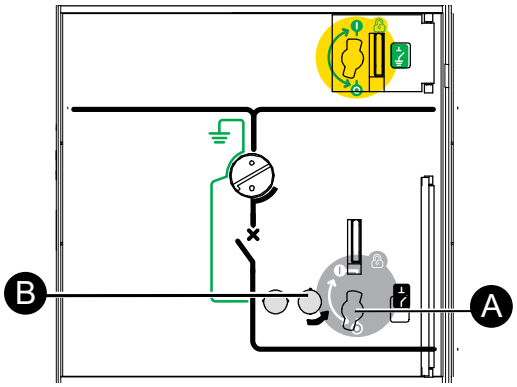
5. Open the circuit breaker by pressing the push-button **O (E)**.



6. Lock the circuit breaker in the open position in **(C)** by pressing the push-button **O (E)**.



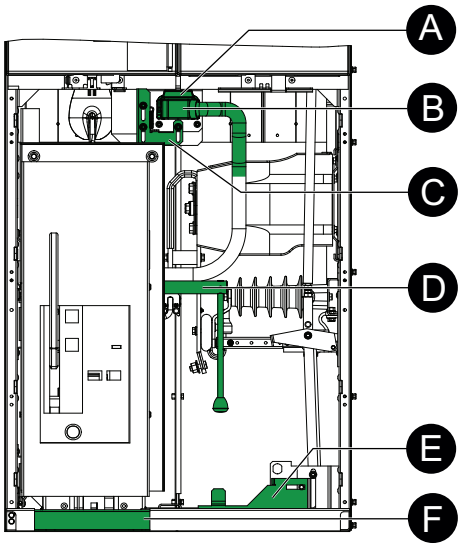
7. Remove the key from **(C)** and place it in **(B)**.



8. Release the lever entry **(A)** of the line disconnector.

Description of Racking Out and Racking In the Circuit Breaker in a DM1-W or DM1-Z Cubicle

Description of the Actioned Parts of the Cubicle



A. Connector lock
B. Low voltage connector
C. Connector metallic support
D. Withdrawable circuit breaker lever
E. Earthing switch lock for DM1-W only
F. Mobile plinth

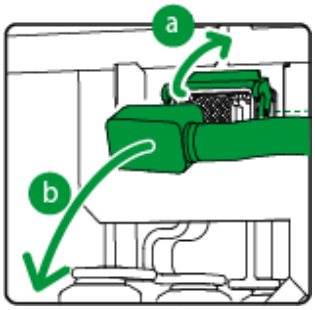
Racking Out the Circuit Breaker from a DM1-W / DM1-Z Cubicle

Initial conditions:

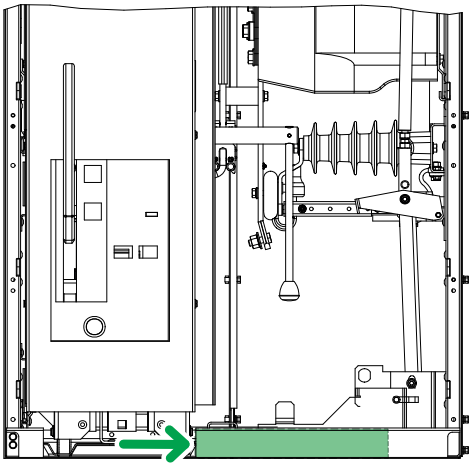
- The line disconnector is in the earth position.
- The circuit breaker is open and discharged.
- The front panel is removed.
- The bolt that helps secure the circuit-breaker for transport is removed.

Refer to *SM6 Installation and Start-up Instructions Manual (NVE7176401)*, section *Checking Cubicles Before Energizing*.

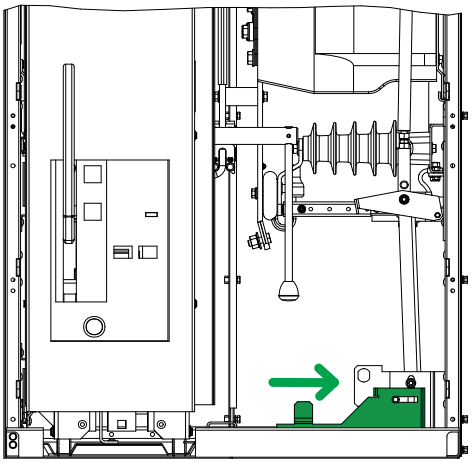
1. Unplug the low voltage cable:
   a. Lift the plug lock.
   b. Disconnect the low voltage plug.



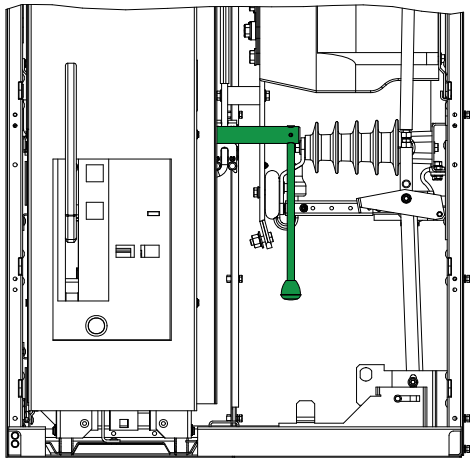
2. Move the mobile plinth completely to the right.



3. For DM1-W only, move the earthing switch lock to the right.



4. Extracting the circuit breaker:
   a. Pull on lever to disconnect the circuit breaker.



   b. Withdraw the circuit breaker manually.

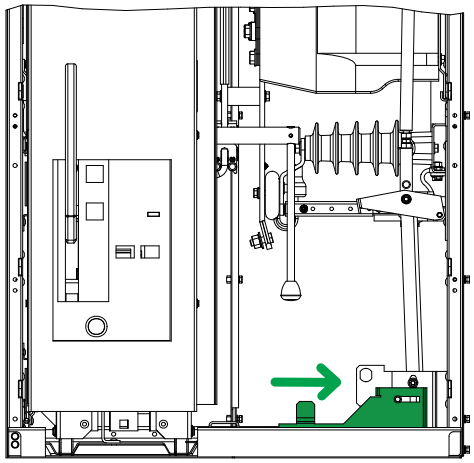
Racking In the Circuit Breaker in a DM1-W / DM1-Z Cubicle

Initial conditions:

- The line disconnector is in the earth position.
- The circuit breaker is open and discharged.
- The front panel is removed.

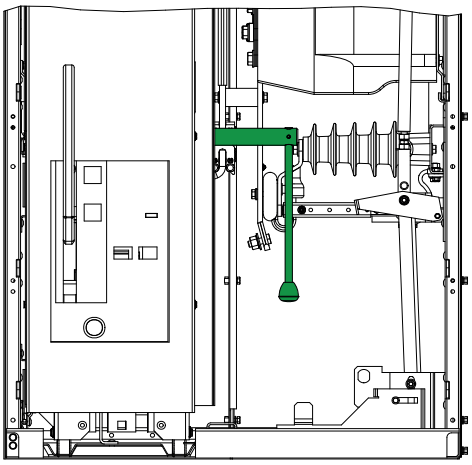
Refer to *SM6 Installation and Start-up Instructions Manual (NVE7176401)*, section *Checking Cubicles Before Energizing*.

1. Racking in the circuit breaker:
   a. For DM1-W only. Push the earthing switch lock to the right, if it is not done yet.

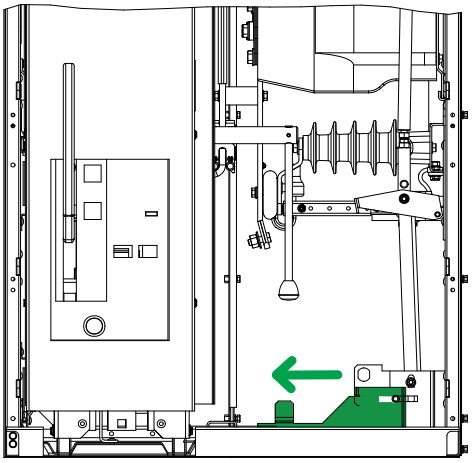


   b. Insert the circuit-breaker manually in the cubicle until it is blocked.

2. Push the lever to connect the circuit breaker.

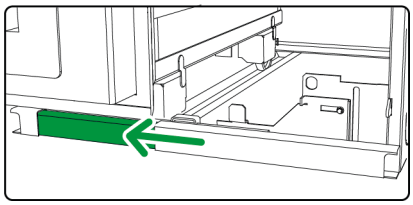


3. Move the earthing switch lock to the left.

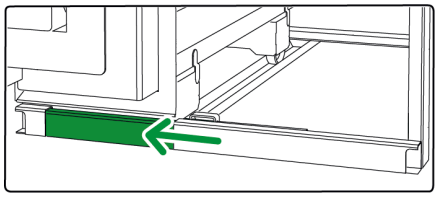


4. Move the mobile plinth completely to the left.

For DM1-W



For DM1–Z

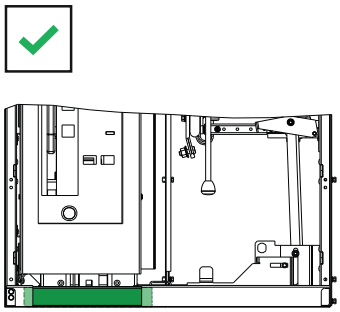


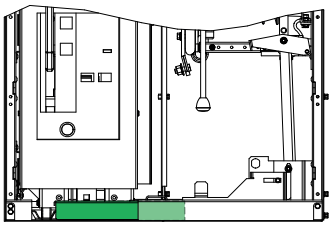
⚠⚠DANGER

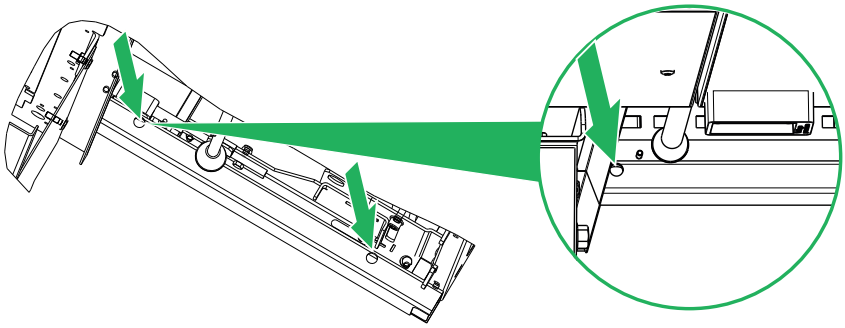
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Before reassembling the front panel, check that the mobile plinth is completely pushed to the left, and that the three holes of the fixed plinth are unobstructed.

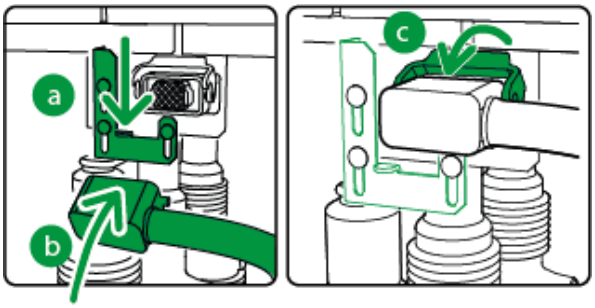
Failure to follow these instructions will result in death or serious injury.



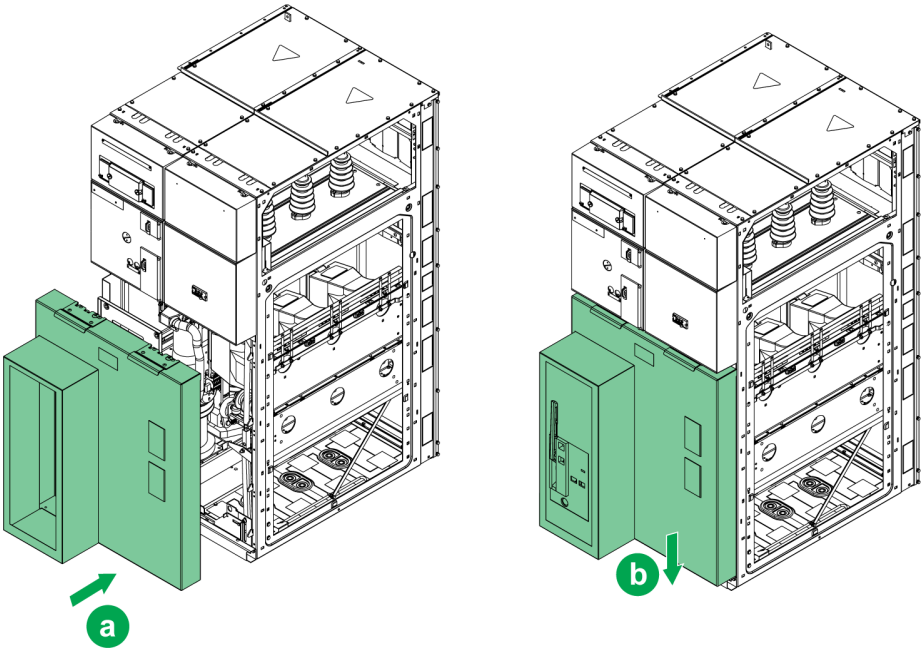




5. Plug in the low voltage cable:
   a. Lower the metallic part.
   b. Connect the low voltage plug.
   c. Lower the plug lock.



6. Reassemble the front panel.



Energizing

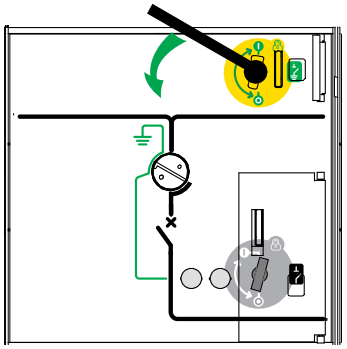
Energizing the Downstream Part of the Installation for DM1 / DM2 / DMV / DMVL Cubicles

Initial conditions:

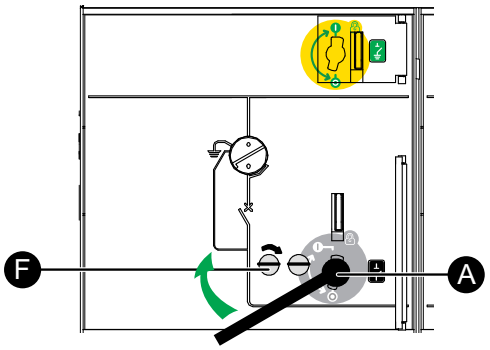
- The earthing switch is in closed position.
- The circuit breaker is open.
- The front panel is in place.

1. Move the earthing switch to the open position using the operating lever.

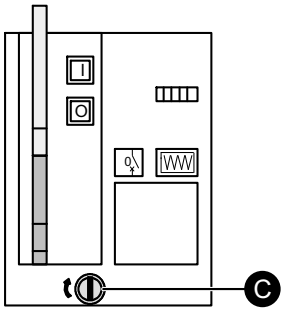
   NOTE: The downstream earthing switch opens simultaneously except for DMVL-D, DM1-D, and DM2 cubicles.



2. Move the line disconnector to the closed position then lock the entry **(A)** of the line disconnector with the key in **(F)**.

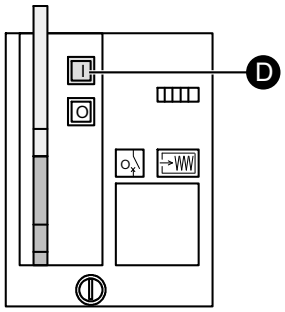


3. Remove the key from **(F)**. Place it in **(C)**.



4. Release and charge the circuit breaker by using the handle.

5. Close the circuit breaker by pressing push-button **I (D)**.



The downstream part of the installation is energized.

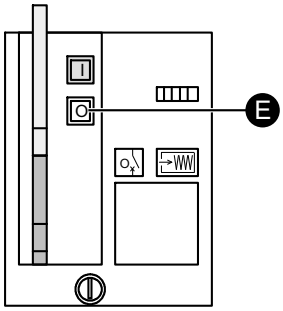
De-Energizing

De-Energizing the Downstream Part of the Installation for DM1 / DM2 / DMV / DMVL Cubicles

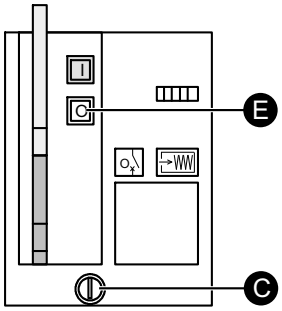
Initial conditions:

- The line disconnector in closed position.
- The circuit breaker is closed.

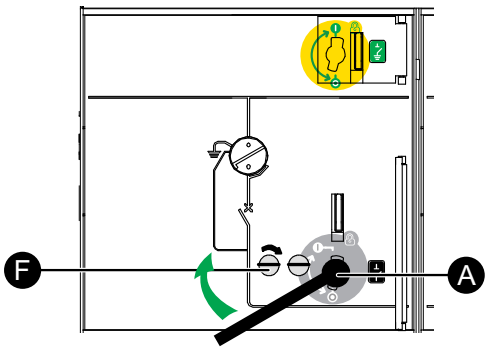
1. Open the circuit breaker by pressing the push-button **O (E)**.



2. Lock the circuit breaker in the open position with the key in **(C)** by pressing the push-button **O (E)**.

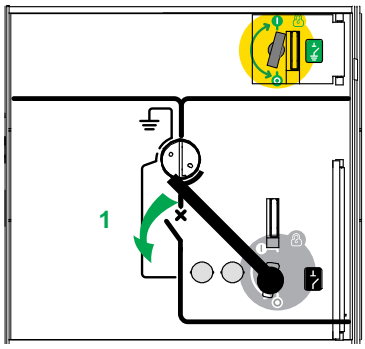


3. Remove the key from **(C)** and place it in **(F)**. Turn the key clockwise to unlock the keylock.

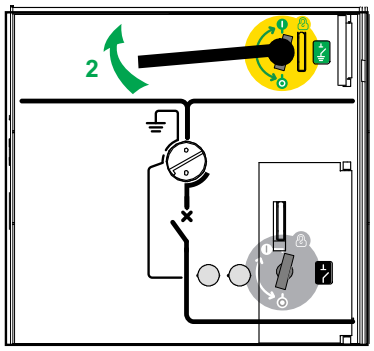


4. Release the lever entry **(A)** of the line disconnector.

5. Move the line disconnector to the open position **(1)**.



6. Release the lever entry of the line disconnector.
7. Move the earthing switch to the earth position **(2)**.



The front panel can be removed.

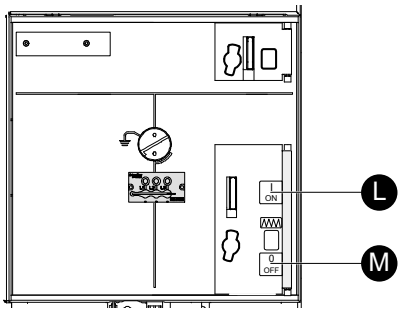
NOTE: The downstream earthing switch closes simultaneously except for DMVL-D, DM1-D, and DM2 cubicles.

Discharging a CI2 Operating Mechanism

All Cubicles Except NSM

Recommended method: switch closing/opening cycle

1. Close the switch by pressing the **I/ON** button **(L)**.
2. Open the switch by pressing the **0/OFF** button **(M)**.

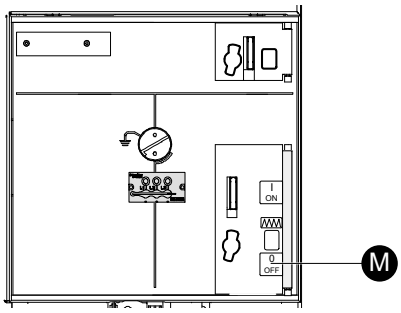


Exceptional method: direct discharging

⚠CAUTION
HAZARD OF INAPPROPRIATE OPERATION Perform this operation only when strictly necessary. **Failure to follow these instructions can result in injury or equipment damage.**

Only if the first method cannot be used, the direct discharging can be used.

Open the switch by pressing the **0/OFF** button **(M)**.



NSM Cubicles

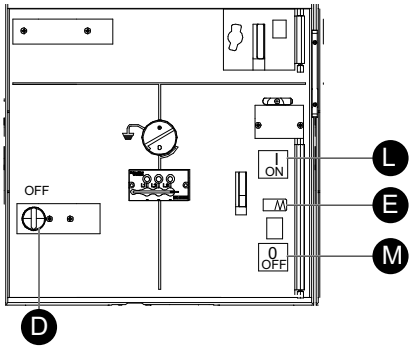
Recommended method: switch closing/opening cycle

Initial conditions:

- The button **(D)** in the **OFF** position.
- The mechanism is open discharged.
- The spring is charged. See Charging the spring, page 89.

1. Select the switch to be operated.
2. Close the switch by pressing the **I/ON** button **(L)**.
3. Open the switch by pressing the **0/OFF** button **(M)**.

The arming indicator **(E)** changes status.



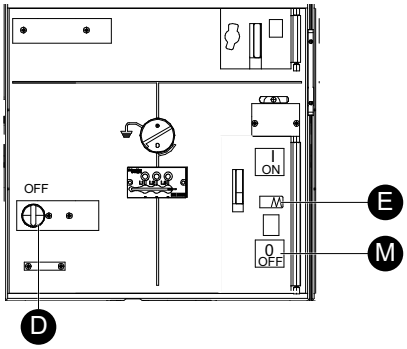
Exceptional method: direct discharging

⚠ CAUTION
HAZARD OF INAPPROPRIATE OPERATION Perform this operation only when strictly necessary. **Failure to follow these instructions can result in injury or equipment damage.**

Only if the first method cannot be used, the direct discharging can be used.

1. Button **(D)** in the **OFF** position.
2. Press the **0/OFF** button **(M)**.

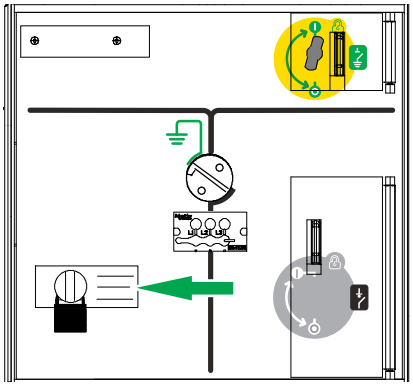
The arming indicator **(E)** changes status.



Padlocking

IM / IMB / IMC / IMM / PM / QM / QMC / SM Cubicles

- Padlocking the motor drive if installed (option) (shackle diameter 6 to 8 mm).

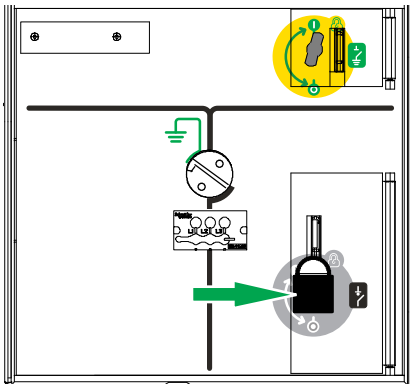


NOTE:

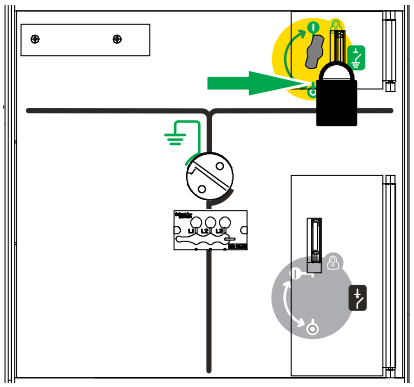
Not applicable for SM (not motorized).

The motor drive can be padlocked in service or out of service.

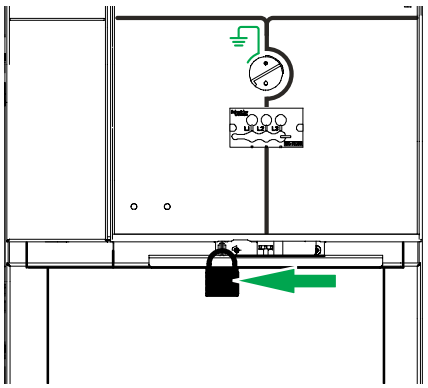
- Padlocking the switch open or closed using 1, 2 or 3 padlocks (shackle diameter 6 to 8 mm).



- Padlocking the earthing switch open or closed using 1, 2, or 3 padlocks (shackle diameter 6 to 8 mm).

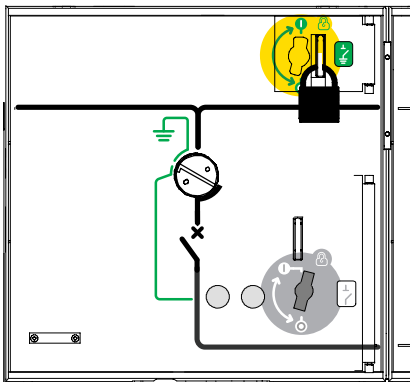


- Padlocking the front panel (shackle diameter 6 to 8 mm).

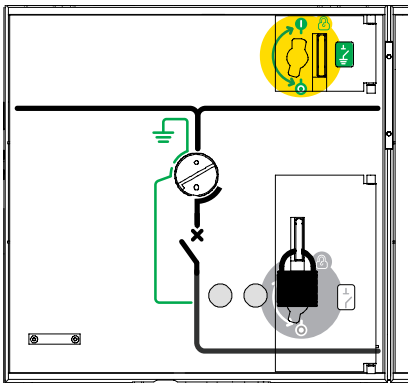


CM / CM2 / CVM / DM1 / DM2 / DMV / DMVL / TM Cubicles

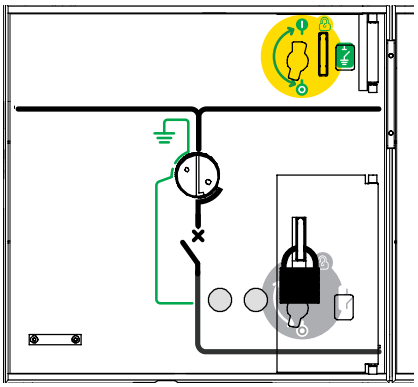
- Padlocking the earthing switch in earthing close position using 1, 2 or 3 padlocks allows you to padlock the line disconnector in earthing close position (shackle diameter 6 to 8 mm).
- Padlocking the earthing switch in earthing open position using 1, 2 or 3 padlocks (shackle diameter 6 to 8 mm).



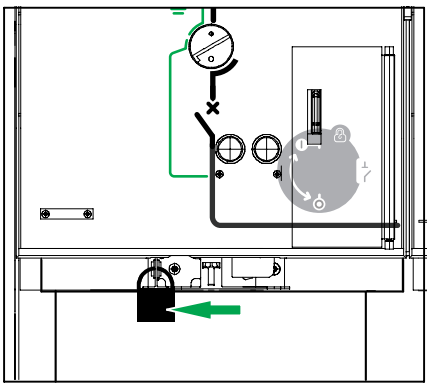
- Padlocking the line disconnector in open position using 1, 2, or 3 padlocks (shackle diameter 6 to 8 mm).



- Padlocking the line disconnector in closed position using 1, 2, or 3 padlocks (shackle diameter 6 to 8 mm).

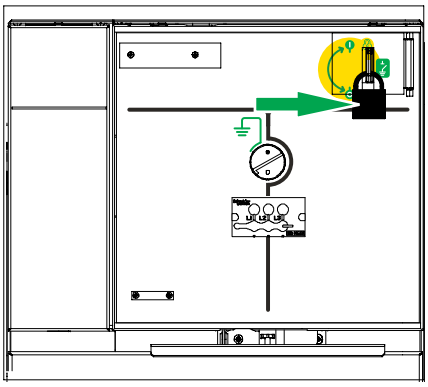


- Padlocking the front panel (shackle diameter 6 to 8 mm).

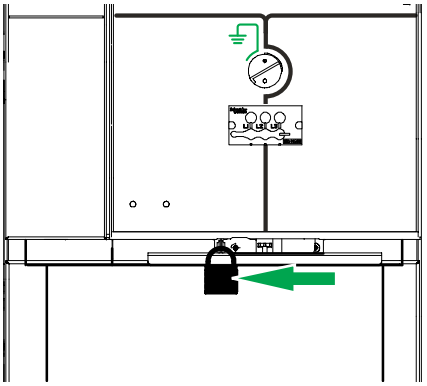


GAM Cubicles

- Padlocking the earthing switch in open or closed position using 1, 2 or 3 padlocks (shackle diameter 6 to 8 mm).

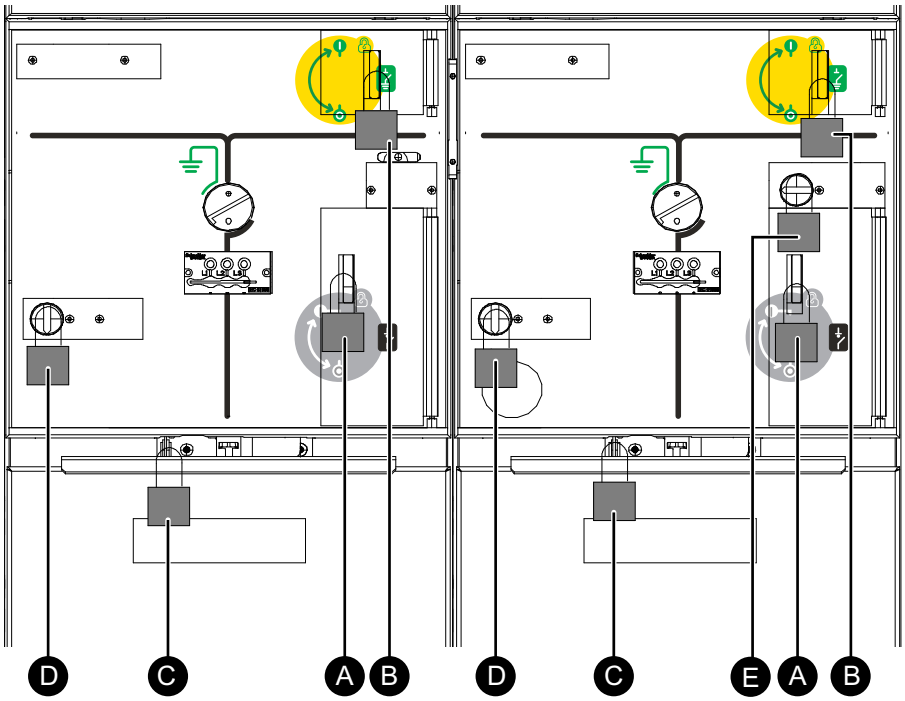


- Padlocking the front panel (shackle diameter 6 to 8 mm).



NSM Cubicles

- Padlock **A**: blocks switch operations.
- Padlock **B**: blocks earthing switch operations.
- Padlock **C**: blocks front panel access.
- Padlock **D**: blocks operating mechanism electrical charging. Electrical charging is automatically performed when the switch operation is blocked.
- Padlock **E**: disables parallel-connection of the two switches.



Keylocks

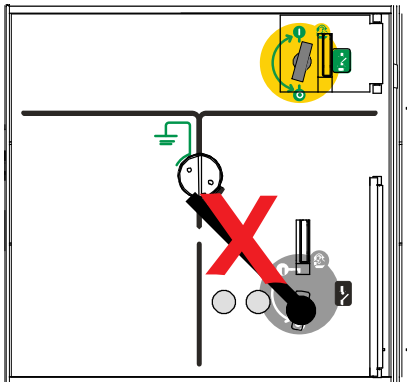
For General Information

See the Keylocks installation and operation instructions 7896785EN01.

To install a keylock on the circuit breaker, see the instruction manual for the unit concerned. If the keylock option was not specified with the order, contact your Schneider Electric service center.

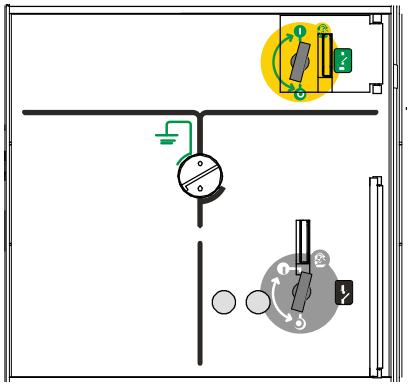
Operating Safety

- Operations are impossible when the circuit breaker is closed.



- Line disconnector is in the open or closed position.

  It is impossible to remove the front panel.



NOTE: The front panel can only be removed or fitted when the line disconnector is in the earth position.

NOTE: Once the front panel has been removed, you can move the line disconnector to the open position. However, you cannot move it to the closed position.

Schneider Electric
35 rue Joseph Monier
92500 Rueil Malmaison
France

+ 33 (0) 1 41 29 70 00

www.se.com

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

MFR9323101-03