Medium Voltage Distribution

SM6 - 24kV
Modular Cubicles

Operating and Maintenance

S1B7039801-03
12/2025

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.

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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 provide installers and users with technical information needed to operate and maintain SM6-24 units.

Validity Note

This manual applies to SM6 24 kV cubicles.

The characteristics of the products described in this document are intended to match the characteristics that are available on www.se.com. As part of our corporate strategy for constant improvement, we may revise the content over time to enhance clarity and accuracy. If you see a difference between the characteristics in this document and the characteristics on www.se.com, consider www.se.com to contain the latest information.

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.

Environmental Data

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

Related Documents

Title of documentation	Reference number
PowerLogic T300 User Manual	NT00378
Keylocks installation and operation instructions	7896785EN01

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

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.

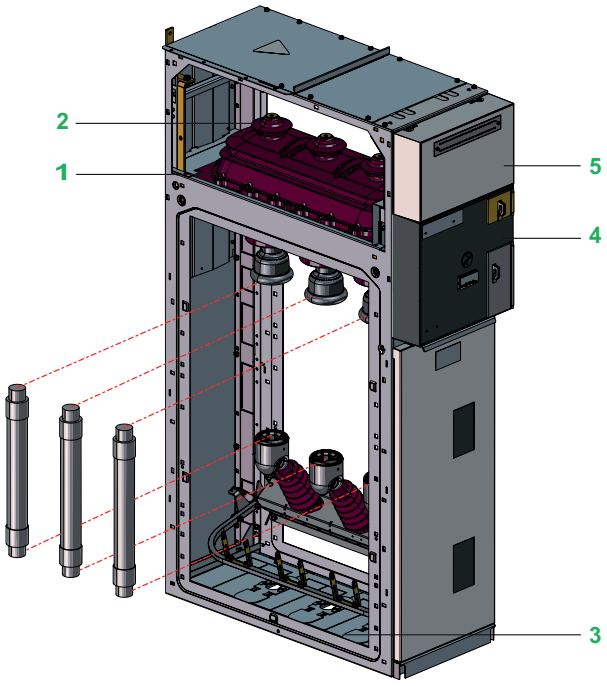
Generalities

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.



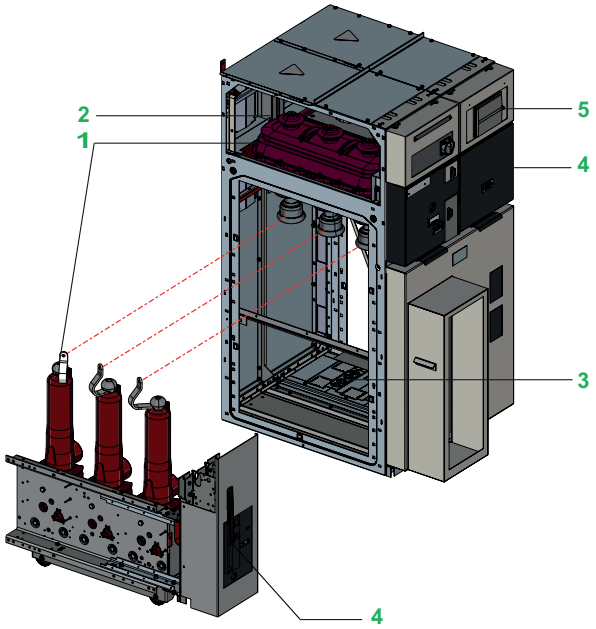
SF6 Circuit Breaker Protection Cubicles

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.

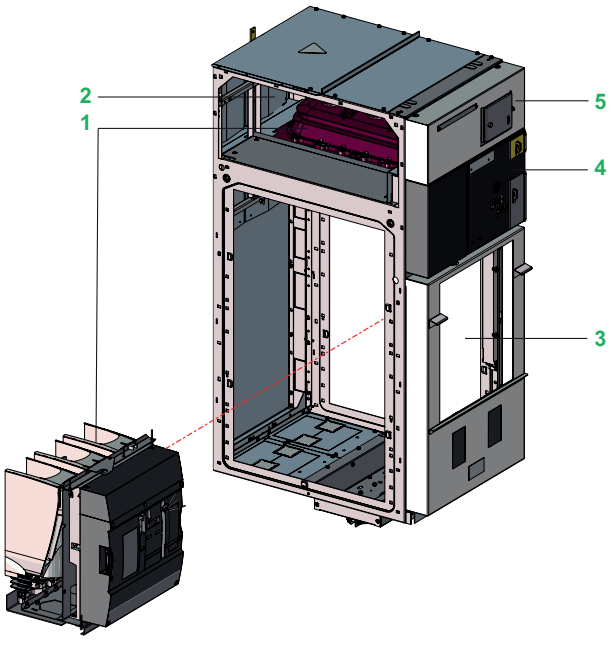


Frontal Vacuum-Type Circuit Breaker Protection Cubicles

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.

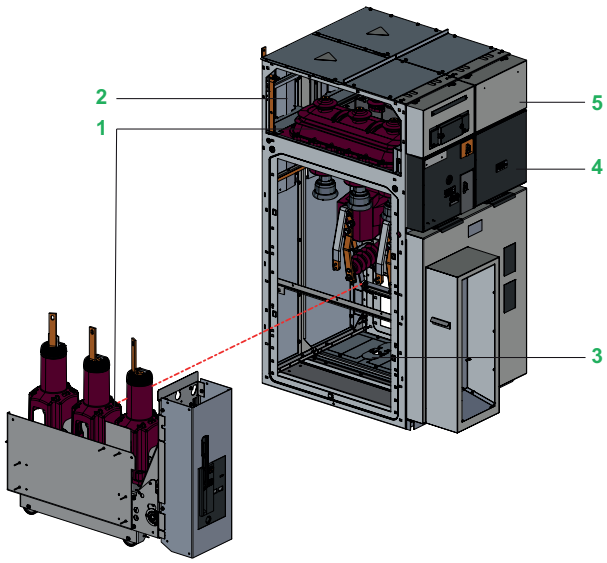
   - Evolis: device associated with an electronic relay and standard sensors (with or without auxiliary source).
2. **Busbars:** all in the same horizontal plane, thus enabling later switchboard extensions and connection to existing equipment.
3. **Connection:** accessible through front, connection to the 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

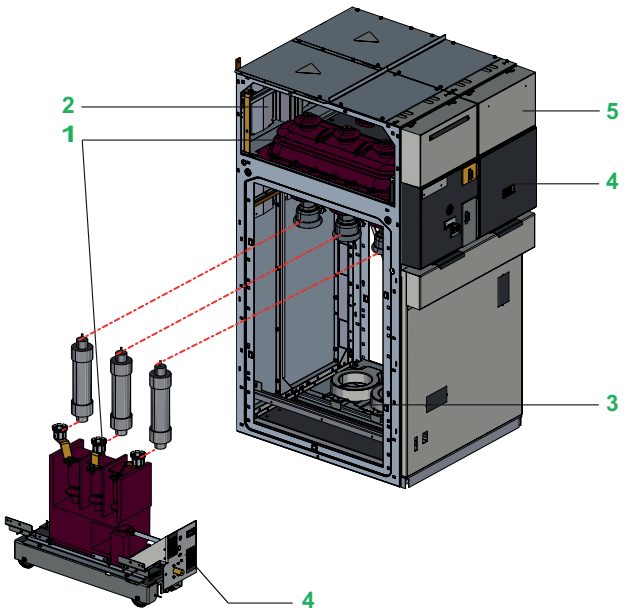
1. **Switchgear:** one or several disconnectors and earthing switches, in an enclosure filled with SF6, and one vacuum circuit breaker, satisfying “sealed pressure system” requirements.
   - Vacuum Circuit Breaker: device associated with an electronic relay and standard sensors (with or without auxiliary 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

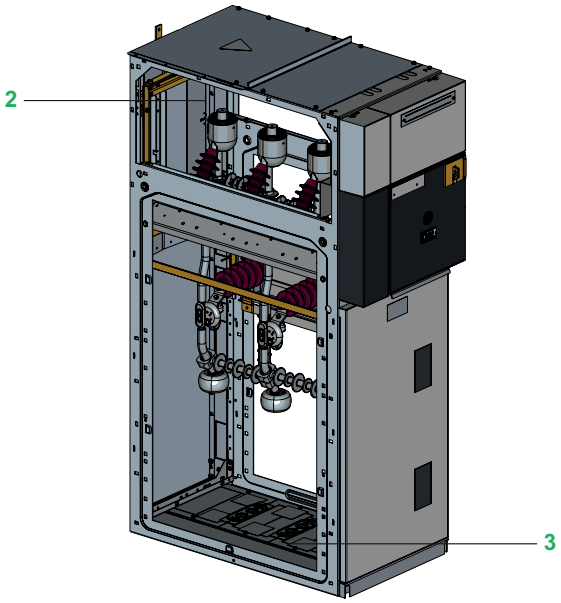
1. **Switchgear:** disconnector and earthing switch in enclosures filled with SF6 and satisfying “sealed pressure system” requirements. Two types may be used for the contactor:
   - Vacuum with magnetic holding
   - Vacuum with mechanical latching
2. **Busbars:** all in the same horizontal plane, thus 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

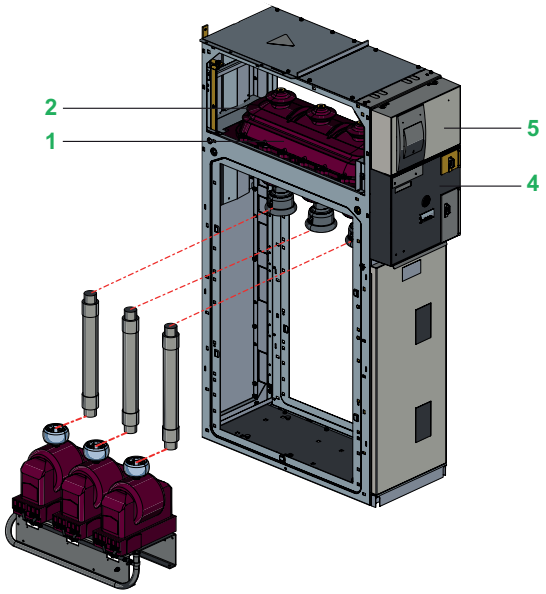
1. **Switchgear:** N/A.
2. **Busbars:** all in the same horizontal plane, thus enabling later switchboard extensions and connection to existing equipment.
3. **Connection:** accessible through front, on the busbars or cables. This compartment may be equipped with an earthing switch downstream.



Metering Cubicles

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

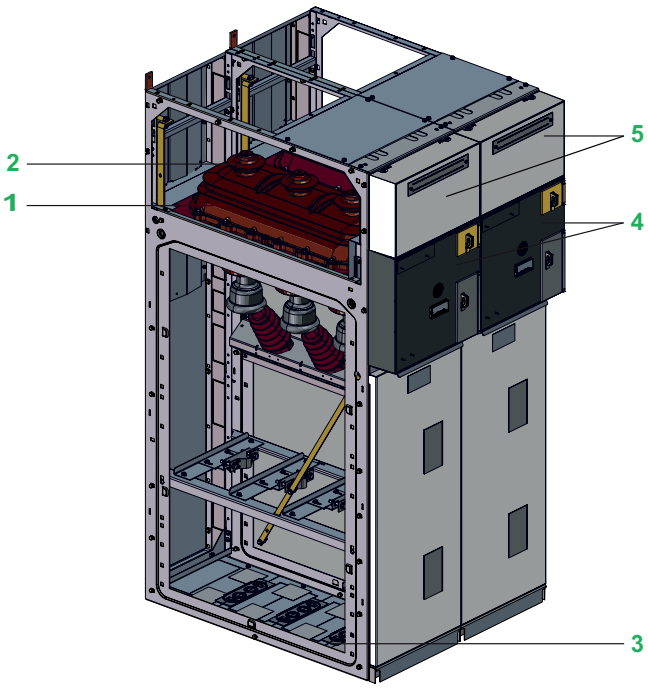
1. **Switchgear**
   - **CM / CM2 / IMM / TM:** switch-disconnector and earthing switch in an enclosure filled with SF6dry air and satisfying “sealed pressure system” requirements.
   - **GBC-A / GBC-B:** N/A.
2. **Busbars:** all in the same horizontal plane, thus enabling later switchboard extensions 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

Operating Instructions for Manual Usage

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

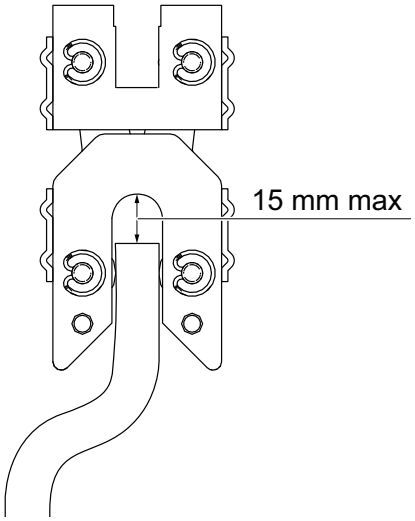
⚠CAUTION

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:

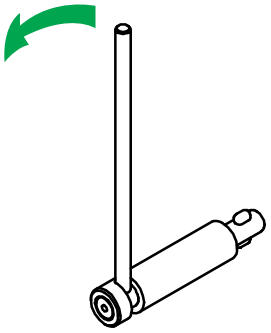
- The fuse has been properly fitted.
- The field distributor has been properly positioned.

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

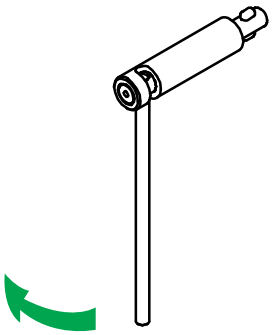
Operating the Equipment

Operating Lever

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

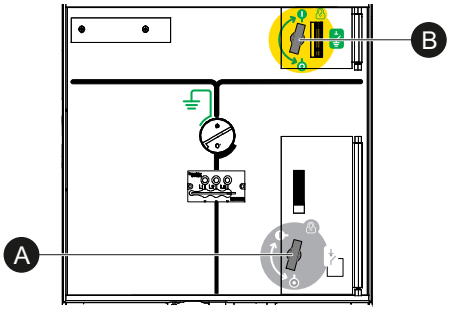


Position the lever as indicated for upward (closing) operations.

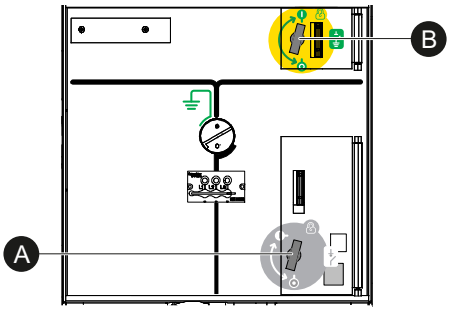


Mechanism Overview

- **CIT** operating mechanism front plate.

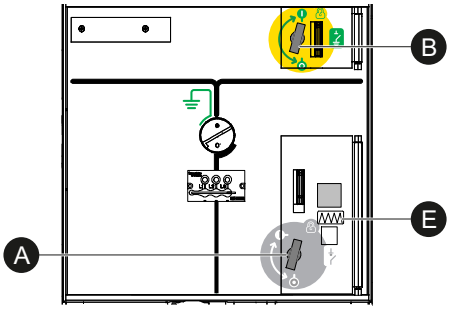


- **CI1** operating mechanism front plate.



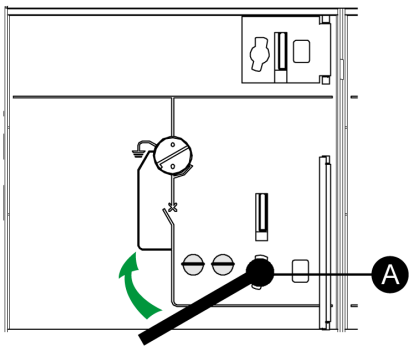
- **CI2** operating mechanism front plate.

  E. Arming indicator

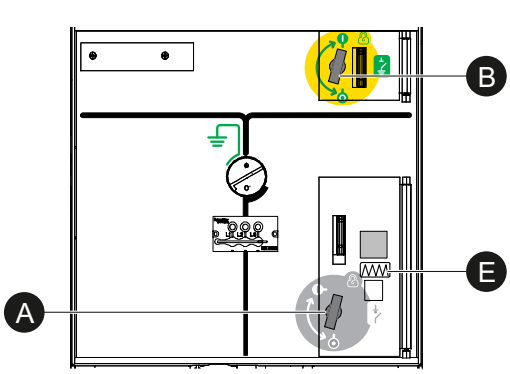


Charging the spring

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

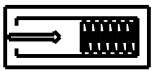


Charging status: indicator (E)



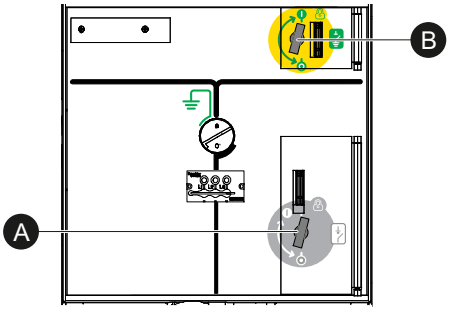
White indicator: spring discharged

Yellow indicator: spring charged



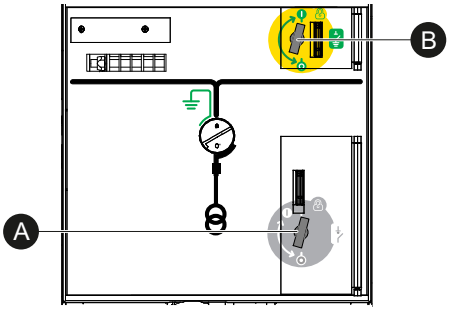
IM / IMC / QM / QMC Cubicles

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



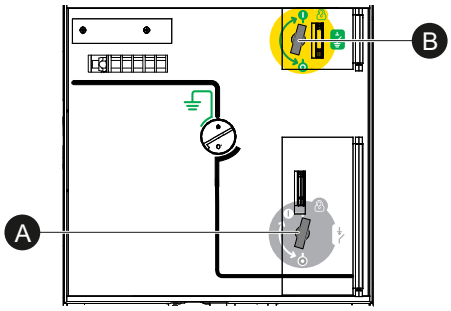
CM / CM2 / CVM / GBC / TM Cubicles

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



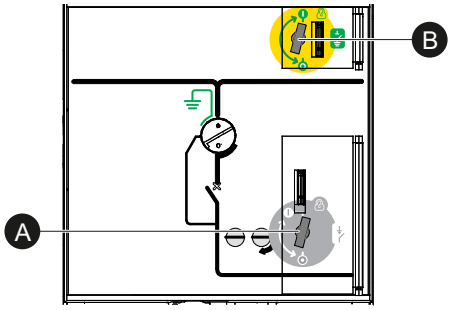
IMB / IMM Cubicles

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



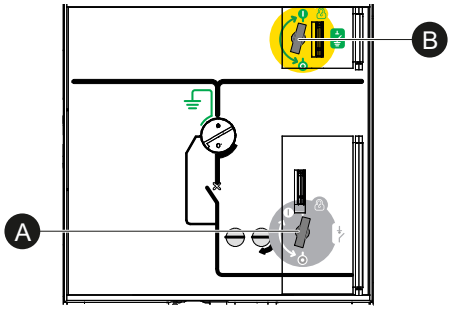
DM1 / DM2 / DMVL Cubicles

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



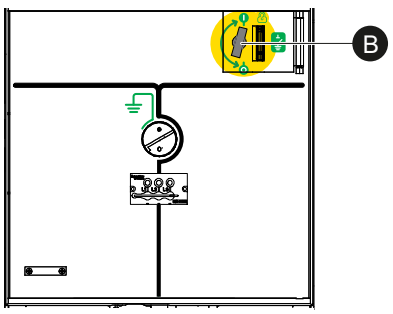
DMV Cubicles

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



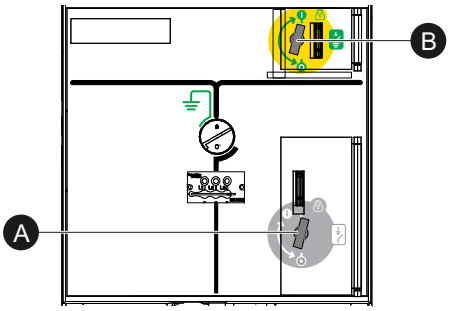
GAM Cubicles

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



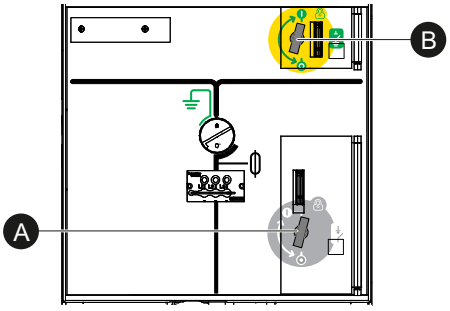
SM Cubicles

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:

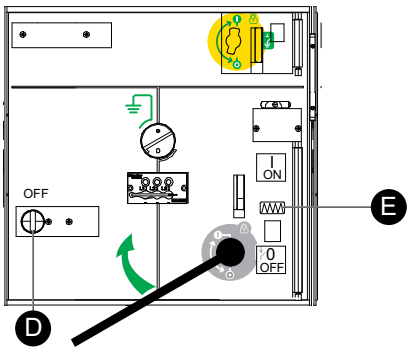
- The automation is out of operation.
- The earthing switch is in open position.

Charging the operating mechanism

Initial conditions:

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

Charge the spring, page 17.

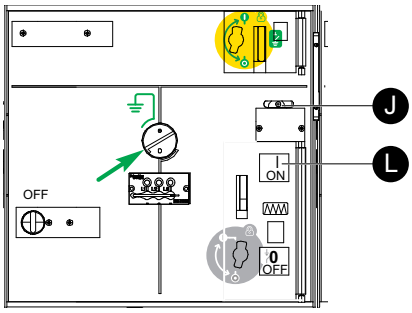


The arming indicator **(E)** changes status.

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)**.



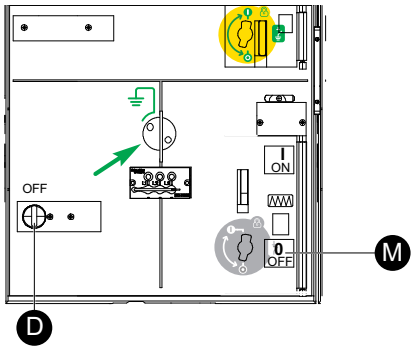
The switch is closed.

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.

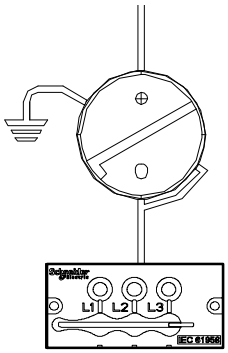
Before Energizing the MV Incoming Cables

⚠⚠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

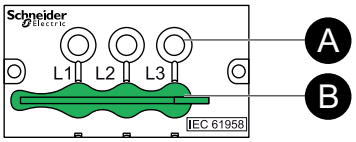
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

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

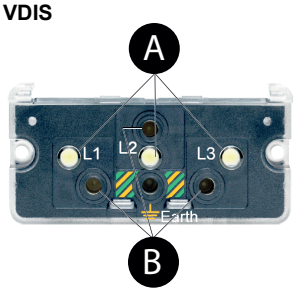
Failure to follow these instructions will result in death or serious injury.

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)

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.

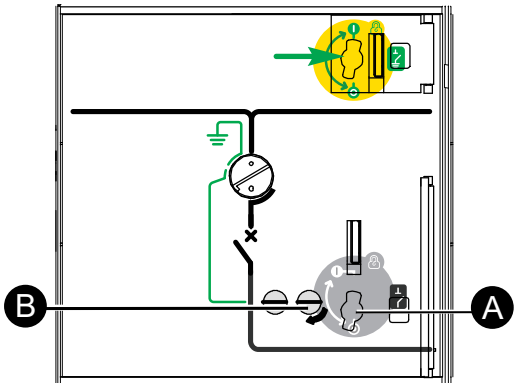
Off–Load Operations

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

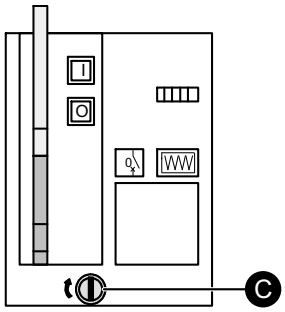
Initial conditions:

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

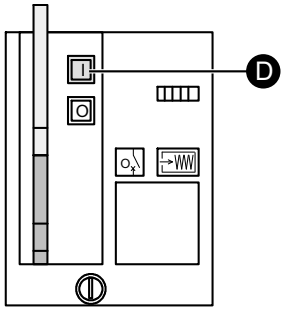
1. Lock the lever entry **(A)** of the line disconnector with the key in **(B)**.



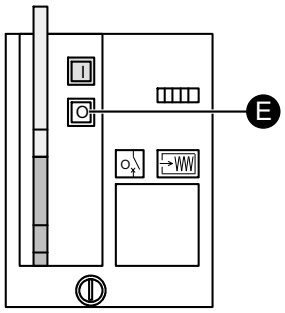
2. Remove the key from **(B)** then place it in **(C)**.



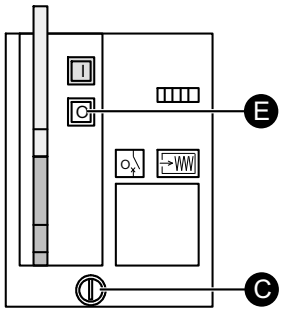
3. Release then charge the circuit-breaker.
4. Close the circuit breaker by pressing the push-button **I (D)**.



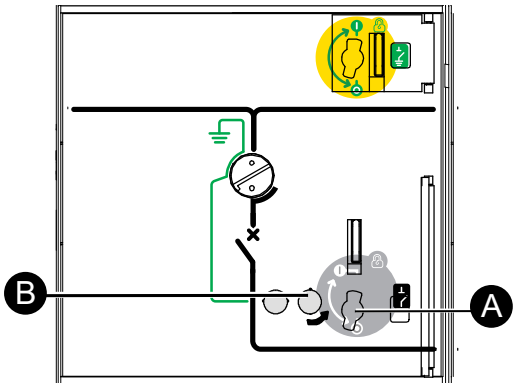
5. Open the circuit breaker by pressing the push-button **O (E)**.



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.

Energizing

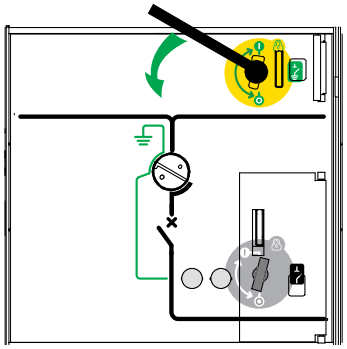
Energizing the Downstream Part of the Installation for DM1 / DM2 / DMV / DMVL Cubicles

Initial conditions:

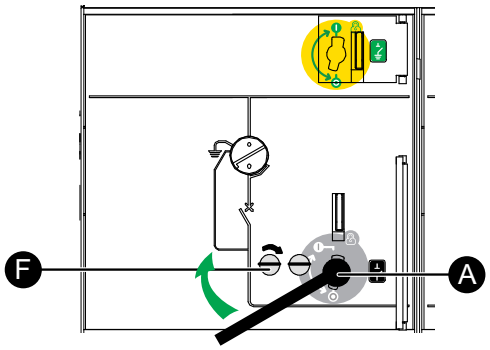
- The earthing switch is in closed position.
- The circuit breaker is open.
- The front panel is in place.

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

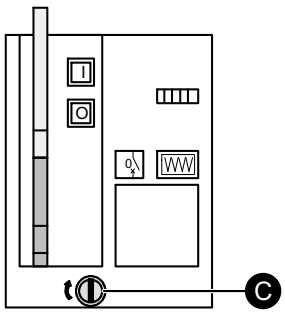
   NOTE: The downstream earthing switch opens simultaneously except for DMVL-D, DM1-D, and DM2 cubicles.



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

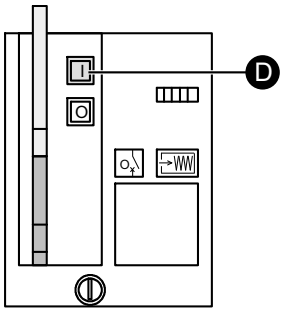


3. Remove the key from **(F)**. Place it in **(C)**.



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.

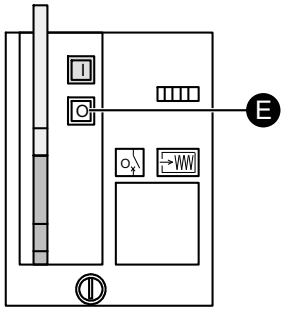
De-Energizing

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

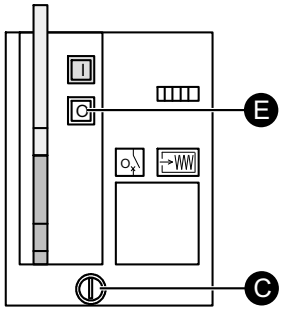
Initial conditions:

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

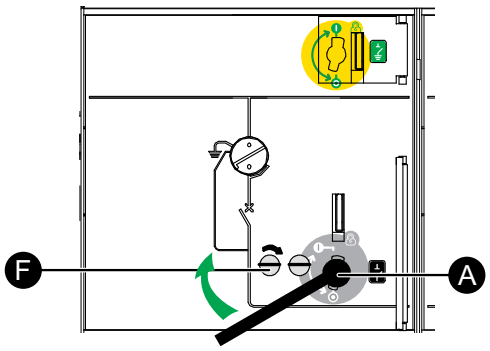
1. Open the circuit breaker by pressing the push-button **O (E)**.



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

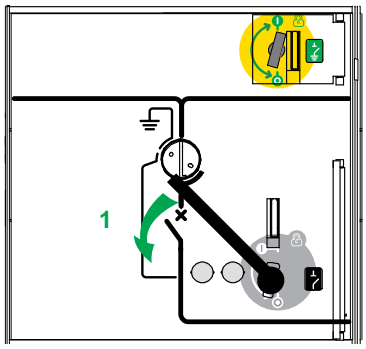


3. Remove the key from **(C)** and place it in **(F)**. Turn the key clockwise to unlock the keylock.

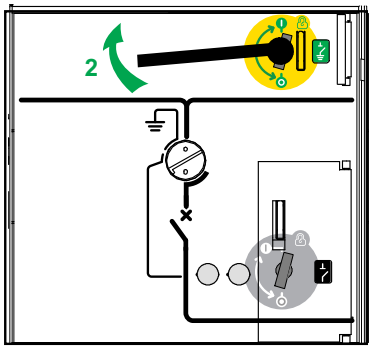


4. Release the lever entry **(A)** of the line disconnector.

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.

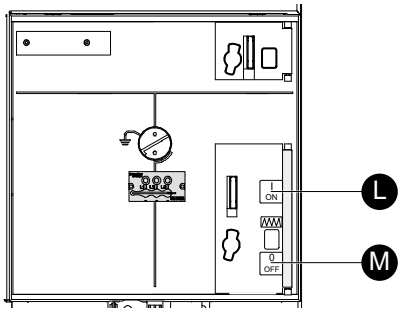
NOTE: The downstream earthing switch closes simultaneously except for DMVL-D, DM1-D, and DM2 cubicles.

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)**.

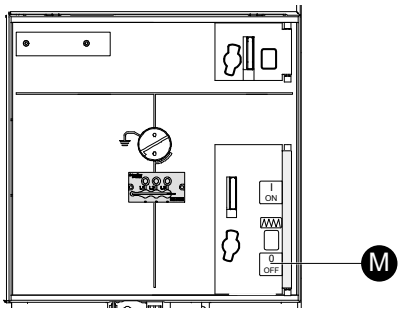


Exceptional method: direct discharging

⚠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

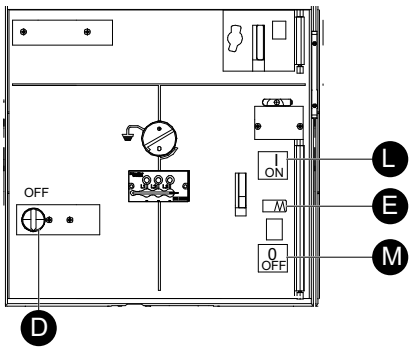
Recommended method: switch closing/opening cycle

Initial conditions:

- The button **(D)** in the **OFF** position.
- The mechanism is open discharged.
- The spring is charged. See Charging the spring, page 17.

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.



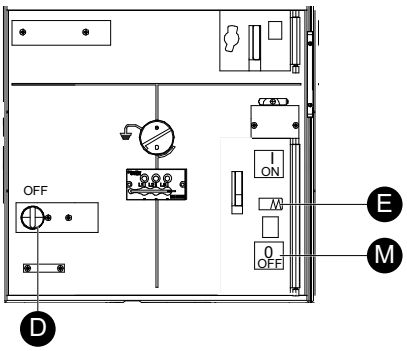
Exceptional method: direct discharging

⚠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.



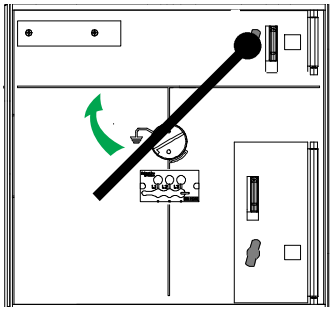
Operating the Earthing Switch

All Cubicles Except NSM

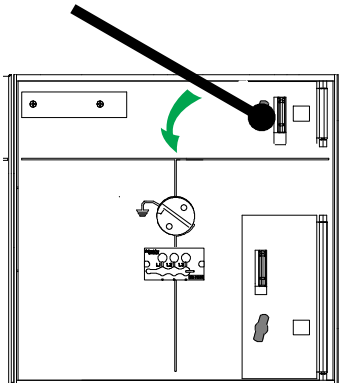
Initial conditions:

- The switch operating mechanism is in the open discharged position.
- There is no voltage present (see information about voltage presence, page 21).

- Closing the earthing switch.



- Opening the earthing switch.



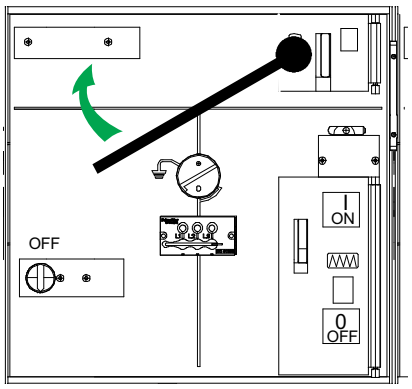
NSM Cubicles

Initial conditions:

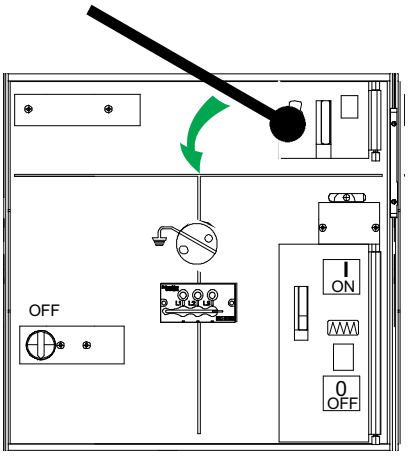
- The switch operating mechanism is in the open discharged position.

- There is no voltage present (see information about voltage presence, page 21).

- Closing the earthing switch.

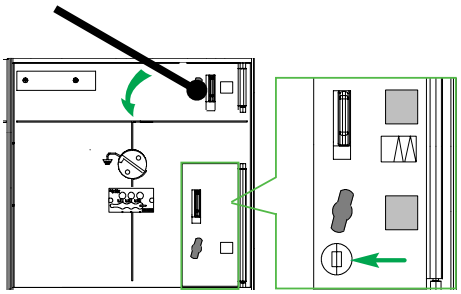


- Opening the earthing switch.

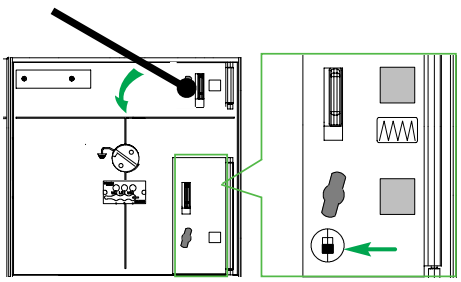


Fuse Status Indication for CM / CM2 / PM / QM / QMC / TM Cubicles

- Fuses serviceable (white indicator).

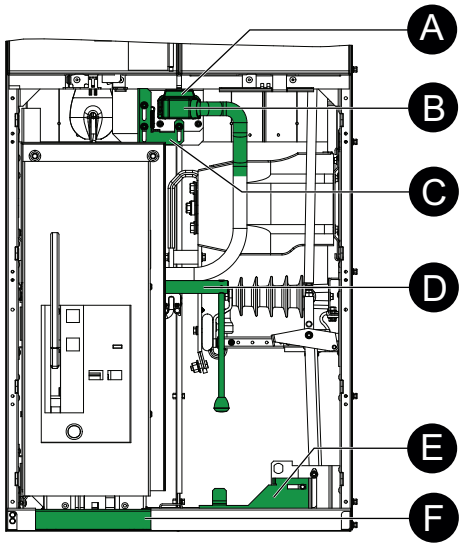


- At least one fuse unserviceable (red indicator).



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

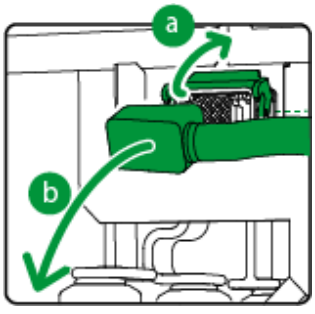
Racking Out the Circuit Breaker from a DM1-W / DM1-Z Cubicle

Initial conditions:

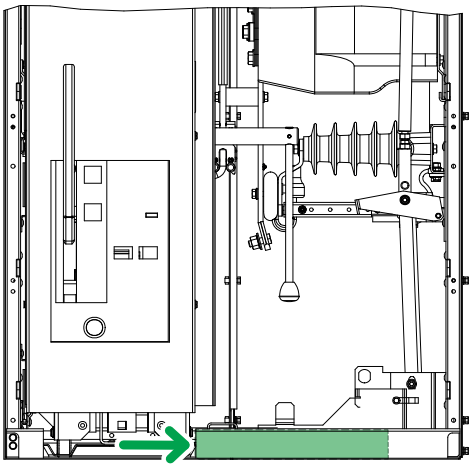
- The line disconnector is in the earth position.
- The circuit breaker is open and discharged.
- The front panel is removed.
- The bolt that helps secure the circuit-breaker for transport is removed.

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

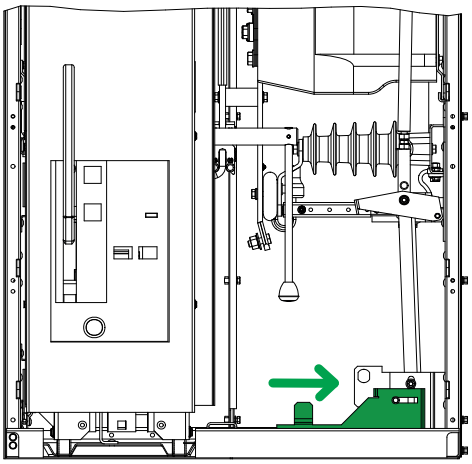
1. Unplug the low voltage cable:
   a. Lift the plug lock.
   b. Disconnect the low voltage plug.



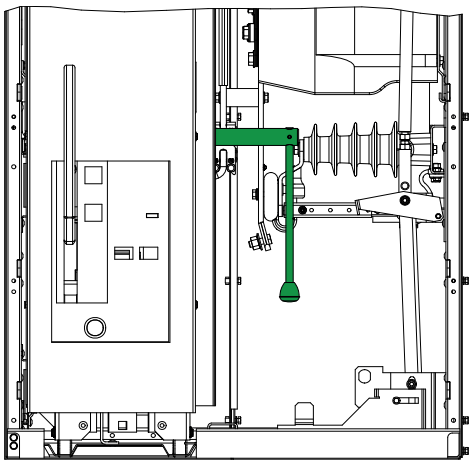
2. Move the mobile plinth completely to the right.



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.

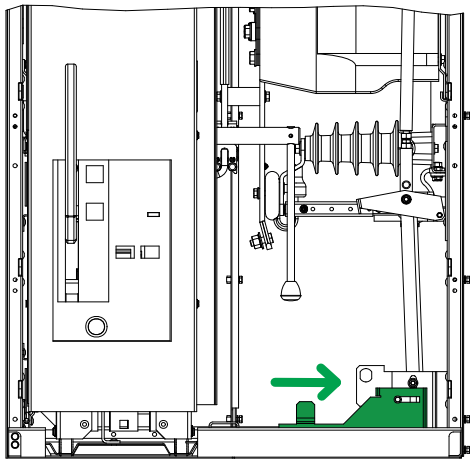
Racking In the Circuit Breaker in a DM1-W / DM1-Z Cubicle

Initial conditions:

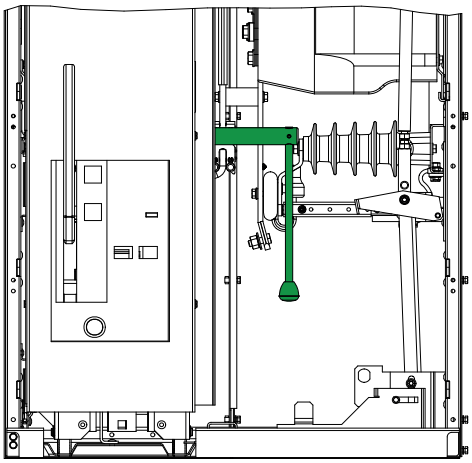
- The line disconnector is in the earth position.
- The circuit breaker is open and discharged.
- The front panel is removed.

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

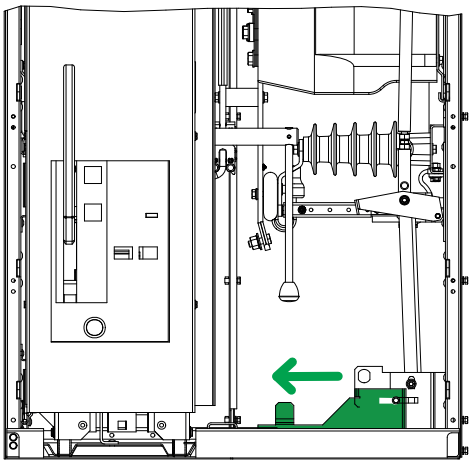
1. Racking in the circuit breaker:
   a. For DM1-W only. Push the earthing switch lock to the right, if it is not done yet.



   b. Insert the circuit-breaker manually in the cubicle until it is blocked.
2. Push the lever to connect the circuit breaker.

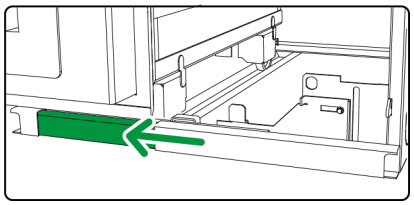


3. Move the earthing switch lock to the left.

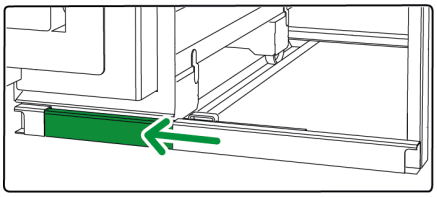


4. Move the mobile plinth completely to the left.

For DM1-W



For DM1–Z

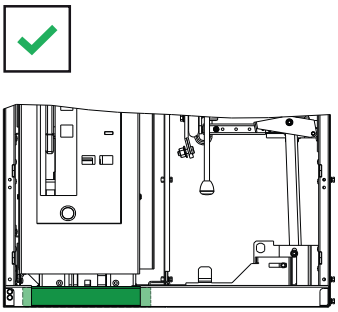


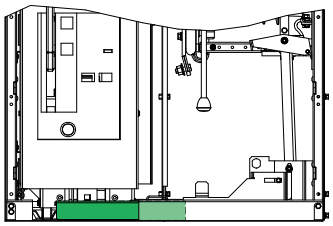
⚠⚠DANGER

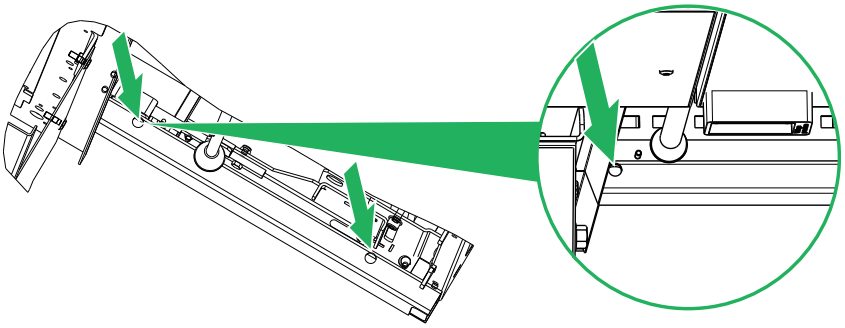
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

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.

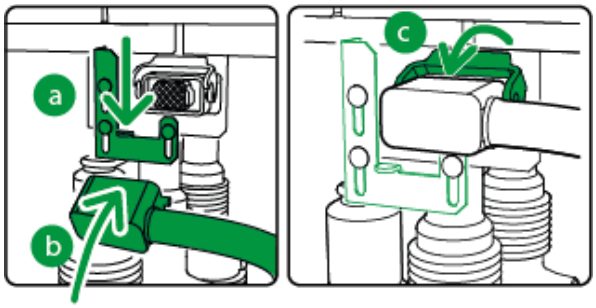
Failure to follow these instructions will result in death or serious injury.



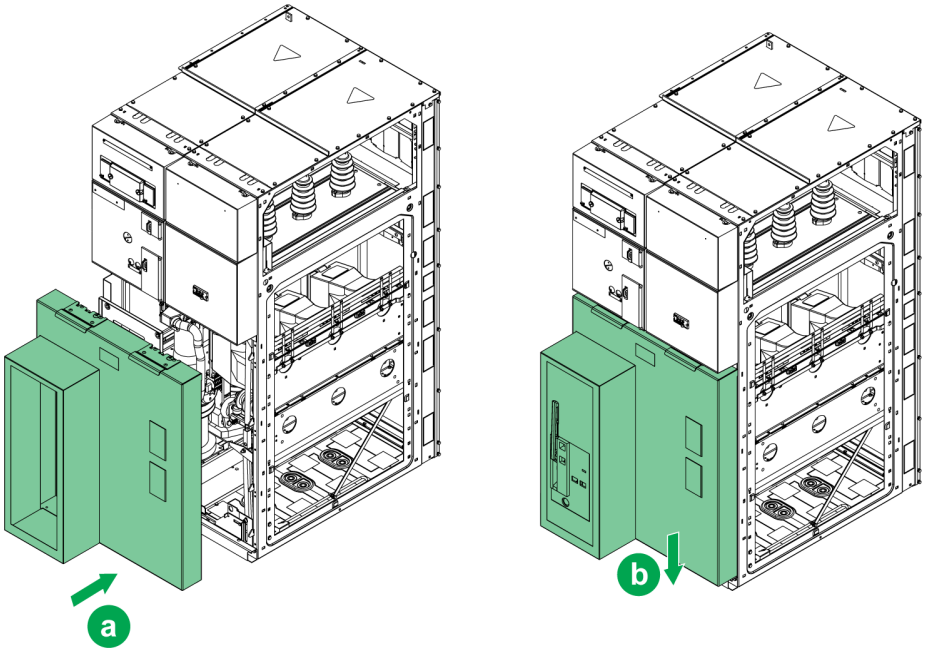




5. Plug in the low voltage cable:
   a. Lower the metallic part.
   b. Connect the low voltage plug.
   c. Lower the plug lock.



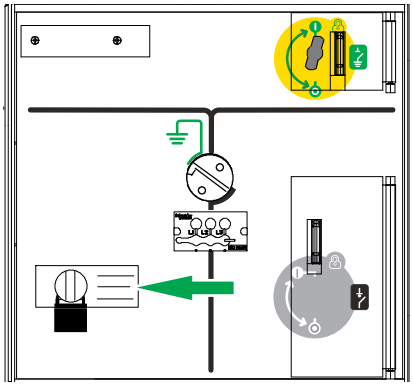
6. Reassemble the front panel.



Padlocking

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

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

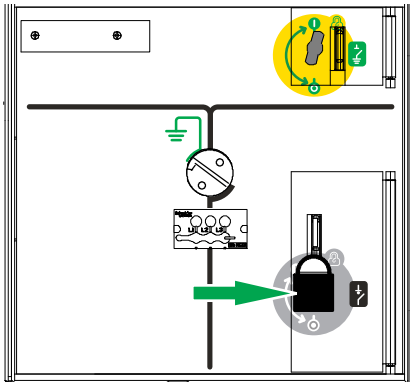


NOTE:

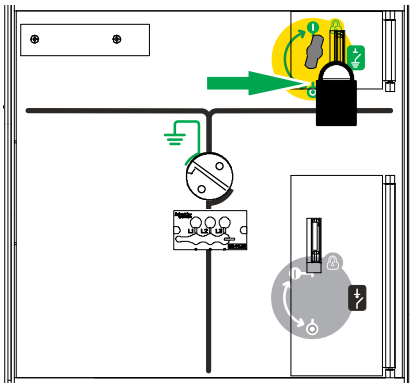
Not applicable for SM (not motorized).

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

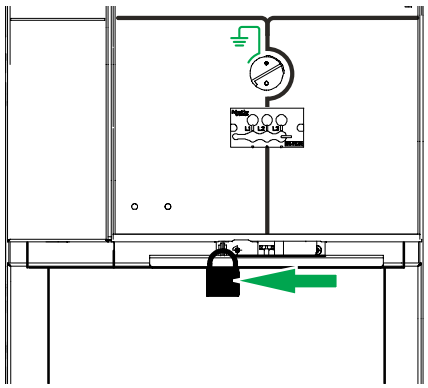
- Padlocking the switch open or closed using 1, 2 or 3 padlocks (shackle diameter 6 to 8 mm).



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

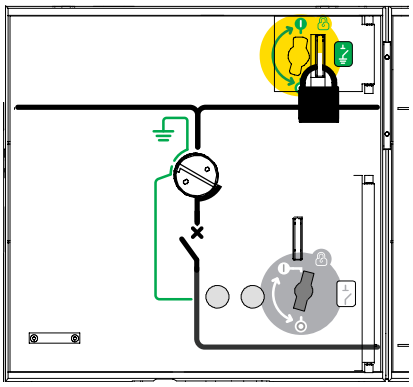


- Padlocking the front panel (shackle diameter 6 to 8 mm).

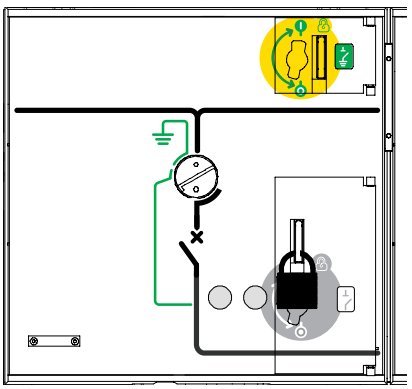


CM / CM2 / CVM / DM1 / DM2 / DMV / DMVL / TM Cubicles

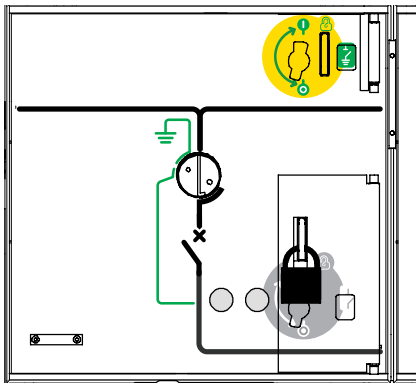
- Padlocking the earthing switch in earthing close position using 1, 2 or 3 padlocks allows you to padlock the line disconnector in earthing close position (shackle diameter 6 to 8 mm).
- Padlocking the earthing switch in earthing open position using 1, 2 or 3 padlocks (shackle diameter 6 to 8 mm).



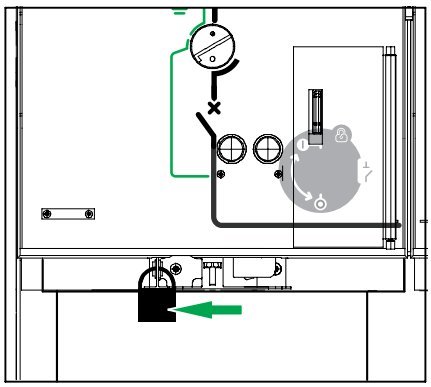
- Padlocking the line disconnector in open position using 1, 2, or 3 padlocks (shackle diameter 6 to 8 mm).



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

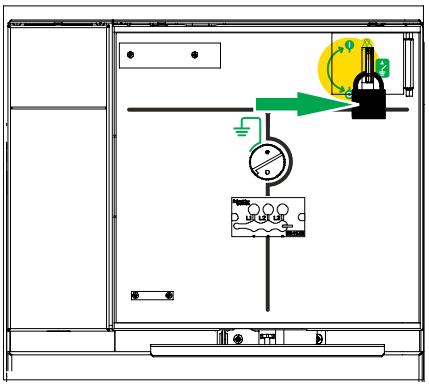


- Padlocking the front panel (shackle diameter 6 to 8 mm).

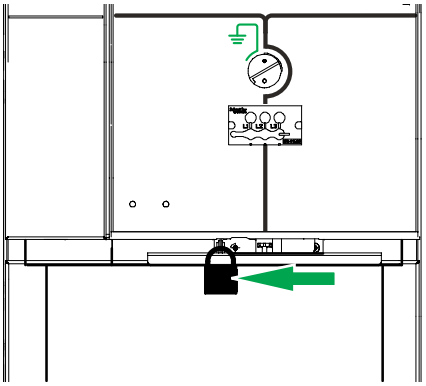


GAM Cubicles

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

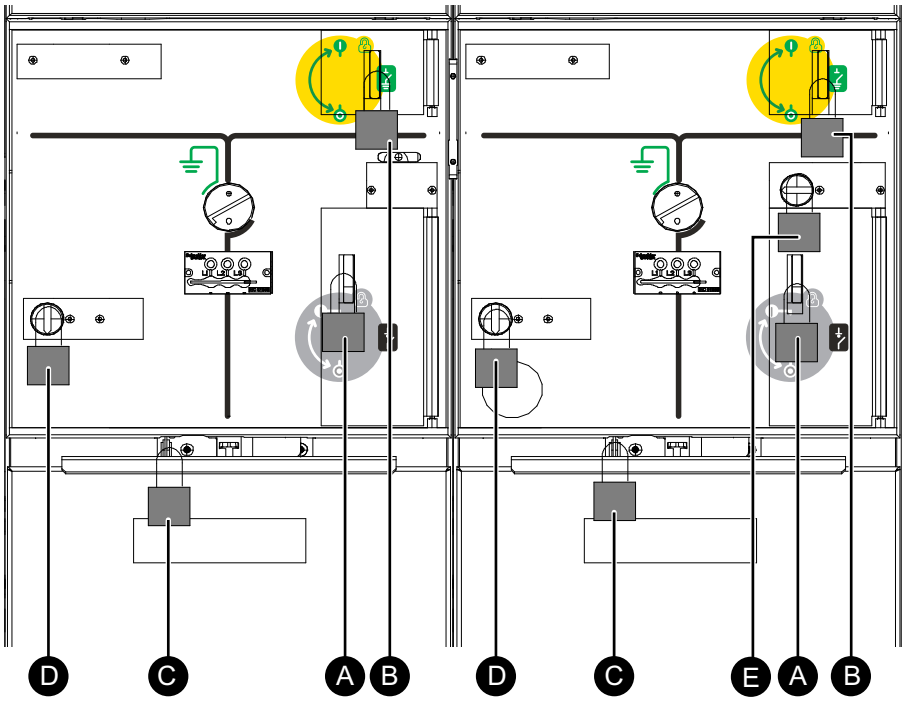


- Padlocking the front panel (shackle diameter 6 to 8 mm).



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

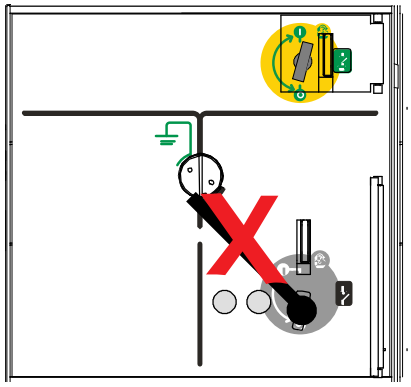
For General Information

See the Keylocks installation and operation instructions 7896785EN01, page 8.

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.

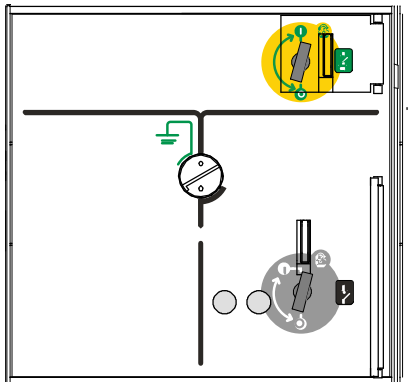
Operating Safety

- 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.

Maintenance

Preventive Maintenance

Periodical Maintenance

In normal operating conditions (temperature between -5 °C and 40 °C) no special maintenance.

In harsh conditions (aggressive atmosphere, dust, temperature less than -25 °C or greater than 40 °C), contact the nearest Schneider Electric service center.

⚠CAUTION

HAZARD OF INADEQUATE MAINTENANCE

Carry out a few operating cycles on the switching devices, at regular intervals (every 2 years).

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

If needed, contact the nearest Schneider Electric service center.

Cleaning Instructions

⚠CAUTION

HAZARD OF INADEQUATE MAINTENANCE

- Do not put grease on the operating mechanism.
- Do not use chemical solvent or alcohol.
- Do not use high pressure cleaning process.
- Inspect each compartment (cable, fuse, busbar) at regular intervals according to environmental conditions. If the insulating parts are dusty, use a clean and dry cloth to remove dust.

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

Corrective Maintenance

NOTICE

HAZARD OF WRONG MAINTENANCE CONDITIONS

On replacement, all the following accessories must be replaced with new equipment:

- Self-locking nut
- Contact washer
- Locking ring
- Mechanical pin

Failure to follow these instructions can result in equipment damage.

Loss of Pressure in the Tank

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

If the needle of the manometer is in the red zone:

- Do not refill the tank.
- Do not perform any operation on the cubicle.
- Contact Schneider Electric Services Center immediately.

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

VPIS/VDIS Replacement

To replace a VPIS or a VDIS, contact the nearest Schneider Electric service center.

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

⚠WARNING

HAZARD OF INADEQUATE MAINTENANCE

- Change all 3 fuses when changing a fuse.
- Do not re-use fuses that have already been used.

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

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

Initial conditions:

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

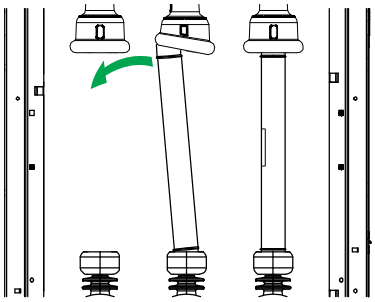
- The cubicle must be de-energized.
- The disconnector must be open.
- The earthing switch must be closed.

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

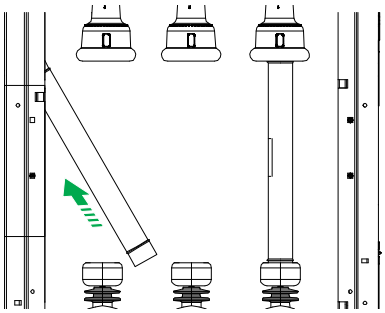
Open the front panel to access the fuses.

Standard IEC 282.1 § 23.2 states that the three MV fuses should be changed whenever one of them blows.

1. Remove the top of the fuse.



2. Support and remove it completely.



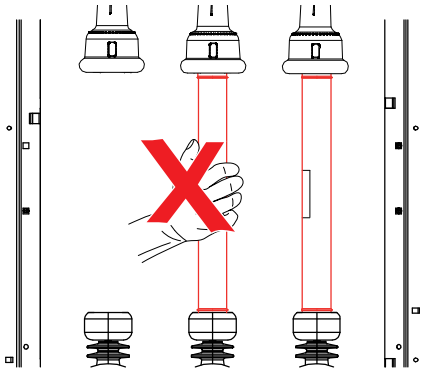
Assembling the Fuses for CM / CM2 / CVM / PM / QM / QMB / QMC /TM Cubicles

NOTICE

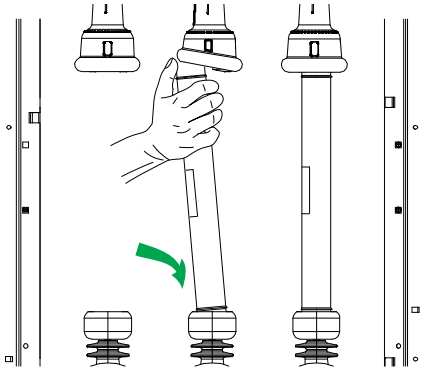
HAZARD OF INAPPROPRIATE OPERATION

Do not hold the fuse in the middle.

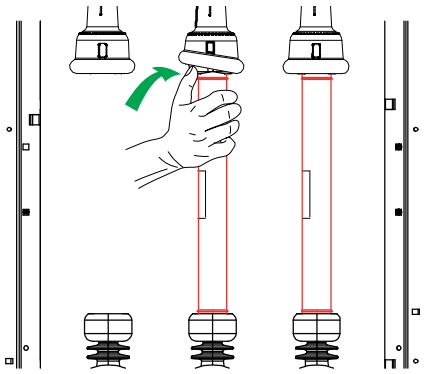
Failure to follow these instructions can result in equipment damage.



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



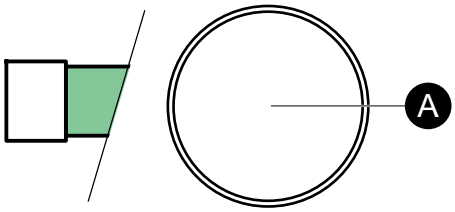
- Then put the top of the fuse in the upper contact
- Check that the upper field repartitor is properly placed.
- Turn the fuse so that the label appears in front.



Striker fuse mounting direction

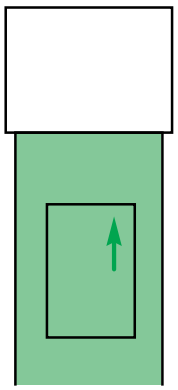
- Install the striker fuses which trip the switch when they blow.

  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).



Replacing the Fuses for GBC-A and GBC-B Cubicles

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

De-energize the entire MV switchboard before any operation.

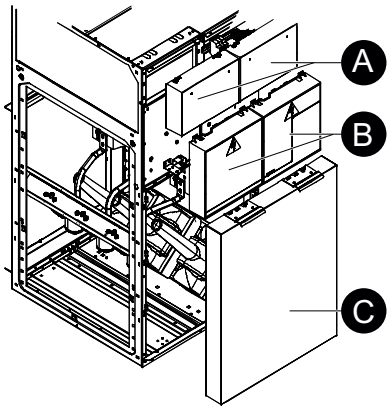
Failure to follow these instructions will result in death or serious injury.

Equipment required:

- 10 mm key
- Voltage check rod

Refer to IEC 60282-1 standard.

1. Remove the covers **(A)** and **(B)**.
2. Remove the front panel **(C)**.



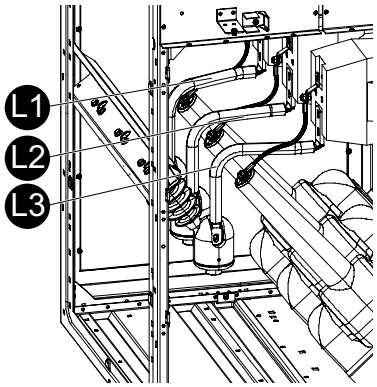
3.

⚠⚠DANGER

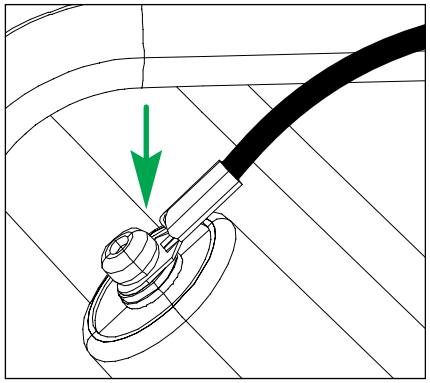
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Check the absence of voltage for phases L1, L2 and L3 by using the voltage check rod, before accessing the cubicle.

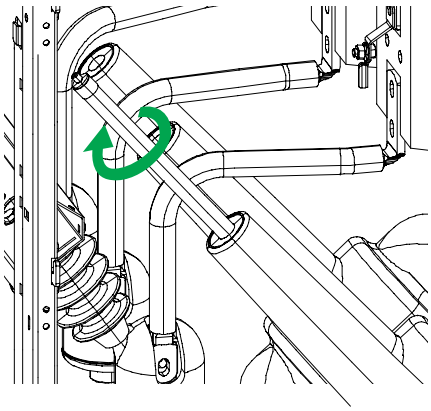
Failure to follow these instructions will result in death or serious injury.



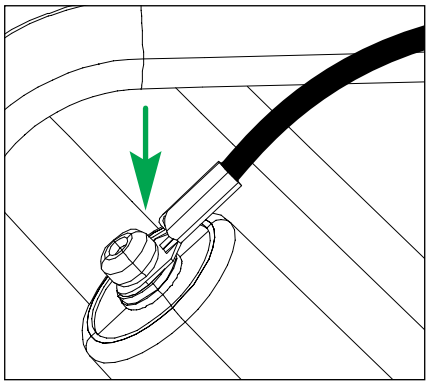
4. Loosen the special nut and the fuse to be changed.



5. Tighten the new fuse into its compartment.



6. Connect the wire from the voltage transformer.



7. Install and moderately tighten the special nut by hand.

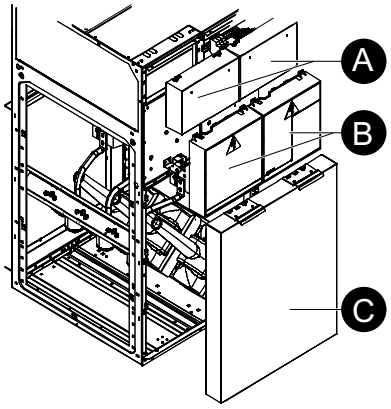
⚠CAUTION

HAZARD OF INADEQUATE MAINTENANCE

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

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

8. Reassemble the front panel **(C)** and then the covers **(A)** and **(B)**.



Anomalies / Solutions Table - Spare Parts - Options

Anomalies and Solutions Tables for CM / CM2 / CVM / IM / IMB / IMC / GAM / GAM2 / PM / QM / QMB / QMC / SM / TM Cubicles

Anomalies and Solutions Table

Anomalies	Solutions
Voltage indicator not illuminated.	• Check that the incoming cables are live. • Check that the incoming busbars are live (for IMB cubicle). • Check the voltage presence indicating system VPIS/VDIS. • Check that the switch is closed (for IM / IMC / PM / QM / QMC cubicles). • Check that the fuses are present (for PM / QM / QMC cubicles). • Check the condition of the fuses (for PM / QM / QMC cubicles). • Check that the disconnector is closed (for SM cubicle). • Check that the line disconnector and the contactor are closed (for CVM cubicle). • Check that the busbars are live (for CVM cubicle).
Front panel cannot be opened or closed.	• Check that the earthing switch is closed. • Check that the disconnector is in earthed position (for CVM cubicle). • Check the LV connection (for CVM cubicle).
Earthing switch cannot be operated.	• Check that the switch is open. • Check that the disconnector is open (for SM cubicle).
Line disconnector cannot be set to earthed position (for CVM cubicle).	• Check that the disconnector is in open position.
Line disconnector cannot be set to closed position (for CVM cubicle).	• Check that the disconnector is in open position.
Contactor cannot be operated (for CVM cubicle).	• Check that the fuse on the power supply is OK (this fuse is located on the terminal block installed in the low voltage enclosure). **NOTE:** A spare fuse is supplied on the terminal block.
Disconnector cannot be operated.	• Check that the earthing switch is open.
Switch cannot be operated.	• Check that the earthing switch is open.

Motor mechanism (option)	
Anomalies	**Solutions**
Electrical operation impossible; S13 = switch lever input ; S14 = earth switch lever input.	• Check the LV fuses HA21 (CIP2). • Check electrical interlocks S13 - 14 (lever insertion). • Check that the earthing switch operating shaft has reached its end position. • Check that contact S14 has not disabled the power supply and re-adjust if necessary. • Check the configuration of the CIP1 subassembly (see diagram).
(*) Manual operation impossible following an electrical closing cycle for a voltage level less than -15% rated value.	Use the operating lever to apply a torque in the closing direction until the end position is reached; manual operation is possible.
(*) Insertion of lever impossible following an electrical closing cycle for a voltage level greater than +15% rated value.	• If possible, carry out an electrical operation, using a backup power source if necessary. • To allow insertion of the operating lever, push the back of the switch shaft in the closing direction using a large screwdriver; (for safety reasons, remember to first lock out the electrical operating mechanism; if necessary, push up and hold the locking blade that actuates contact S13).
(*) Operation can be done for rated voltage ±15%.	

Spare Parts

Presence voltage indicator (VPIS/VDIS)				
Fuses UTE or DIN (Consult us for other types of fuse)				
6.3 A UTE fuses for CM cubicle				
6.3 A DIN or UTE fuses for CM2 and TM cubicles				
DIN type MV fuses for CVM cubicle				
5 x 20 low voltage fuses (time delay type) for CVM cubicle				
Un (V)	49	60–72	100–127	220–250
Is (A)	10	3.15	2.5	1.25
For other parts, contact Schneider Electric service centers.				

Options

Contact Schneider Electric.

Motor mechanism
Auxiliary contacts
Incoming cables cabinet from top

Keyed interlocks
50 W heating element
Phase concordance tester
Low voltage cabinet
Earth fault relay
Contact for “fuse blown” indication (PM / QM / QMC)
Shunt type opening release
Enlarged LV cabinet or additional LV enclosure
Pressure indicator

Anomalies and Solutions Tables for DM1 / DM2 / DMV / DMVL Cubicles

Anomalies and Solutions Table

Anomalies	Solutions
Voltage indicator does not light up.	• Check the voltage presence indicating system (VPIS/ VDIS). • Check that the line disconnector and the circuit breaker are closed (for an outgoing cubicle). • Check that the incoming cables are energized.
Front panel cannot be opened or closed.	Check that the line disconnector(s) is(are) in the earth position.
Impossible to move the line disconnector(s) to the earth position.	Check that the line disconnector(s) is(are) in the earth position.
It is impossible to move the line disconnector (s) to the closed position.	Check that the line disconnector(s) is(are) in the earth position.
Impossible to operate the circuit breaker.	Check that the disconnector is in open position. For more details see the Circuit Breaker Manual.

Spare Parts

Presence voltage indicator (VPIS/VDIS)
For other operations, consult us: see your nearest Group Schneider Electric service center.

Options

Contact Schneider Electric.

Auxiliary contacts on disconnector
Keyed interlocks
Monitoring compartment
VT transformer

50 W heating element
Incoming cable compartment from top
Protection by a Sepam programmable electronic protection unit

Anomalies and Solutions Tables for NSM Cubicles

Anomalies and Solutions Table

Anomalies	Solutions
The voltage presence indicator does not light up.	• Check that the incoming cables or bars are energized. • Check the LEDs.
Front panel cannot be opened or closed.	• Check that the earthing switch is closed.
Earthing switch cannot be operated.	• Check that the switch is open.
Switch cannot be operated.	• Check that the earthing switch is open.
Detected failure of electrical operation: motor mechanism, ***opening and closing orders*** (if the detected fault is still present after all these checks have been carried out, refer to the T300 User Manual **NT00378**, page 8). S13 = switch lever inlet S14 = earthing switch lever inlet	• LV fuses (on CIP2). • Check that the automation is in operation (see information about starting up the automation). • Check the electrical lockings S13-14 (inserting the lever). • Check that the earthing switch operating shaft is at opening. • Check that the S14 contact does not prevent power supply. Readjust if required. • Check configuration of the CIP1 subassembly (see diagram).
Manual operation not possible after an electrical with the operating lever, transmit a closing cycle for a voltage level less than -15%.	• Torque in closing direction to end stop. The manual opening operation can then be performed.
The lever cannot be placed after an electrical if possible operate electrically with closing cycle for a voltage level greater than +15% If the fault is still present after all these checks have been carried out, refer to the T300 technical documentation, see the T300 User Manual **NT00378** in English.	• Use an emergency source if required. • To insert the operating lever, adjust the bottom of the switch shaft using a large screwdriver in the closing direction. (Make sure you switch off the electrical operating mechanism. If necessary keep in the upper position the locking pallet acting on the S13 contact).
Orange light on.	**Case of a detected fault on NORMAL function** • Contact the nearest Schneider Electric service center. • Switch off the transfer switch (T300) for operation in manual mode (do not operate the main cubicle). • Restart the set and close the standby device (operation on standby). • Intervention to change the operating mechanism, coil and drive unit of the main cubicle. **Case of a detected fault on STANDBY function** • Contact the Schneider Electric service center (do not manually operate this cubicle). • Intervention to change the operating mechanism, coil, and motorization of the standby device.

Spare Parts

Presence voltage indicator (VPIS/VDIS)
For other parts, contact Schneider Electric service centers.

Options (Contact Schneider Electric)

Auxiliary contacts
Keyed interlocks
50 W heating element
Pressure indicator

Spare Parts and Options for GBC-A / GBC-B Cubicles

Spare Parts

Fuses for VRM3
For other operations, contact the nearest Schneider Electric service center.

Options (Contact Schneider Electric)

Voltage Transformer
Monitoring compartment

Environmental Conservation, End of Life and Recycling

Environmental Conservation

Product Overview

The main function of the SM6-24 range is to switch and break from 1 kV to 24 kV.

This range consists of: up to 24 kV (Ur), 630/1250 A (Ir) 25 kA/1 s (Ik/tk), and 12.5 kA/1 s, 16 kA/1 s and 20 kA/1 s Internal Arc Withstand at 50/60 Hz.

The representative product used for the analysis are IM and QM (without fuses), DM1-A, and DMV-A cubicles.

The environmental impacts of this referenced product are representative of the impacts of the other products of the range which are developed with the same technology.

The environmental analysis was performed in conformity with ISO 14040 *Environmental management - Life cycle assessment - Principles and framework*.

This analysis takes the stages in the life cycle of the product into account.

Manufacturing

The SM6-24 range is manufactured at a Schneider Electric production site on which an ISO 14001 certified environmental management system has been established.

Distribution

The weight and volume of the packaging have been reduced, in compliance with the European Union packaging directive.

For example, the IM and QM packaging weight is 7 kg. It consists of wooden pallet (4.8 kg), carton (1.6 kg), nails (0.4 kg), polystyrene (0.1 kg), band strapping (0.1 kg).

The DMV-A packaging weight is 12 kg. It consists of wooden pallet (8.6 kg), carton (2 kg), nails (0.8 kg), polystyrene (0.2 kg), band strapping (0.4 kg).

The DM1-A packaging weight is 12.5 kg. It consists of wooden pallet (8.7 kg), carton (2.2 kg), nails (0.8 kg), polystyrene (0.4 kg), band strapping (0.4 kg).

The product distribution flows have been optimized by setting up local distribution centers close to the market areas.

Utilization

The products of the SM6-24 range do not generate environmental pollution requiring special precautionary measures (for example: noise, emissions).

For consuming products, indicate following mention: the dissipated power depends on the conditions under which the product is implemented and used.

The electrical power consumed by the SM6-24 range spreads out between 8.6 W and 78.2 W:

- It is 8.6 W in active mode and 0% in standby mode for the referenced IM and QM cubicles.
- It is 38.6 W in active mode and 0% in standby mode for the referenced DMV-A cubicles.
- It is 78.2 W in active mode and 0% in standby mode for the referenced DM1-A cubicles.

This consumed power represents less than 30% of the total power which passes through this product.

For dissipating products, indicate following mention: the dissipated power depends on the conditions under which the product is implemented and used. This dissipated power spreads out between 100 W and 850 W, for the SM6-24 product range.

For a utilization rate of 100%:

- It is 100 W for the referenced IM and QM cubicles.
- It is 440 W for the referenced DMV-A cubicles.
- It is 850 W for the referenced DM1-A cubicles.

This thermal dissipation represents less than $0,2x10^{-3}$ % for IM and QM, $1,6.10^{-3}$% for DMV-A, $3,3.10^{-3}$% for DM1-A of the power which passes through the product.

Environmental Impacts

The EIME (Environmental Impact and Management Explorer) software, version V3, and its database, version 5.4 were used for the life cycle assessment (LCA).

The assumed service life of the product is 30 years with a utilization rate of the installation of 100% and the electrical power model used is European.

The scope of the analysis was limited to a IM and QM, DMV-A, and DM1-A cubicles.

The environmental impacts were analyzed for all phases of the product life, from Manufacturing (M) phases up to the end of life.

Product Overview

Products of this range are designed in conformity with the requirements of the RoHS directive (European Directive 2011/65/EU of 2 January 2013, amended in March 2015, 2015/863/EU and in November 2017, 2017/2102/EU). They can be incorporated without any restriction within an assembly or an installation submitted to this Directive.

End of Life and Recycling

End of life

At end of life, the products of the SM6-24range must be dismantled to facilitate the recovery of the various constituent materials.

The proportion of recyclable and recoverable material is higher than 91%.

This percentage includes among others, the following materials: steel, copper and aluminium.

Recycling

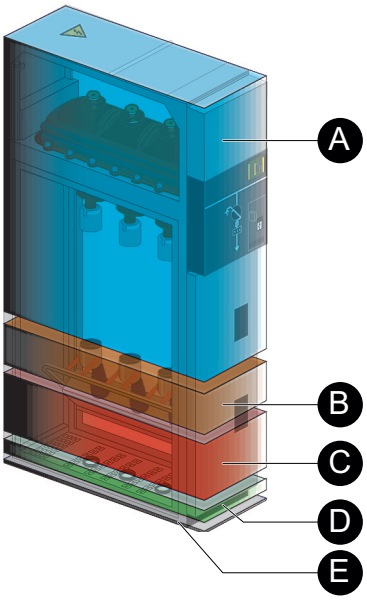
Schneider Electric is committed to a long term environmental approach.

As part of this, the SM6 has been designed to be environmentally friendly, notably in terms of the product recyclability.

The materials used, both conductors and insulators, are identified in product environmental profile analysis and easily separable. It was performed in conformity with ISO 14040 *Environmental management - Life cycle assessment - Principles and framework* standard.

At the end of its life, SM6 can be processed, recycled and its materials recovered in conformity with the draft European regulations on the end-of-life of electronic and electrical products, and in particular without any gas being released to the atmosphere nor any polluting fluids being discharged.

SM6 is compliant with the Restriction of the use of certain Hazardous Substances (RoHS) directive. RoHS restricts the use of 10 hazardous materials in the manufacture of various types of electronic and electrical equipment.



Element	Description	Switch unit	Circuit breaker unit
A	Ferrous metal	84%	65%
B	Non-ferrous metal	4%	10.6%
C	Thermohardening	9.5%	22%
D	Thermoplastics	2.35%	2.3%
E	Fluid	0.15%	0.1%

Recovery of SF6 Gas at End of Life

The SF6 must be removed before any dismantling operation can be carried out in compliance with the procedures described in IEC 61634.

The gas must be treated in compliance with IEC 60480.

- Volume of gas to be recovered: 35 litres per switch.
- Internal gauge pressure: 40 kPa.

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