

Set Series

PIX-36

Medium Voltage Distribution

Air-insulated Switchgear

With EvoPacT HVX-O Vacuum Circuit Breaker

Installation, Operation, Maintenance, and Service Manual

VDRB05981-03

10/2025



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

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SeT Series

Featuring outstanding medium-voltage (MV) and low-voltage (LV) switchboards, motor control centres and power distribution solutions for high-performance power applications, Schneider Electric's Set Series is optimised solutions based on high levels of safety and an optimized footprint. Built on a modular architecture and incorporating smart connected devices for maximum safety, reliability, performance and energy efficiency, the Set Series is delivered to customers directly from our Schneider Electric plants or via a global network of licensed partner panel builders, who are trained and audited to provide quality equipment and support.

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Safety Information

Important Information

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this 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. See standards or local equivalent.
- This EvoPacT HVX-O Vacuum Circuit Breaker and the PIX-36 equipment must only be installed and serviced by qualified electrical personnel.
- Perform work only after reading and understanding all of the instructions contained in this guide.
- Turn off all the power sources before working on or inside the equipment.
- Turn off or trip the Vacuum Circuit Breaker (VCB) and discharge the mechanism.
- Always use a properly calibrated voltage sensing device to confirm power is off.
- Use only Schneider Electric specific tools (operating crank, extraction table, and so on).
- Check all devices, covers, and doors are in correct position before turning on the power.
- Beware of potential hazards and carefully inspect the work area for tools and objects that may have been left inside the equipment.
- Do not modify the mechanical or electrical parts.
- Do not bypass the interlocks before operation.
- Do not operate with protective barriers removed.

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

NOTICE

HAZARD OF INADEQUATE STORING, INSTALLATION, AND USE CONDITIONS

- Comply with the handling rules and avoid causing any shocks to the device.
- If the equipment is stored before its final installation, observe the storage conditions.

Failure to follow these instructions can result in equipment damage.

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.

About the Document

Document Scope

This guide describes operation and maintenance of the air-insulated medium voltage (MV) switchgears of the PIX-36 with EvoPacT HVX-O vacuum circuit breaker 36 kV. It is exclusively intended for use by the manufacturer's staff or by persons certified for the PIX-36 with EvoPacT HVX-O VCB series (training certificate).

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service or maintain it. This guide is an integral part of the product and must be stored so that it is readily accessible at all times and can be used by persons who are going to work on the switchgear. If the switchgear is relocated to another site, this guide must be passed on to the new operators along with the unit.

As our products are subject to continuous development; we reserve the right to make changes regarding the standards, illustrations and technical data described in this guide.

This guide cannot describe every imaginable individual case or every customer specific version of the product. For information which is not included in this guide, contact the manufacture.

All dimensions not specified in detail are in millimeters.

Validity Note

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

Air-insulated medium-voltage switchgear units of the PIX-36 with EvoPacT HVX-O VCB are designed exclusively for switching and distributing electrical power.

⚠️⚠️ DANGER
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH
<ul style="list-style-type: none">• The PIX-36 with EvoPacT HVX-O VCB switchgear must be used only in scope of specified standards and the switchgear-specific technical data.• Do not hold the manufacturer responsible for any damage resulting from failure to follow the guidelines below.
Failure to follow these instructions will result in death or serious injury.

The manufacturer shall not be held responsible for damage without following the below guidelines:

- Instructions in this guide are not complied with.
- The switchgear is not operated according to its intended use.
- The switchgear is assembled, connected or operated improperly.
- Accessories or spare parts are used which have not been approved by the manufacturer.

- The switchgear is modified without the manufacturer's approval, or if inadmissible parts are added.
- No liability is accepted for parts provided by customers, for example Current Transformer (CT).

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.

Related Documents

The following additional documents must be complied with:

- Purchase agreement with the stipulations regarding the switchgear-specific equipment and the legal details.
- The appropriate switchgear-specific circuit diagrams/documentation.
- The operating manuals of the low-voltage devices installed in the switchgear (e.g. voltage presence indicating systems, devices in low-voltage cabinet).
- The assembly drawings supplied with the switchgear.
- The operating Instructions of the trucks used:
 - EvoPacT HVX-O
 - Metering truck MTX-O
 - Isolating truck UTX-O
 - Earthing truck ETX-O
- The assembly instructions of the manufacturer of the cable connection systems to be connected to the switchgear

Title of documentation	Reference number
EvoPacT HVX-O VCB	Reference to related document
Catalog	998-23693625

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.

Queries

For any questions, suggestions, or need of further information about this guide, contact Schneider Electric. For additional details, visit our website www.se.com.

For details of PIX-36 switchgear expansion (either right or left side), it is recommended to contact Schneider Electric.

We always strive to provide you with the best-possible information for optimum, safe use of our products. Contact Schneider if you have any recommendations, amendments, or proposals for improvement.

Safety Provisions

Before performing work on the cubicle, it is essential that you comply with the following instructions:

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Before removing covers and performing assembly or maintenance work:

- Ensure that the system is isolated from high voltage, supply voltage, and properly grounded.
- Ensure that the VCB is in test condition, the Earthing Switch (E/S) is closed, and access is locked.
- Follow the Lock Out Tag Out (LOTO) process to perform any work on switchboard.
- Install barriers, cables, and polycarbonates in accordance with the design specifications wherever necessary.

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

WARNING

HAZARD OF MOVABLE PARTS IN MECHANICAL DRIVES

Before performing mounting and maintenance work, comply with the below safety rules:

- Isolate from the supply voltage.
- Release the energy-storing device of the VCB by performing the OFF-ON-OFF operation.
- Do not remove the mechanisms during maintenance work.

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

WARNING

HAZARD OF SHARP-EDGED SHEET METAL AND METAL PARTS

During installation and maintenance work, comply with the below safety rules:

- Apply appropriate Personal Protective Equipment (PPE) and follow safe electrical work practices. See standards or local equivalent.
- Always cover sharp edges.

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

CAUTION

HAZARD OF INAPPROPRIATE HANDLING, STORAGE AND INSTALLATION

- Respect the handling rules and avoid any shocks to the device.
- Perform the maintenance and servicing operations described in the maintenance section of this guide.
- Observe the normal service conditions described in this guide.
- Before the VCB is installed in its final location, ensure that the storage conditions for the PIX-36 equipment and the VCB are complied.

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

Behavior in Case of Incidents or Accidents

If an internal arc fault occurs, the PIX-36 switchgear is equipped with pressure relief absorbers or ports to help prevent the cubicles and switchgear from being blown off.

This user and maintenance guide does not include information regarding the safety of buildings in case of internal faults (pressure load of the switchgear room and necessary pressure relief ports). Pressure calculations for switchgear rooms, including recommendations for pressure relief ports, are available upon request for a fee. For more details, contact Schneider Electric.

In case of fire or internal faults, toxic and caustic decomposition products are produced. Comply with the locally applicable accident and safety provisions.

Make sure that the first-aid measures are taken in case of injury to persons.

Applicable Standards and Regulations

The applicable standards and regulations are as follows:

- Metal-enclosed; loss of service continuity category according to IEC 62271-200: LSC 2B-PM.
- Type-tested.
- Tested for internal faults (qualification IAC AFLR).

Table 1 - Applicable Standards and Regulations for PIX-36 Cubicles

Designation	IEC Standard	EN Standard
Switchgear	IEC 62271-200	IEC 62271-200
	IEC 62271-1	IEC 62271-1
Internal Arc Classification (IAC)	IEC 62271-200	IEC 62271-200
Circuit Breaker	IEC 62271-100	IEC 62271-100
Earthing Switch	IEC 62271-102	IEC 62271-102
Current Transformer	IEC 60044-1	IEC 60044-1
Voltage Transformer	IEC 60044-2	IEC 60044-2
Voltage Detecting Systems	IEC 61243-5	IEC 61243-5
	IEC 61958	IEC 61958
Protection against accidental contact, foreign bodies and water	IEC 60529	IEC 60529

Table 2 - Degree of protection against accidental contact, and foreign objects according to IEC 62271-200 and IEC 60529

Description	IPX Rating
Degree of protection of the switchgear enclosure	IP4X
Degree of protection of the accessible claddings in the cubicle	IP2X

Environmental and Operating Conditions

PIX-36 is an indoor switchgear and may only be operated under normal conditions in accordance with IEC 62271-1.

Operation under conditions deviating from these is only admissible subject to consultation with and written approval from the manufacturer.

Table 3 - Ambient Conditions Accordance to IEC 62271-1

Description	Values
Temperature class	-5 °C, indoor ⁽¹⁾
Ambient temperature minimum/maximum	-5 °C/ +40 °C ⁽¹⁾
Average value over 24 hours	= 35 °C ⁽¹⁾
Mean relative air humidity: 24 hours/1month	≤ 95%/≤ 90%
Installation altitude above sea level	≤ 1000 m
⁽¹⁾ Other values are available on request.	

Disposal After the End of the Useful Life

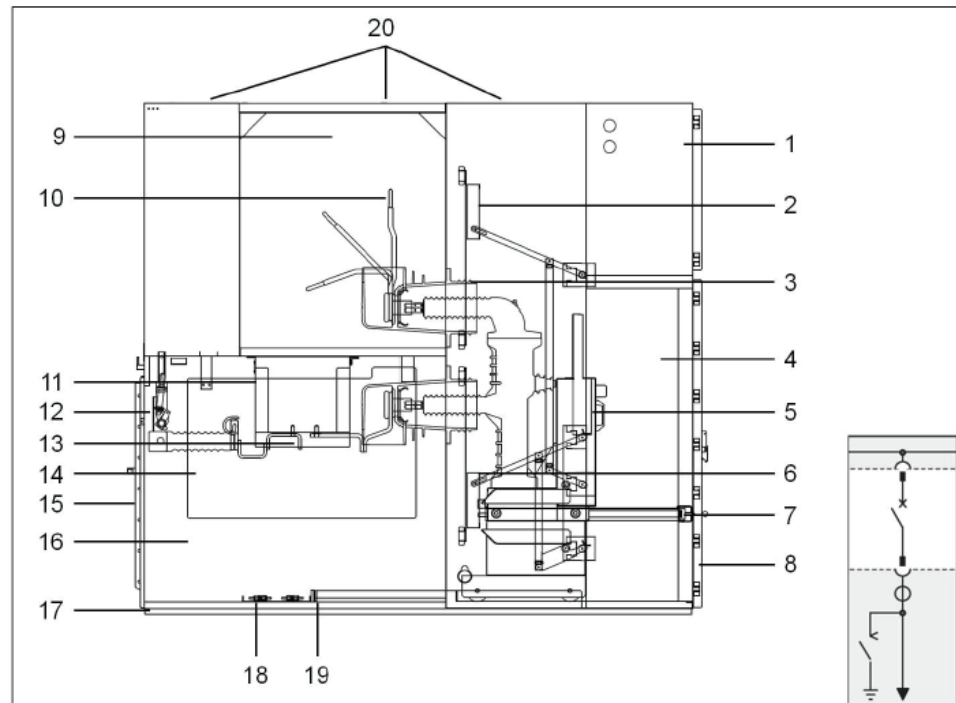
A material and recycling data sheet can be provided on request for the disposal of PIX-36 switchgear units at the end of its service life.

Disposal is performed as a service by Schneider Electric service center which is subjected to payment.

Design and Description

Cubicle Design

Figure 1 - PIX-36 Cubicle with HVX-O Circuit Breaker



- | | | | |
|----|--|----|-----------------------|
| 1 | Low-voltage cabinet with control devices | 11 | Current transformers |
| 2 | Metallic shutter for bus side | 12 | Earthing switch |
| 3 | Spout | 13 | Cable connections |
| 4 | CB compartment | 14 | Phase barriers |
| 5 | CB HVX-O | 15 | Rear cover |
| 6 | Metallic shutter of cable side | 16 | Cable compartment |
| 7 | Guide rails | 17 | Base frame |
| 8 | Front door | 18 | Cable clamp assembly |
| 9 | Busbar compartment | 19 | Earth bus |
| 10 | Risers | 20 | Pressure relief flaps |

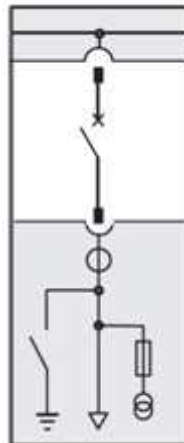
Cubicle Variants

The illustrations show the panel types with their respective basic equipment without pressure relief duct or deflectors. Customized models or add-on elements are described in the switchgear-specific documentation.

Branch Circuit Panels with Switching Devices

- EvoPacT HVX-O VCB
- Withdrawable Voltage Transformers Optional
- Earthing Switch (Optional)

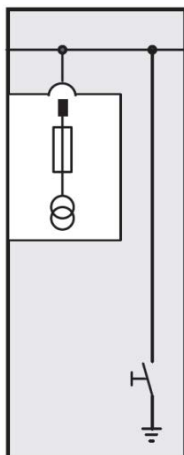
Figure 2 - Branch Circuit Panels with Switching Devices (Single line)



Metering Panel

- Metering Truck (MTX)
- Earthing Switch (Optional)

Figure 3 - Metering Panel (Single line)

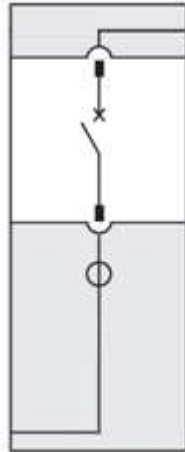


Cubicle for Bus Section Coupler and Riser

Bus Section Coupler Cubicle

- EvoPacT HVX-O VCB
- Current transformers

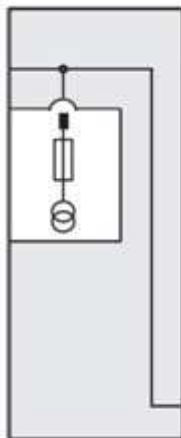
Figure 4 - Bus Section Coupler Cubicle (Single line)



Bus Section Riser Cubicle

- Metering Truck–MTX (Optional)

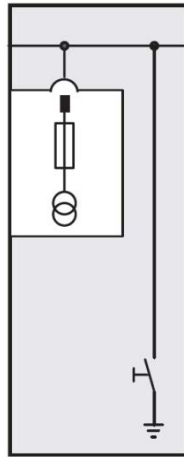
Figure 5 - Bus Section Riser Cubicle (Single line)



Bus Earthing Cubicle

- Metering truck-MTX (Optional)

Figure 6 - Bus Earthing Cubicle (Single line)



Dimensions and Weights

The switchgear-specific documents provides precise dimensions for the cubicles. The dimensions and weights of a cubicle depend on:

- The rated voltage
- The rated normal current
- The rated short-time current
- Additional equipment
- Voltage transformer (optional).

Figure 7 - PIX-36 cubicle

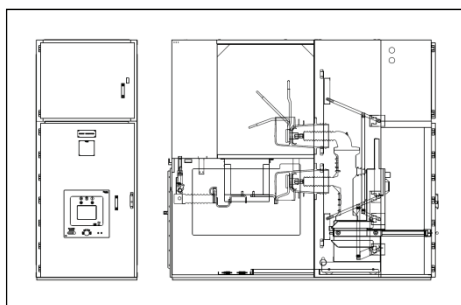
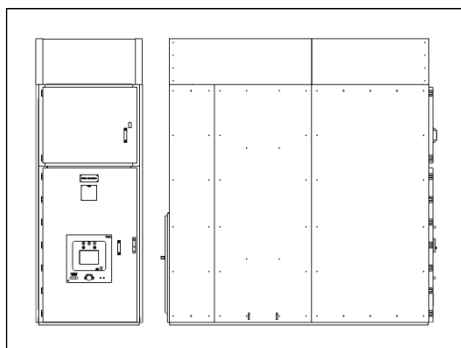


Table 4 - Dimensions of PIX-36 cubicle

Dimensions	Data			
Width (mm)	1000			
Height (mm)	2375			
Depth (mm)	2640	3100	3560	4020
Weight (kg)	< 1600 ⁽¹⁾	1900 ⁽¹⁾	2300 ⁽¹⁾	2600 ⁽¹⁾
⁽¹⁾ Includes moving part and average extent of low-voltage cabinet equipment.				

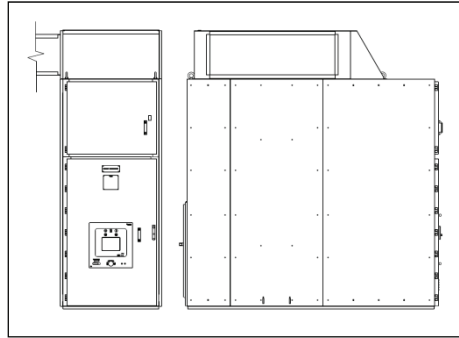
NOTE: For precise cubicle dimensions, refer to the switchgear-specific documentation.

Figure 8 - PIX-36 Cubicle with Deflector



Cubicle Height = 2825 mm

Figure 9 - PIX-36 Cubicle with Tunnel



Total Height = 2875 mm

PIX-36 Switchgear Cubicle Ratings

Switchgear Cubicle		kV	Value
Rated voltage	U_r	kV	36
Rated lightning impulse withstand voltage	U_p	kV	170
Rated power frequency withstand voltage	U_d	kV	70
Rated frequency	f_r	Hz	50
Rated normal current	I_r	A	800
			1250
			2000
			2500 ⁽¹⁾
			3150 ⁽¹⁾
Rated short-time circuit	I_k	kA	26.3 (3 s) / 65.75
Rated peak withstand current	I_p	kA	31.5 (3 s) / 78.75
Internal arc classification (IAC AFLR)	-	kA	31.5 (0.1 s)
			31.5 (1 s)
⁽¹⁾ Force cooling			

The short-circuit capability of the current transformers must be considered separately.

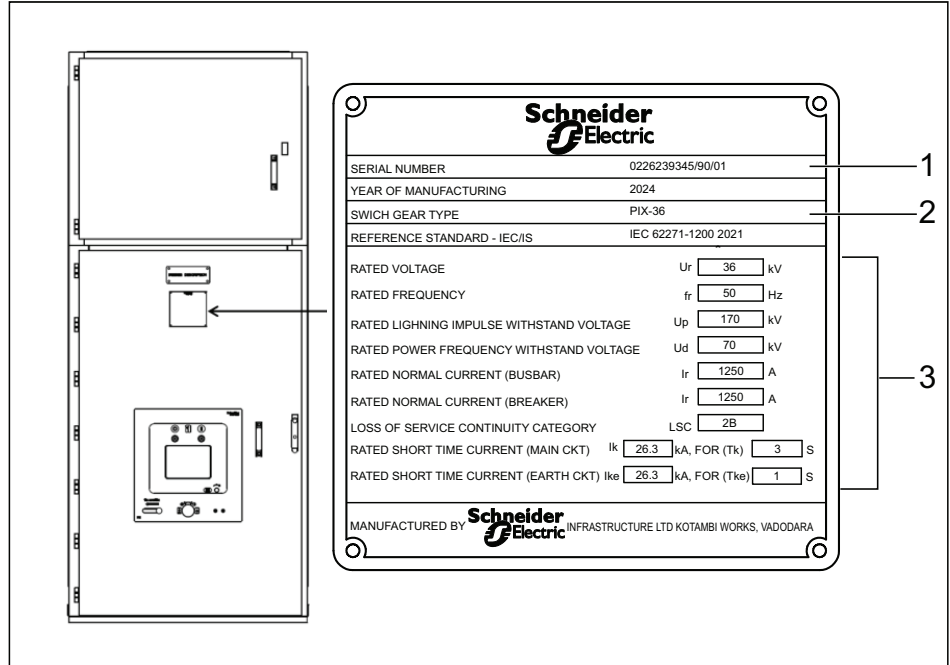
NOTE:

- The applicable panel-specific technical data are indicated on the Rating Plate (refer to Nameplate, page 21) and in the switchgear-specific documentation.
- The technical data of the switching device (HVX-O, UTX-O, ETX-O) are indicated on the nameplate and in the operating manual of the device concerned.

Nameplate

The type designation of the switchgear cubicles, shown on the nameplate provides essential technical data. When submitting inquiries to the manufacturer or ordering spare parts, provide the following details.

Figure 10 - Nameplate on front panel



- 1 Serial number
- 2 Type designation
- 3 Technical data

Technical Data of Electrical Control and Operating Devices

The switchgear cubicles have been designed based on the principle of allowing manual operation.

Depending on the specific customer model, the drive mechanisms of the individual switching devices can be equipped with additional electrical control and operating devices. These components are specified in the switchgear-specific circuit diagram (refer to the switchgear documentation).

Component Fitting Options:

- **Blocking coil (optional):** The blocking coil helps prevent manual operation of the earthing switch. If the supply voltage fails or is switched off, all blocking coils remain in the **blocked** position.
- **Auxiliary switches:** Auxiliary switches are always actuated directly by the truck or by the switch shaft through an intermediate linkage. Their position always corresponds to that of the main contacts. The switching functions are preset at the factory according to the circuit diagram.
- **Micro switches:** Micro switches are used depending on the customized cubicle models.

Table 5 - Overview of Rated Supply voltages

Descriptions	Specifications					
Direct Voltage DC [Vdc]	24	48	60	110	125	220
Alternating Voltage AC [Vac]	(110)/120			(220)/230		

Trucks

Electrical control and operating devices of the trucks are described in the Related Documents.

- EvoPacT HVX-O
- Metering Truck MTX-O
- Isolating Truck UTX-O
- Earthing Truck ETX-O

Handling Instructions

▲ WARNING

HAZARD OF EQUIPMENT TOPPLING

- Wear appropriate PPE.
- Handle the equipment with appropriate care as specified below.
- Keep the cubicle in vertical orientation while handling.

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

The transport and handling information for a cubicle are as follows.

- The conditions and types of transport have been stipulated in the contract details.
- The type of packaging depends on the type of transport and the storage conditions.
- The cubicles are delivered individually and are fastened on pallets. The standard accessories are included.
- The transport trolley with accessories will be dispatched in a separate box.
- The EvoPacT HVX-O rated above 2500 A will be dispatched in a separate package.
- The cubicles are delivered in vertical position.
- The weight of the entire transport unit is indicated on the packaging.

Packaging

NOTICE

HAZARD OF INCORRECT HANDLING

- Competent operators must handle the lifting of the cubicle.
- It is recommended to use inspected cranes or forklifts for transportation.
- The lifting or handling of the cubicle from the loaded transportation vehicle should be done safely.
- Careful disassembly of the packaging is essential to help prevent damage to the cubicle.

Failure to follow these instructions can result in equipment damage.

The packaging for various modes of transportation are as follows:

- If packed exclusively for truck transport, the cubicles are delivered on a pallet with PE protective film.
- For sea transport, the units are packed in sealed aluminium foil with desiccant and in a closed wooden case with tightly closed wooden base (also for container transport).
- In case of air transport, the cubicles are packed in wooden crates with a protective PE film hood (dust protection) or in wooden crates, also with closed wooden bases, however without protective hoods.

NOTE: Observe the centre of gravity label to help ensure safe transport. You can find the label on the packaging and on the switchgear cubicle.

Figure 11 - Packed in PE protective Film on a pallet

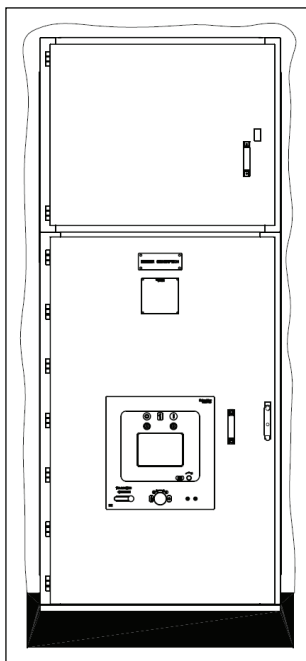
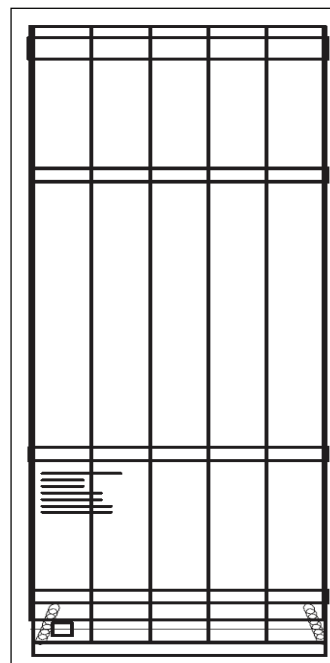


Figure 12 - Packed in PE protective film suitable for seaworthy transport



Transport

⚠ WARNING

HAZARD OF TOPPLING

- When transporting the switchgear, ensure that the units remain stable and do not tilt or tip over.
- Nail down the transport pallets to the loading surface.
- When transporting the trucks, comply with the transport guidelines in the relevant manuals.

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

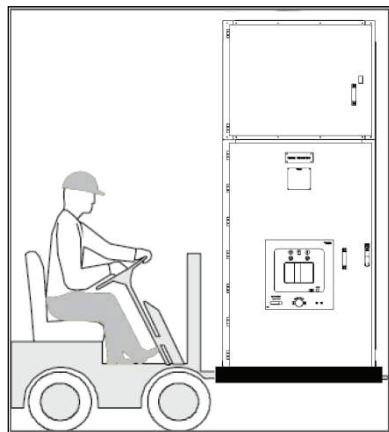
⚠ CAUTION

HAZARD OF EQUIPMENT TOPPLING

- For transport, the cubicles must be packaged completely.
- The entire length of the forks must be placed under the transport unit.

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

Figure 13 - Transport with Forklift Truck



Delivery

NOTICE

HAZARD OF INCORRECT HANDLING

- Competent operators must handle the lifting of the cubicle.
- It is recommended to use inspected cranes or forklifts for transportation.
- Ensure the cubicle is lifted or handled safely when unloading it from the transport vehicle.
- Careful remove the packaging to prevent any damage to the cubicle.

Failure to follow these instructions can result in equipment damage.

NOTICE

HAZARD OF COMPROMISE OF SYSTEM AVAILABILITY

Shipping units must be checked upon receipt. Any damage that may have occurred in transit must be recorded and reported to the manufacturer immediately.

Failure to follow these instructions can result in equipment damage.

NOTE:

- Check completeness of consignment based on the transport documents.
- The supplier must be notified in writing without delay about any deviations.

Storage

⚠ WARNING

HAZARD OF STORING UNDER INADEQUATE CONDITIONS

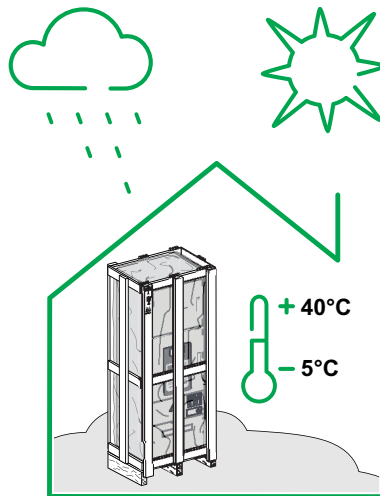
- Sufficient stability and evenness of the supporting area must be ensured.
- Panels must be stored in vertical positions and must not be stacked.

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

If the cubicles are not installed immediately after delivery, they can be stored under the following conditions:

- Indoor storage only is admissible.
- Switchgear panels and accessories should be stored sealed with desiccants in aluminum foil and packed in a wooden box (the storing time before installation is compliant with the warranty period in the terms and conditions).
- Pallet should not be removed until the installation.
- Store only in the original packed condition. Performance is not guaranteed if stored in open condition.
- The storage room environment should be clean and dry with no rodents, humidity control should be $\leq 95\%$ / $\leq 90\%$ for 24 hours and 1 month respectively, and no water on the floor.

Always place the packaged devices on dry ground or on an insulating material to help protect them from environmental exposure.



NOTICE

HAZARD OF DEGRADED EQUIPMENT PERFORMANCE

Ensure that the equipment is not stored for longer than 6 months.

Failure to follow these instructions can result in equipment damage.

The cubicle storage conditions within the period are as follows:

- Between 6 and 12 months, perform basic level preventive maintenance to help ensure a correct cubicle and withdrawable devices operation.
- Beyond 12 months, contact Schneider Electric Service local representative for check-up.

NOTE: Check the switchgear periodically for any signs of deterioration. It is advised that switchgear not be stored for more than six months.

After unpacking, check the cubicle carefully for:

- Absence of broken or damaged parts.
- Absence of condensation marks or droplets.
- Absence of visible degradation (color change, rust, deposits, and so on).

NOTE: In case of any degradation detected, the cubicle cannot be installed.

Access to Main Circuit Compartment

⚡ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Ensure that the truck is in disconnected/test position before opening the front door.
- Turn off all power supply or de-energize the complete panel because opening any door is not allowed if the busbar or cable is live.

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

Access to the Circuit Breaker Compartment

⚡ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Ensure that the racking device is in disconnected/test position before opening the front door.
- Turn off all power supply or de-energize the complete cubicle because opening any door is not allowed if the busbar or cable is live.

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

Opening and Closing the Front Door

Opening the Front Door

1. Make sure truck is in disconnected position.
2. Pull the handle lever.
3. Rotate the handle clockwise (approximately 120°) to unlock.
4. Open the front door by pulling the handle.
5. Access the switching device.

Figure 14 - Handle in open condition

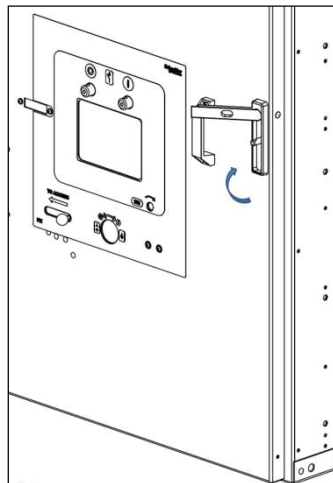
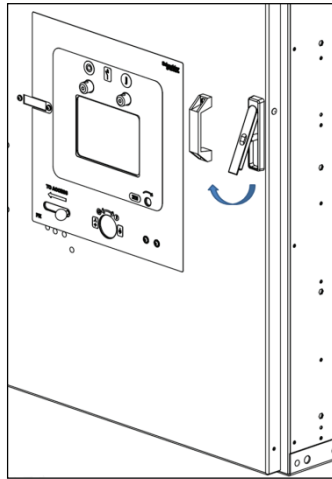
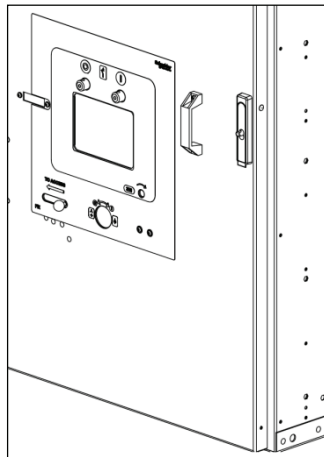


Figure 15 - Handle in intermediate condition**Closing the Front Door**

1. Close the door completely.
2. Press the front door slightly to compress the gasket.
3. Rotate the handle anti-clockwise (approximately 120°) to lock.
4. Press the handle to rest position.

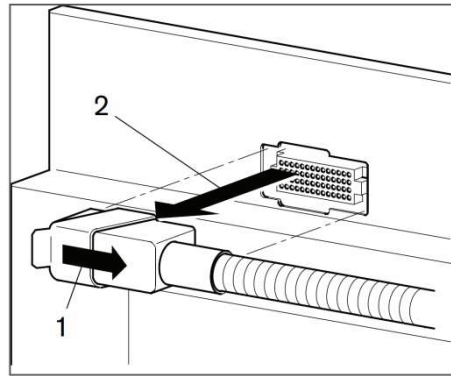
Figure 16 - Handle in close condition

Removal and Insertion of LV Connector

The LV connector can only be removed or inserted while the truck is in its disconnected/test position.

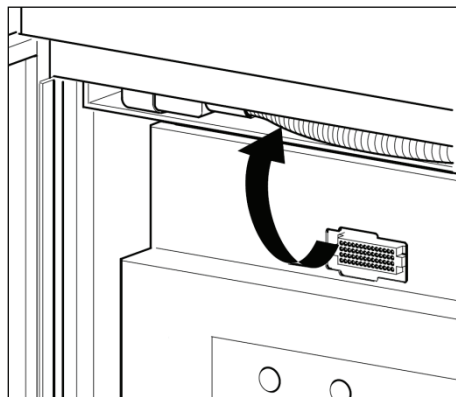
Removal of LV Connector

1. Pull the interlocking lever of the LV connector forward (1).
2. Remove the connector (2).
3. Fix the LV connector to the pin on the EvoPacT HVX-O VCB.



Insertion of LV Connector

1. Remove the LV connector from the fixation pin on the EvoPacT HVX-O VCB.
2. Insert the LV connector into the socket of interchangeability interlock inside the cubicle above the EvoPacT HVX-O VCB.
3. Press the interlocking slide forward.



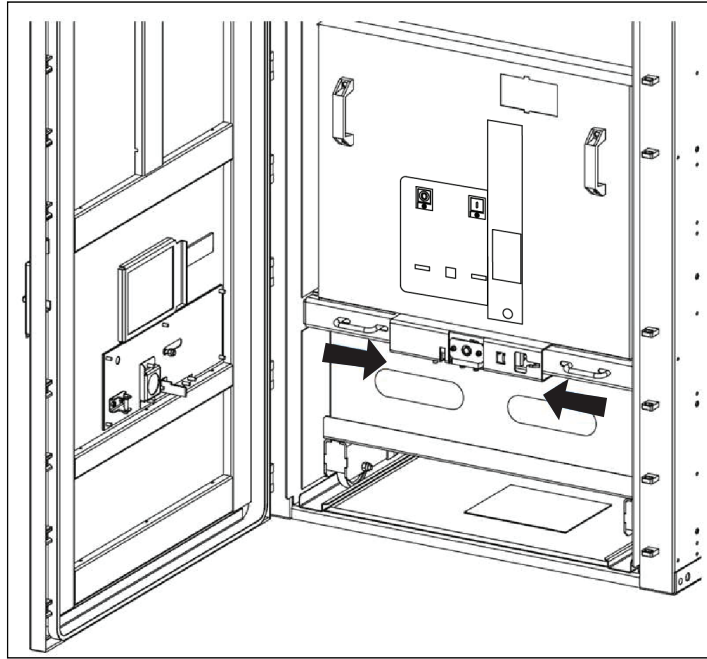
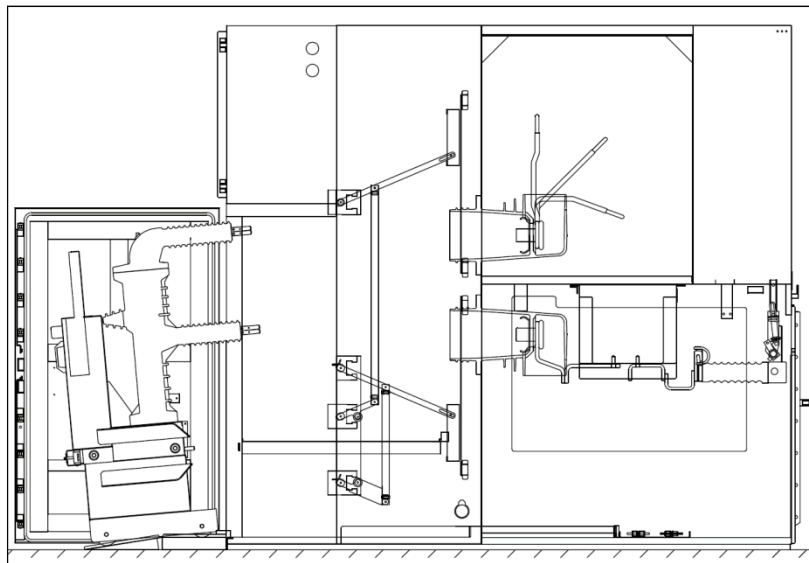
Extraction of the Truck from the Cubicle

Initial situation:

- The device is in disconnected/test position.
- The VCB is OFF and discharged position.

Follow the below steps for extraction of the panel:

1. Place the ramp aligned with the cubicle rails.
2. Disconnect LV auxiliary connection from the VCB.
3. De-latch the locking handles by sliding towards each other to release the VCB from the cubicle.
4. Pull the VCB by holding the locking handles, from the VCB cubicle and remove it from the cubicle.

Figure 17 - Unlocking the Truck from the Cubicle**Figure 18 - Extraction of the Truck from the Cubicle**

Insertion of the Truck into the Cubicle

Initial situation:

- The VCB is Closed/OFF, discharged and in disconnected/test position.
- The panel shutters are not padlocked.

Follow the below steps for insertion of the truck into the cubicle:

1. Open the VCB compartment door.
2. Check the compartment for:
 - Cleanliness in accordance with the service conditions.
 - No installation scraps or items have been left inside (tools, electrical wires, broken parts or shreds, metal objects, and so on).
3. Position the truck in front of the panel.
4. Align the ramp with the cubicle rails.

5. Slide the truck locking handle inwards.
6. Push the VCB by holding the locking handles, into the VCB cubicle to its test position.

▲ WARNING
HAZARD OF EQUIPMENT TOPPLING
<ul style="list-style-type: none">• Ensure that the pins of the truck is properly aligned to the holes on the panel.• Move the truck towards the cubicle until the secure lock engages with the panel and firmly arrests it in place.
Failure to follow these instructions can result in death, serious injury, or equipment damage.

7. Lock the truck in slots of guide rails by sliding the truck locking handles outwards. Refer to figure 20.
8. Close the VCB compartment door.

Figure 19 - Insertion of the Truck into the Cubicle

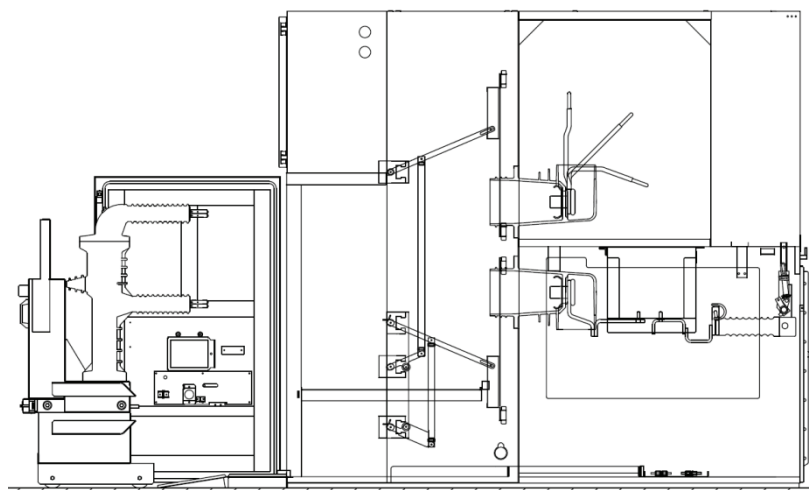
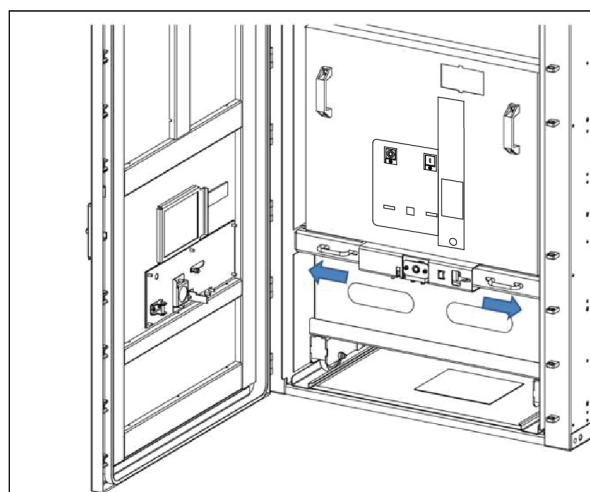


Figure 20 - Locking the truck in the cubicle



Access to the Cable Compartment

⚡ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Before accessing the cable compartment, ensure the following

- Earth Switch is ON.
- EvoPacT HVX-O VCB is OFF and in disconnected/test condition.
- Check the VDIS indication for zero voltage across the cubicle.

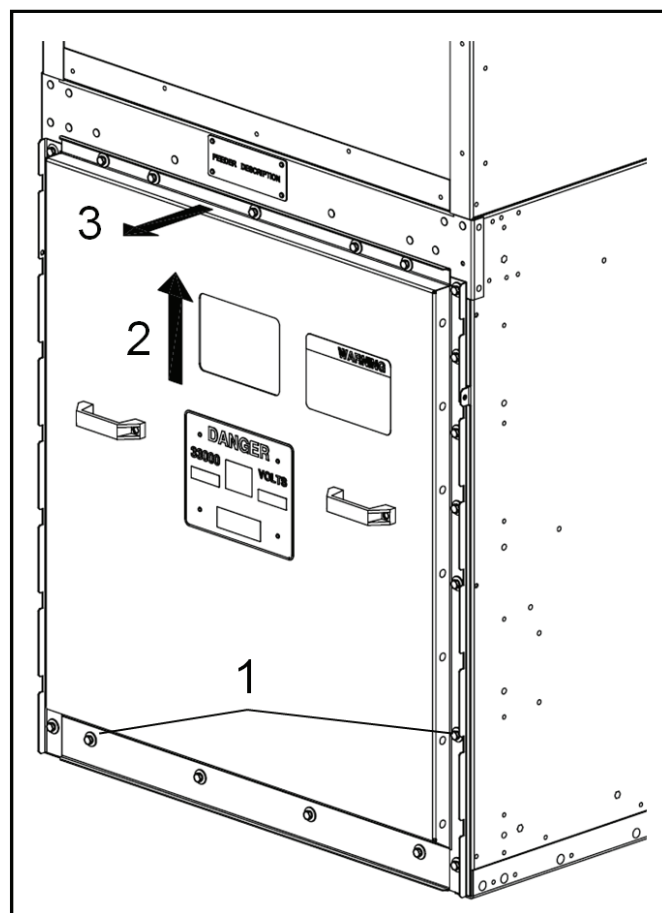
Failure to follow these instructions will result in death or serious injury.

Demounting and Mounting the Cable Compartment Cover

Demounting the Cable Compartment Cover:

1. Release the securing bolts (1) on the cable compartment cover.
2. Lift the cover (2), with the help of handles provided, to release it.
3. Pull the cable compartment cover (3) to remove it.
4. The cable compartment is now accessible.

Figure 21 - Demounting the Cable Compartment Cover



Mounting the Cable Compartment Cover:

1. Place the cable compartment cover (2) on to the panel, after completing the assembly work.
2. Fasten it using securing bolts (1).

Access to the Busbar Compartment

⚠️⚠️ DANGER

HAZARD OF ELECTRICAL ARC, EXPLOSION, AND FIRE

- Ensure EvoPacT HVX-O VCB must be in OFF and disconnected/test condition.
- Ensure the Earthing Switch is in a closed or earthed condition.
- Check the VPIS indication.
- Isolate the cubicle from the power supply.
- Obtain work permission for zero voltage.

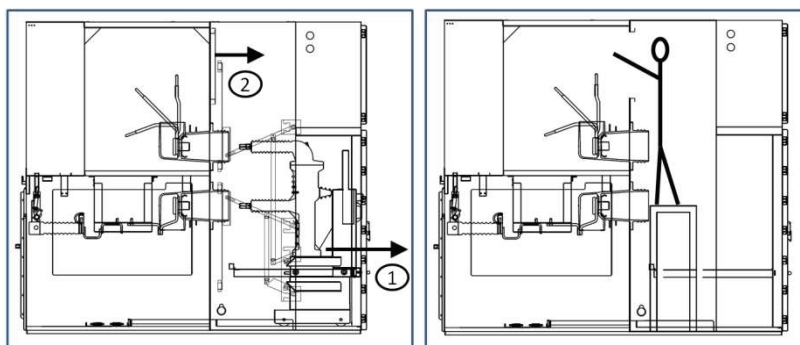
Failure to follow these instructions will result in death or serious injury.

Mounting and Demounting the Partition Plate

Demounting the Partition Plate:

1. Open the front door of the panel.
2. Remove the truck from the panel. Refer to *Extraction of the Truck from the Cubicle*, page 31.
3. Demount the busbar access cover from the CB compartment.
4. The busbar compartment is accessible.

Figure 22 - Mounting and Demounting the Partition Plate



Mounting the Partition Plate:

1. Re-insert the partition plate after completing the assembly work.
2. Fasten the partition plate with securing bolts.

Installation Instructions

Safety Provisions for Installation

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

During assembly, installation, and connection, the energy-storing devices must not be charged.

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

WARNING

HAZARD OF TOPPLING

When handling the moving devices, pay attention to uneven floor surfaces (for example, cracks, projections, and so on) of the switchgear room.

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

WARNING

HAZARD OF FALLING

- Do not walk upon the topsides of the switchgear cubicles.
- During civil engineering activities, when working on the top of the switchgear panels (such as during the installation of deflectors, fans, or pressure relief ducts), temporarily attach a sturdy and walkable base plate.

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

WARNING

HAZARD OF INCORRECT INSTALLATION

- The switchgear cubicles must only be installed and assembled by the manufacturer's staff or by persons who are certified for this work.
- Observe the Safety Provisions, page 10.

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

Important Information for Assembly

The PIX-36 cubicles are delivered with earthing switch ON position. The VCBs are always shipped in an open state (OFF) with the energy-storing device released.

NOTICE

HAZARD OF NON COMPLIANCE TO ASSEMBLY INSTRUCTIONS

- Ensure there is no condensation, dirt, and dust during assembly of panels on all accounts.
- Observe and read assembly drawings before commencing the assembly work.

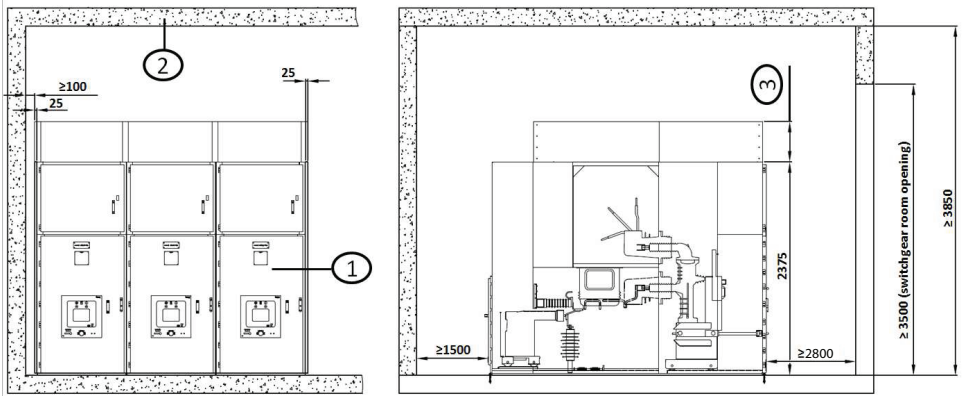
Failure to follow these instructions can result in equipment damage.

Requirements of the Switchgear Room

⚠ CAUTION
<p>HAZARD OF EQUIPMENT OVERHEATING</p> <ul style="list-style-type: none"> • Adhere to the specified spacing dimensions around the switchboard. • The load-bearing capacity of the fastening areas must correspond to the weight of the switchgear (perform a stress analysis of the building). • Ensure a minimum clearance of 2800 mm for VCB handling when the feeder rating is 2000 A or higher. <p>Failure to follow these instructions can result in injury or equipment damage.</p>

- Observe the minimum distance between the switchgear and the wall of the room.
 - Check base frame (if used) for dimensions and positional tolerances.
 - Check position of floor openings for HV and LV cables.
- NOTE:** Observe switchgear-specific space assignment plan.

Figure 23 - Dimensions of the Switchgear Room



- 1 PIX-36 Cubicles
- 2 Switchgear room
- 3 450 mm for deflector and 500 mm for tunnel

Ground Plan of PIX-36 Cubicle

Figure 24 - Ground Plan of PIX-36 Cubicle

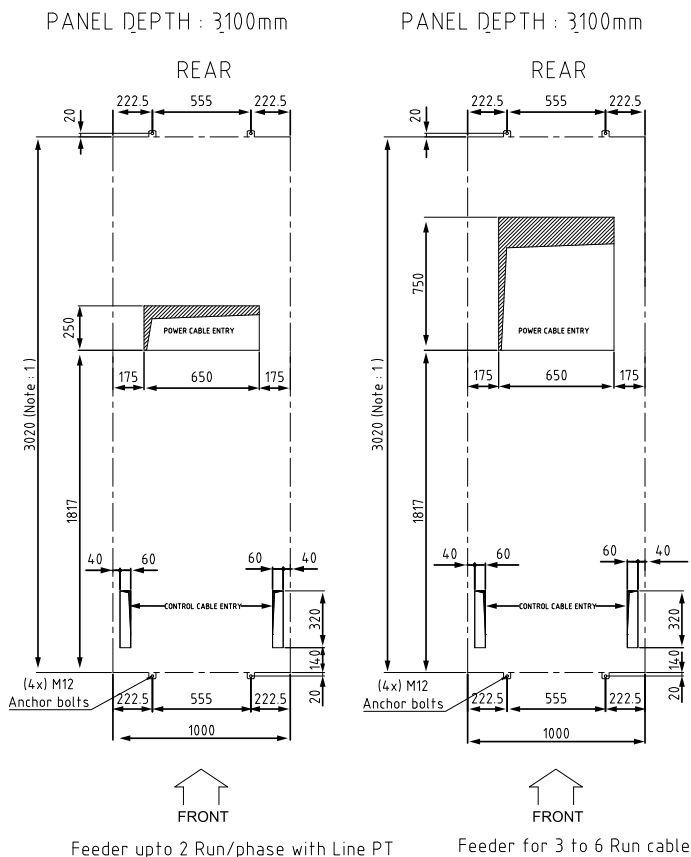
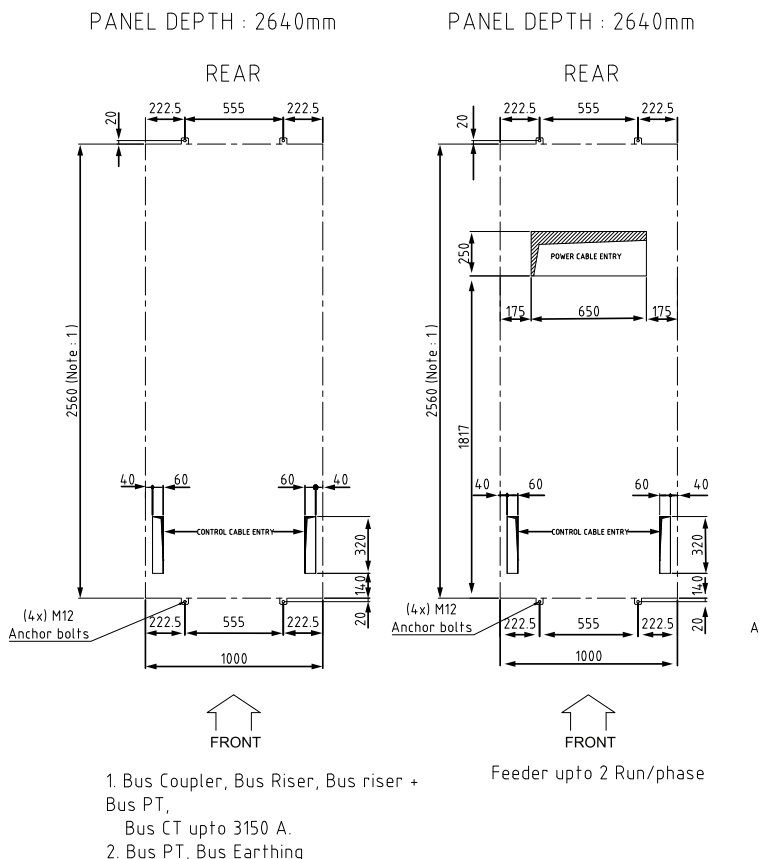
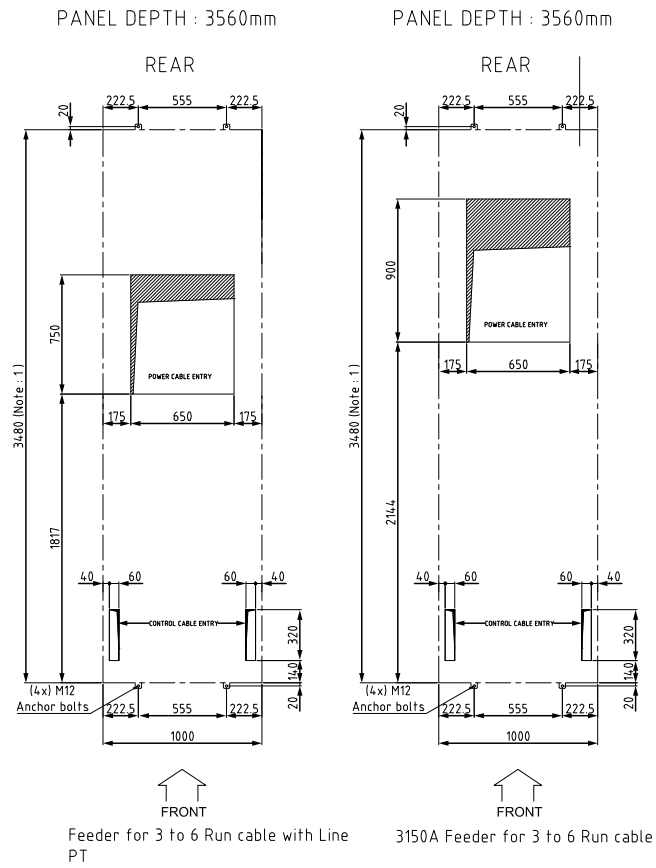
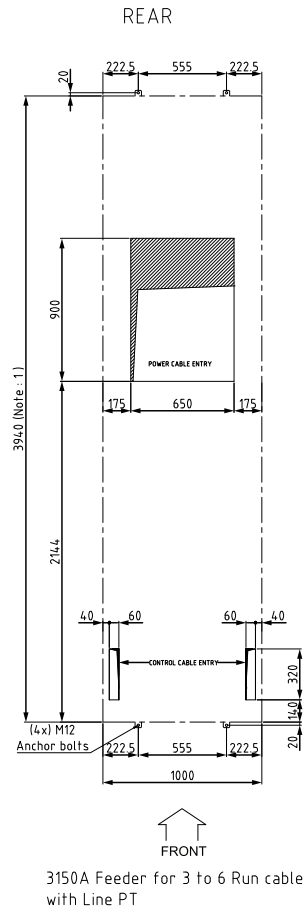


Figure 25 - Ground Plan of PIX-36 Cubicle



PANEL DEPTH : 4020mm



Transport of the Cubicles and VCB on the Construction Site

⚠ WARNING

HAZARD OF TOPPLING

- Ensure the ropes or chains are strong enough to bear the weight of the cubicle and the trucks.
- Comply with the relevant provisions for hoisting equipment.
- When lowering the cubicles and trucks, ensure that the supporting platform is stable and level.

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

⚠ WARNING

HAZARD OF FALLING

Watch out for floor openings in the switchgear room.

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

Transport of the Cubicle with a Crane

⚠ CAUTION

HAZARD OF INAPPROPRIATE HANDLING

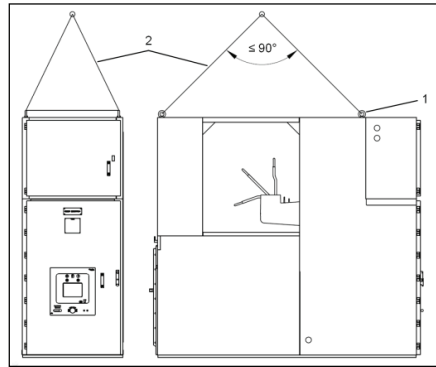
- Use the lifting bracket provided for all switchgear handling operations. Prior to lifting, verify that the bracket is secured firmly with the appropriate fasteners.
- Adhere to the specified height for lifting and follow the recommended lifting procedures.
- Refrain swing area of the cubicle when lowering or raising it into position.

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

Follow the below steps to transport the cubicles using crane:

1. Remove the transport packaging and protective film from the cubicle.
2. Attach four crane ropes or chains to the cubicle, helping ensure they meet the minimum load capacity and length. See figure 26.
3. Release the cubicle fastenings on the pallet.
4. Carefully lift the cubicle and place it slowly on the floor at the designated installation site.

Figure 26 - Transport of the Cubicle using a Crane



- 1 Eyebolt fixed in the panel
- 2 Crane ropes/chains with hooks

Transport of the Cubicle on the Floor

▲ WARNING

HAZARD OF STORING UNDER INADEQUATE CONDITIONS

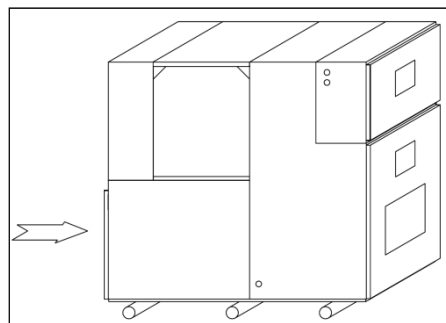
Ensure sufficient stability and evenness of the supporting area (floor).

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

Follow the below steps to move the panel on the floor:

1. Use three rollers with a minimum diameter of 30 mm.
2. Move the panel on the rollers to its final site of installation.

Figure 27 - Transport of the Cubicle on the Floor



Aligning and Fastening of the Cubicles

⚠ WARNING

HAZARD OF INSTALLING UNDER INADEQUATE CONDITIONS

- Do not install the next cubicle until the previous one is properly aligned, as raised cubicles can cause vibrations depending on the load.
- Do not position the switchgear at its installation site until the fastening points are confirmed and are at the correct level.
- Do not allow unevenness to exceed ± 2 mm/m, and never permit a height difference greater than 6 mm across the full width of the switchgear.

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

NOTICE

HAZARD OF INAPPROPRIATE ASSEMBLY

Comply with precise measurements for the placement of the cubicle, as the positioning of the first cubicle determines the placement of the remaining cubicles.

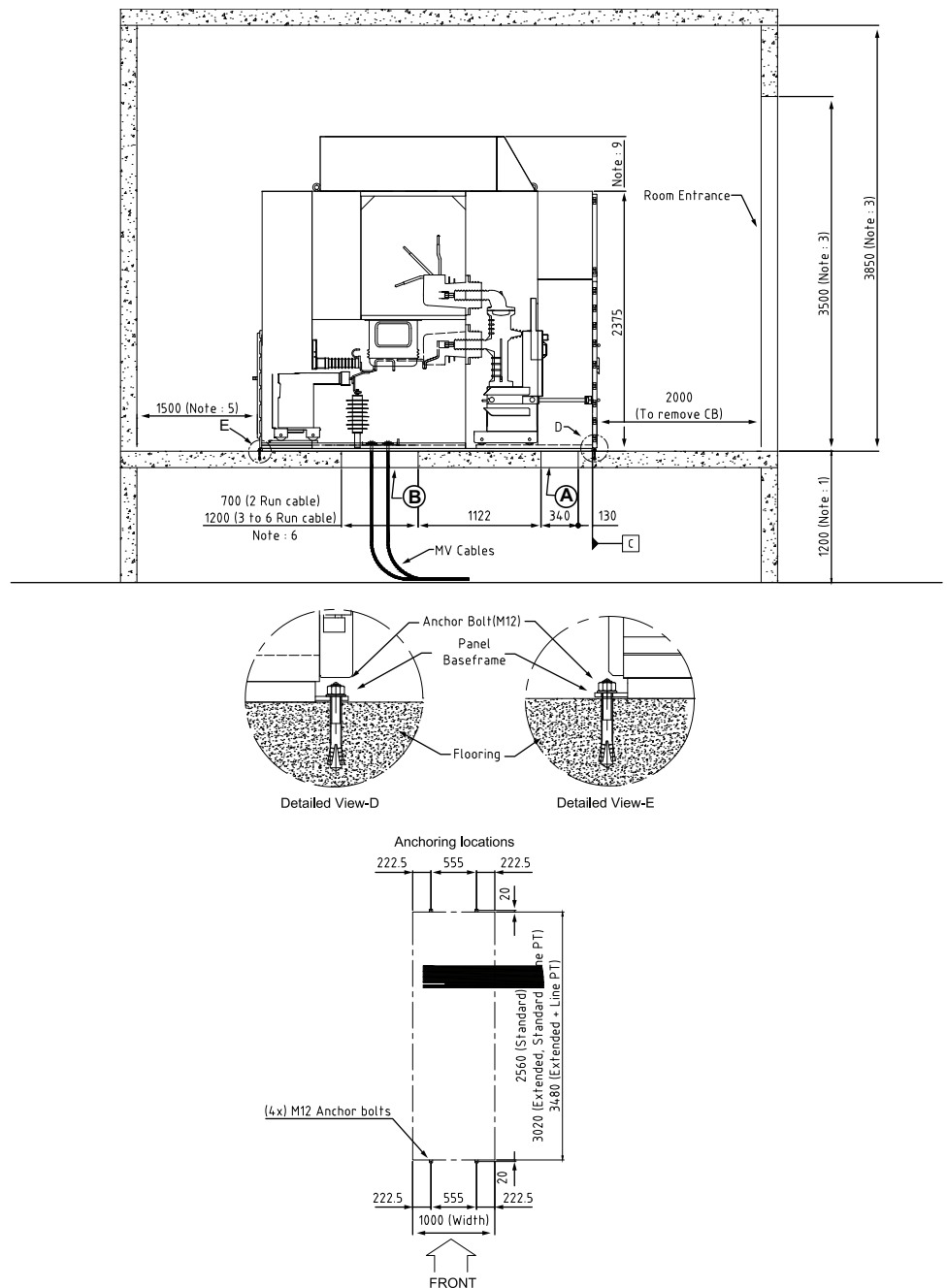
Failure to follow these instructions can result in equipment damage.

Fastening on Concrete Foundations

Follow the below steps to fasten the cubicle to the floor on standard civil engineering works.

1. Position the first cubicle on the floor in accordance with the switchgear-specific space assignment plan.
2. Remove the cable compartment cover.
3. Once the cubicle is positioned:
 - Verify that the cubicle front is correctly aligned both horizontally and vertically.
 - If necessary, raise the cubicle and insert shims below the cubicle near the fastening points until the correct horizontal position is achieved.
4. Fasten the cubicle with screws to the two fastening points on both the front end and the rear end.

Figure 28 - Fastening of cubicles on concrete foundation

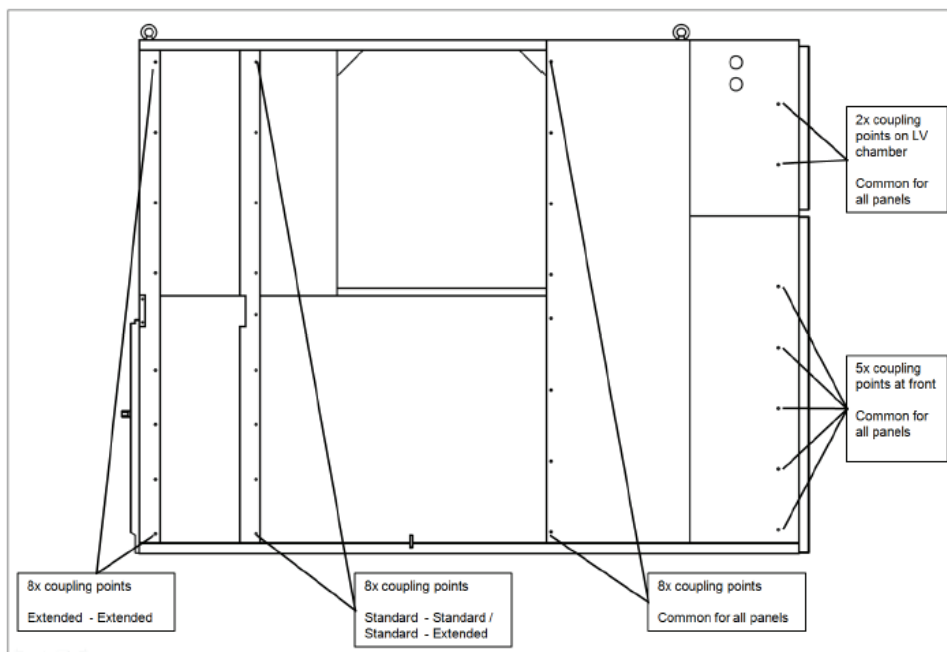


Coupling of Cubicles

Follow the below steps to couple the cubicles:

1. Position the second cubicle next to the previous one in accordance with the assignment plan and align it.
2. Position the cubicle next to the previous one according to switchgear room assignment plan and align the cubicle corresponding to the previous panel.
3. Screw-fasten the cubicles for coupling by using M8 x 30/40 bolts along with plain and spring washers as shown in Figure 29.

Figure 29 - Cubicle coupling details



Installing the Busbars

⚠ **DANGER**

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Do not open the busbar compartment unless the busbar is properly earthed.
- Comply with the specifications on treatment of contact surfaces and the tightening torques for busbar screw fastening. Refer to How to Treat the Contact Surfaces, page 85 and Standard Screw Tightening Torques, page 86.
- Comply with the position and direction of screws and nuts as shown in the diagram.

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

For detailed arrangement of busbars in branch-circuit panels, refer to Annexure A - Busbar Assembly Procedure, page 88.

Number of outgoing feeder bars per phase	Number of busbars per phase			
	1 ≤1250 A	2 2000 A	3 2500 A	4 3150 A
1 ≤1250 A				
2 2000 A	—			
3 2500 A	—	—		
4 3150 A	—	—	—	

NOTE: Keep shrouds on bus joints after assembly.

Installation of the Earth Bar

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Do not operate the cubicle without a proper earthing system in place, as it is essential for safely directing electrical current to the ground during a fault or overload.
- Do not neglect effective earthing, as it helps keep system voltage stable and within safe limits.
- Do not operate electrical installations without a proper earthing system, as it ensures efficient operation and reliable performance of protective relays and control devices.

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

NOTICE

HAZARD OF INAPPROPRIATE ASSEMBLY

Strict adherence to country-specific earthing system standards is mandatory and must never be compromised.

Failure to follow these instructions can result in equipment damage.

NOTE: During the installation of the end sheets, punch the knock-outs from the sheets. The earth bars are screw-fastened from cubicle to cubicle by means of connecting bars.

Follow the below steps to install the main earth connection from switchboard to the buildings earth:

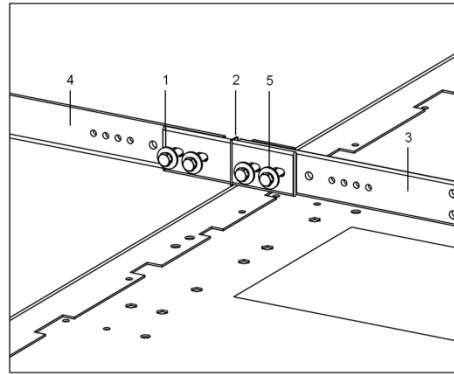
1. Clean all contact areas of the connecting bar and the appropriate earth bar in the switchgear panels and coat them with Synthetic lubricant. Refer to *Auxiliary Products*, page 85.
2. Slip the connecting bar (1) into the adjacent cubicles (4) supporting structure through the cut out in the cubicle—supporting structure (2).
3. Screw-fasten connecting bar on both sides to the earth bar.

NOTE: Comply with the specifications on treatment of contact surfaces and the tightening torques for screw fastenings according to *Standard Screw Tightening Torques*, page 86.

4. Connect earth bus to the earthing system of the switchgear building.

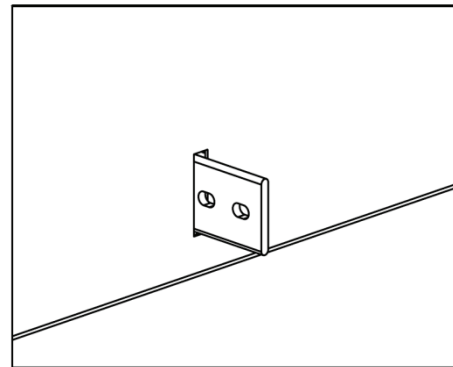
NOTE: Connecting lines and screw accessories are not included in the scope of supplies.

Figure 30 - Mounting the earth bar



- | | | | |
|---|--------------------------------------|---|--|
| 1 | Connecting bar | 4 | Adjacent panel |
| 2 | Cutout in panel supporting structure | 5 | Screw fastening of connecting bar to earthing bars |
| 3 | Earthing bars in the panels | | |

Figure 31 - Connecting point of switchgear earth bus to building earth



Assembly of the Deflectors

The deflectors are required to help ensure the operator's safety in accordance with IEC 62271-200 in case of internal faults. Refer to Annexure B - Deflector Assembly Procedure, page 91

IAC: Internal arc classification: AFLR

Assembly of the Pressure Relief Duct

The pressure relief duct on the upper side of the cubicle are required to help ensure the operator's safety in accordance with IEC 62271-200 in case of internal faults. Refer to Annexure C - Tunnel Assembly Procedure, page 106

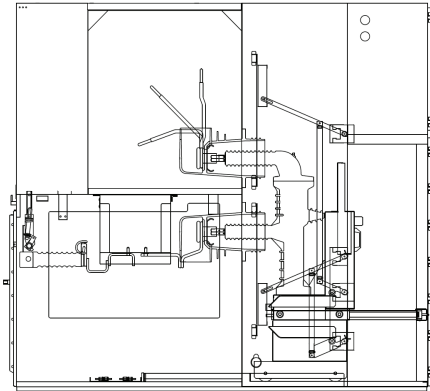
IAC: Internal arc classification: AFLR

High-voltage Connection

Table 6 - Cable Connection Variants Overview

In Cubicle (A)	Panel width (mm)	Cables per Phase
800	1000	1/2
1250	1000	1/2/3/4
2000	1000	4/5
2500	1000	5/6
3150	1000	6

Figure 32 - Cable connections



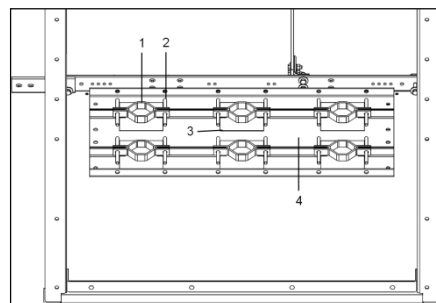
Installing the High-voltage Cables

Screws, bolts, and plastic plates are provided to assemble the clamping for high-voltage cables. Refer to *Access to the Cable Compartment*, page 34.

Preparation of the Cable Compartment

- Remove the cable clamp fasteners.
- Drill the cable plastic plate as per cable requirement.
- Remove the plain gland plates and drill as per cable requirement.

Figure 33 - Installing the High-voltage Cables



- 1 Cable clamps
- 2 Cable clamp fasteners

- 3 Plastic plates
- 4 Plain gland plates

Connection of the High-voltage Cables

NOTICE

HAZARD OF INAPPROPRIATE ASSEMBLY

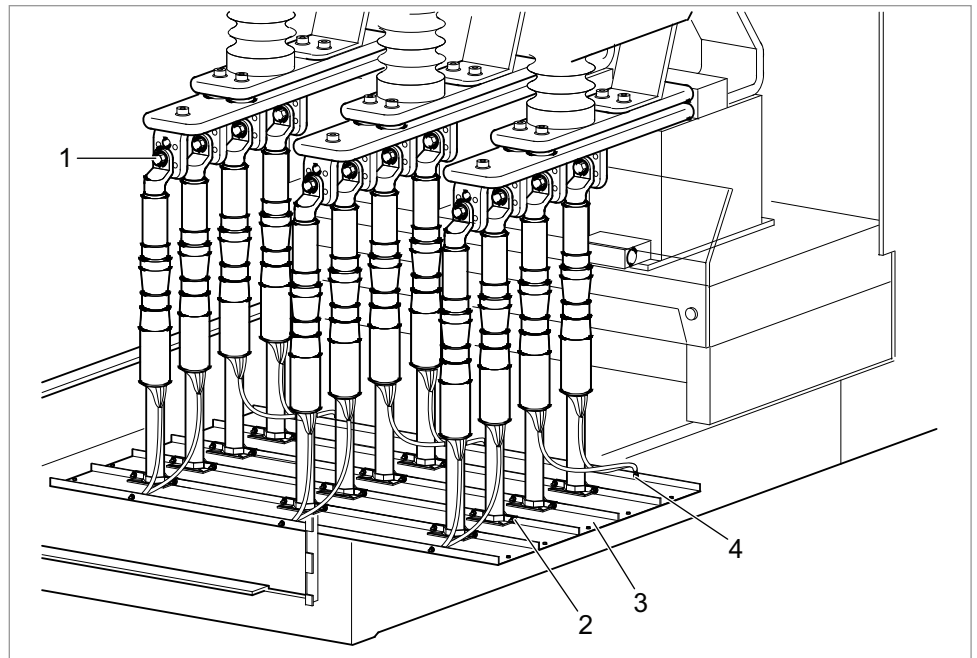
- Comply with the specified tightening torques and pre-coat contact areas if not specified by the cable manufacturer. Refer to *How to Treat the Contact Surfaces*, page 85.
- Observe the phase grouping of the switchgear panel.

Failure to follow these instructions can result in equipment damage.

The Connection of the High-voltage cables are as follows:

1. Fasten the individual cables to the appropriate connection surfaces.
2. Re-mount the base plates.
3. Fasten high-voltage cables to the floor opening using clamping assemblies.
4. Connect the ground wires to the panel rack.

Figure 34 - High-voltage connections



- | | | | |
|---|----------------------------------|---|---|
| 1 | Cable connection on the panel | 3 | Base plates |
| 2 | Clamping assembly for the cables | 4 | Connection of the ground wires to the panel |

Clamping assembly for the cables

NOTICE

HAZARD OF INAPPROPRIATE ASSEMBLY

To avoid the cable stress transferring to the busbar, ensure that the cable is clamped properly.

Failure to follow these instructions can result in equipment damage.

Figure 35 - Clamping assembly for cables with a diameter of ≥ 40 mm

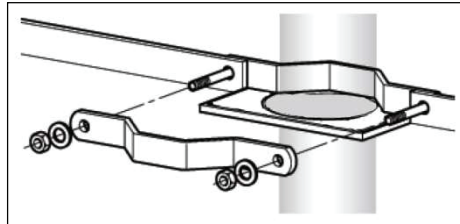
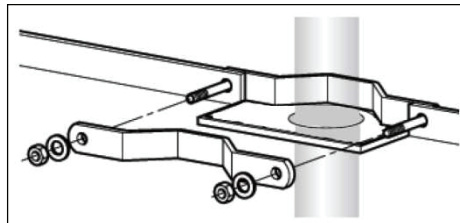


Figure 36 - Clamping assembly for cables with a diameter of ≤ 40 mm



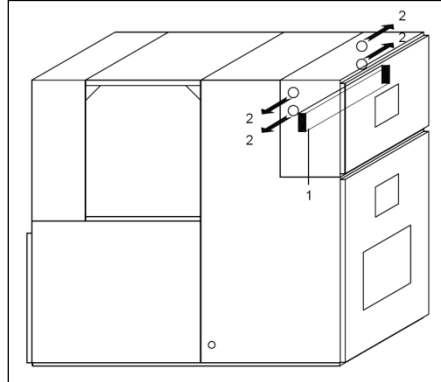
Low-voltage Connection

Connection to the ring circuits in the low-voltage cabinet

Follow the below steps to connect the ring circuits:

1. Route the ring circuits for the inter-panel wiring through the lateral openings of the low-voltage cabinet.
2. Connect ring circuits to the appropriate terminal strips in the low-voltage cabinet according to the circuit diagram.

Figure 37 - Connection of low-voltage cable



- 1 Terminal strip
- 2 Openings for ring circuits in the low-voltage cabinet

Placing External Cables in the Switchgear Panel

⚡ ⚠ DANGER

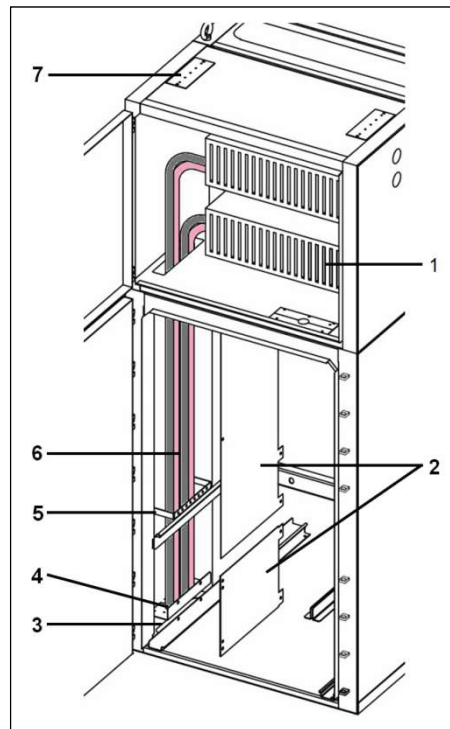
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Do not route external cables into the low-voltage compartment from the top of the cubicle without providing appropriate cable fastening and protection equipment, as this is required to maintain the cubicle's IP rating and must be arranged by the customer.

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

Customized low-voltage cables for control and measuring purposes can be placed for each panel on the left inside of the panels to the low-voltage cabinet .

- Remove the metal cable duct covers on the left and right inside of the panel depending on the requirement (2).
- Remove the LV gland plate (4) and drill as per cable requirement.
- Route external cables (6) from the cable basement through the cutout in the panel floor (3) and route them in the cable duct to the low-voltage cabinet.
- Fasten cables to the panel using cable clamps (5).
- Connect external cables to the terminal strip in the low-voltage cabinet according to the circuit diagram (1).
- Reposition cable compartment covers.

Figure 38 - Placing external cables in the switchgear panel

- | | | | |
|---|---|---|--|
| 1 | Connection to terminal strip in the low-voltage cabinet | 5 | Cable clamp |
| 2 | Cable duct covers | 6 | Low-voltage cables |
| 3 | Cutout in the panel floor | 7 | Gland plate in case the cables has to be routed from above the low-voltage cabinet |
| 4 | Low-voltage gland plate | | |

Routing external cables from top of Low-voltage cabinet

- Open the gland plate (7) provided on the top of low-voltage cabinet.
- Drill as per cable requirement
- Route the cables to the low-voltage cabinet.
- Connect external cables to the terminal strip in the low-voltage cabinet according to the circuit diagram (1).
- Reposition gland plate on the cabinet.

Commissioning

Final Steps

⚠ WARNING

HAZARD OF INAPPROPRIATE PRE-COMMISSIONING CHECKS

Before charging the cubicles, ensure that the pre-commissioning checks are performed.

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

NOTICE

HAZARD OF INCORRECT INSTALLATION AND OPERATION

- Whenever you detect anomalies, faults or malfunctions, do not commission the switchgear, but inform the manufacturer.
- For switching operations, comply with *Operations*, page 57.

Failure to follow these instructions can result in equipment damage.

Cleaning and checking of cubicle assembly

- Clean the switchgear, removing contamination resulting from assembly work.
- Remove all the attached information tags, cards, brochures and instructions.
- Check the tightening torques of all screw fastenings and connections established on the site of installation:
 - High-voltage connection
 - Earth conductor
 - Panel screw fastenings
 - Busbar links
 - Deflector fastening
 - Special attachments

Damaged paint

The panels are powder-coated. Minor damage to the paint can be repaired using commercially available paint (standard colour RAL 7032r corresponding colour).

Removing the covers

- Low-voltage cables duct cover. Refer to *Placing External Cables in the Switchgear Panel*, page 51.
- Remove cable compartment cover. Refer to *Access to the Cable Compartment*, page 34.
- Remove temporary base from the panel top, if such a base has been used.
- Re-mount cladding between busbar compartment and EvoPacT HVX-O compartment.

Inspection

- Check the switchgear for damage which might be due to transport or assembly work.
- Compare data on nameplate to the required ratings.
- Check the connected cables for phase coincidence

Racking-in the trucks

Rack the following components into the cubicle:

- EvoPacT HVX-O
- Isolating truck UTX-O
- Metering truck MTX-O
- Close the front doors. Refer to *Opening and Closing the Front Door*, page 29.

Checking Switching Functions and Interlocks

NOTICE

HAZARD OF INCORRECT INSTALLATION

Comply with the recommended switching operations. For details refer to *Operations*, page 57.

Failure to follow these instructions can result in equipment damage.

Preparation

- Apply supply voltage.
 - NOTE:** The energy-storing device of the EvoPacT HVX-O drive is charged autonomously as soon as the supply voltage is applied.
- Perform several manual test operations with each switching device.
- Check switch position indicators.
- Check electrical functions of control and operating devices for Closing and opening releases for the EvoPacT HVX-O.
- Check switch position indicators and interlocks.

Power Frequency Test for Busbar (Optional)

⚠️⚠️ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

Do not connect high-voltage cables in the panel for voltage testing and to the busbar.

- Ensure to mount the test cables securely to the high-voltage terminal.
- During testing, ensure all accessible high-voltage terminals are closed in a surge-proof manner.
- Use a commercially available earthing device to ground the residual phases.

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

⚠️ CAUTION

HAZARD OF INCORRECT OPERATION

- Observe the assembly and operating instructions for the test unit and the test adapter.
- Observe admissible test values for the switchgear and the admissible test values for power-frequency tests after installation of the switchgear in accordance with IEC 62271-200.

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

A test unit and a test adapter (not included in scope of supply) are required for the power frequency test.

Preparation

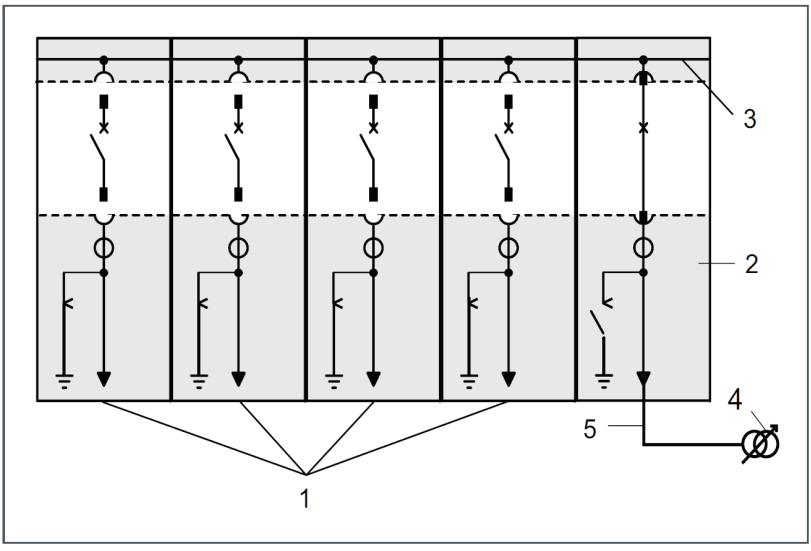
Follow the below steps to test the power frequency of the busbar:

- Isolate the power supply for all panels and ensure they are earthed. Refer to *Standard Switching Operations, page 77*.
- **Busbar:** Disconnect the voltage transformer and surge arrester.
- **Earth voltage detecting systems (Incoming feeder panel for voltage test):** Remove cable compartment cover and disconnect voltage transformer and surge arrester.

Power frequency test

- To perform the power frequency test of the busbar on the feeder panel, follow the below steps:
 - Connect test unit to the test cable.
 - Switch OFF the earthing.
 - Move the EvoPacT HVX-O into service position and switch ON the EvoPacT HVX-O.
 - Perform the power frequency test successively for all three phases (L1, L2, L3) in accordance with the specifications of the test unit manufacturer.
 - After the test, Switch OFF the EvoPacT HVX-O and keep the EvoPacT HVX-O truck into disconnected position; switch ON the earthing switch.
 - Remove test unit and test cables.
 - Reconnect the disconnected voltage transformers and surge arresters.

Figure 39 - Switch position during the power frequency test



- | | | | |
|---|--|---|--|
| 1 | Branch-circuit panels | 4 | Test unit (e.g. high-voltage source, test transformer) |
| 2 | Incoming feeder panel for test voltage | 5 | Test cable |
| 3 | Busbar | | |

Operations

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Maintenance work must only be performed by trained electricians with proven experience of the PIX-36 and all the relevant safety standards.
- Comply with the operating sequences.
- Perform every switching operation completely.
- Ensure the presence of voltage in the system.
- After each switching operation for which a crank or a lever or a handle is used, remove this tool and store it in the tool board.

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

CAUTION

HAZARD OF INCORRECT OPERATION

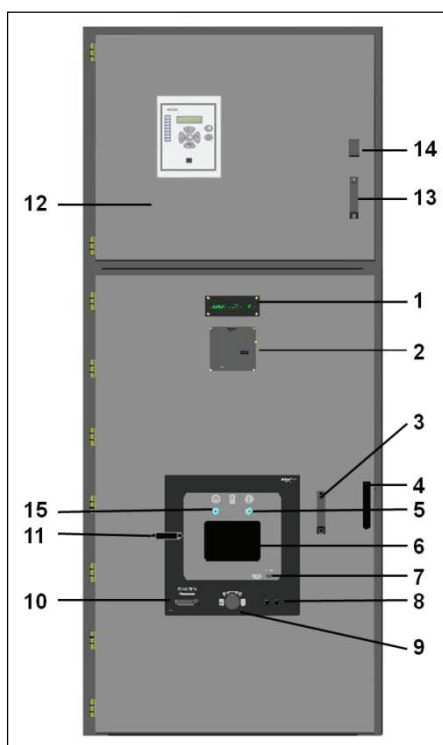
In case supply voltage is not available:

- Check if blocking coils (locking the interrogation slides and CB push buttons, depending on design) are in locked position.
- Check if an under voltage release (optional) has dropped out.
- Measure: Re-establish the supply voltage.

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

Operating Interface of the Cubicle

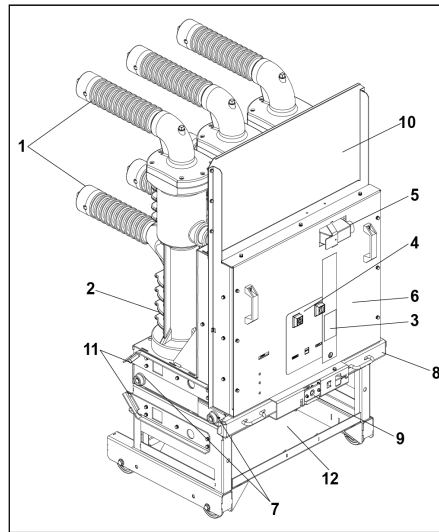
Figure 40 - Operating interface of a PIX-36 cubicle



- | | |
|--|--|
| 1 Feeder Nameplate | 9 Insertion opening for racking the truck in/
out manually |
| 2 Rating plate | 10 Slide for opening the insertion opening (9)
for racking the truck in and out |
| 3 Handle for pulling door | 11 Window for checking Test / Service
indication |
| 4 Operating handle for door locking and
unlocking | 12 Low-voltage cabinet with control unit |
| 5 Switching EvoPacT HVX-O ON | 13 Handle for pulling door |
| 6 Inspection glass | 14 Locking for low-voltage cabinet door |
| 7 Opening for manual charging of the circuit-
breakers energy storing device | 15 Switching EvoPacT HVX-O OFF |
| 8 Option for defeating the close door
interlock (to be operated only by authorized
person) | |

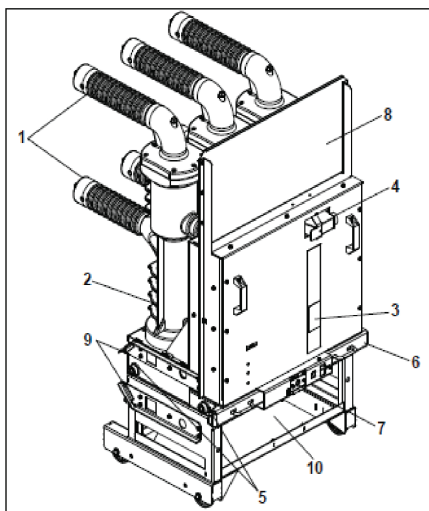
Operating Interface of the Trucks

Figure 41 - Vacuum Circuit Breaker HVX-O



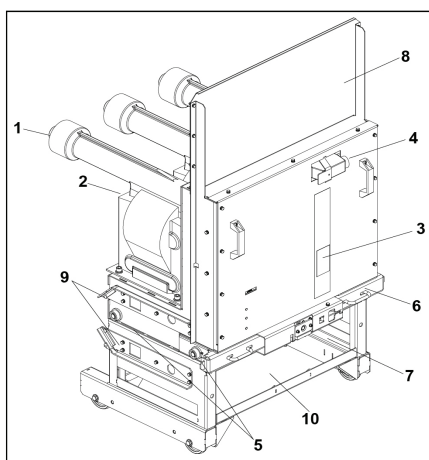
- | | | | |
|---|--------------------------------------|----|---|
| 1 | Conductor insulated in epoxy housing | 7 | Rollers |
| 2 | Circuit breaker | 8 | Withdrawable unit |
| 3 | Rating plate | 9 | Insertion opening for crank to move the EvoPacT HVX-O into its disconnected/service position manually |
| 4 | Operator interface | 10 | IP protection sheet |
| 5 | Low voltage plug with socket | 11 | Shutter rails |
| 6 | Drive housing | 12 | Floor-rolling trolley |

Figure 42 - Isolating Truck UTX-O



- | | | | |
|---|--------------------------------------|----|---|
| 1 | Conductor insulated in epoxy housing | 6 | Withdrawable unit |
| 2 | UTX housing | 7 | Insertion opening for crank to move the UTX into its disconnected/service position manually |
| 3 | Rating plate | 8 | IP protection sheet |
| 4 | Low voltage plug with socket | 9 | Shutter rails |
| 5 | Rollers | 10 | Floor-rolling trolley |

Figure 43 - Metering Truck MTX-O



- | | | | |
|---|------------------------------|----|--|
| 1 | PT fuse contact | 6 | Withdrawable unit |
| 2 | Voltage transformer | 7 | Insertion opening for crank to move the MTX into its disconnected/ service position manually |
| 3 | Rating plate | 8 | IP protection sheet |
| 4 | Low voltage plug with socket | 9 | Shutter rails |
| 5 | Rollers | 10 | Floor-rolling trolley |

Operation Accessories

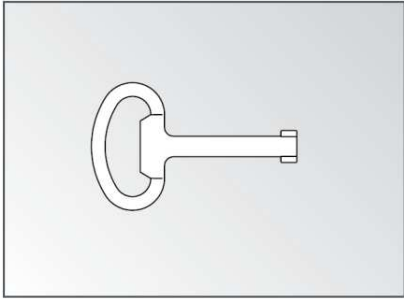
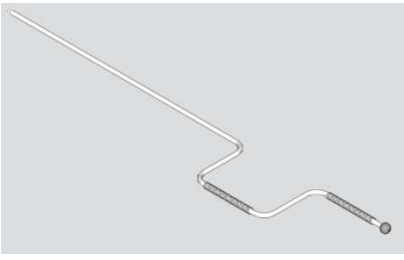

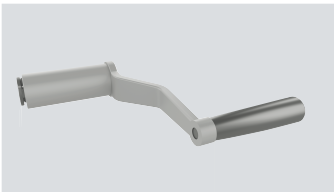
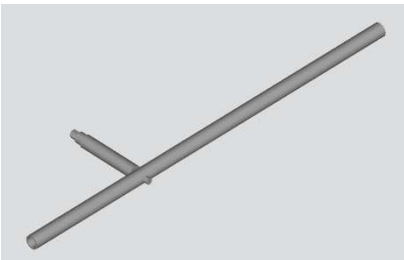
NOTICE

HAZARD OF INADEQUATE USE CONDITIONS

Ensure to operate the panel using only the accessories supplied with it.

Failure to follow these instructions can result in equipment damage.

Table 7 - List of Operational Accessories

Description	Item number	Illustration
Standard double-bit key to lock/unlock the door of the LV cabinet.	SEM101137-01	
Crank to charge the CB's energy storing device	MVIA00207-01	
Operating rod to switch the CB ON and OFF	MVIB00775-01	
Truck handle (rack-in/rack-out)	VDRG00157-04	
Operating lever for the earthing switch	VDRB05405-01	

Interlocks

The PIX-36 switchgear has two types of interlocks:

- Mechanical interlocks.
- Electromagnetic interlocks (optional).

▲ WARNING
HAZARD OF INAPPROPRIATE OPERATION
<ul style="list-style-type: none"> • Installation, repair and maintenance work on the EvoPacT HVX-O VCB must only be carried out by qualified and certified personnel. • Ensure to comply with the operation procedures and the interlock mechanism is operated effectively. Refer to <i>Operations</i>, page 57 and <i>Interlocks</i>, page 62.
Failure to follow these instructions can result in death, serious injury, or equipment damage.

The mechanical interlocks are the primary interlocks, which is supported by an additional electrical interlock function to achieve the switchgear cubicle safe guard interlock function.

EvoPacT HVX-O racking device has a robust interlocking system with:

- Switchgear door
- LV plug
- EvoPacT HVX-O VCB
- Earthing Switch.

Mechanical Interlocks

Table 8 - Functions and Methods of Operation of Mechanical Interlocks

Interlocks	Function of interlock	Method of operation
Between truck and LV plug interlock	The EvoPacT HVX-O VCB cannot be racked-in until the LV connector is plugged.	The rotary movement of the EvoPacT HVX-O VCB crank is blocked after one rotation. Do not apply force.
	LV plug cannot be removed when the EvoPacT HVX-O VCB is in the service condition.	The low voltage plug is locked.
Between truck and earthing switch	The truck cannot be racked-in if the earthing switch is ON.	The movement of the truck is blocked. Do not apply force.
	The earthing switch can no longer be switched ON if the truck has left its disconnected position.	The insertion of the earthing switch lever is blocked.
Between the EvoPacT HVX-O and the truck	EvoPacT HVX-O cannot be racked-in or racked-out while it is switched ON.	The rotary movement of the truck crank is blocked after one rotation. Do not apply force.
	EvoPacT HVX-O cannot be switched ON or switched OFF unless the truck is completely in its disconnected/service condition.	The EvoPacT HVX-O cannot be switched ON or OFF.
Between the truck and the cubicle	If the truck frame is not locked in the panel, the truck cannot be actuated.	The handle cannot be inserted to the truck if both truck handles in the front frame are not moved outwards. Rotation of the crank is not possible if both truck handles in the front frame are not moved outwards.

Table 8 - Functions and Methods of Operation of Mechanical Interlocks (Continued)

Interlocks	Function of interlock	Method of operation
	If the truck has left its disconnected position, the truck front frame cannot be unlocked in the panel.	Both truck handles in the front frame are locked.
Between the truck and the front door (optional).	The front door can only be opened if the truck is in its disconnected position.	Door is latched with the truck, however, handle can be operated.
	If the front door is opened, the truck cannot be moved into service position. This interlock is standard.	The crank cannot be inserted to the truck if the front door is opened.
For the truck in disconnected position (optional castle lock).	CB can be moved to service position only when the key is inserted in the lock. Key is blocked in the lock when CB is in service position.	LV plug insertion is blocked by the lock and is possible only when key is inserted. Key cannot be taken out unless LV plug is disconnected. LV plug cannot be disconnected when CB is in service position.

Cable Earthing Switch Interlocks

Table 9 - Cable Earthing Switch Interlocks

Interlocks	Function of interlock	Method of operation
Incomer/Outgoing cubicle (optional mechanical castle key lock).	Castle key lock is fixed on the panel. Key is required to operate the earthing switch. Insertion of earthing switch operating handle is blocked by the key lock.	The key lock helps prevent the operation of earthing switch lever until key is inserted (key should be brought from upstream/downstream).
Incomer cubicle (electrical)	The insertion of the earthing switch operating handle is blocked using solenoid if cable is energized.	Supply to the solenoid is possible when there is no presence of voltage in incoming side.
Outgoing cubicle (optional electrical)	The insertion of the earthing switch operating handle is blocked using solenoid if cable is energized.	Supply to the solenoid is possible when there is no presence of voltage in incoming side.
	Interlock can be adapted as per customer requirements.	As per specific customer requirement.

Bus Earthing Switch Interlocks

Table 10 - Bus Earthing Switch Interlocks

Interlocks	Function of interlock	Method of operation
Bus PT and bus earthing panel (mechanical) key lock.	Key lock fixed on the panel.	Set of keys gets free from the panels, once all CB's are in disconnected position.
All feeders of same bus shall be in disconnected position.	Key required to switch on earthing switch insertion of earthing switch operating handle is blocked by the key lock.	The master key is released from the key junction box by inserting the above set of keys, which is used for switching earthing switch in bus PT or bus earthing panel.

Table 10 - Bus Earthing Switch Interlocks (Continued)

Interlocks	Function of interlock	Method of operation
Bus PT and bus coupler panel (optional electrical).	The insertion of the earthing switch lever is blocked using solenoid.	The solenoid plunger helps prevent the operation of earthing switch until it gets supply when all CB's of all panels are completely in its disconnected position.
All feeders of same bus shall be in disconnected position.	Unless all CB's of all panels are completely in its disconnected position.	Supply to the solenoid is possible when there is no presence of voltage in bus side

Electromagnetic Interlocks (Optional)

⚠ WARNING
<p>HAZARD OF INAPPROPRIATE OPERATION</p> <p>Ensure that the switchgear interlocking is complete.</p> <p>Failure to follow these instructions can result in death, serious injury, or equipment damage.</p>

Electromagnetic blocking coils can be used for inter-panel as well inter-panel interlocks:

- The EvoPacT HVX-O ON and OFF push buttons are blocked.
- Manual actuation of the earthing switch is blocked.

NOTE:

- In case of failure of the supply voltage, all electrical interlocks are in the **locked** position.
Measure: Re-establish power supply.
- Note the purchase contract and the switchgear-specific circuit diagram as regards the design of the interlocking systematics.

Padlock (Optional)

The holes are designed for the shackles of padlocks with a diameter of maximum 8 mm.

Figure 44 - Manual rack IN of truck locked by padlock

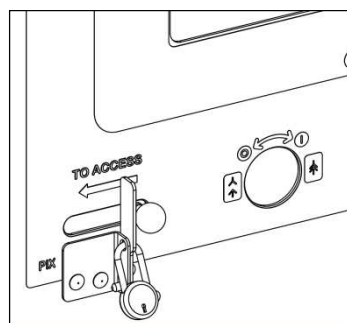


Figure 45 - Manual switching ON of EvoPacT HVX-O locked by padlock

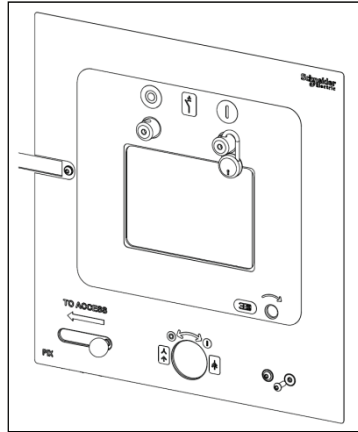
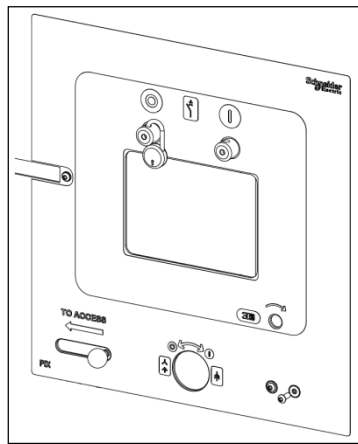


Figure 46 - Manual switching OFF of EvoPacT HVX-O locked by padlock



Operating Specifications

⚡ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- The switchgear unit may only be operated by specialist electricians who have proven experience (training certificate) in conjunction with the PIX-36 series and all relevant safety provisions.
- Comply with the operating sequences described below.
- Perform every switching operation completely.

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

NOTICE

HAZARD OF INAPPROPRIATE OPERATION

- While the power supply is not available, blocking coils (locking the interrogation slides and circuit-breaker push-buttons, depending on design), are in “locked” position. An under voltage release (optional) has dropped out.
- Measure: Re-establish the supply voltage.
- After each switching operation for which you have used a crank or a lever, remove this tool and store it in the tool board.

Failure to follow these instructions can result in equipment damage.

Operating the EvoPacT HVX-O

Operator Interface

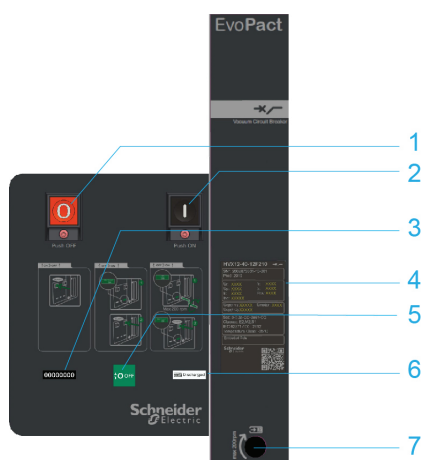
⚡⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR BURN

- Installation, repair, and maintenance work on the EvoPacT HVX-O must only be carried out by qualified and certified personnel.
- Beware of potential danger, apply appropriate PPE.
- Follow safe electrical work practices.

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

Figure 47 - Operator interface of HVX-O



- 1 OFF button (rocker "O") or push button "O"
- 2 ON button (rocker "I") or push button "I"
- 3 Operations counter
- 4 Rating plate
- 5 Position indicator of EvoPacT HVX-O
- 6 Position indicator of closing spring
- 7 Insertion opening for charging the closing spring

Charging the EvoPacT HVX-O Energy Storing Device

Initial Position:

- Circuit Breaker: OFF
- Energy storing device: Released

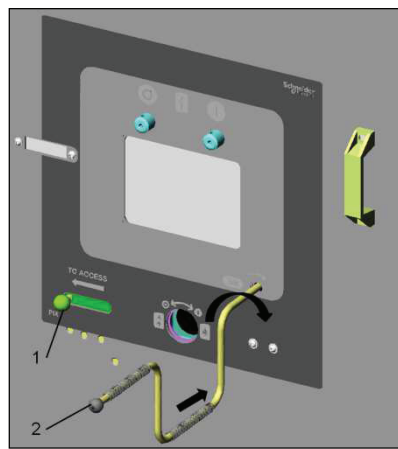
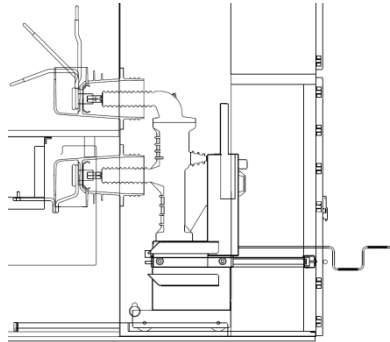
Manual Charging

Follow the below steps to charge the CB:

1. Move the slider to the left and hold it (1).
2. Insert the crank handle (2) into the guide.

3. Turn the crank handle clockwise until the charge drive mechanism is uncouples (sound), and confirm that the spring charging indicator shows the charged condition.
4. Remove and place the crank handle back into the tool board.

Figure 48 - Charging the EvoPacT HVX-O energy storing device



- 1 Knob
- 2 Crank handle

Motorized Charging

The energy-storing device automatically charges upon the application of the motor supply voltage.

The position indicator of the energy-storing device indicates the charged.

Switching the EvoPacT HVX-O VCB Manually

Switching ON via the Operating Rod

The closed-door operation of the EvoPacT HVX-O VCB involves switching the EvoPacT HVX-O to the connected/service position or rack-in position.

Follow the below steps to switch ON the CB via operating rod:

1. Take the operating rod from the tool board.
2. Insert the operating rod into the guide of the front door.
3. Push the switch ON button with the operating rod.

▲ WARNING

HAZARD OF INAPPROPRIATE OPERATION

Ensure that the EvoPacT HVX-O VCB is switched ON via operating rod and the position indicator indicates ON through the inspection glass.

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

4. Remove the operating rod from the guide of the EvoPacT HVX-O door.
5. Place the operating rod back into the tool board.

NOTE: The energy-storing device can be charged immediately after switching ON, either manually or by motor. The energy-storing device is charged automatically when the supply voltage is present..

Figure 49 - Switching the EvoPacT HVX-O via the operating rod

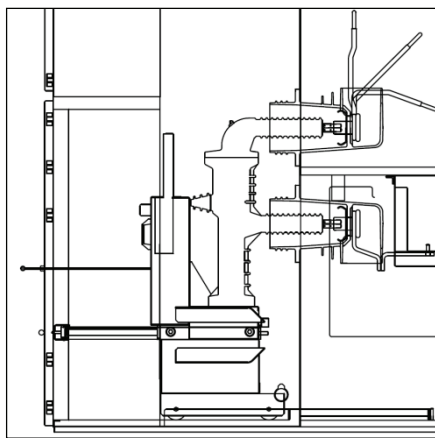
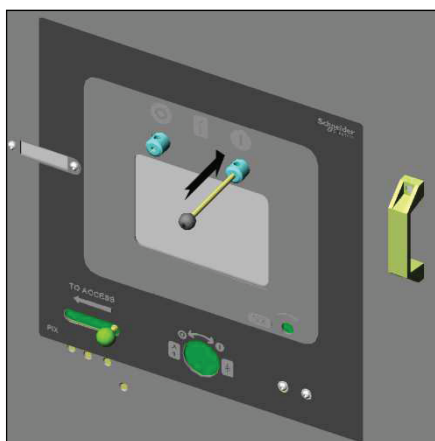


Figure 50 - Switching the EvoPacT HVX-O ON via the operating rod



Switching OFF via the Operating Rod

Follow the below steps to switch OFF via operating rod:

1. Take the operating rod from the tool board.
2. Insert the operating rod through the guide of the circuit breaker front door.
3. Push the switch OFF button with the operating rod.

⚠ WARNING

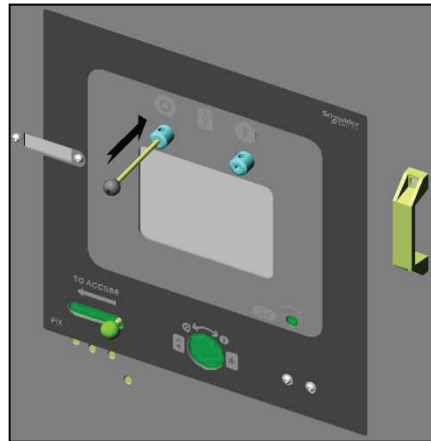
HAZARD OF INAPPROPRIATE OPERATION

Ensure that the CB is switched OFF via push rod and the position indicator indicates OFF through the inspection glass.

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

4. Remove the operating rod from guide of CB door.
5. Place the operating rod back into the tool board.

Figure 51 - Switching the circuit-breaker OFF via the operating rod



Switching the EvoPacT HVX-O VCB Electrically

Switching ON (Closing)









Actuate closing release via bay computer or remote control.

The energy storing device can be charged immediately after switching ON (either manually or by motor). If voltage is applied to the motor, charging is performed automatically.

Switching OFF (Opening)

- Actuate the opening release via the bay computer or the remote control
- By under voltage release or
- By secondary release.

Table 11 - Position indicators on circuit-breaker and possible operating sequences

Item	Position indicator Energy-storing device (closing spring)	Released	Position indicator ON/OFF Switch position		Possible operating sequence
1		Released		OFF	None
2		Charged		OFF	C-O
3		Released		ON	O
4		Charged		ON	O-C-O
C = Switching ON (Closing) O = Switching OFF (Opening)					

Move the Truck into Service/Disconnected Position

The truck can only be moved into connected/service or disconnected/test position when de-energized.

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Switch OFF the EvoPacT HVX-O VCB or, in the case of isolate the feeder.
- Do not pull the crank out before the EvoPacT HVX-O VCB has reached its end position.
- Do not pull the crank out in an undefined intermediate position.

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

Initial Situation:

- Circuit Breaker OFF
- Earthing Switch OFF

Rack-in the Truck from Disconnected Position into Service Position

Follow the below steps to rack-in the truck from disconnected/test position into connected/service position:

1. Move the slider (1) to the left and hold it.
2. Insert the truck handle (2) through the opening guide in the door onto the drive shaft of the CB truck.
3. Turn the truck handle (2) clockwise until the truck is racked-in.
4. Remove the truck handle (2) and place it back into the tool board.
5. Check the position of the truck through the inspection glass (3).

Figure 52 - Truck racked-in service position

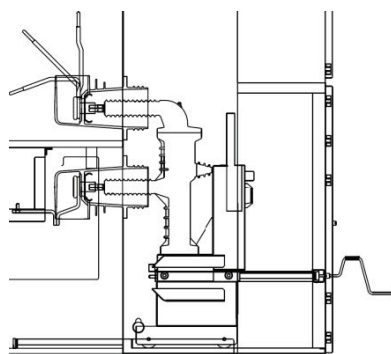
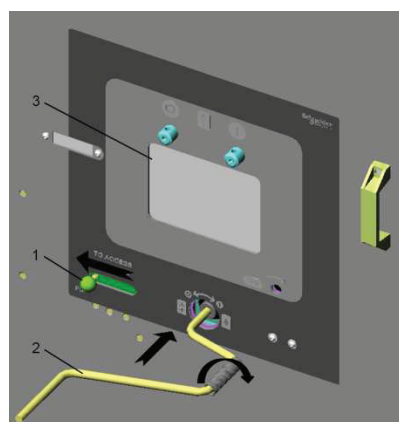


Figure 53 - Racking-in the Truck via Truck Handle



- 1 Slider
- 2 Handle
- 3 Indicator

NOTE: During the rack-in/rack-out, the door gets locked to help prevent it from opening. The door can be unlocked only if the truck is in the disconnected/test position.

Rack-out the Truck from Service Position into Disconnected Position

Follow the below steps to rack-out the truck from connected/service position to disconnected/test position:

1. Move the slider (1) to the left and hold it.
2. Insert truck handle (2) through the opening guide in the door onto the drive shaft of the CB truck.
3. Turn truck handle (2) counter-clockwise until the truck is racked-out.
4. Remove and place the truck handle back into the tool board.
5. Check the position of the truck through the inspection glass (3).

Figure 54 - Truck racked-out in disconnected position

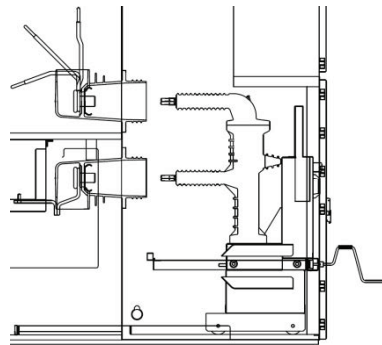
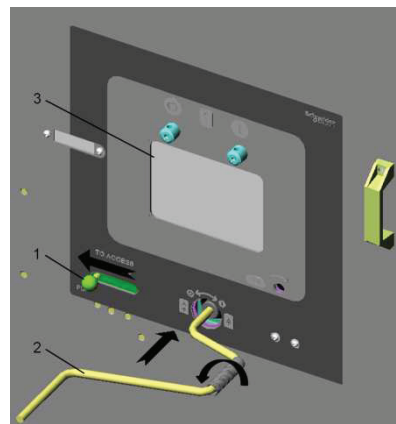


Figure 55 - Racking-out the Truck via Truck Handle



- 1 Slider
- 2 Handle
- 3 Indicator

NOTE: During the rack-in/rack-out, the door gets locked to help prevent it from opening. The door can be unlocked only if the truck is in the disconnected/test position.

Switching the Earthing Switch Manually

⚠ WARNING

HAZARD OF INAPPROPRIATE OPERATION

- Do not attempt to rack-in the breaker if earthing switch is ON.
- Do not attempt to close the earthing switch if the circuit breaker is in **service** position.
- Do not attempt to force open the flap, ensure circuit breaker is in **test** position.
- Do not forcibly rack-in circuit breaker, ensure earthing switch is OFF and the flap is completely closed.
- Do not release the push button after inserting the handle and before earthing switch is closed (in case of solenoid interlock).

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

Follow the below Earth switch operating sequence, in case of non-compliance will complaint of earth switch interlock failure. Please contact Schneider Electric for further details.

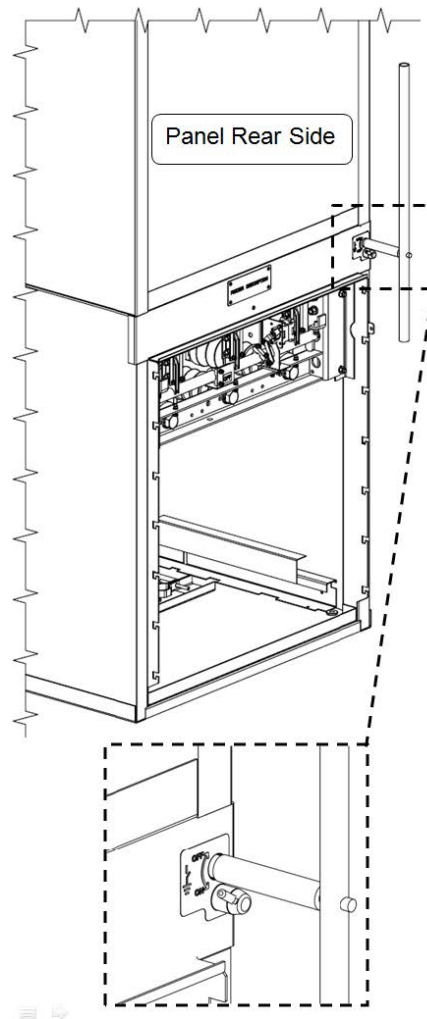
Switching ON the Earthing Switch

Initial Situation:

- Earthing switch: OFF
- Circuit Breaker: OFF
- Truck: Disconnected position

Follow the below steps to switch ON the earthing switch:

1. Rotate the flap anti-clockwise to access the operating shaft.
2. Insert the operating handle aligned with axis point.
3. Rotate the handle anti-clockwise by 90° to close the earthing switch.
4. Check the earthing switch position indicator through cable compartment inspection window and ensure that the earthing switch is ON.
5. Remove the operating handle and place it back into the tool board.

Figure 56 - Operation of Earthing Switch

Switching OFF the Earthing Switch

Initial Situation:

- Earthing switch: ON
- Circuit Breaker: OFF
- Truck: Disconnected position

Follow the below steps to switch OFF the earthing switch:

1. Rotate the flap anti-clockwise to access the operating shaft.
2. Insert operating handle aligned with axis point.
3. Turn the handle clockwise by the 90°.
4. Check the earthing switch position indicator through cable compartment inspection window and ensure that the earthing switch is OFF.
5. Remove the earthing switch handle and place it back into the tool board.
6. Close the flap completely (clockwise).

Switching ON the Earthing Switch in case of Solenoid Interlock

NOTICE

HAZARD OF INAPPROPRIATE OPERATION

Do not insert earth switch handle when slider visible in slot.

Failure to follow these instructions can result in equipment damage.

Initial Situation:

- Earthing switch: OFF
- Circuit Breaker: OFF
- Truck: Disconnected position

Follow the below steps to switch ON the earthing switch in case of solenoid interlock:

1. Press and hold the push button to gain access.
2. Rotate the flap anti-clockwise to access the operating shaft.
3. Insert the operating handle aligned with axis point.
4. Turn the handle counter-clockwise by 90° to close the earthing switch.
5. Check the earthing switch position indicator through rear cover and ensure that the earthing switch is OFF.
6. Remove the earthing switch handle and place it back into the tool board.

Standard Switching Operations

⚠️ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, AND ARC FLASH

Observe the conditions of Operations, page 57 and Interlocks, page 62.

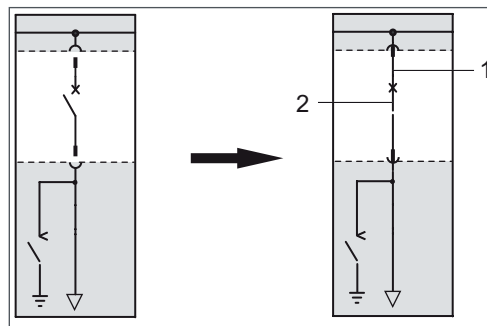
Failure to follow these instructions will result in death or serious injury.

Switching a Feeder Cable

Initial Situation:

- Circuit Breaker: OFF
- EvoPacT HVX-O: Disconnected/test position
- Earthing switch: OFF

Figure 57 - Switch Feeder Cable ON



Switch Feeder Cable ON

Follow the below steps to switch outgoing feeder cable ON:

1. Move the truck into connected/service position (1).
2. Switch ON the circuit breaker (2).

Switch Feeder Cable OFF

Follow the below steps to switch outgoing feeder cable OFF:

1. Switch OFF the circuit breaker.
2. Move the truck into disconnected/test position.

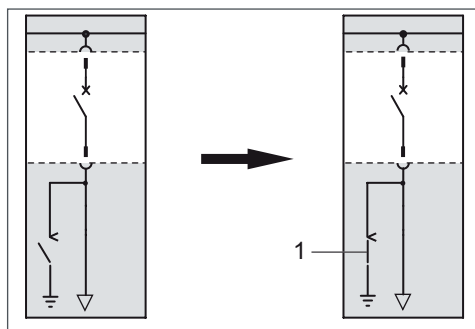
Earthing the Feeder Cable

Initial Situation:

- Circuit Breaker: OFF
- EvoPacT HVX-O: Disconnected/test position
- Earthing Switch: OFF

Earthing Feeder Cable

1. Check the feeder is de-energized.
2. Switch ON the earthing switch (1).

Figure 58 - Earthing Feeder Cable**De-earthing**

Switch OFF the earthing switch.

Coupling Busbar Sections using the Bus Section Coupler

With EvoPacT HVX-O Truck and Direct Bus Riser

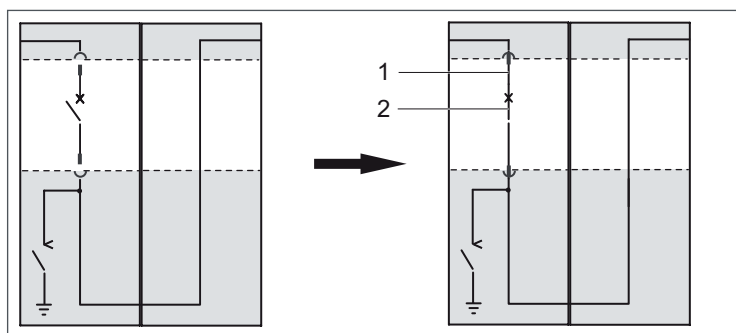
Initial Situation:

- Circuit Breaker: OFF
- EvoPacT HVX-O: Disconnected/test position

Coupling the busbar Sections

Follow the below steps for coupling the sections:

1. Move trucks into the connected/service position (1).
2. Switch ON the circuit breaker (2).

Figure 59 - Coupling Busbar Sections using Bus Section Coupler**Uncoupling**

Follow the below steps for uncoupling the sections:

1. Switch OFF the circuit breaker.
2. Move trucks into disconnected/test position.

Earthing the Busbar

⚡ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, AND ARC FLASH

- Truck (EvoPacT HVX-O VCB and EvoPacT Metering) in the appropriate busbar sections must be in disconnected position.
- Observe the conditions of Operations, page 57 and Interlocks, page 62.

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

Earthing the Busbar with Busbar E/S in the Metering Panel

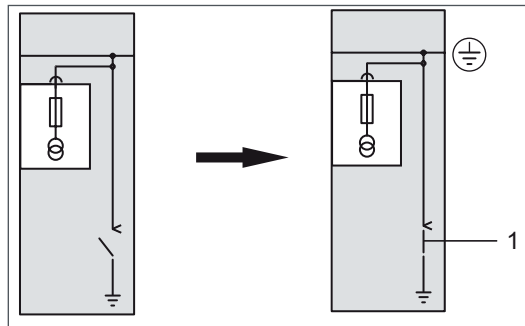
Initial Situation:

- Busbar earthing switch: OFF

Earthing the Busbar

Switch ON the earthing switch (1).

Figure 60 - Earthing the busbar with earthing switch



De-earthing

Switch OFF the earthing switch.

Maintenance

Safety Provisions

Before performing work on the cubicle, it is essential that you comply with the following instructions:

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Before removing covers and performing assembly or maintenance work:

- Ensure that the system is isolated from high voltage, supply voltage, and properly grounded.
- Ensure that the Circuit breaker is in test condition, the Earth switch is closed, and access is locked.
- Follow the LOTO process to perform any work on switchboard.
- Install barriers, cables, and polycarbonates in accordance with the design specifications wherever necessary.

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

WARNING

HAZARD OF MOVABLE PARTS IN MECHANICAL DRIVES

Before performing mounting and maintenance work, comply with the below safety rules:

- Isolate from the supply voltage.
- Release the energy-storing device of the Circuit breaker by performing the OFF-ON-OFF operation.
- Activate the make-proof Earth switch to ON position, to ensure that the equipment is ready for use (if any).
- Do not remove the mechanisms during maintenance work.

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

WARNING

HAZARD OF SHARP-EDGED SHEET METAL AND METAL PARTS

During installation and maintenance work, comply with the below safety rules:

- Apply appropriate PPE and follow safe electrical work practices. See standards or local equivalent.
- Always cover sharp edges.

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

Maintenance and Servicing Specifications

PIX-36 series indoor switchgear units have been designed for normal operating conditions in accordance with IEC 62271-1.

Inspection

It is recommended to check the panels visually at regular intervals depending on the strain they are subject to during operation and in accordance with the national regulations.

⚠ CAUTION
HAZARD OF INSTALLING UNDER INADEQUATE CONDITIONS
In case of frequent condensation or air pollution (dust, smoke or corrosive gases), the maintenance intervals must be adapted to the actual conditions.
Failure to follow these instructions can result in injury or equipment damage.

A visual inspection includes a complete check of the panels by certified staff for contamination, condensation and damage. The Cubicles must be cleaned in expert fashion. Refer to [Cleaning](#), page 82 and [Avoid Condensation](#), page 82.

Maintenance

If there are signs of contamination or condensation, the panels must be cleaned in expert fashion and subsequently the drives, interlocks and position indicators checked for proper functioning. Refer to [Operations](#), page 57.

Repair

If damage is detected on the cubicles, these must be repaired or components be replaced immediately. Refer to [Corrosion Protection](#), page 82 and [Replacement of Components and Cubicles](#), page 82.

In case of ambiguities or irregularities, please contact the manufacturer’s Service Center immediately.

Table 12 - Maintenance and Servicing Specifications

Maintenance interval	Work to be carried out	Qualification /Work performed by
Every 4 years	<ul style="list-style-type: none"> Clean and grease drives and movable main current contacts. Refer to Lubrication Instructions, page 83. Check releases and blocking coils for proper function. 	Staff who have been certified for this work
After 1,000 actuations of the truck or the earthing switch	Revision of the switching device in question	Staff who have been certified for this work
Truck	Refer to the applicable instruction manual for the truck concerned	Service Center of the manufacturer
Circuit-breaker HVX-O		
Metering truck MTX-O		
Isolating truck UTX-O		
Axial fan & Radial fan (6 months)	Check and clean the fan blades and wiring for any signs of damage. The fan requires no regular maintenance due to its ball bearings, which are equipped with lifetime lubrication.	Service Center of the manufacturer

Cleaning

DANGER

HAZARD OF ELECTRICAL ARC, EXPLOSION AND FIRE

- To maintain the cubicle insulating level, ensure that the insulating components are clean.
- Wear appropriate PPE before any cleaning operation.
- Only use the cleaning agent specified by Schneider Electric (reference no. S008152).
- Check the cubicle for any dirt buildup.
- Clean the contaminated components with a dry, clean, and lint free cloth.
- Depending on the level of soiling, replace the cloth as required.
- Soak the cloth thoroughly in a recommended cleaning agent and wipe the insulating components.
- Keep the duration of exposure as short as possible.
- Expose the cleaned surface to air at least for two hours.

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

Avoid Condensation

To maintain the specific insulation level, it's crucial to shield the switchgears, particularly insulation parts, from condensation exposure.

Follow the below instructions to help avoid condensation:

- Check the cubicles for any condensation. If any condensation is found, clean the cubicle and insulating components.
- Inspect the cubicle for sufficient ventilation and heating. If required, use de-humidification devices.

Corrosion Protection

Drive mechanisms and covers have a long-term protection against corrosion.

Any damage to the paint, scratches and other damage should be repaired immediately to help avoid corrosion.

Replacement of Components and Cubicles

The drive mechanisms, current transformers and voltage transformers as well as the testing and monitoring systems can be replaced if necessary. Also, entire panels can be replaced.

For any queries regarding replacement of components or panels, please contact Schneider Electric.

The data on the nameplate are relevant for replacement of components or panels or in case of any queries. Refer to Nameplate, page 21.

NOTE: PT fuse, LV control fuse, SMPS, Battery, Power pack, Surge arrestor, LLI, VPIS, FPI, battery, Relay battery, Relay memory card, and Battery charger is a consumable parts. It is not covered by free replacement, even though the product is under the warranty period.

Lubrication Instructions

NOTICE
<p>HAZARD OF INAPPROPRIATE MAINTENANCE</p> <p>The bearings and joints must not be washed out by the cleaning agent and following elements must not be lubricated:</p> <ul style="list-style-type: none"> • Motor • Ball bearings • Auxiliary releases • Push switches • Blocking coils • Auxiliary switches <p>Only approved lubricants may be used. Refer to Auxiliary Products, page 85.</p> <p>Failure to follow these instructions can result in equipment damage.</p>

Table 13 - Details of Lubrication

Lubrication points	Lubricants	Lubrication procedure
Sliding contact surfaces	Mobilith SHC 100	Apply a thin and uniform film of lubricant.
All accessible friction points and sliding surfaces	Mobilith SHC 100	Clean lubrication points with lint free cotton cloth; apply a thin film of lubricant (for example, using a paintbrush).
Bearing and joints	Liquid lubricant	Pour drops of liquid lubricant (oil can, drip feed lubricator) into the bearing gap. Liquid lubricant gets between the bearing surfaces due to the capillary effect. In case of inaccessible lubrication points, use an extension tube or spray.

Once maintenance work is complete:

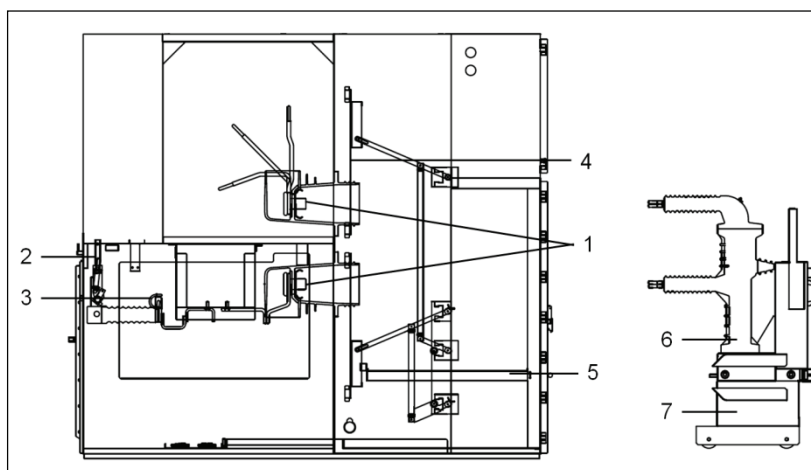
1. Remove all the tools and auxiliary equipment used.
2. Re-insert truck into the panel. Refer to Insertion of the Truck into the Cubicle, page 32.
3. Reposition covers, close doors and check switching functions. Refer to Commissioning , page 53.

Preparation:

1. Remove the truck from the panel.
2. Clean lubrication points using a lint-free cloth.

NOTE: Use cleaning agent in case of serious contamination.

Figure 61 - Points of lubrication/maintenance



- 1 Fixed contacts on the cubicle
- 2 Earthing switch drive
- 3 Earthing switch contacts
- 4 Shutter mechanism
- 5 Guide for the truck
- 6 Truck (lubricate in accordance with lubricating instructions in the appropriate operating manual HVX-O / UTX-O / MTX-O)

Replace Fuses for Voltage Transformers

NOTICE

HAZARD OF INAPPROPRIATE OPERATION

Ensure to follow the below sequence to replace the fuses.

Failure to follow these instructions can result in equipment damage.

Voltage transformers in outgoing feeder cable

- Isolate outgoing feeder cable from the power supply and earth it.
- Remove cable compartment cover. Refer to Demounting and Mounting the Cable Compartment Cover, page 34.
- Insert PT ramp on the rear end of panel.
- Push the trolley handles inwards & pull the PT trolley outside of the panel.
- Remove the PT contact & pull fuse carefully out of the PT.
- Coat all contact areas (refer to Annex, page 85) and insert new fuses and assemble the PT contact.
- Re-insert the PT trolley in to the cable chamber.
- Ensure the trolley is locked by pushing the handles outwards.
- Mount the cable compartment cover .

Annex

Auxiliary Products

⚠ WARNING	
HAZARD OF INAPPROPRIATE HANDLING	
Comply with the safety data sheets of the auxiliary products.	
Failure to follow these instructions can result in death, serious injury, or equipment damage.	

Auxiliary Products	Reference Number
Cleaning agent	S008152
Synthetic lubricant, 0.5 kg can	ST312-111-835
Liquid lubricant FL, 0.5 kg can	S008153
Touch-up paint RAL 7044, silk-grey, 50 ml	S009561
Touch-up paint, special paint (specify colour shade)	S009562

The auxiliary products are available from the manufacturer. The use of alternative auxiliary products is not permissible.

How to Treat the Contact Surfaces

⚠ CAUTION	
HAZARD OF INAPPROPRIATE ASSEMBLY	
<ul style="list-style-type: none"> When handling bars insulated by heat-shrinkable sleeves: The heat-shrinkable sleeve must not get into contact with lubricant (swelling possible). Contact areas coated with synthetic lubricant should not be touched. Contact areas must be subjected to preliminary treatment before screw-fastening (see Table below). 	
Failure to follow these instructions can result in injury or equipment damage.	

- Immediately after the pre-treatment, coat the contact surfaces sparingly with a thin and uniform film of synthetic lubricant so that the space between the contact surfaces is completely filled once the screws have been fastened.

Material of contact surfaces	Pre-treatment
Silver-plated	Cleaning ⁽¹⁾
Nickel-plated	Remove passivation layer ⁽⁴⁾
Copper or copper alloy	Clean ⁽¹⁾ , expose metallic surface ⁽²⁾
Aluminium alloy	Clean ⁽¹⁾ , expose metallic surface ⁽²⁾
Steel	Clean ⁽¹⁾ , expose metallic surface ⁽²⁾
Zinc-plated steel	Remove passivation, not, however, the zinc layer ⁽³⁾
Hot-galvanized sheet-metal	Clean ⁽¹⁾ , passivation need not be removed

- (1) Clean by means of lint-free cloth; use cleaning agent in case of serious contamination.
- (2) Expose metallic surface:
 - By treating the entire surface with emery cloth or a rotating grinding tool (grain size of 80 or 100).
 - Using a wire brush which is clearly marked for use exclusively for aluminium or exclusively for copper.
- (3) using a brass brush, steel brush.
- (4) Rub slightly by hand using Scotch brite abrasive agent (Ni layer must not be reduced).

Standard Screw Tightening Torques

▲ CAUTION
<p>HAZARD OF INAPPROPRIATE ASSEMBLY</p> <ul style="list-style-type: none"> • The threads of screws and bolts must generally not be pretreated. • Ensure tightening torque is within $\pm 15\%$ of the recommended value. • The nut must correspond in strength to the grade of the screw/bolt used or be of better quality. <p>Failure to follow these instructions can result in injury or equipment damage.</p>

NOTE: It is recommended to utilize these torque values for the installations that are covered in this guide.

Table 14 - Recommended Tightening Torques for General Screw Connections

Screw or bolt	Plastics [N•m]	Grade or material	
		$\geq 8.8 \leq 10.9$	Self-locking screw ≤ 8.8
Thread Ø	Tightening torque [N•m]		
M4	0.25	2.6	–
M5	0.5	5.0	7.0
M6	0.8	8.8	12.3
M8	1.8	21.0	30.0
M10	3.5	42.0	59.0
M12	6.0	70.0	97
M16	12	170	–






**Table 15 - Screw Fastening for Power Transmission
Screws and bolts: Grade ≥ 8.8**

Conductor material:	Copper	Aluminum
Thread Ø	Tightening torques [N•m]	Tightening torques [N•m]
M6	6.5	5.5
M8	17	12
M10	35	23.5
M12	68	48
M16	135	94
M20	200	140

Table 16 - Screw Connection for Terminal Strips

Thread Ø	Tightening torques [N·m]
M2.5 (M2.6)	0.5
M3	0.7
M3.5	1.0
M4	1.5
M5	2.5

Required Tools (Not Included in the Scope of Supplies)

Required tools	Image
Cutter	
Nail puller	
Approved torque wrenches with different bits for hexagon socket screws and socket-head screws and nuts; bits for screw and nut grades M5, M6, M8, M10, M12	
Screwdriver and Philips screwdriver	
Cutting pliers	
Four crane straps/chains of L ≥ 2000 mm each, capacity ≥ 1500 kg	
Lint-free, clean rags	

List of assembly drawings

This does not apply to special modules or customer-specific special designs.

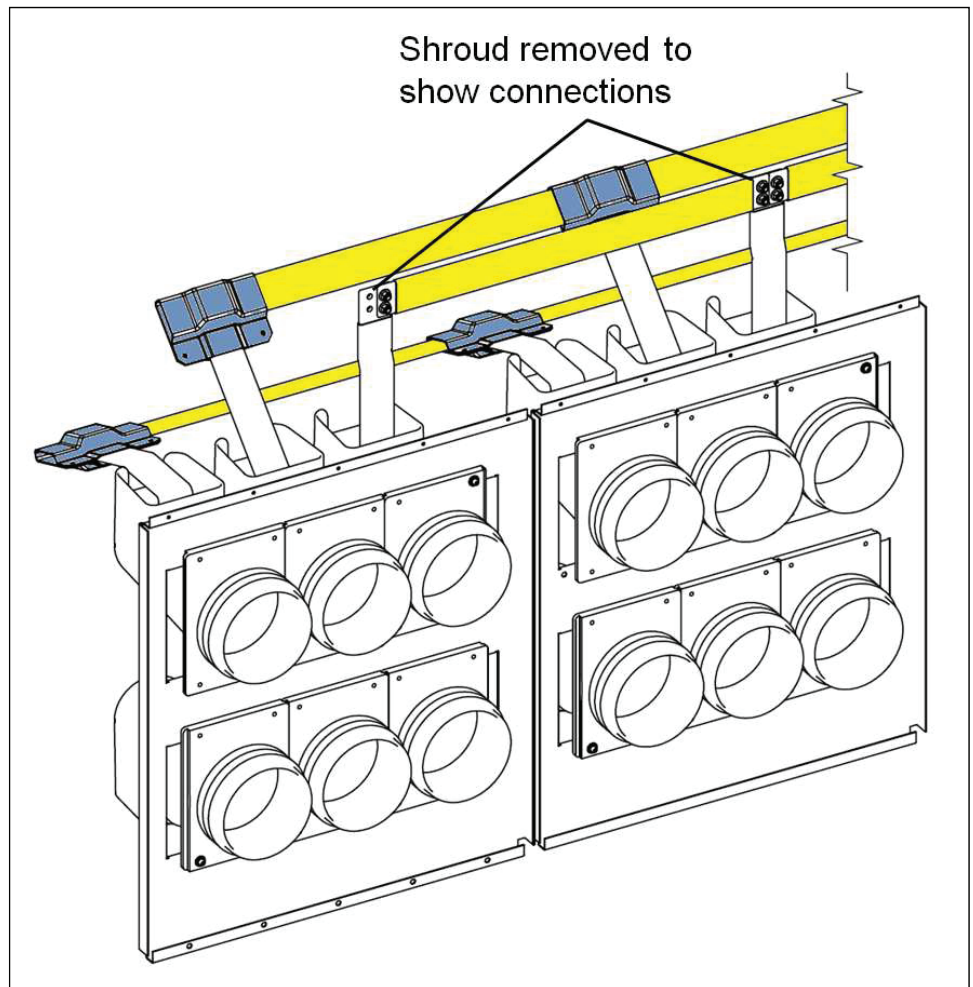
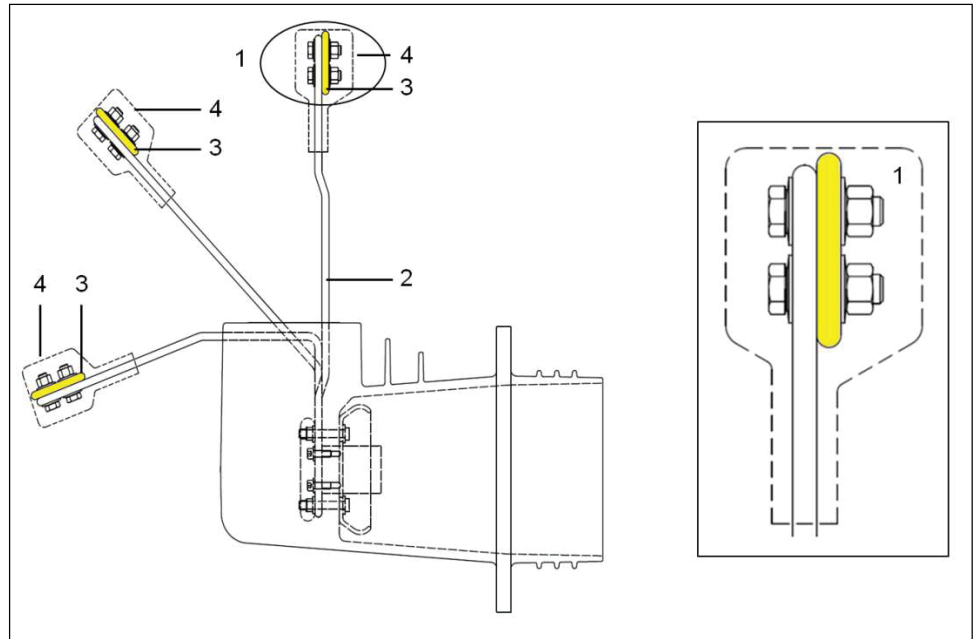
According to the switchgear configuration in question, only such drawings from the list are supplied by the factory as are actually required.

Description	Assembly Drawing
Fastening on concrete foundations	VDRB05605-04
Screw-fastening the switchgear panels	VDRB05614-01
Transportation of panels	VDRB05614-02
Busbar assembly	Refer to Annexure A - Busbar Assembly Procedure, page 88
Mounting deflector for IAC	Refer to Annexure B - Deflector Assembly Procedure, page 91
Mounting tunnel for IAC	Refer to Annexure C - Tunnel Assembly Procedure, page 106

Annexure A - Busbar Assembly Procedure

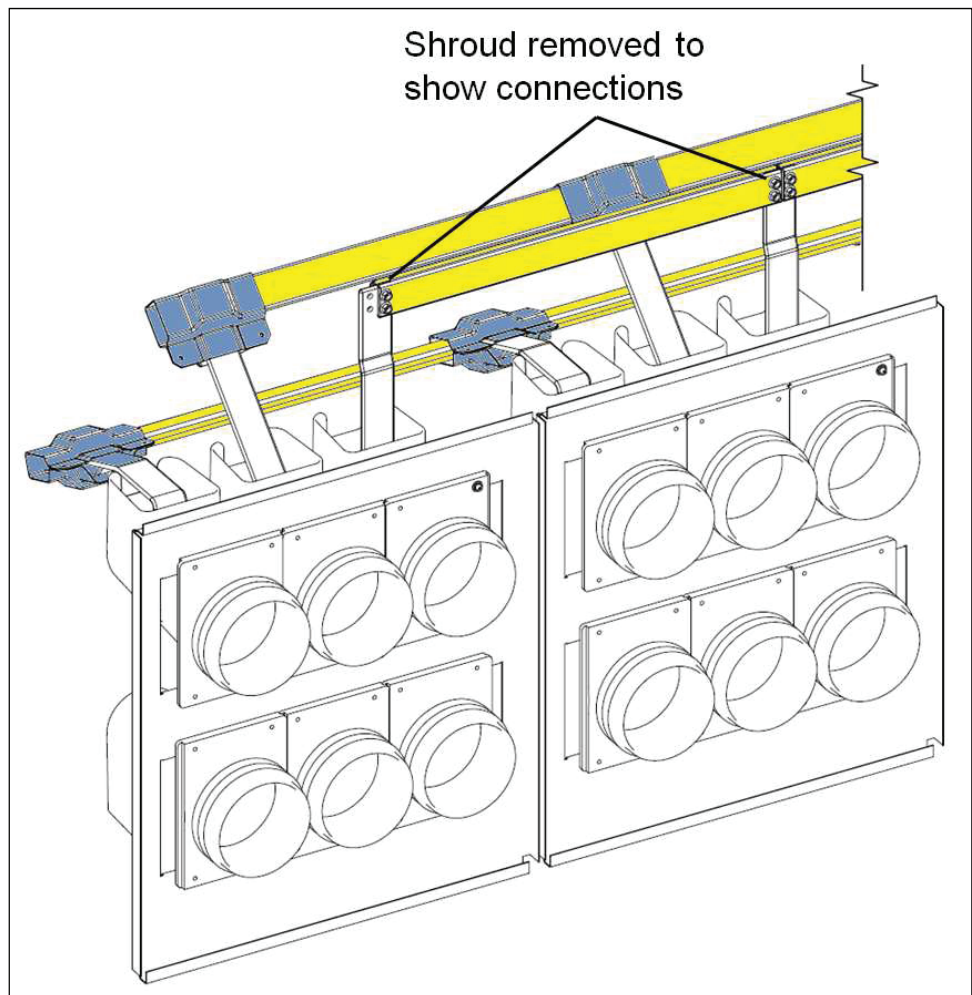
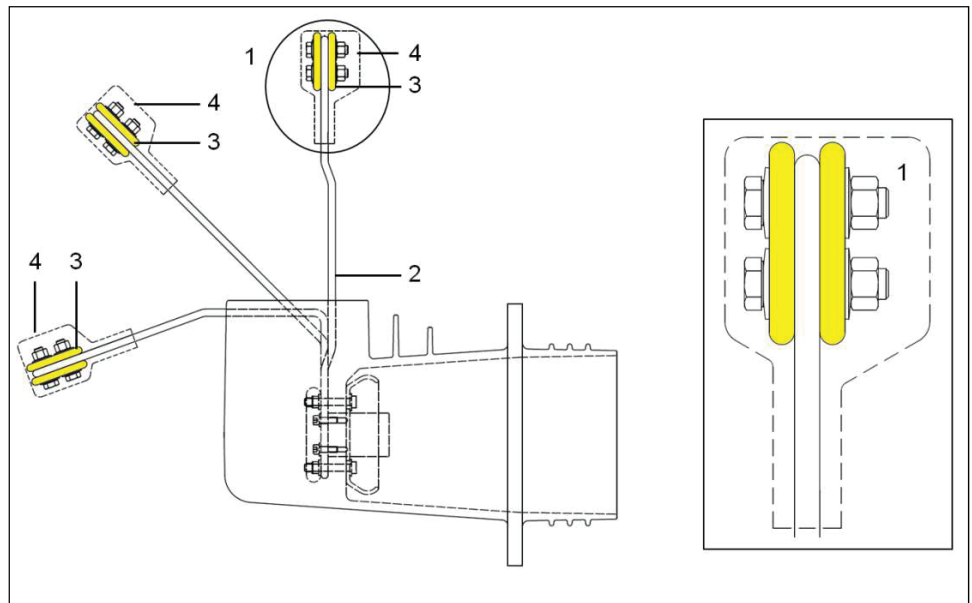
Busbar assembly for:

1. Cubicle rating: ≤ 1250 A
2. Bus rating: ≤ 1250 A



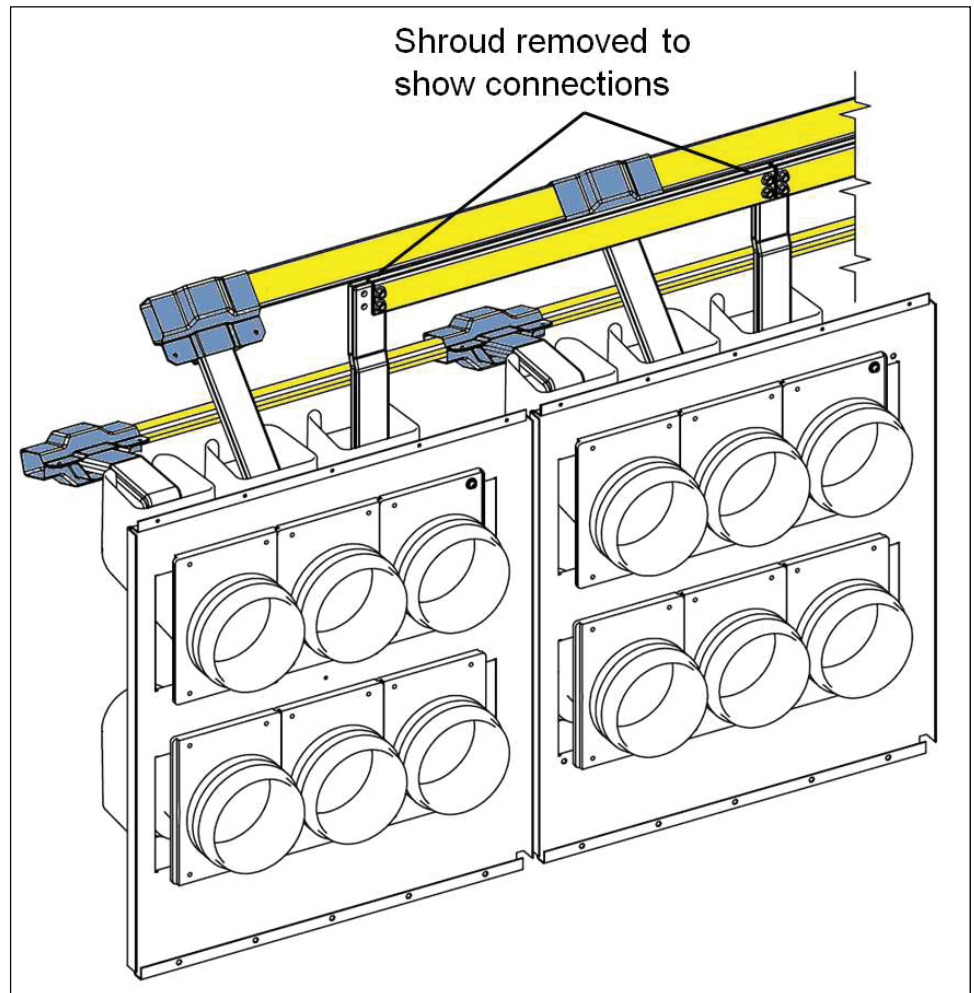
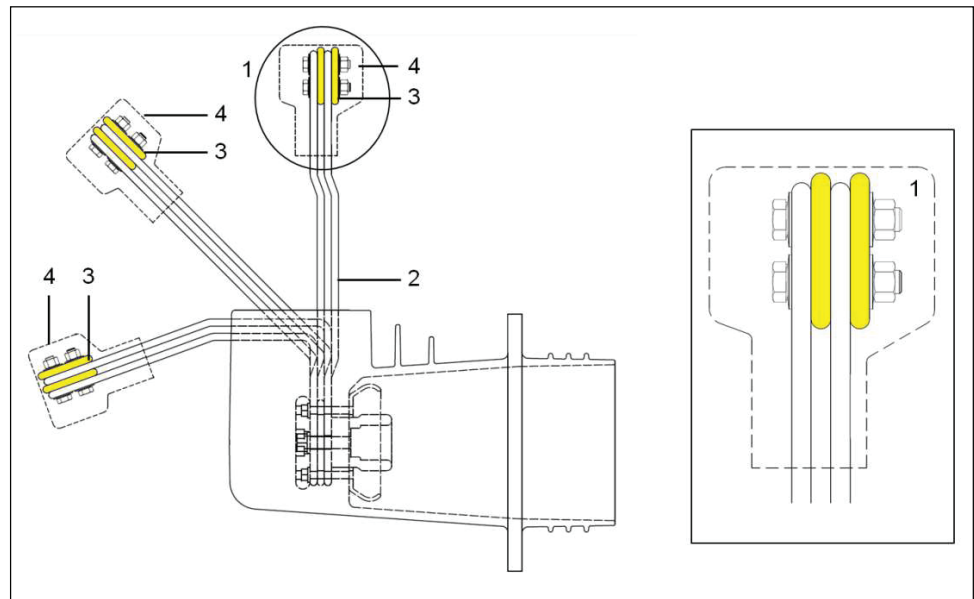
Busbar assembly for:

1. Cubicle rating: ≤ 1250 A
2. Bus rating: 1250 A ≥ 2000 A / 2500 A



Bus assembly for:

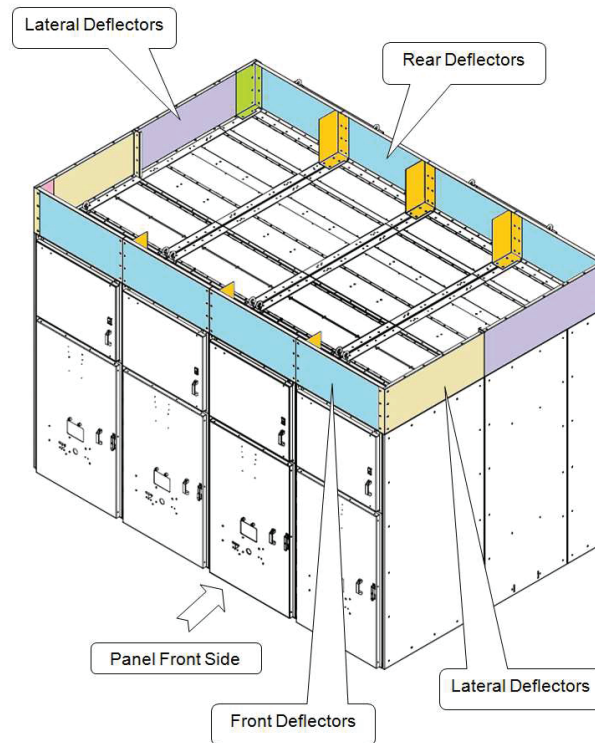
1. Cubicle rating: 2000 A
2. Bus rating: 2000 A



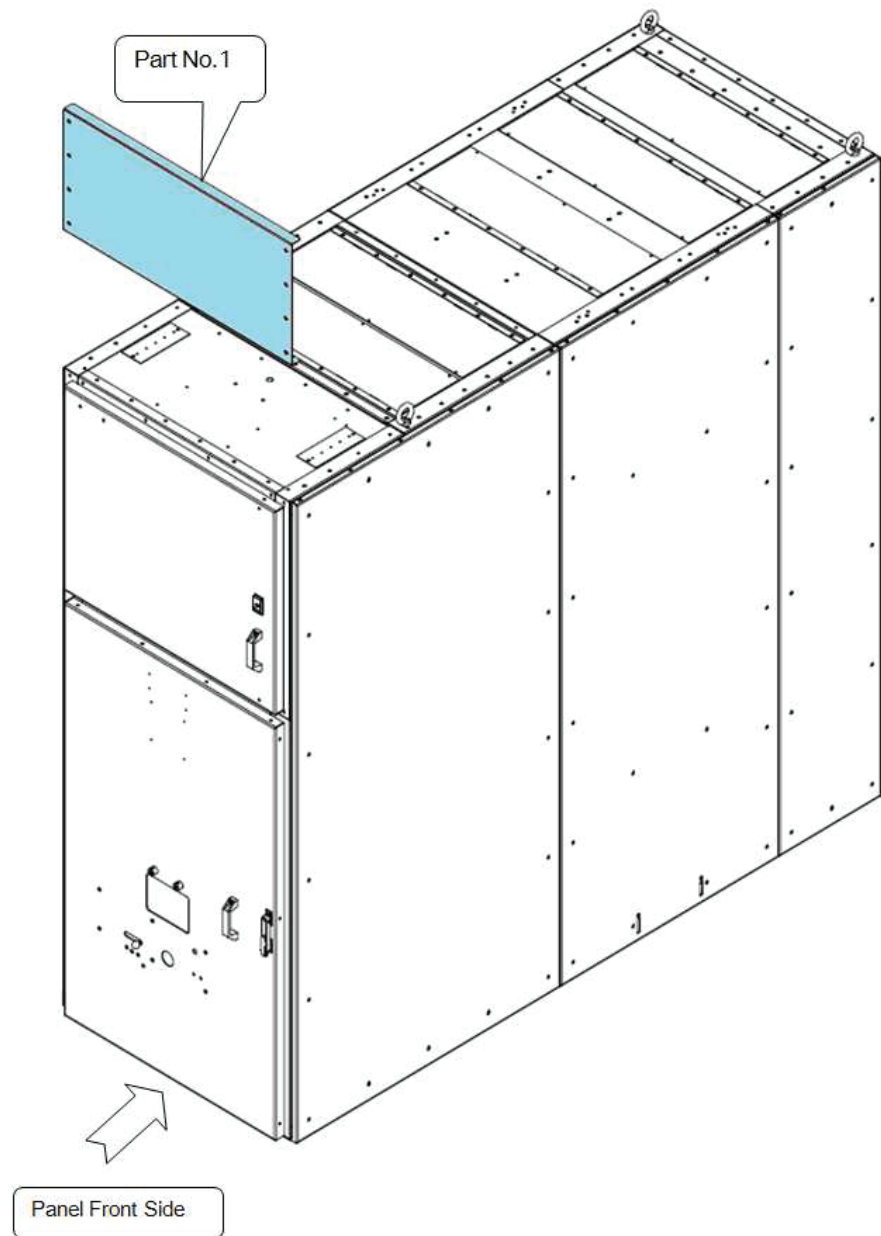
Annexure B - Deflector Assembly Procedure

Deflectors are necessary to help ensure personal safety in case of Internal Faults in accordance with IEC 62271-200.

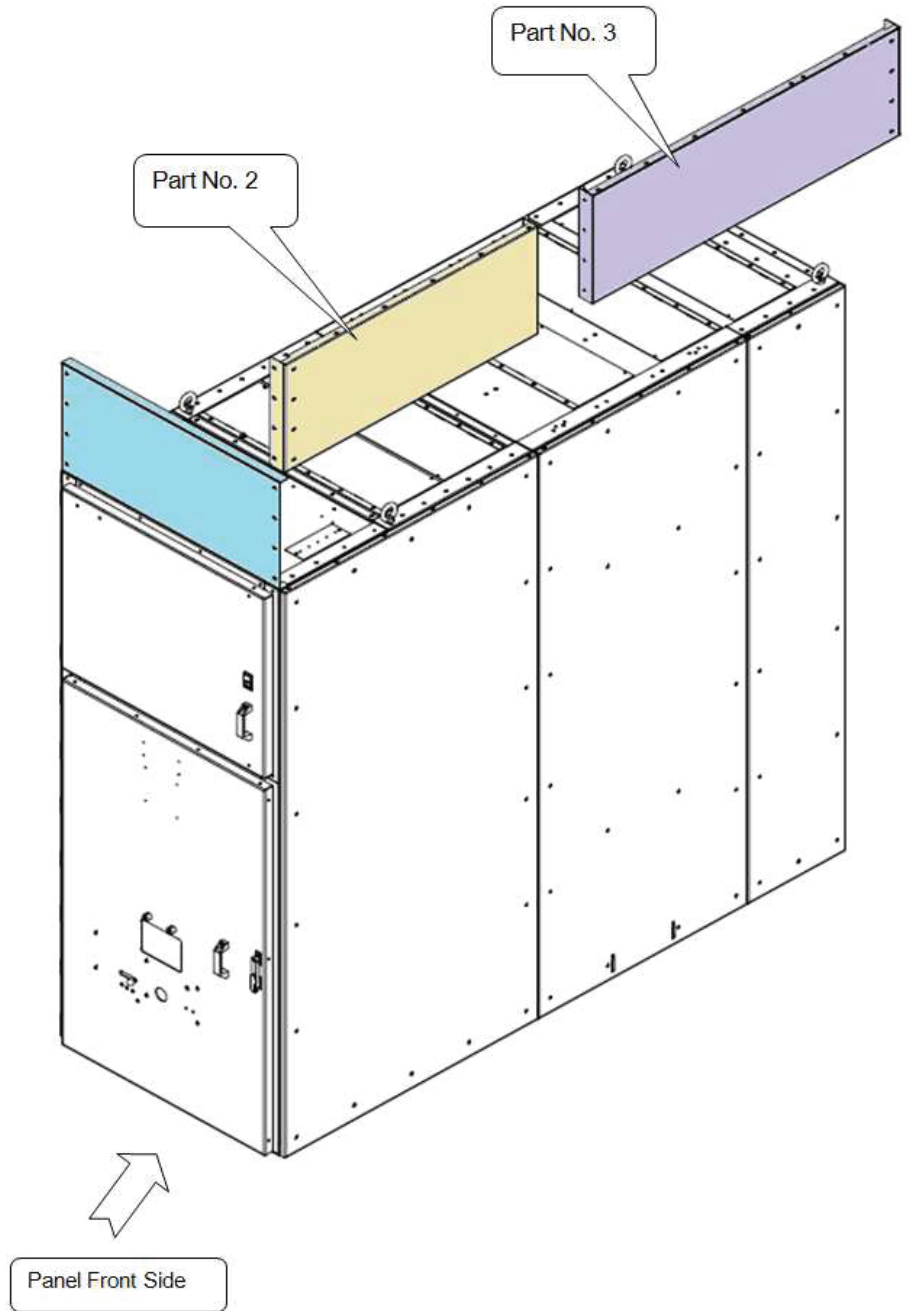
Before performing work on the panel, it is essential to comply with the following instructions:



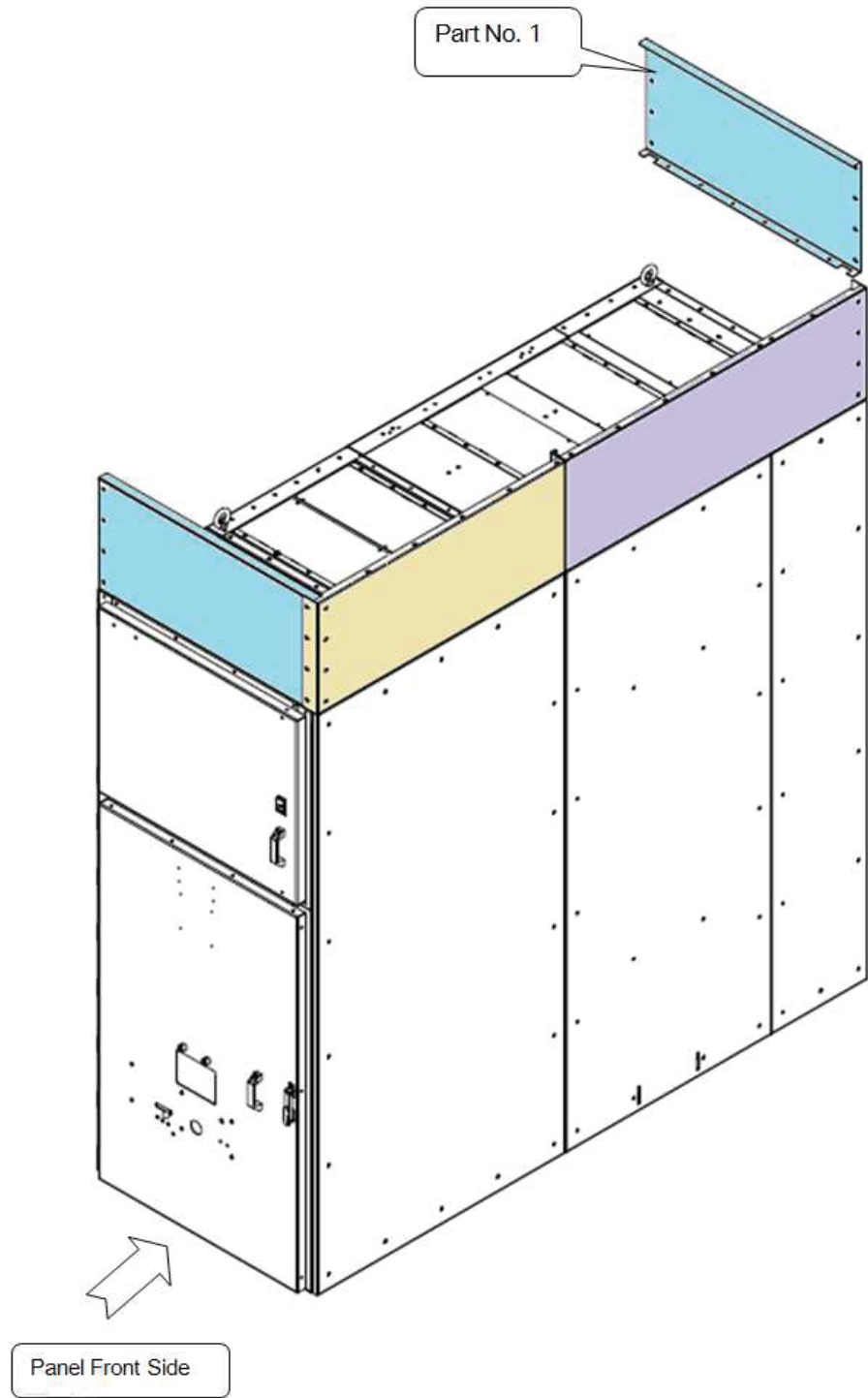
1. Start from one end of the switch board, first assemble the front deflector (Part No.1) on top of the end panel.



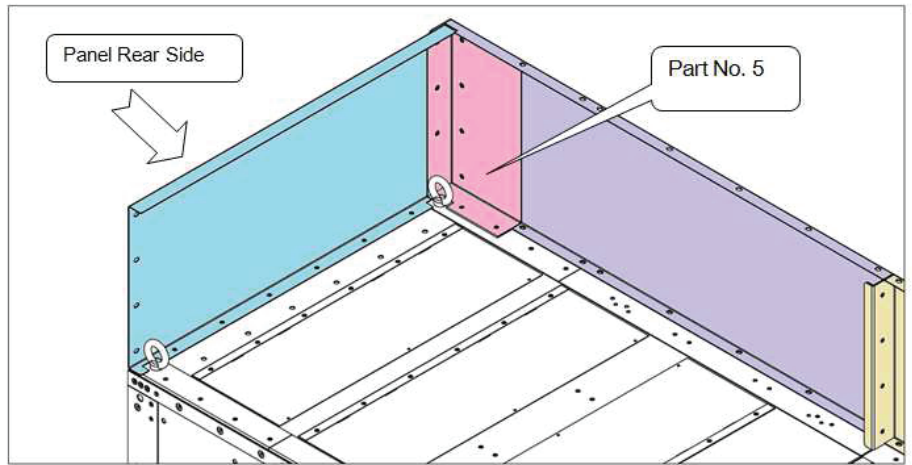
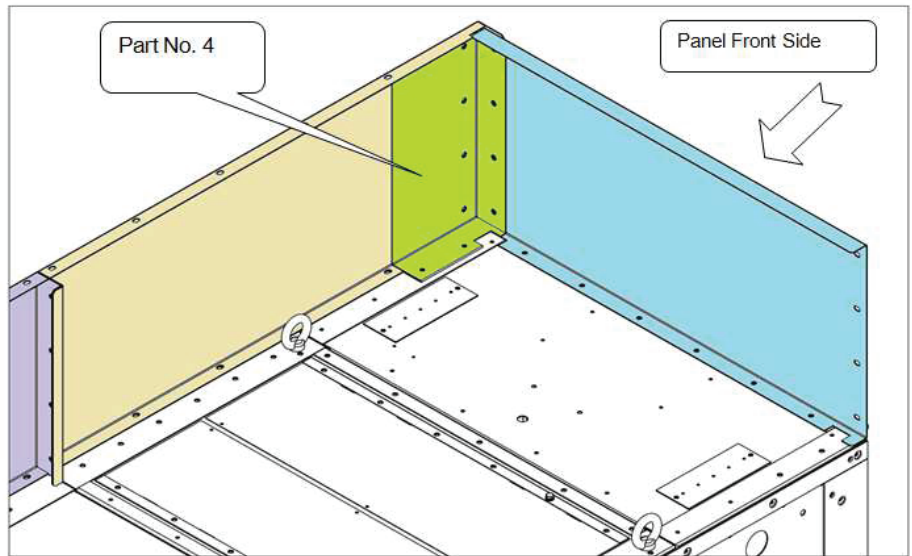
2. Assemble the side deflectors (Part No.2 & 3) on top of the end panel.



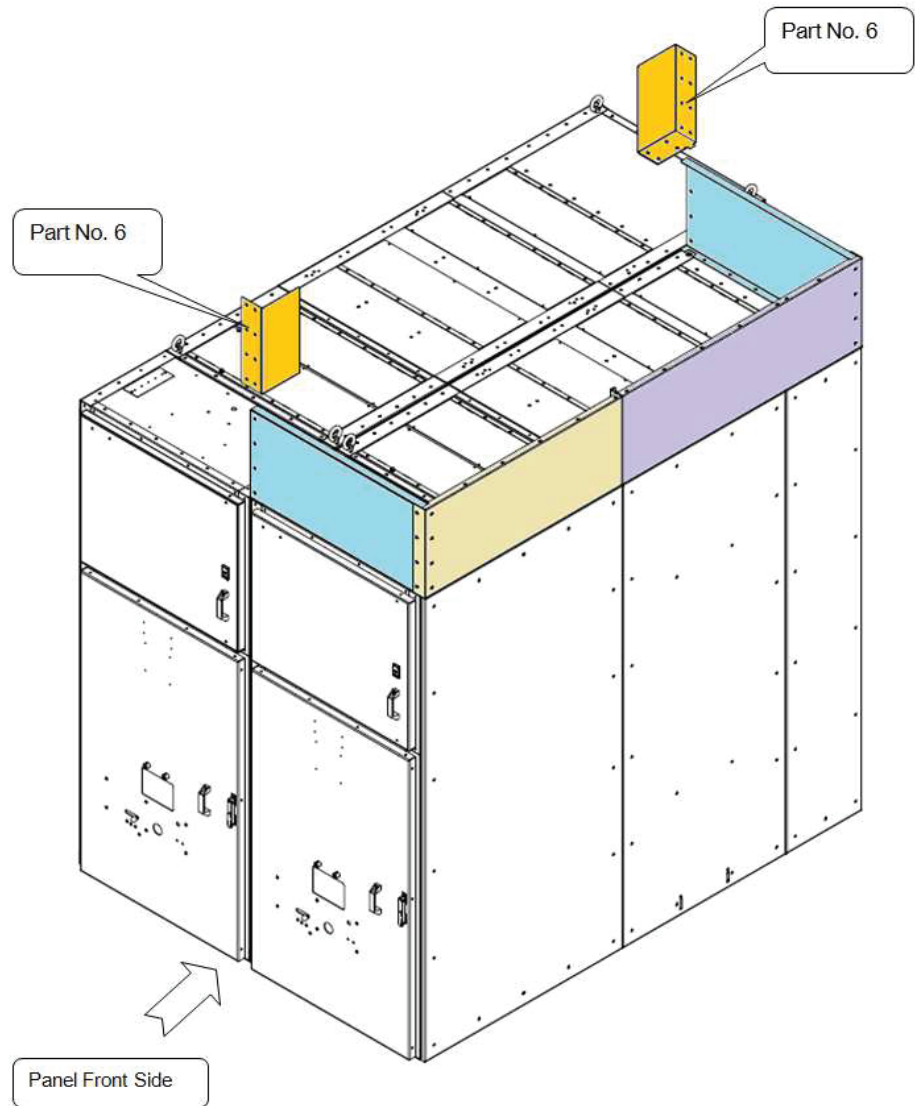
3. Assemble the rear deflector (Part No.1) on top of the end panel.

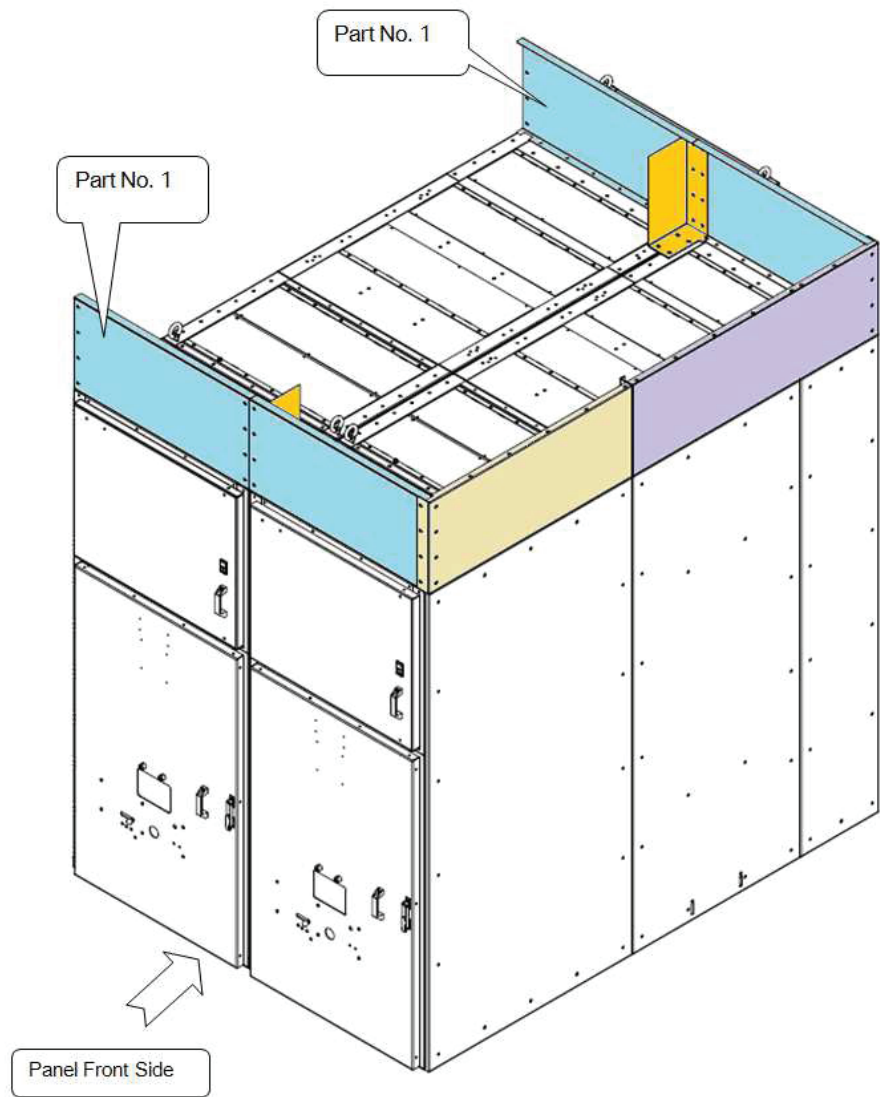


The detailed corner assemblies are shown below.



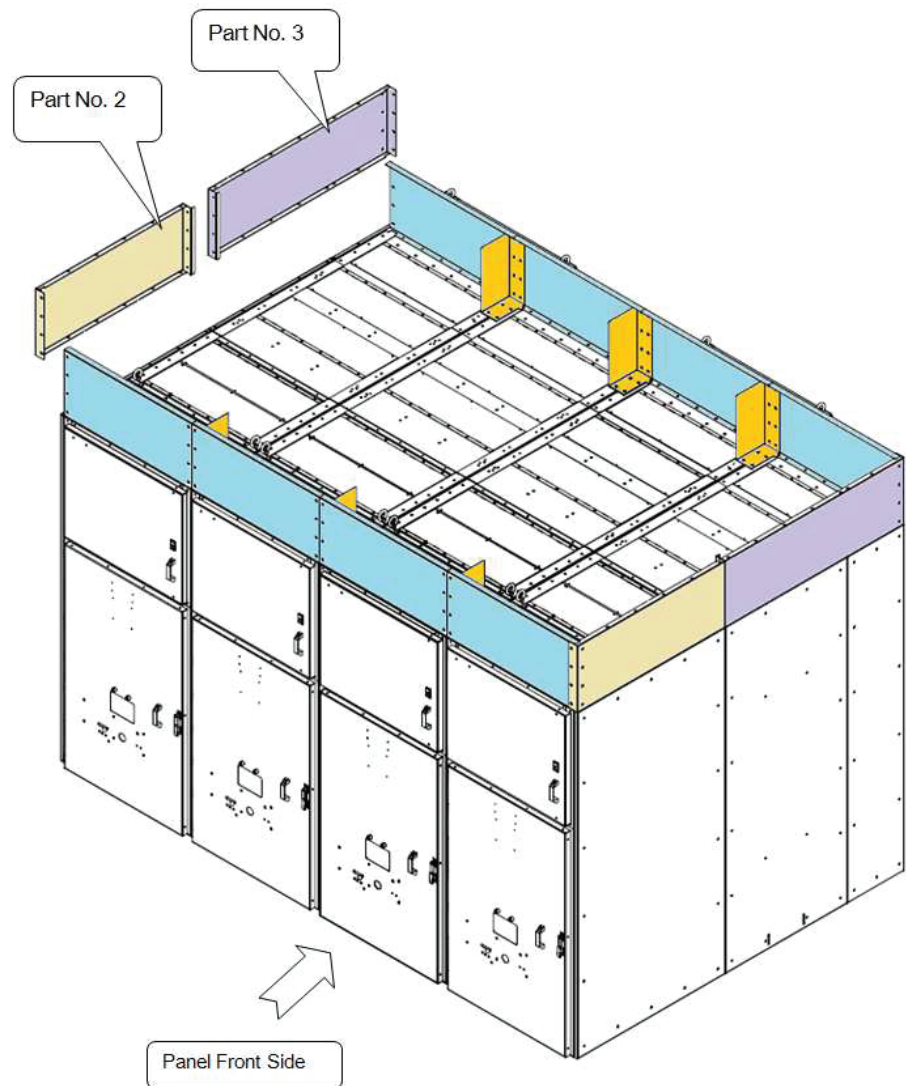
4. Assemble the front supports (Part No.6) followed by the front and rear deflectors (Part No.1) for the adjacent panel.



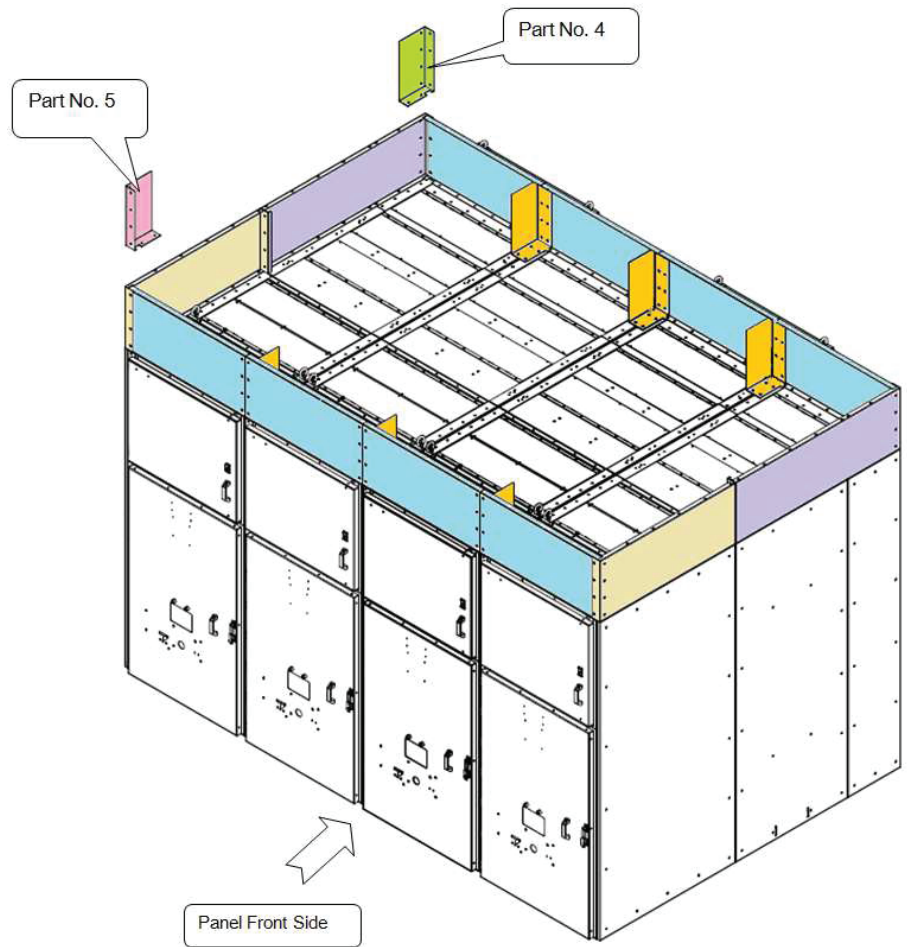


Repeat Step 4 for all the panels in the switchboard starting from one end.

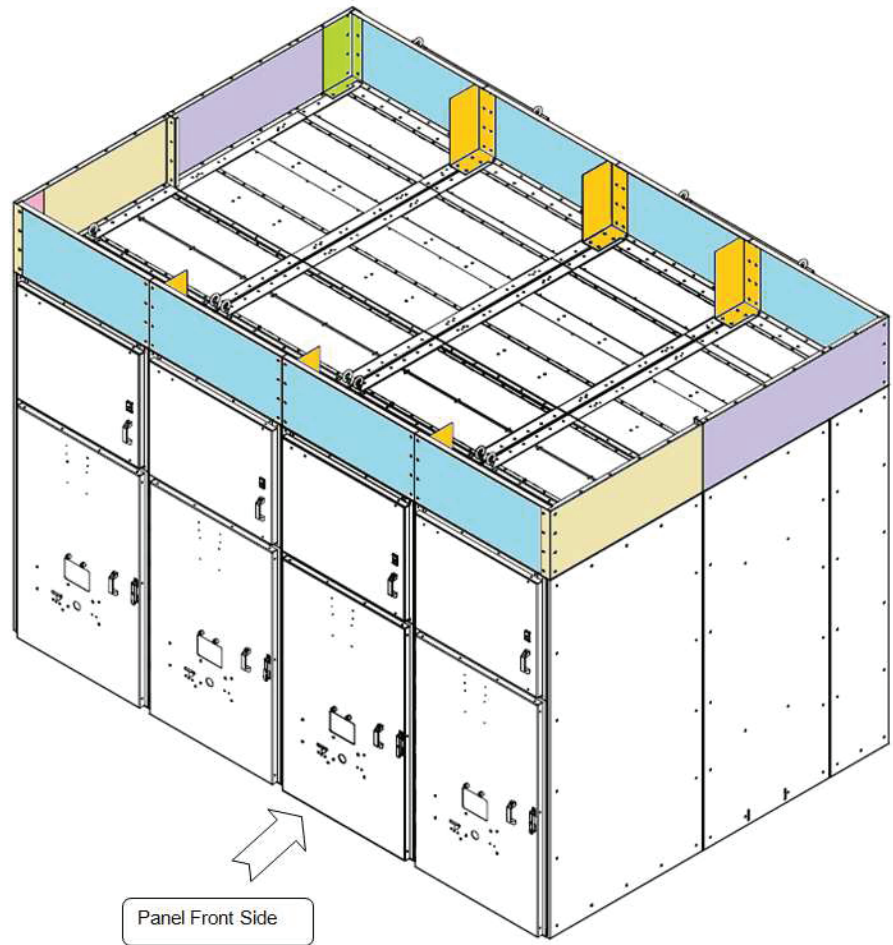
5. Assemble the side deflectors (Part No.2 & 3) on top of the end panel.



6. Assemble the side supports (Part No.4 & 5) as given in detail in Step 3.

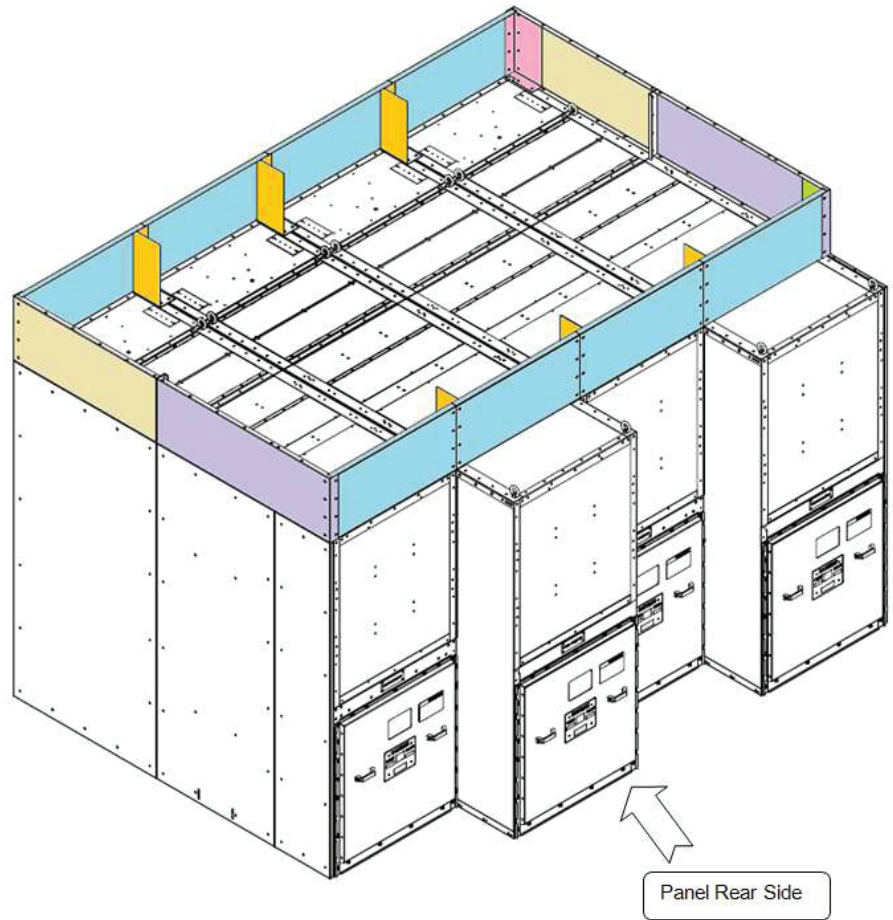


The complete assembly will be as shown below. (Incase of all standard / all extended panels)



Panel Front Side

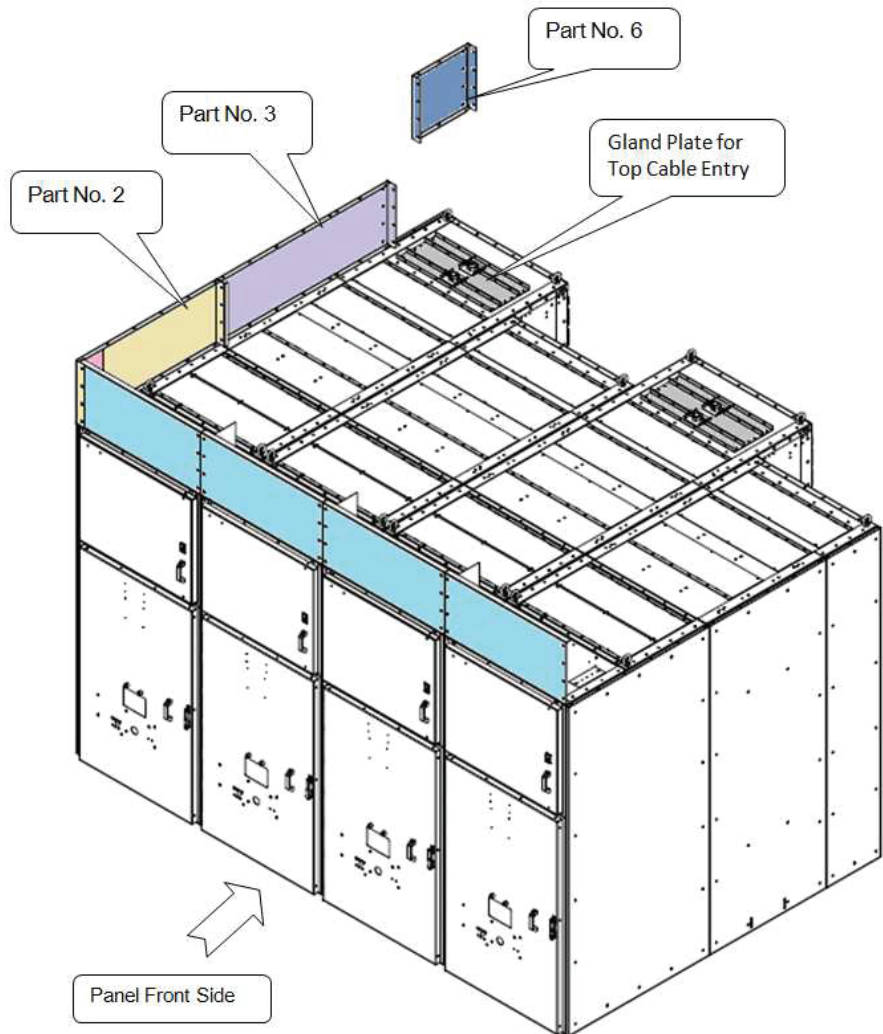
The complete assembly will be as shown below. (Incase of combination of different depth panels)



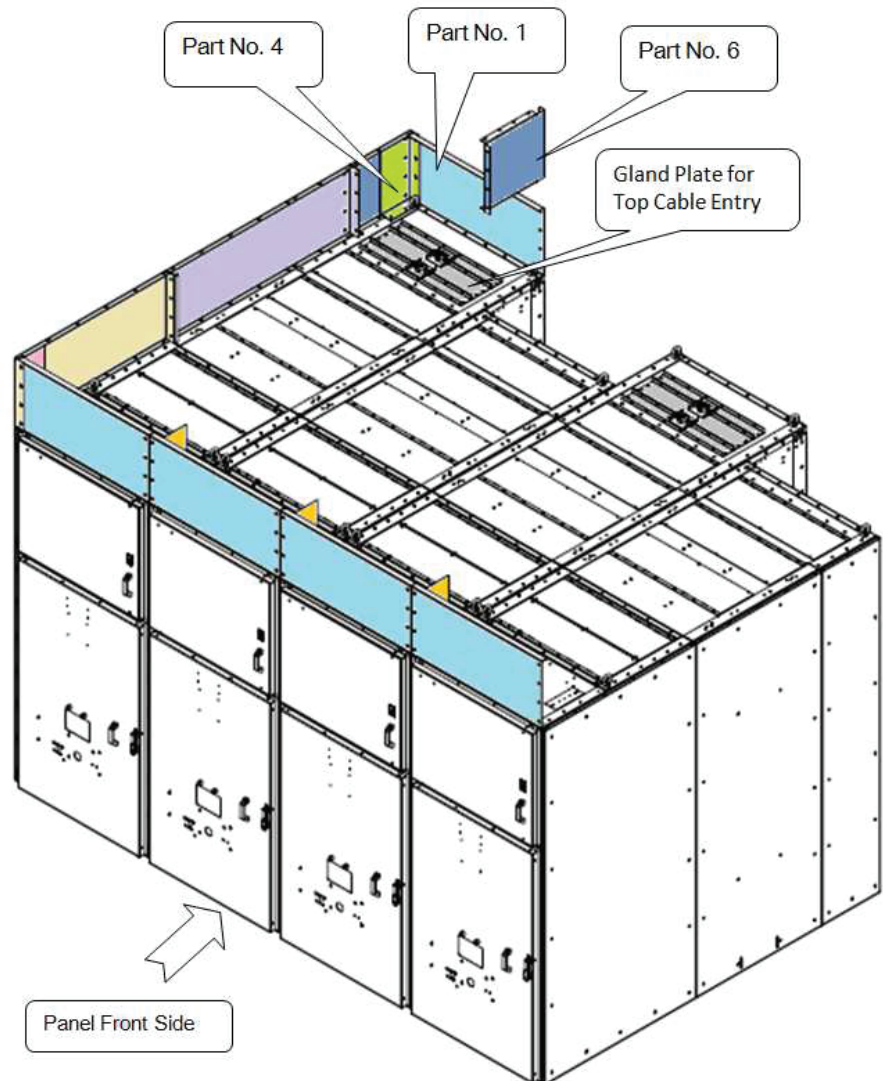
7.

NOTE: The below steps are additional for Top Cable Entry Panel only.

If the top cable entry panel is the end panel, in addition to the side deflectors (Part No.2 & 3) assemble side deflector (Part No. 6) on top of the end panel.

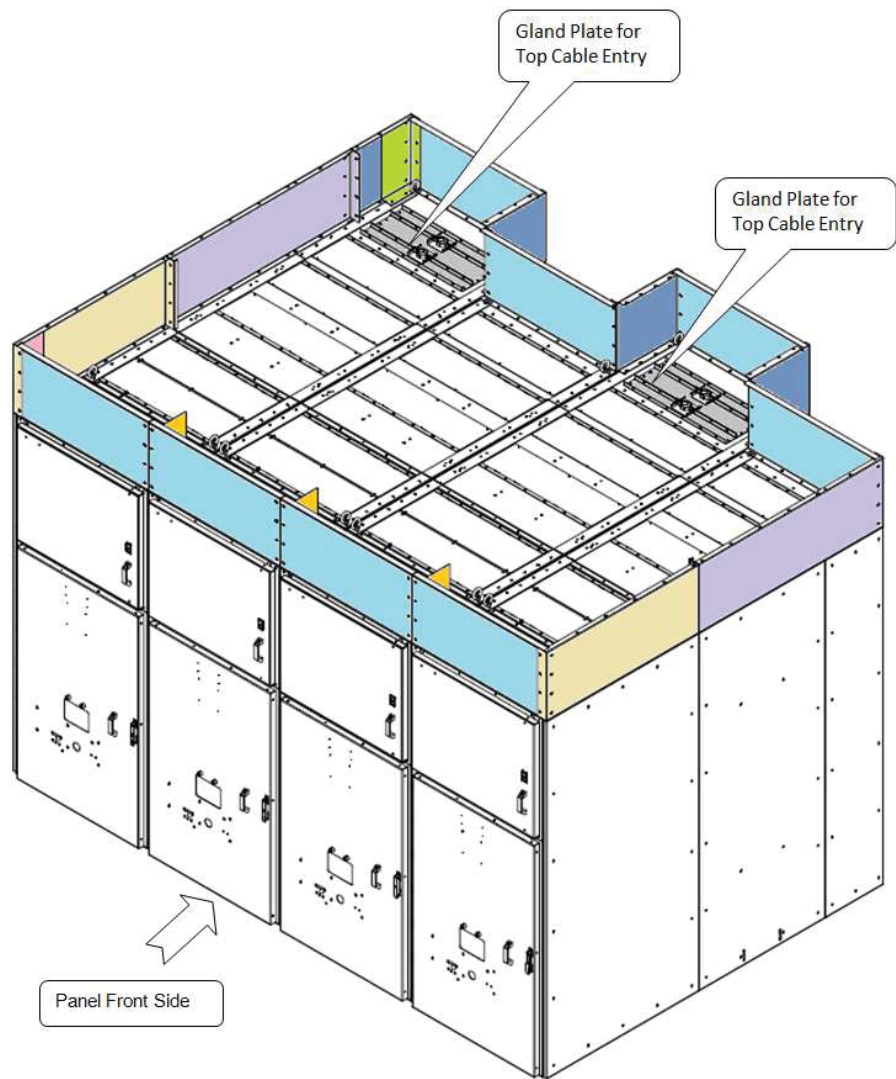


8. Then assemble the rear deflector (Part No.1) as given in Step No.3 behind the gland plate for top cable entry, followed by the side support (Part No. 4 or 5) as given in Step No.4 depending on whether it is the left or right end panel.
- Then assemble the side deflector (Part No.6) if the adjacent panel is a standard depth panel, else follow Step no.4

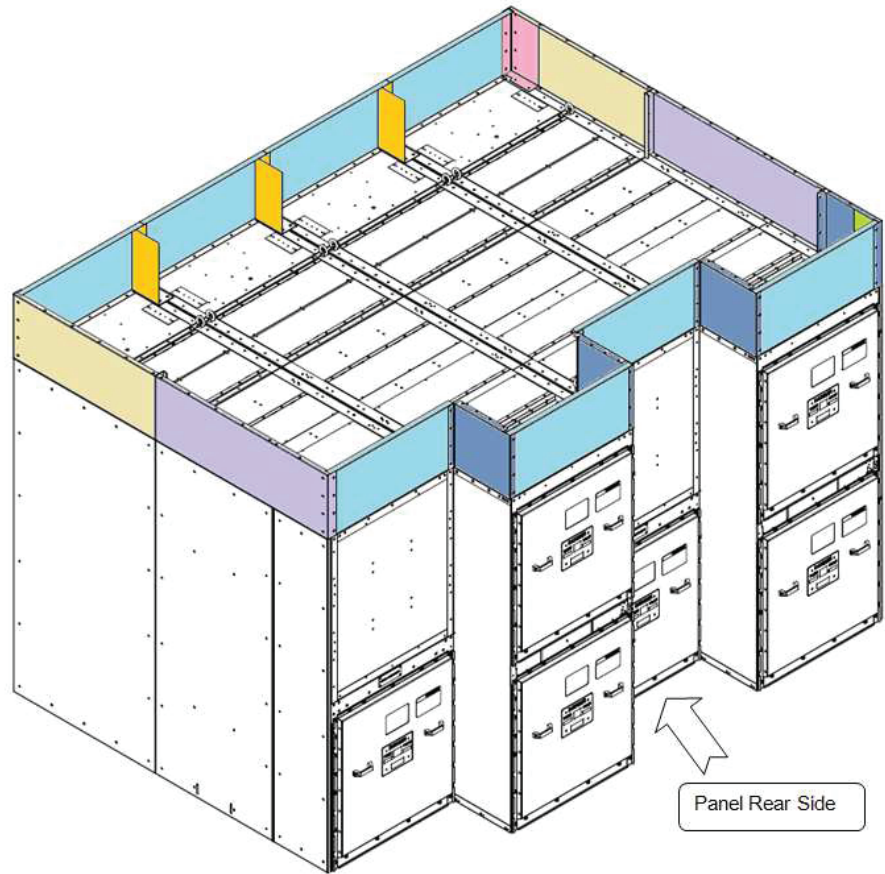


9. Depending on the adjacent panel follow Step 8 – if adjacent panel is of different length or Step 4 – if adjacent panel is of same length.

The complete assembly will be as shown below.



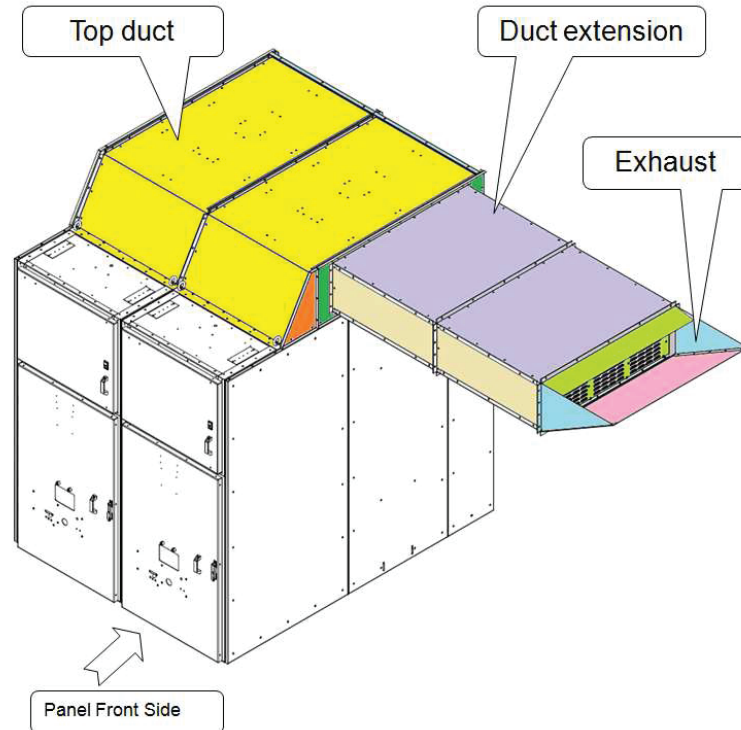
The complete assembly will be as shown below.



Annexure C - Tunnel Assembly Procedure

Arc ducts is necessary to help ensure personal safety in case of Internal Faults in accordance with IEC 62271-200.

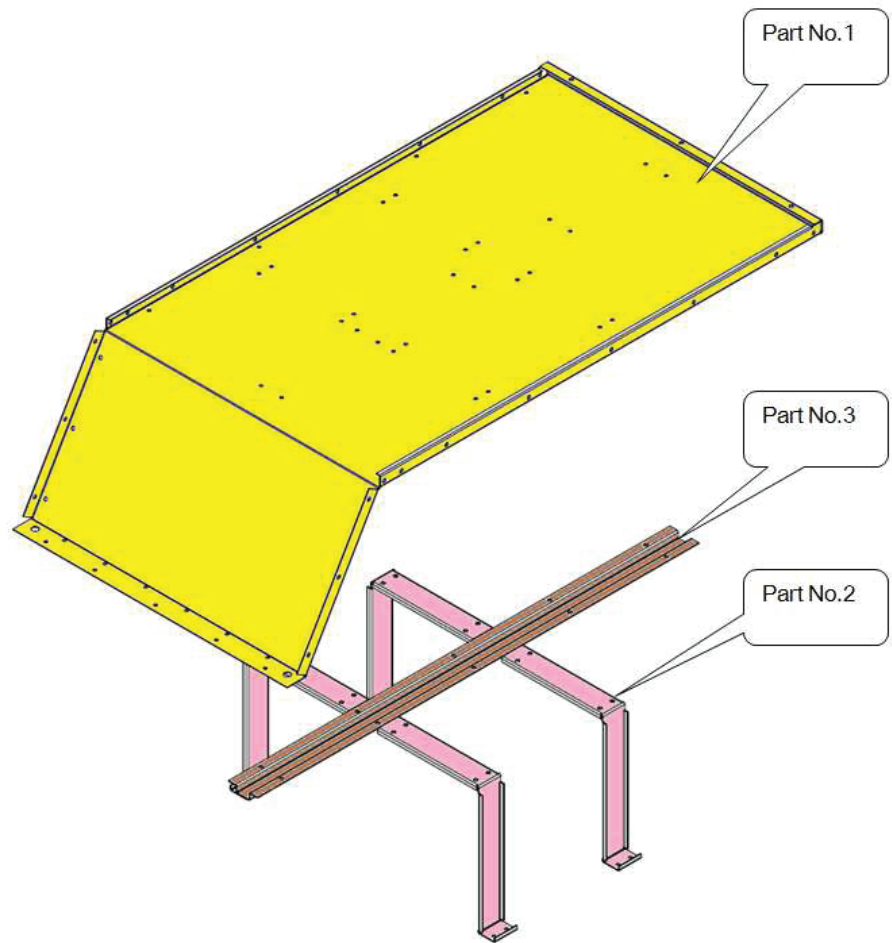
Before performing work on the panel, it is essential to comply with the following instructions:



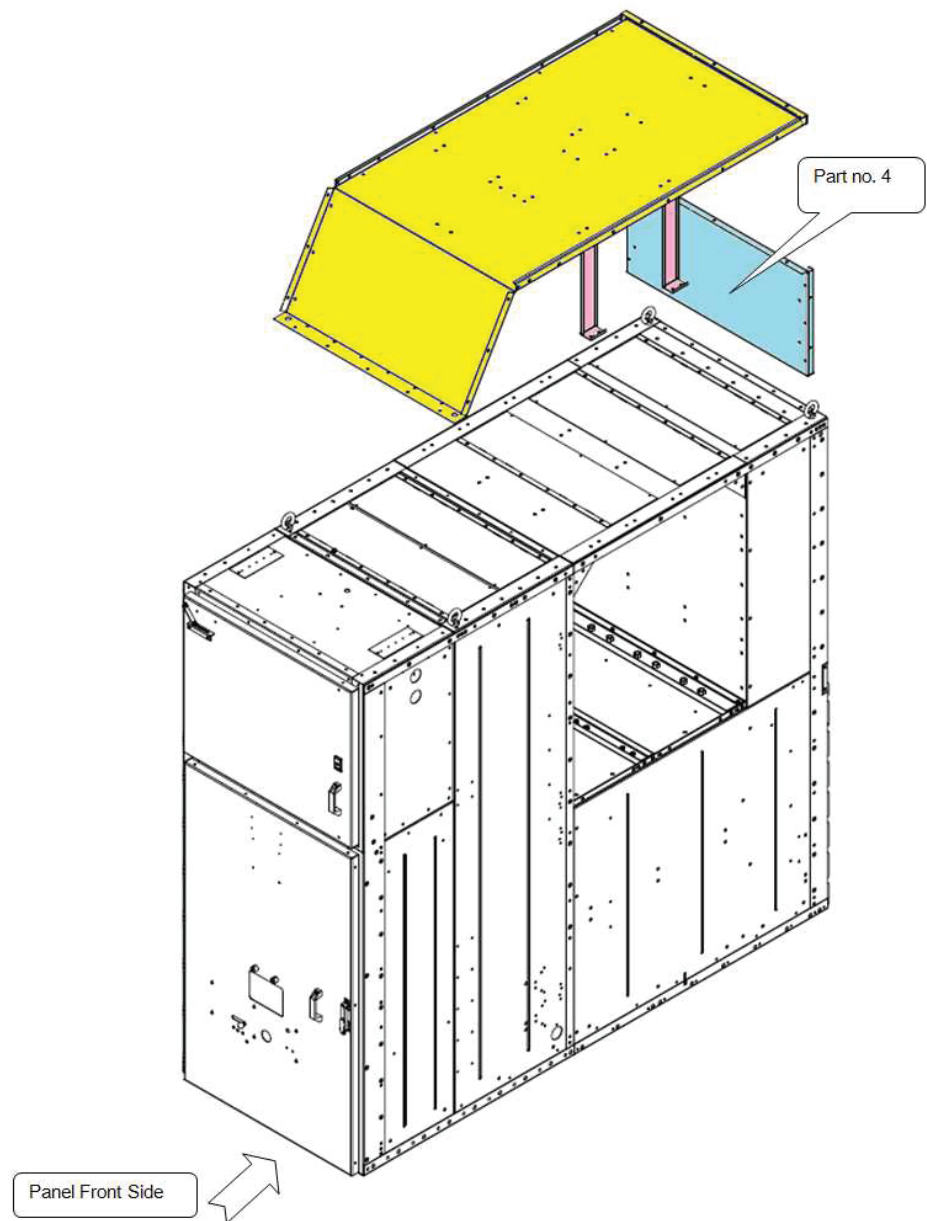
1. Top Duct Assembly for each individual panel.

First assemble the top duct of the panel as per the order mentioned below.

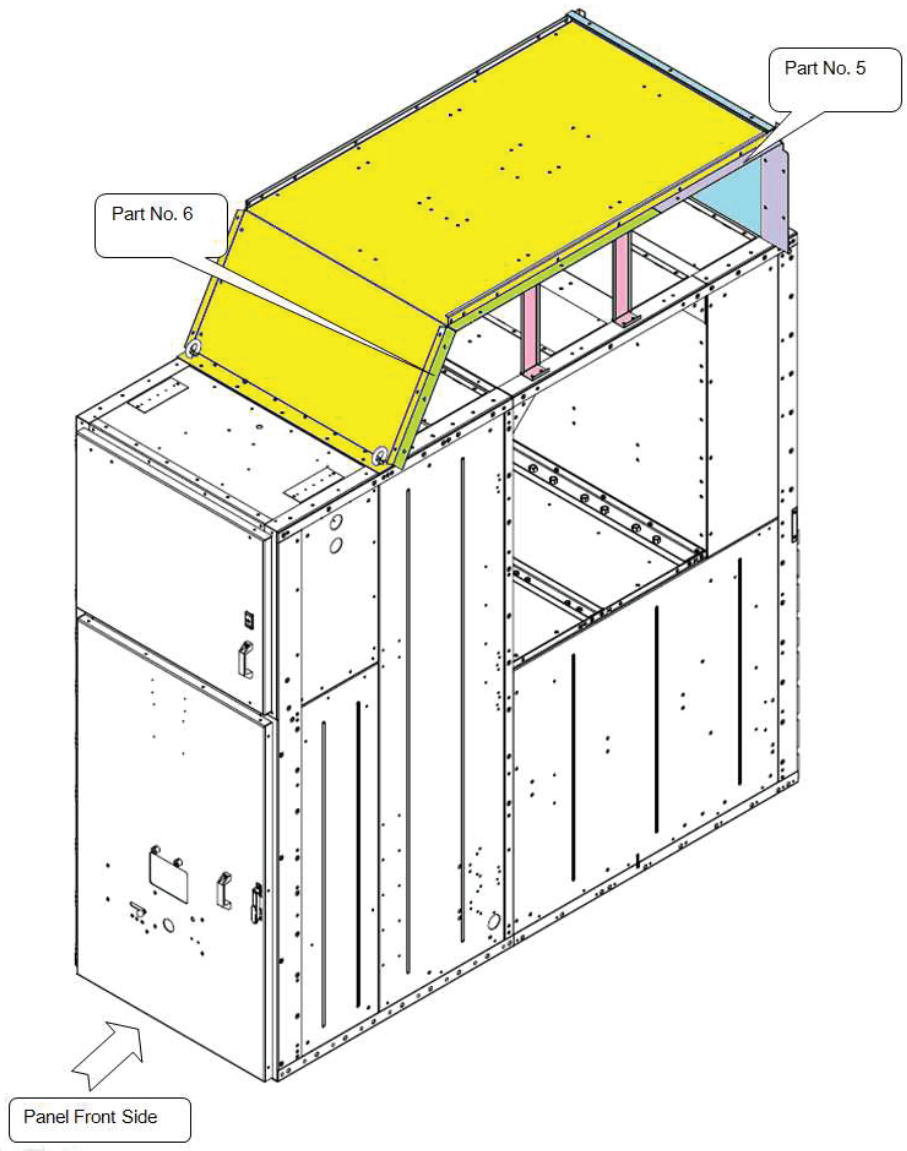
- a. Part No.1 - 1 Quantity
- b. Part No.2 - 4 Quantity
- c. Part No.3 - 1 Quantity



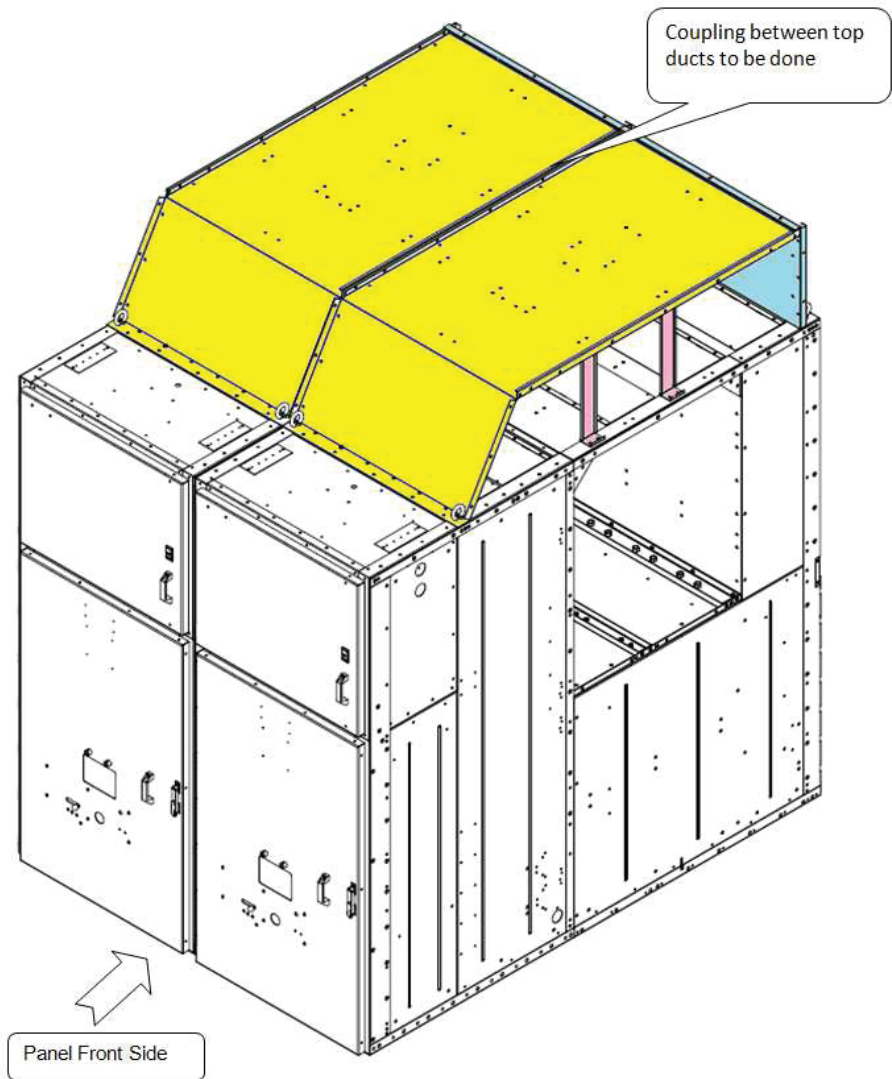
2. Start from one end of the switch board, assemble the rear support (Part No. 4) on the panel. Then mount the assembled top duct on top of the panel as shown.



3. Assemble the coupling joints (Part No.5 & 6) under the top duct towards the side of the adjacent panel as shown.

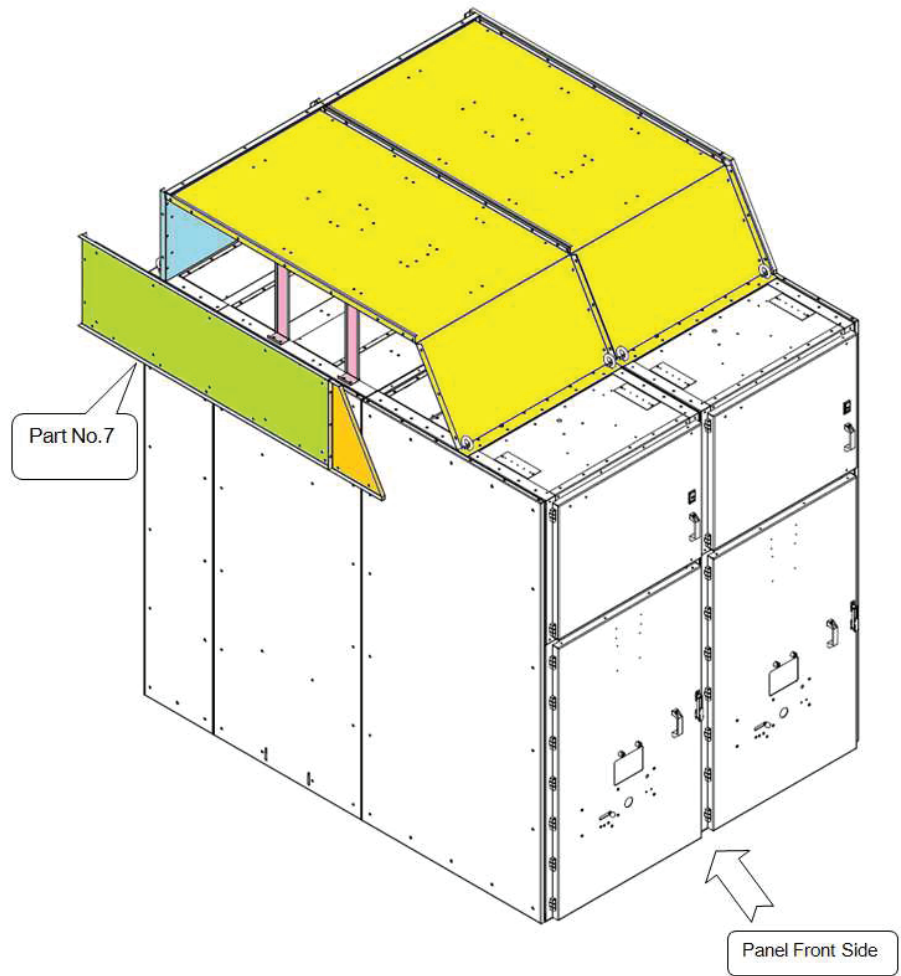


Next repeat Step 1 & 2 for the adjacent panel. Then couple together the top ducts of the two adjacent panels.

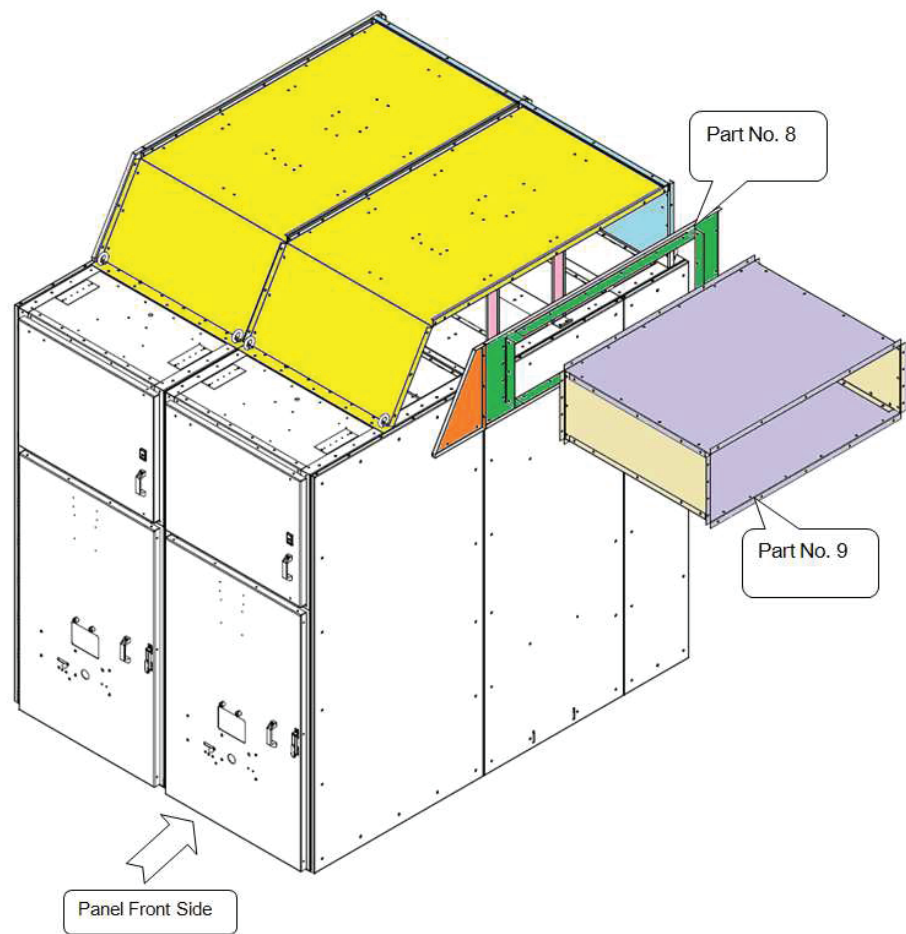


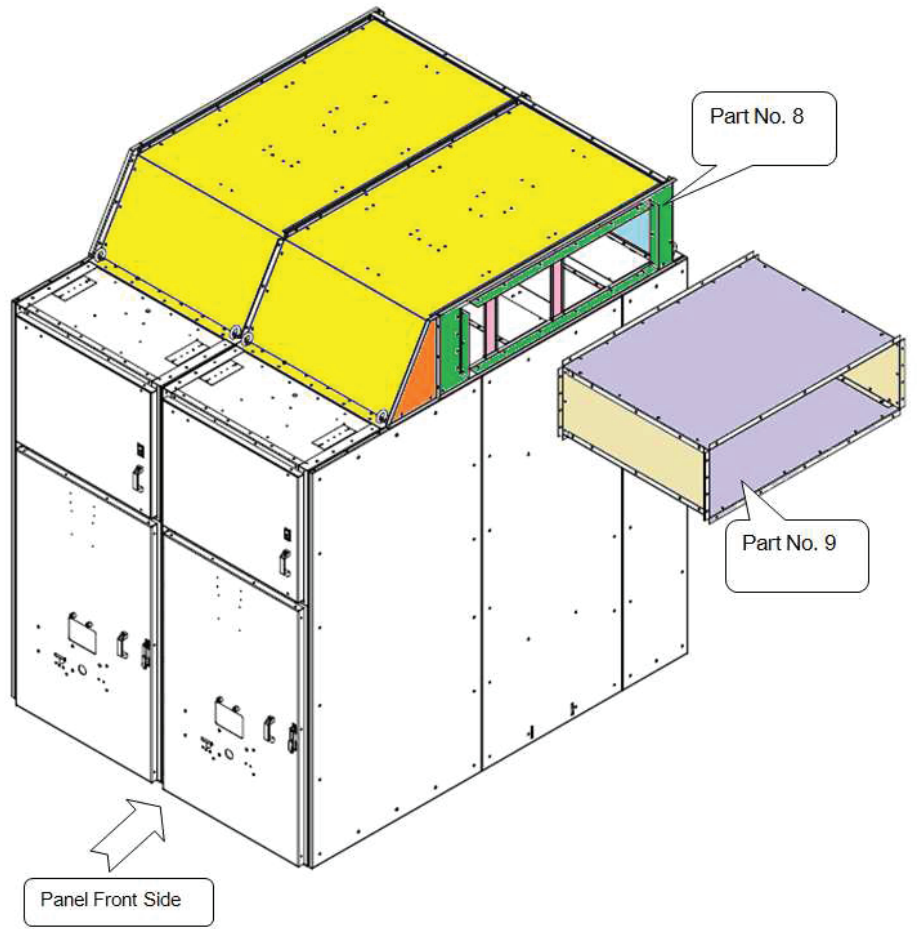
4. Determine on which side – left or right – the tunnel would exit. The tunnel end cover would be on the opposite side.

Assemble the tunnel end cover (Part No.7) with the top duct on the side as shown.

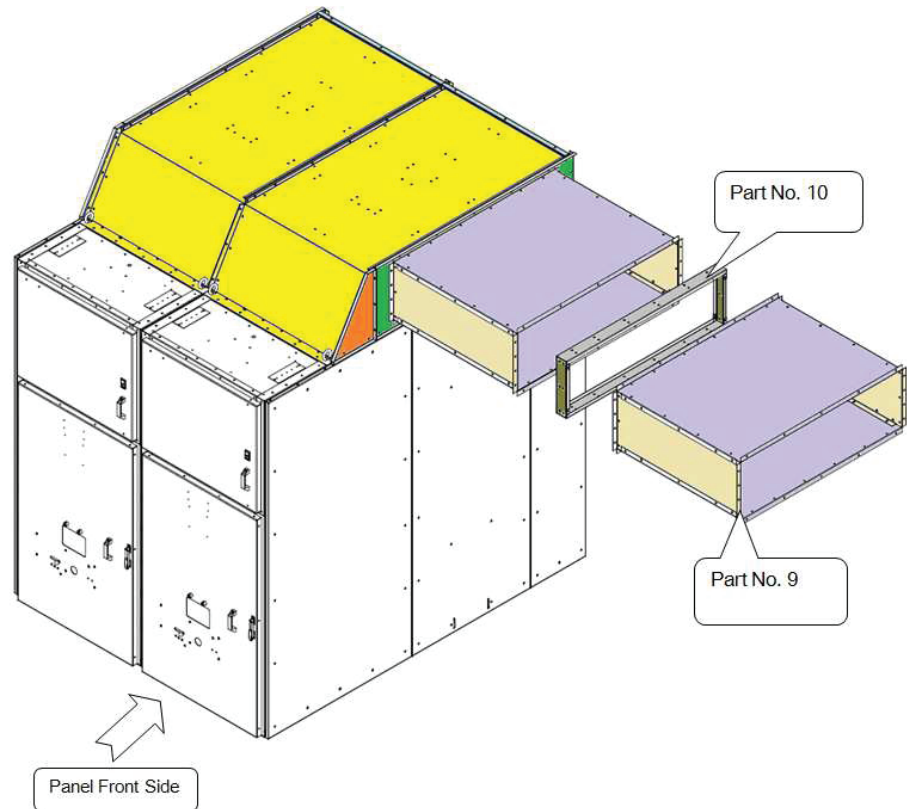


5. Towards the tunnel exit, first assemble the extension cutout for duct (Part No.8) with the top duct and then assemble to it the duct of 1m length (Part No.9) as shown.



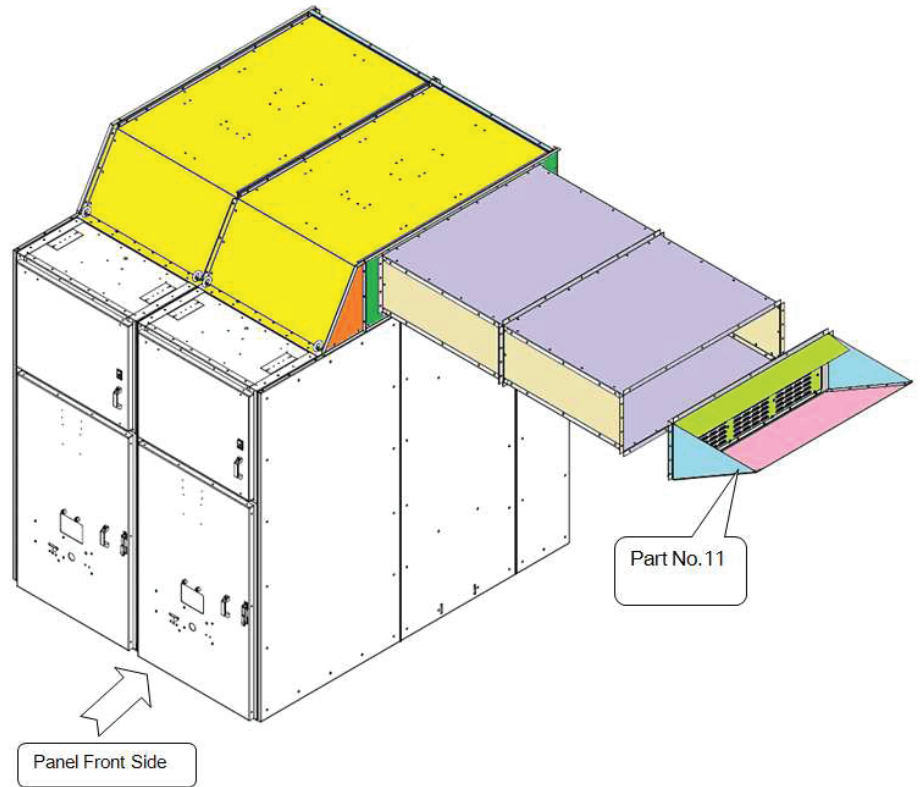


- Next assemble the Duct to Duct Joint (Part No.10) under the duct before assembling another duct of 1meter length (Part No.9) as shown.

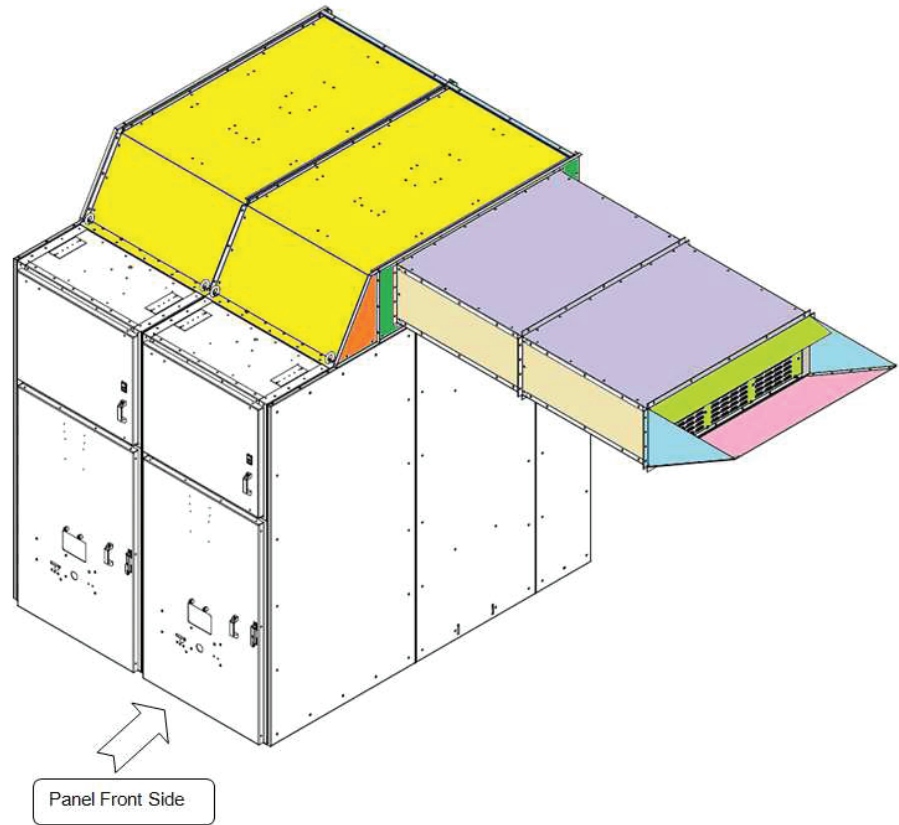


NOTE: The manufacturer recommends a minimum duct length of 2 meter. If the duct is longer than 2 meter then follow the same procedure as given in Step 5 for each successive duct.

7. Next assemble the angular duct with flap (Part No.11) at the end of the duct as shown.

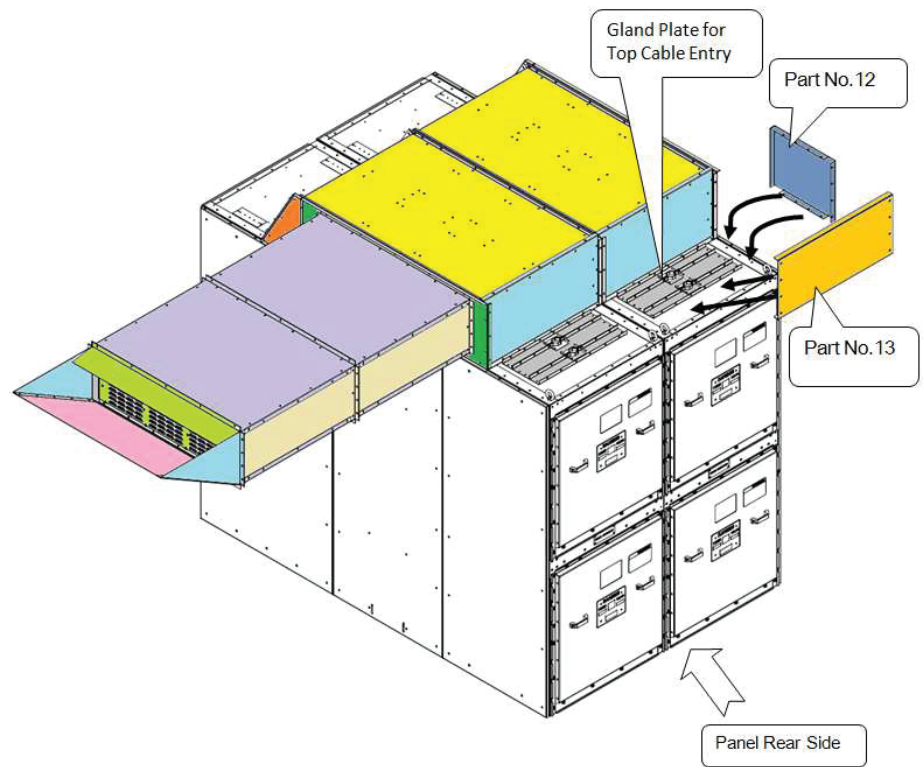


The complete assembly will be as shown below.

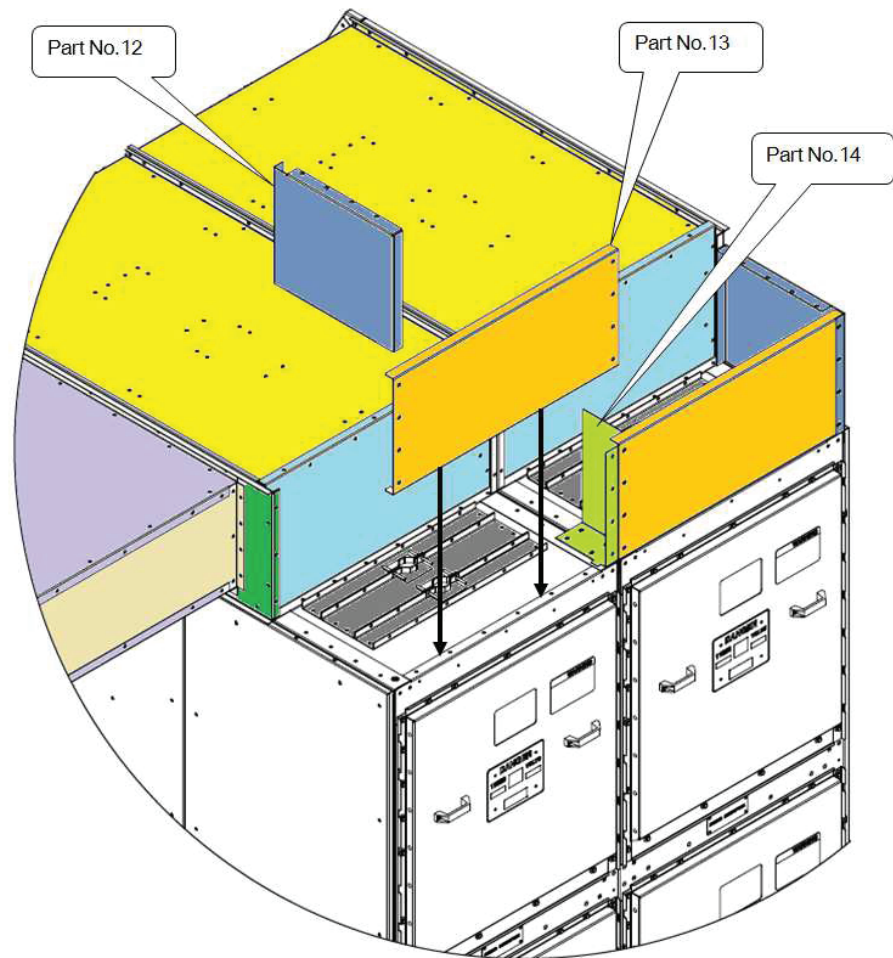


8.

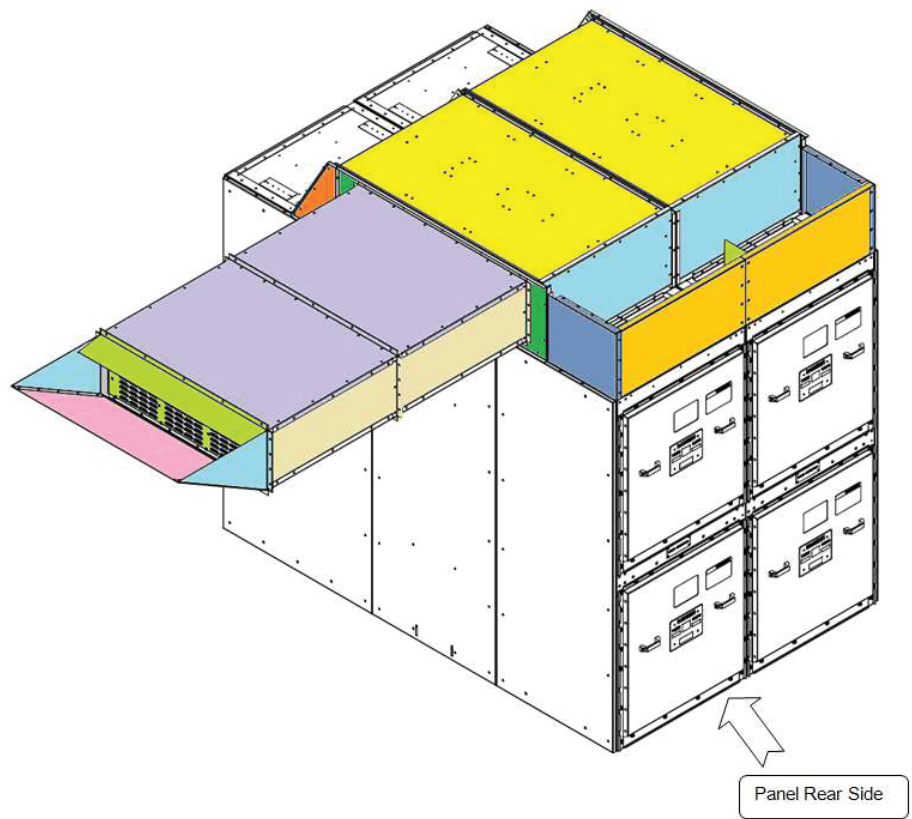
NOTE: The below steps are additional for Top Cable Entry Panel only.
Assemble the vertical side deflector (Part No.12) and rear end vertical deflector (Part No.13) behind the gland plate for top cable entry as shown.



9. If the adjacent panel is a Top Cable Entry panel then first assemble the rear support (Part No.14) and then assemble the rear end vertical deflector (Part No.13) and finally the vertical side deflector (Part No.12).



If the adjacent panel is not a Top Cable Entry Panel then assemble another vertical side deflector (Part No.12) only. The complete assembly will be as shown below.



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

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VDRB05981-03