AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE	PAGE OF PAGES	
	1	6

2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO.(If applicable)
0007	12-Apr-2009		

6. ISSUED BY CODE W917PM	7. ADMINISTERED BY (If other than item 6) CODE
AFGHANISTAN ENGINEER DISTRICT US ARMY CORPS OF ENGINEERS KABUL APO AE 09356	**See Item 6**

8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code)		
	X	9A. AMENDMENT OF SOLICITATION NO. W917PM-09-R-0028
	X	9B. DATED (SEE ITEM 11) 27-Dec-2008
		10A. MOD. OF CONTRACT/ORDER NO.
		10B. DATED (SEE ITEM 13)
CODE FACILITY CODE		

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

[X] The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offer [ ] is extended, [X] is not extended.

Offer must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended by one of the following methods: (a) By completing Items 8 and 15, and returning 1 copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

[ ] A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.

[ ] B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(B).

[ ] C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:

[ ] D. OTHER (Specify type of modification and authority)

E. IMPORTANT: Contractor [ ] is not, [ ] is required to sign this document and return _____ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

1. The purpose of this Amendment is to provide Question and Answers, revise Section 00010 Proposal Schedule, add subCLIN 0003AT Security Administration, CLIN 0008 Additional General Warehouse and Attachment Switch Gear Information, PDF File IG-123 GE Verison 03. See next pages.

2. The cut off date for receiving questions by this office is 16 April 2009.

3. The proposal due date remains unchanged: 30 April 2009, NOT LATER THAN 5:00PM Kabul Time. NO LATE PROPOSALS SUBMISSIONS WILL BE ACCEPTED.

4. Contractors must provide acknowledgement of all Amendments.

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER (Type or print)		16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) TEL: EMAIL:	
15B. CONTRACTOR/OFFEROR (Signature of person authorized to sign)	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA BY (Signature of Contracting Officer)	16C. DATE SIGNED 12-Apr-2009

SECTION SF 30 BLOCK 14 CONTINUATION PAGE

SUMMARY OF CHANGES

SECTION SF 30 - BLOCK 14 CONTINUATION PAGE

The following have been modified:
BLOCK 14 CONTINUATION PAGE

1. Section 00010 Proposal Schedule is revised as follows:

SubCLIN 0003AT is added Security Administration 1 LS
CLIN 0008 is added Additional General Warehouse 1 LS

QUESTIONS/ANSWERS:

1. Question: Please provide the manufacturer name, model # and power rating for the existing Power Plant switchgear so we can provide the proper equipment for extension of the additional base and future loads.

1. Answer: See attachment for Switchgear information, PDF file IG-123-GE Version 03, (ig3_gb.pdf).

2. Question: Amendment 0006, page 2 of 31, Item 4 states, "Contractors should review Amendment No. 0006 and submit technical and price proposals to the attention of Ms. Demeteria Chunn." Please clarify if we are required to resubmit **the entire technical and pricing proposal** or just the items which have changed, ie, the construction schedule on the technical portion and the Price Schedule for the pricing proposal.

2. Answer: Amendment 0006 requires submittal of a complete revised technical and price proposal. The technical preparation requirements remain unchanged.

3. Question: Amendment 0006 Scope of work paragraph 4.30 says design and construct a total 320 SM security administrations building, but proposal schedule does not contain CLIN item for this building to put the cost for. Please clarify.

3. Answer: Amendment with a revised Bid Schedule will add a CLIN for the Security Administration building.

4. Question: Scope of work paragraph 4.19 Says design and construct a 466 SM toilet, shower, ablution and laundry building according to the number of the personal that lived in open bay barracks
(600 person) the building with 466 SM area is not enough and also the fixtures shown in this building is not sufficient, Do we estimate the area and the fixtures according to the building code (1:12) or can you provide us the requirements?

4. Answer: The customer is aware of the difference between the design and the ratio to soldier count. Contractor is only required to build the 466SM Latrin,shower,ablution,laundry building as shown in the Appendix.

5. Question: Are you allowing other contractors who were not present in the first round to bid? I mean are you doing it all over again?

5. Answer: Amendment 0006 is restricted to contractors that previously submitted a proposal on 5 February 2009. Contractors should review Amendment 0006 and submit complete revised technical and price proposals (no cut sheets) to the attenion of Ms. Demetria Chunn. Proposals may be left at the Qalaa House Compound guard gate. No proposals will be received after due date and time of 30 April 2009, 5:00 PM Kabul time. Proposals from contractors that did not submit proposals on 5 February 2009 will be not accepted and/or evaluated.

SECTION 00010 - SOLICITATION CONTRACT FORM

The following have been modified:
SECTION 00010

SECTION 00010
PROPOSAL SCHEDULE

Provide a price for all items, including those labeled, "Optional Items." The Government will evaluate the Contractor's entire proposal to determine which CLINs represent the best value to the Government.

No.	*Description*	*Qty*	*Unit*	*Unit Price*	*Total Amount*
1. Base Proposal:					
0001	**Design Program:**				
0001AA	Site Survey / Master Planning A & E Design	1	LS	xxx	$_____
0001AB	As-Built Drawings	1	LS	NTE (Not to Exceed)	**$20,000**
Sub-Total Design Program:					**$_____** (Including NTE Amount)
0002 Site Development / Improvements:					
0002AA	Mobilization, Demobilization, Field Office, and General Site Work	1	LS	xxx	$_____
0002AB	Security Measures	1	LS	xxx	$_____
0002AC	Wadi Diversion/ Mitigation	1	LS	xxx	$_____
0002AD	Potable Water Supply System	1	LS	xxx	$_____
0002AE	Sanitary Sewer and Treatment System	1	LS	xxx	$_____
0002AF	Site Electrical Distribution System	1	EA	$_____	$_____
0002AG	Perimeter Wall/Fencing	1	LS	xxx	$_____

0002AH	Primary ECP	1	EA	$_____	$_____
0002AJ	Guard Towers	8	EA	$_____	$_____
0002AK	Access Road to the Camp (Paved finish)	1	LS	xxx	$_____
0002AL	Camp Inside Roads, and Walkways (Paved finish)	1	LS	xxx	$_____
0002AM	Trash Collection Points	7	EA	$_____	$_____

Sub-Total Site Developments / Improvements: **$_____**

0003 Buildings & Building Complexes:

No.	*Description*	*Qty*	*Unit*	*Unit Price*	*Total Amount*
0003AA	BOQ Barracks	3	EA	$_____	$_____
0003AB	Enlisted Open Bay Barracks	6	EA	$_____	$_____
0003AC	Dining Facility with Storage Yard	1	EA	$_____	$_____
0003AD	Battalion HQs Buildings	1	EA	$_____	$_____
0003AE	ToiletShowerAblutionLaundry Facility	1	EA	$_____	$_____
0003AF	Vehicle Refueling Point	1	EA	$_____	$_____
0003AG	Motor Pool Gravel Parking	1	LS	xxx	$_____
0003AH	CSB Vehicle Maint Bldg (9 Double Bay)	1	EA	$_____	$_____
0003AJ	Communication Building	1	EA	$_____	$_____
0003AK	POL Storage	1	EA	$_____	$_____
0003AL	General Warehouse Storage	1	EA	$_____	$_____
0003AM	Arms Storage Building	1	EA	$_____	$_____
0003AN	Vehicle Wash Rack	1	LS	xxx	$_____
0003AP	Non-Organic Veh Maint. (9 Double Bay)	2	EA	$_____	$_____
0003AQ	Bunkers	8	EA	$_____	$_____
0003AR	GSE Comm. and Armament Maint.	1	LS	xxx	$_____
0003AS	Temporary Life Support Facilities	1	LS	xxx	$_____
0003AT	Security Administration	1	LS	xxx	$_____

Sub-Total Buildings & Building Complexes: **$_____**

0004	DBA Insurance	1	LS	xxx	$_____

TOTAL BASE BID ITEMS: **$_____**
(Including NTE Amount)

2. Optional Bid Items:

0005	MWR GYM and outside Volleyball	1	LS	xxx	$_____
0006	Irrigation System for Camp Gamberi	1	LS	xxx	$_____
0007	Non-Organic Veh Maint (9 Double Bay)	1	LS	xxx	$_____
0008	Additional General Warehouse	1	LS	xxx	$_____

TOTAL ALL OPTIONAL BID ITEMS: **$_____**

TOTAL PROPOSAL: **$_____**
(total of all above costs – Base and all Options including NTE)

PROPOSAL SCHEDULE NOTES

1. Offeror shall submit prices on all items. Scope of work on each items are described in Section 01010.

2. Only one contract for the entire schedule will be awarded under this solicitation. This project will be awarded as a lump sum contract. This Proposal Schedule is an accounting tool for allocating funds to applicable budget.

3. Costs associated with this project shall include design and construction costs, site development, and utility installation.

4. DESIGN COSTS DEFINITION: Design costs shall consist of design analysis, drawings, and specifications of all facilities.

5. COST LIMITATION: The established design cost limitation for all Design Costs, as defined in paragraph 4, shall not exceed 6 percent of the total construction cost.

6. The government has the right to reduce the number of units in a bid item or choose to delete a base bit item entirely if necessary after the proposals are received.

7. EVALUATION OF OPTIONS: The award will be made to the offeror whose proposal represents the best overall value to the Government. For pricing purposes the Government will evaluate both the Base Proposals and Option Proposals. The Government is not obligated to exercise the options.

8. EXERCISE OF OPTIONAL BID ITEMS: Optional bid items (if any) may, at the option of the Government, be added to the contract at any time within 120 calendar days after receipt of the notice to proceed for Base Proposal.

9. ORDER of WORK: The following order of work shall apply before start of optional bid items:
All base bid contract line items have priority.

11. Period of performance is per Section 01010 Scope of Work – 5.0 Completion of Work, from receipt of notice to proceed; Liquidated damages are assessed at $**3,291.90 per day** for every day of delay past the period of performance as stated per Section 01010 Scope of Work – 5.0 Completion of Work until contract completion for either the Base Items or the Optional Items whichever is applicable.

-END OF SECTION-

(End of Summary of Changes)

ORMAZABAL

IG-123-GB
version 03

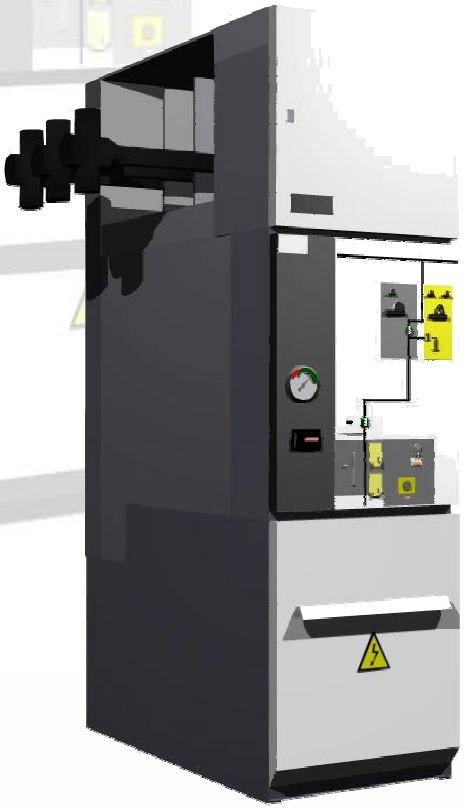
General Instructions

CPG.0

SF_6 INSULATED MEDIUM VOLTAGE GIS TYPE MODULAR CUBICLES

LIB

25.02.2008



Transformer Substations | Secondary Distribution Switchgear | **Primary Distribution Switchgear** | Protection and Automation | Low Voltage Boards | Distribution Transformers

Legal Deposit: BI-0046/08

ATTENTION!

Whilst the MV equipment is in operation, certain parts are electrified, others may be moving and some may reach high temperatures. As a result, there may be electrical, mechanical and thermal risks involved when handling it.

In order to ensure an acceptable level of protection for persons and things, and taking into account the applicable guidelines in terms of the environment, Ormazabal designs and manufactures its products in adherence with the principle of integrated safety, based on the following criteria:

- ***Elimination of all dangers where possible.***
- ***When this is not technically and economically feasible, incorporation of suitable protection in the equipment itself.***
- ***Provision of information on the risks involved in order to enable the implementation of risk-preventative operational procedures, training of the operational personnel in carrying these out, and the use of suitable personal protection equipment.***
- ***The use of recyclable materials and establishment of handling procedures for the equipment and components which, once at the end of their life, are handled in such as way as to respect the environmental criteria as laid down by the competent organisations as closely as possible.***

As a result, section 11.2 of the forthcoming standard IEC 62271-1 has been taken into consideration for the equipment in this manual, and only adequately trained and supervised personnel may work with the equipment, as per EN 50110-1 and EN 50110-2 standards on the operation of electrical installations applicable to all operations on, and around, electrical installations. The personnel must also be familiarised with the instructions and warnings contained in the manual as well as those pertaining to current legislation.

The above information must be carefully observed, as the correct and safe operation of this equipment does not only depend on its design, but also on the general circumstances that are beyond the control and responsibility of the manufacturer, in particular:

- ***The transportation and handling of the equipment from the factory outlet to the place of installation must be carried out appropriately.***
- ***Any intermediate storage must be carried out in conditions that do not alter or deteriorate the characteristics of the assembly, or its essential parts.***
- ***The service conditions must be compatible with the equipment rating.***
- ***Any operations and use must be carried out in strict accordance with the instructions manual, with a clear understanding of the applicable operational and safety principles.***
- ***Maintenance must be carried out properly, taking into account the actual service and environmental conditions in the place of installation.***

As such, the manufacturer cannot be held responsible for any significant indirect damages resulting from any violation of the guarantee, under any jurisdiction, including loss of profits, periods of inactivity, costs associated with the repair and replacement of materials.

Guarantee

The manufacturer guarantees this product against any defect in the materials and operation for the duration of the contractual period. If any defect is detected, the manufacturer may opt to either repair or replace the equipment. Any inappropriate handling of the equipment, as well as any repairs carried out by the user will be considered as a violation of the guarantee.

Registered Trademarks and Copyrights

All the registered trademarks cited in this document are the property of the respective owners. The intellectual property of this manual belongs to the manufacturer.

Due to the constant updating of the standards and new designs, the characteristics of the parts contained in these instructions are subject to change without prior notice.

These characteristics, as well as the availability of the materials, can only be considered as valid when confirmed by Ormazabal's Technical – Commercial Department.

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1. OVERVIEW AND MAIN FEATURES

The **CPG** system is a set of SF_6 gas-insulated, GIS-type, modular cubicles, for primary distribution electrical applications in Medium Voltage networks up to 36 kV, designed in accordance with IEC 62271-001/200/100/102/105.

The **CPG.0 range** consists of the following functional units:

- **CPG.0-V: Circuit Breaker**
  - Main Transformer Protection
  - Line protection
  - Capacitor Bank Protection
  - Auxiliary Service Transformer Protection
- **CPG.0-C: Busbar Coupling**
  - Longitudinal Busbar Coupling
- **CPG.0-S: Disconnector**
  - Line/Transformer Disconnection
  - Busbar Voltage Metering
- **CPG.0-F: Fuse Protection**
  - Auxiliary Service Transformer Protection

1.1. COMPONENTS OF THE CUBICLE

The cubicle is made up of a series of independent compartments:

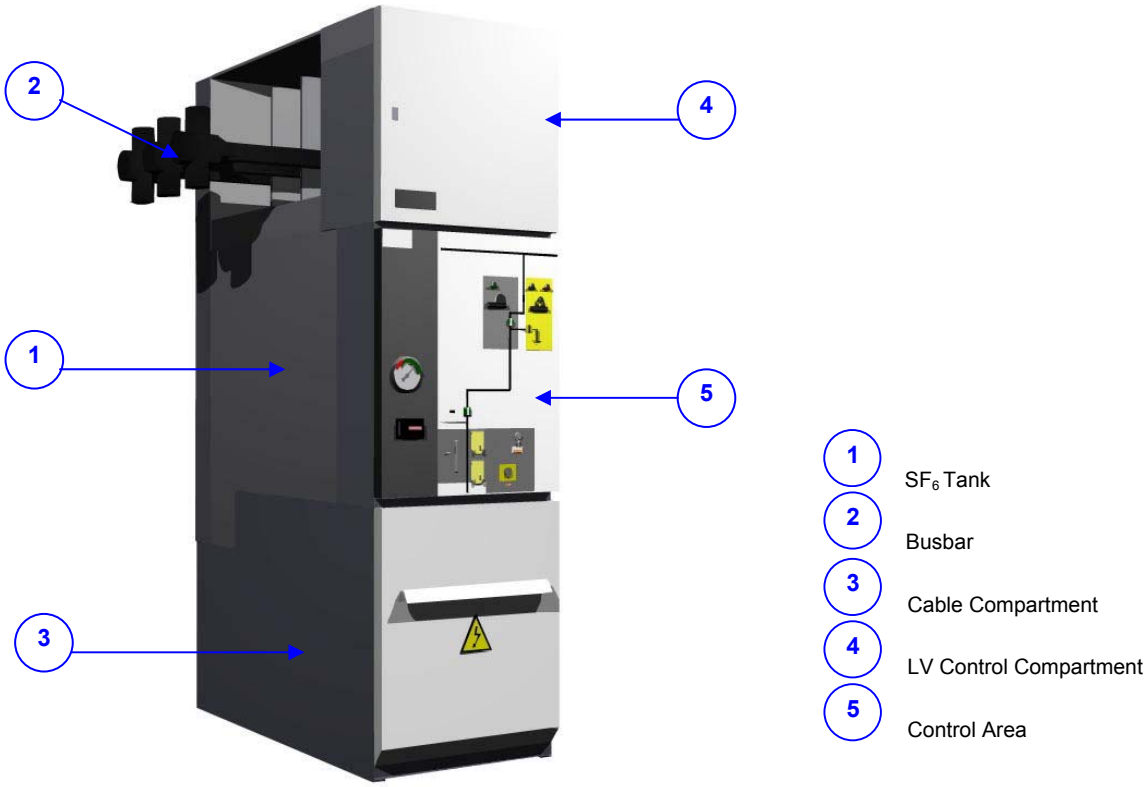


Figure 1.1: *Main elements of CPG.0 cubicles*

1 ***Tank:*** leak-proof compartment housing the switching and breaking switchgear, using SF_6-gas as the isolating medium.

Depending on the function for which the cubicle has been designed, the following components are installed inside:

- Internal busbar and connections
- Three-position disconnector
- Vacuum circuit breaker
- Fuse-holder tubes

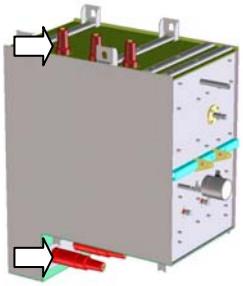


Figure 1.2: *Bushing position in tank*

There are bushing assemblies at the top and bottom of the tank, thus enabling the connection of the busbar and the voltage cables respectively.

A temperature-compensated pressure gauge is fitted in each cubicle to **check the gas pressure**, with one potential free-contact, that may be used as a remote alarm or position lock/trip.

2 ***Busbar:*** it is used for connecting the cubicles. It has solid and shielded insulation with earthing through a compartment-specific earthing bar, and is made up of a fully assembled, factory-tested kit.

The busbar forms a phase-to-phase segregated device thanks to the set of earthed metal plates (metal-clad device).

Optionally, toroidal current transformers and/or plug-in voltage transformers can be installed in this compartment, thus avoiding the need for metering cubicles.

Figure 1.3: *Phase segregation in busbar*

3 ***Cable compartment:*** this is located at the bottom of the cubicle and is fitted with a cover interlocked with the earthing circuit, thus allowing front access to the medium voltage cables.

In the worst case scenario, and as a special **option**, the interior of the base can house the following:

- Phase-segregation device.
- 3 screwable shielded terminals per phase, in addition to space for the connection to the corresponding power cables.
- Power cable clamps.
- Earthing bars.
- Toroidal current transformers.
- Plug-in voltage transformers.

Figure 1.4: *Cable compartment phase-segregation (optional)*

All the components of the enclosure are connected to earth by a 200 mm^2 copper bar conductor, designed to withstand the rated short-circuit current. It is located in the base and therefore does not require disassembling in order to insert or take out a cable and its terminal.

4 ***Control Compartment:*** this is located at the top of the cubicle separated from the medium voltage area. It is designed to house the metering equipment and protection relays. It contains the complete terminal block for control signals duly identified.

Figure 1.5: *Connectors for assembling the control box*

Figure 1.6: *Layout of the terminal blocks inside the control box*

5 ***Control Area:*** in addition to a cubicle-specific synoptic diagram, the following operating elements are located in the central part of the cubicle: switch-disconnector and circuit breaker driving mechanisms, circuit breaker open/close push buttons, status indicators, slot for access to the spring loading lever, etc.

- **CPG.0-S: Disconnector**

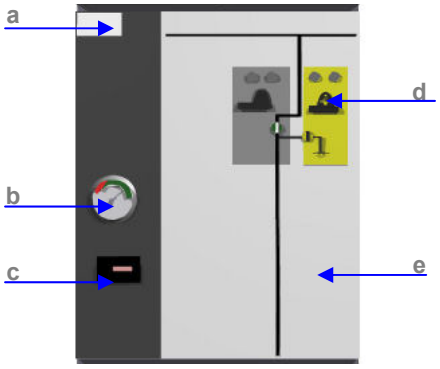


Figure 1.7: *Synoptic of CPG.0-S cubicle for 1250 A*

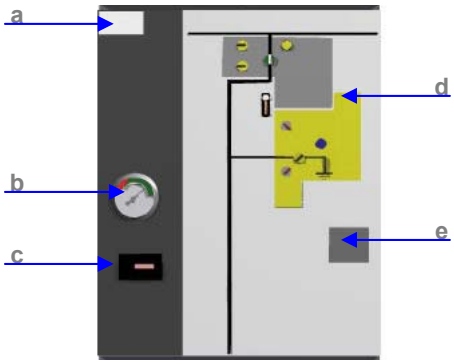


Figure 1.8: *Synoptic of CPG.0-S cubicle for 1600 A*

where:

a: Characteristics plate
b: Pressure gauge window
c: ekorIVDS Voltage Presence-Absence Detector
d: Operation area:

- GREY for Disconnector
- YELLOW for Earthing Switch

e: Operation Sequence plate

- **CPG.0-V: Circuit-Breaker**

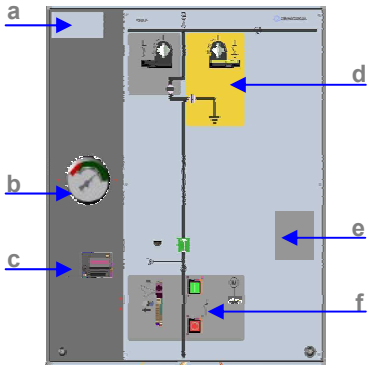


Figure 1.9: *Synoptic of CPG.0-V cubicle for 630 A*

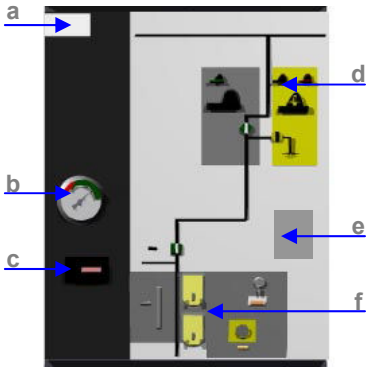


Figure 1.10: *Synoptic of CPG.0-V cubicle for 1250 A*

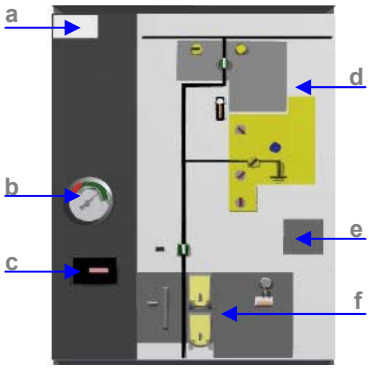


Figure 1.11: *Synoptic of CPG.0-V cubicle for 1600 A*

where:

a: Characteristics plate
b: Pressure gauge window
c: ekorIVDS Voltage Presence-Absence Detector
d: Control area:

- GREY for Disconnector
- YELLOW for Earthing Switch

e: Operation Sequence plate
f: Circuit Breaker Operation Area

- **CPG.0-C: Busbar Coupling**

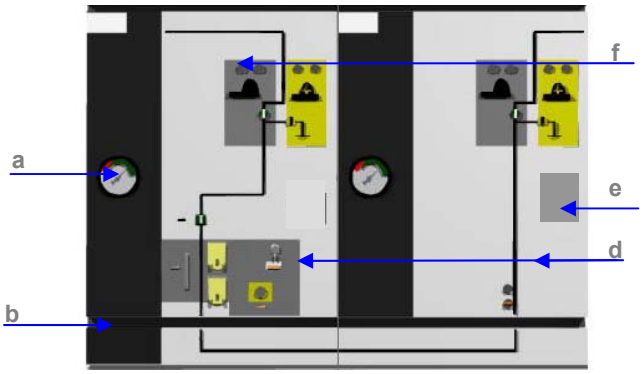


Figure 1.12: *Synoptic of CPG.0-C cubicle for 1250 A*

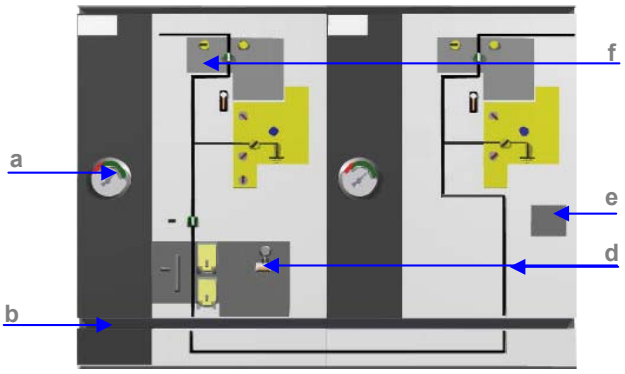


Figure 1.13: *Synoptic of CPG.0-C cubicle for 1600 A*

where:

a: Characteristics plate
b: Pressure gauge window
d: Control area:

- GREY for Disconnector
- YELLOW for Earthing Switch

e: Operation Sequence plate
f: Circuit Breaker Operation Area

- **CPG.0-F: Fuse Protection**

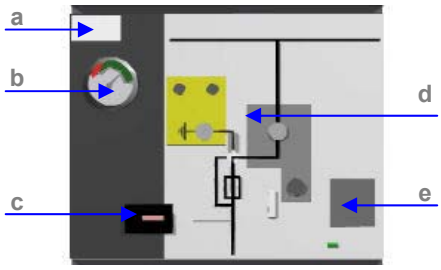


Figure 1.14: *Synoptic of CPG.0-F cubicle*

where:

a: Characteristics plate
b: Pressure gauge window
c: ekorIVDS Voltage Presence-Absence Detector
d: Control area:

- GREY for Disconnector
- YELLOW for Earthing Switch

e: Operation Sequence plate

1.1.1. ekorIVDS Voltage Presence - Absence Detection Unit

Ormazabal's **ekorIVDS** voltage presence-absence detector is designed and built in compliance with the recommendations specified in **IEC 61243.T, VDE 0682 Part 415** and **IEC 61958**, in the category of integrated detectors without an auxiliary power supply.

The unit has three indication lights corresponding to the L1, L2 and L3 phases. There is a test point for each of the phases and earth on the front of the display device, which allows to check the phases comparison. The use of any universal phase comparator complying with IEC 61243-5 is recommended.

The detection unit has the ekorRTK unit as an option, which, using the same signal as ekorIVDS, provides free auxiliary contact for each phase for the remote signalling of the voltage presence-absence display.

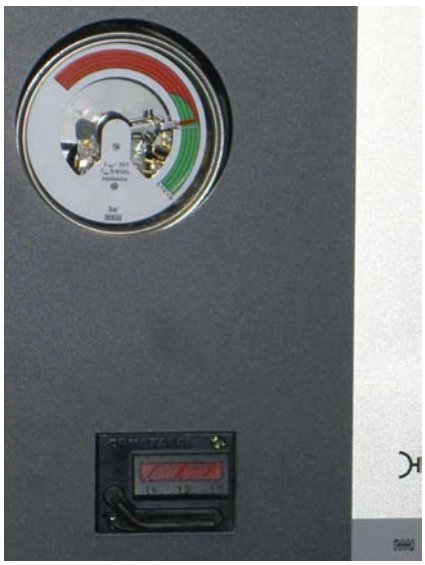


Figure 1.15: *ekorIVDS in CPG.0 cubicle*

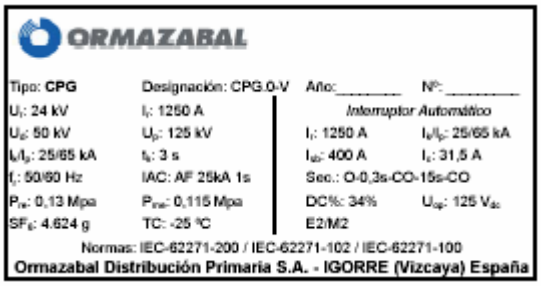
The ekorIVDS device display is defined in compliance with the requirements specified in IEC 61243-5:

Absence of Voltage	Uncertainty	Presence of Voltage
$U < 10\% U_r$	$10\% U_r < U < 45\% U_r$	$U > 45\% U_r$

*U_r, service rated voltage.
U, phase-to-earth voltage.

The presence of voltage is displayed by activating the leds of each phase with a flashing frequency of over 1 Hz. If no voltage presence is detected the leds of each phase remain switched off.

1.1.2. Characteristics Plate



1.2. SERVICE CONDITIONS

Installation	Indoor
Maximum ambient temperature	+ 40 ºC[a]
Minimum ambient temperature	- 25 ºC[b]
Maximum average temperature, measured over a 24 hour period	+ 35 ºC
Maximum average relative humidity, measured over a 24 hour period	< 95%
Maximum average relative humidity, measured over a 1 month period	< 90%
Maximum altitude above sea level	1000 m[c]
Solar radiation	Inconsiderable
Air pollution (dust, salinity, etc.)	Insignificant
Vibrations (seismic)	Inconsiderable

[a] For special operating conditions (maximum ambient temperature above 40 ºC) Ormazabal's Technical - Commercial department should be consulted.

[b] Above the temperature established in IEC 62271-001, which sets the minimum ambient temperature at – 5 ºC.

[c] For higher altitudes Ormazabal's Technical-Commercial department should be consulted.

Note: The above specifications refer to section 2.1.1 "Normal conditions of service for interior switchgear" from IEC 62271-001 "Common specifications for high-voltage switchgear and controlgear standards".

1.3. MECHANICAL FEATURES

1.3.1. Dimensions and Weight

- **CPG.0-S: Disconnector**

Figure 1.16: *CPG.0-S cubicle dimensions*

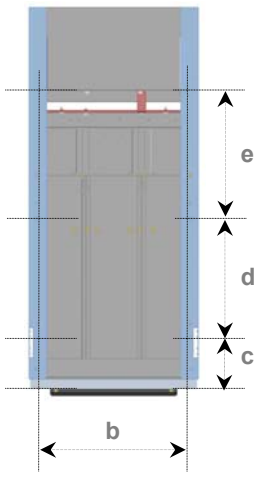


Figure 1.17: *CPG.0-S cubicle anchoring points*

Dimensions [mm]		
Cubicle	*With low control box*	*With high control box*
Width (a)	600	
Depth (f)	1365	
Height (h))	2125	2425
Anchorage		
Level b	540	
Level c	235	
Level d	530	
Level e	430	
Weight [kg]		
Total	< 550	

- **CPG.0-V: Circuit-Breaker**

Figure 1.18: *CPG.0-V cubicle dimensions*

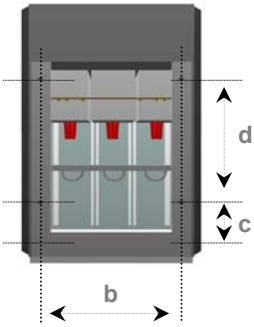


Figure 1.19: *CPG.0-V 630 A cubicle anchoring points*

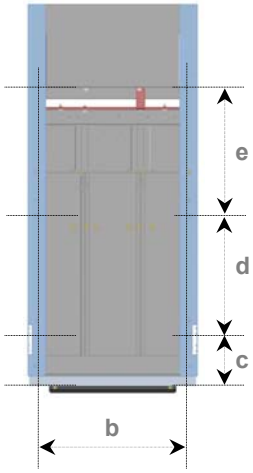


Figure 1.20: *CPG.0-V 1250 / 1600 A cubicle anchoring points*

Dimensions [mm]			
	CGP.0-V 630 A	*CPG.0-V 1250 / 1600 A*	
Celda		*With low control box*	*With high control box*
Width (a)	600	600	
Depth (f)	1015*	1365	
Height (h)	2125	2125	2425
Anchorage			
Level b	540	540	
Level c	235	235	
Level d	530	530	
Level e	-	430	
Weight [kg]			
Total	< 300	< 750	

* Without gas vent

- **CPG.0-C: Busbar Coupling**

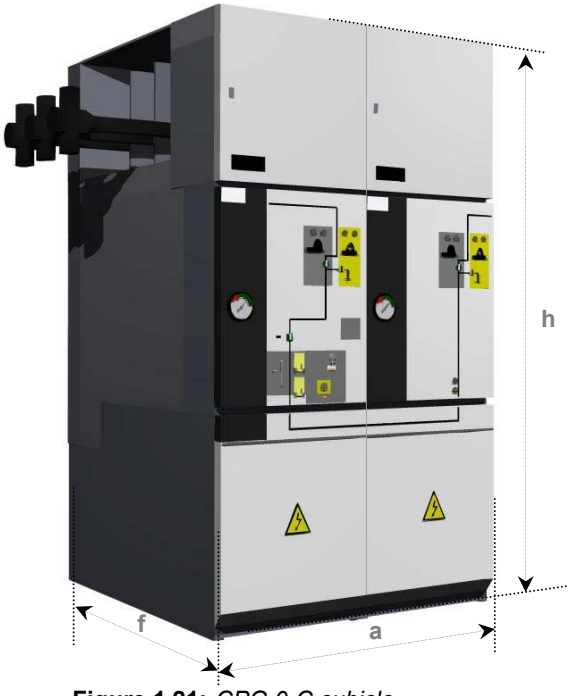


Figure 1.21: *CPG.0-C cubicle dimensions*

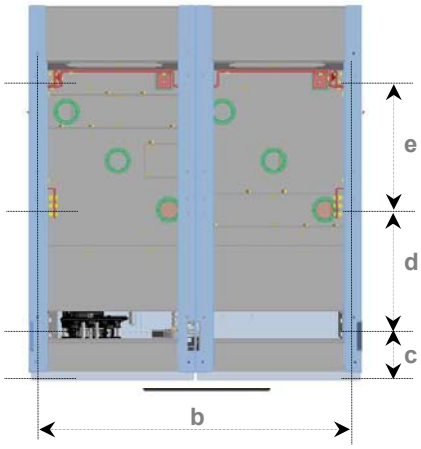


Figure 1.22: *CPG.0-C cubicle anchoring points*

Dimensions [mm]		
Cubicle	*With low control box*	*With high control box*
Width (a)	1200	
Depth (f)	1365	
Height (h)	2125	2425
Anchorage		
Level b	1150	
Level c	235	
Level d	530	
Level e	430	
Weight [kg]		
Total	< 1300	

- **CPG.0-F: Fuse Protection**

Figure 1.23: *CPG.0-F cubicle dimensions*

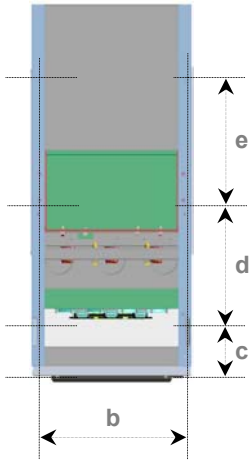


Figure 1.24: *CPG.0-F cubicle anchoring points*

Dimensions [mm]		
Cubicle	*With low control box*	*With high control box*
Width (a)	600	
Depth (f)	1365	
Height (h)	2125	2425
Anchorage		
Level b	540	
Level c	235	
Level d	530	
Level e	430	
Weight [kg]		
Total	< 550	

1.4. MAIN ELECTRICAL CHARACTERISTICS

1.4.1. Voltage

Function	Circuit breaker Disconnector Busbar Coupling Fuse Protection	
Rated [kV]	24	36
Industrial frequency 1 min [kV]		
phase-to-phase and phase-to-earth	50	70
isolating distance	60	80
Lightning impulse [kV]		
phase-to-phase and phase-to-earth	125	170
isolating distance	145	195

1.4.2. Current

For 24 kV	Circuit breaker Disconnector	Busbar coupling	Fuse Protection
Rated [kV]			
General Busbar	1250 / 1600	1250 / 1600	1250 / 1600
Feeder	630 / 1250 / 1600	630 / 1250 / 1600	200
Short circuit [kA – 1/3 s]	25	25	25

For 36 kV	Circuit Breaker Disconnector	Busbar coupling	Fuse Protection
Rated [kV]			
General Busbar	1250 / 1600	1250 / 1600	1250 / 1600
Feeder	630 / 1250	630 / 1250	200
Short circuit [kA – 3 s]	25	25	25

2. TRANSPORT

2.1. LIFTING METHODS

When there is only one **CPG.0** cubicle it can be handled by lifting it (with slings) or with a fork lift truck (with pallet):

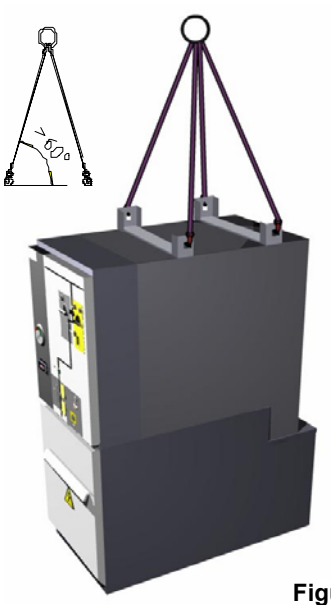


Figure 2.1: Lifting of a CPG.0 cubicle with slings

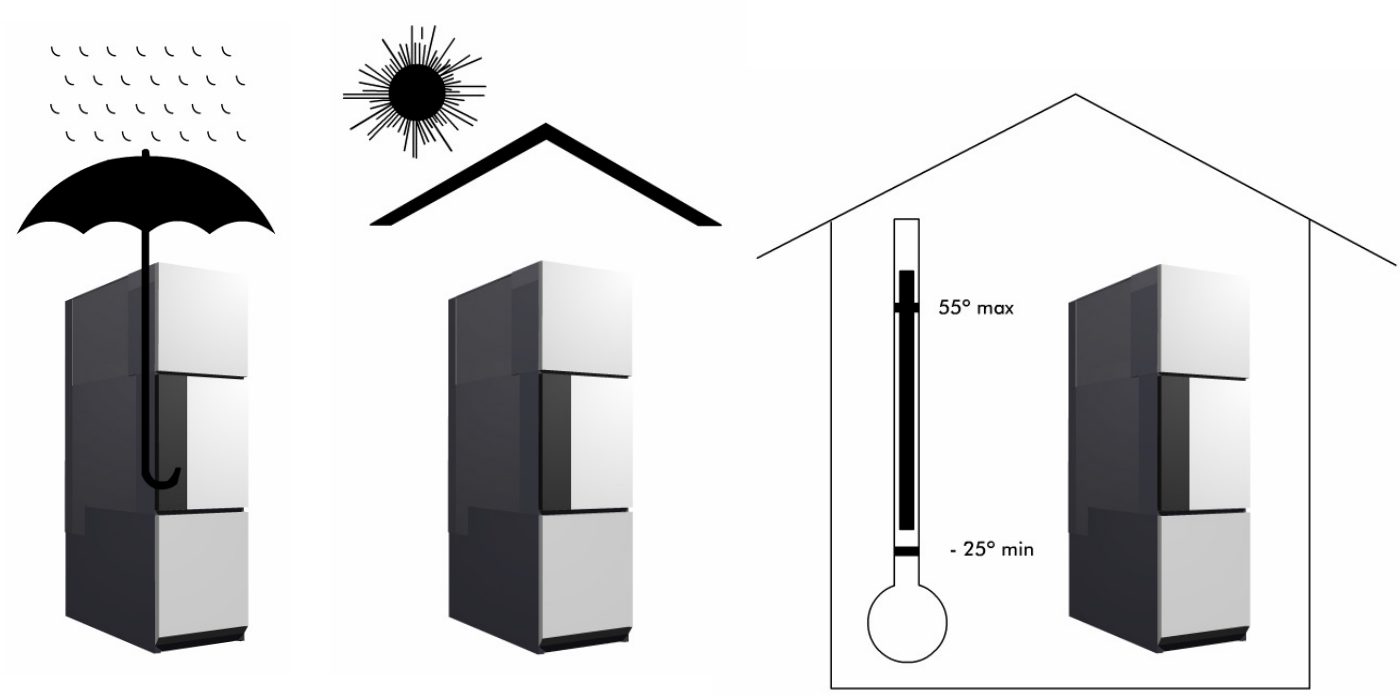
Figure 2.2: *Lifting of a CPG.0 cubicle with a fork lift truck*

To handle the CPG.0-C busbar coupling cubicle, it is necessary to use a special lifting device that Ormazabal will provide during the installation:

Figure 2.3: *Lifting of a CPG.0-cubicle with slings*

Figure 2.4: *Lifting of a CPG.0-C cubicle with a fork lift truck*

3. STORAGE



4. INSTALLATION

4.1. CIVIL WORKS

The minimum distances to the walls and the roof as well as the MV cable trench are the following:

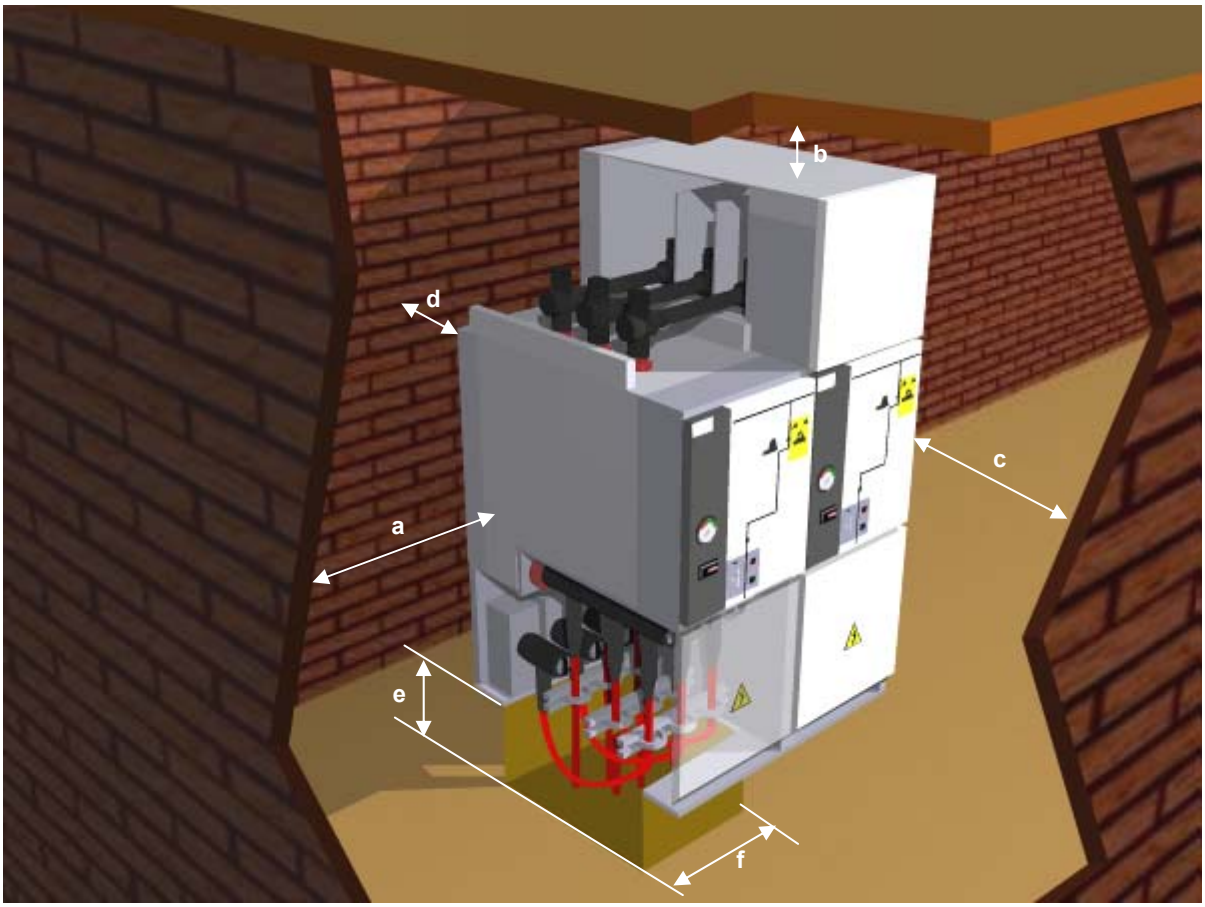


Figure 4.1: *Minimum installation distances*

Minimum distances [mm]		
Cubicle		
Side wall (a)	> 100	
Roof (b)	> 600	
Front corridor (c)	*Operation:* > 1000	*Cubicle extraction:* > 2000
Rear wall (d)	> 100	
Trench		
Depth (e)	> 500	
Width (f)	750 “depending on the cable”	

The trench dimensions depend on the minimum curvature radius of the cables used.

4.1.1. Cubicle Assembly

1: When **CPG.0** cubicles are placed against side walls, at least 100 mm distance must be left between them.

2: The bases of the **CPG.0** cubicle range have two 110 x 35 mm rectangular pipes for the installation of Low Voltage cables and circuits.

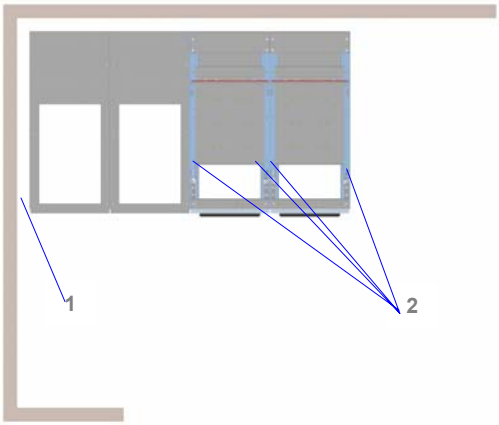


Figure 4.2: *CPG.0 cubicles installation plan view*

3: At the same time, a group of **CPG.0** cubicles is finished off with final side panels that allow to install control and signal cables, etc.

Figure 4.3: *Side panels*

4.2. CONNECTION BETWEEN CUBICLES

The cubicle connection is external to the sealed gas tank, where the rest of the equipment is housed.

The unit consists of three separate insulated and shielded, cylindrical copper busbars. The cubicle connection is made using a section of bars and connectors in T- or L-shape.

The whole assembly is unaffected by dirt and condensations and protected against impacts with a metal cover that also provides it with protection against possible arcs in the busbars.

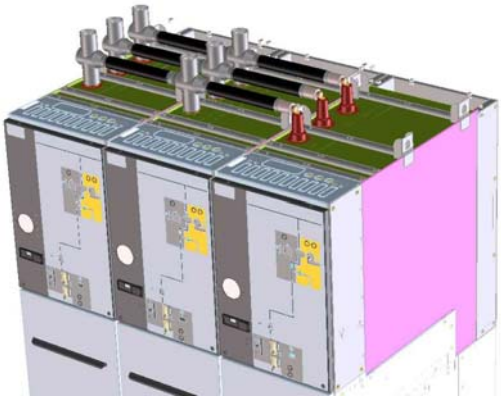


Figure 4.4: *Upper Busbar*

1: Once aligned and levelled, the cubicles are connected mechanically with M8 x 20 nuts and bolts.

The bases have five rivet points on their sides.

- 2 at the front (at the top and at the bottom).
- 2 in the middle (at the top and at the bottom).
- 1 at the back (at the bottom).

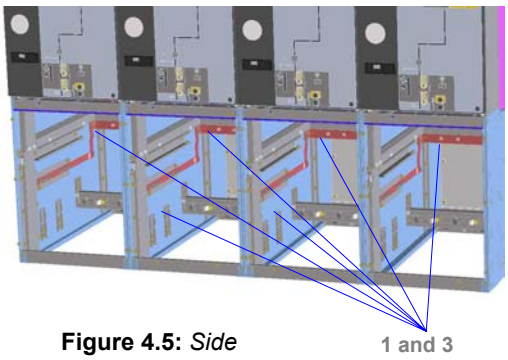


Figure 4.5: *Side connection points*

2: The upper racks of each cubicle have three rivet points on their sides.

It is recommended to alternate the tightening between the upper part (racks) and the lower part (bases).

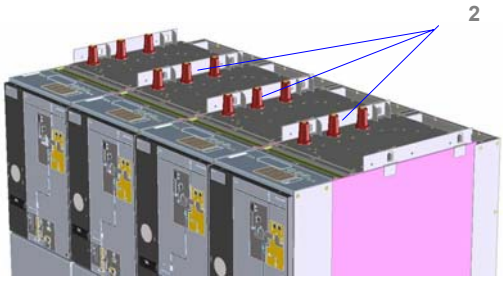


Figure 4.6: *Upper connection points*

3: Once the cubicles have been riveted, the earthing circuit of each cubicle between the bases is connected to the corresponding interconnection bars. Both the individual bars of each cubicle and the connection bars between each cubicle are fixed to the earthing circuit.

4: The whole circuit is connected to the cubicles general earth bus on the bases bottom with the earthing bar.

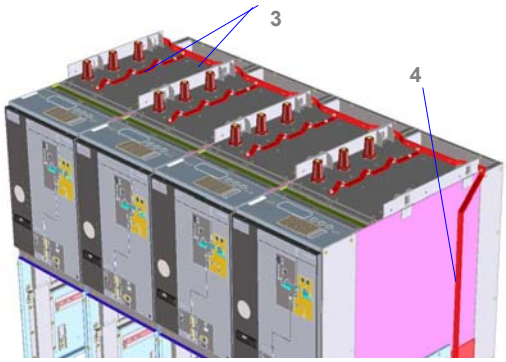


Figure 4.7: *Earthing bars*

5: Connectors are used for the electrical connection between cubicles, as well as intermediate connection bars.

The assembly must be carried out following the instructions provided by the connector manufacturer.

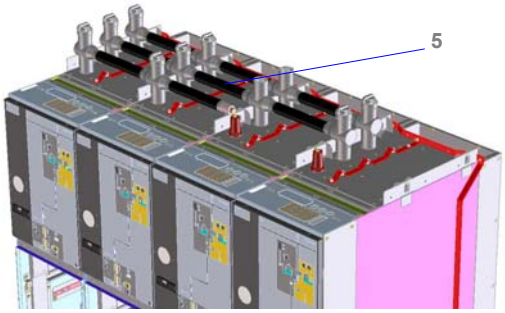


Figure 4.8: *Assembly of upper busbars*

6: Once all the cubicles have been connected, the busbar compartment assembly is assembled, screwing the rear panels first, then the side panels and finally the front panels.

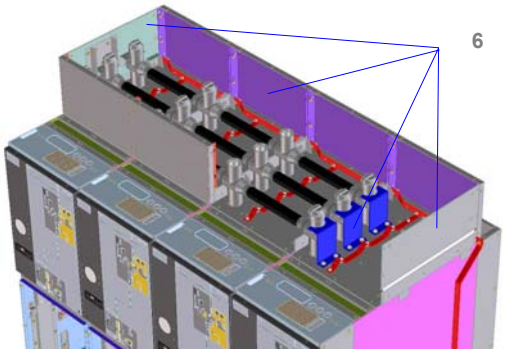


Figure 4.9: *Earthing bars*

> ⚠ **IMPORTANT:**
> **Internal arc starters** are supplied with the right-hand side panel that must be assembled on the upper rack together with the "T" connectors of the final right-hand cubicle (*see figure 4.10*). These starters are incorporated in the left-hand side panel.

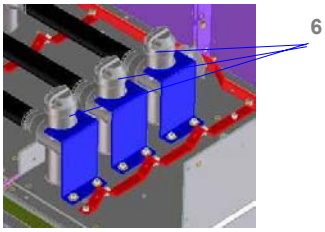


Figure 4.10: *Starters*

7: Next, the panels separating each cubicle are assembled (7A) sliding the front and rear panels downwards on the grooves. The phase segregation panels (7B) are assembled in the same way, i.e. sliding them downwards, lengthways to the cubicle group.

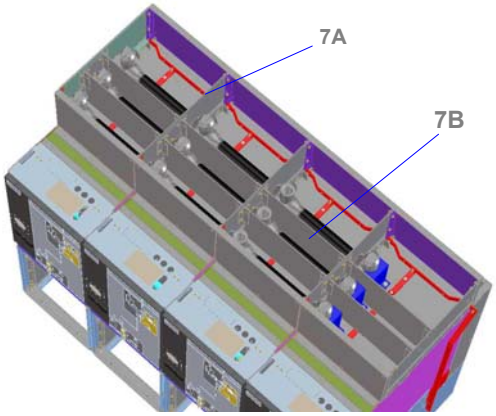


Figure 4.11: *Upper panels*

8: If the cubicles have a gas vent, the vent supplements on each cubicle busbar compartment must be assembled, screwing them to the vents upper part and to the rear panel of each cubicle busbar compartment. Then the busbar compartment is closed, screwing the upper grooved panels to each cubicle and to each other.

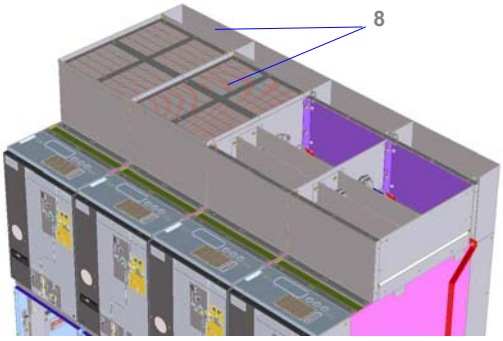


Figure 4.12: *Upper panels*

9: Once the busbar compartment has been configured, the control boxes can be installed, connecting them to their corresponding connectors in each cubicle.

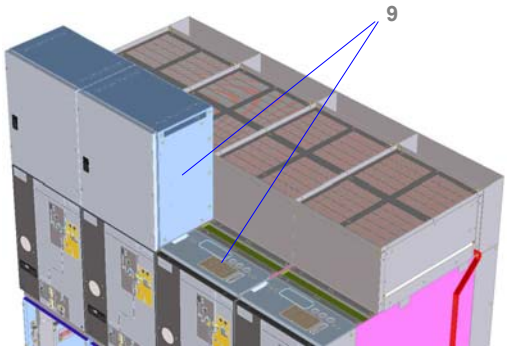


Figure 4.13: *Upper panels*

10: Finally, the assembly is finished off with the final side panels.

Figure 4.14: *Side panels*

5. SEQUENCE OF OPERATIONS

5.1. CPG.0-S DISCONNECTOR CUBICLE

5.1.1. CPG.0 Cubicle for 1250 A

Connecting the Disconnector:

1. Carry out the connection operation:

1.1. **Manual Operation:**
Insert the Disconnector lever, in the position indicated in figure 5.1 (grey area), and turn it 90º CLOCKWISE.

1.2. **Motorized Operation:**
Activate the corresponding operation command.

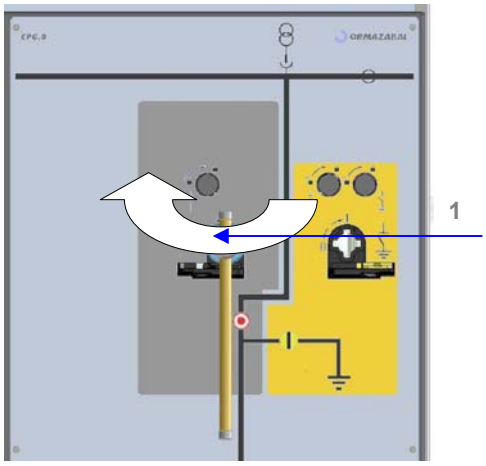


Figure 5.1: *Disconnector Connection Operation in CPG.0-S cubicle for 1250 A*

RECOMMENDATION for manual operation: although the figure shows the start-up position of the operation with the lever arm vertical, it is recommended to start with the lever arm horizontal and to the right. This is to make the best use of the force applied by the operator.

Disconnecting the Disconnector:

2: Carry out the disconnection operation:

2.1. **Manual Operation**
Insert the Disconnector lever in the position indicated in figure 5.2 and turn it 90º ANTICLOCKWISE.

2.2. **Motorized Operation**
Activate the corresponding operation command.

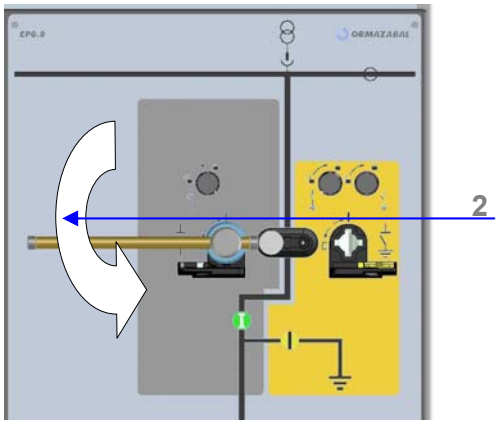


Figure 5.2: *Disconnector Disconnection Operation in CPG.0-S cubicle for 1250 A*

Earthing Switch Connection:

3: Insert the Earthing Switch lever in the position indicated in figure 5.3 and turn it 90º CLOCKWISE.

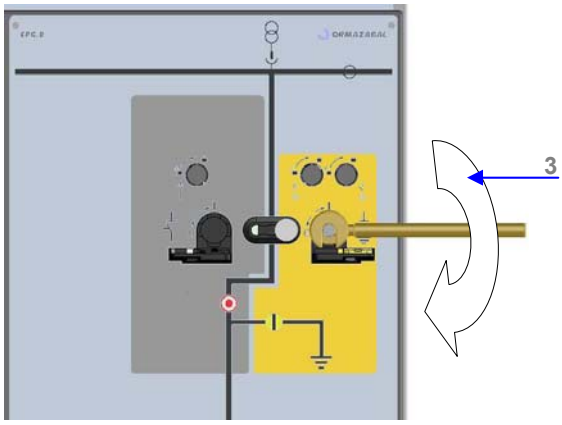


Figure 5.3: *Earthing Switch Connection Operation in CPG.0-S cubicle for 1250 A*

Earthing Switch Disconnection:

4: Insert the Earthing Switch lever, in the position indicated in figure 5.4, and turn it 90º ANTICLOCKWISE.

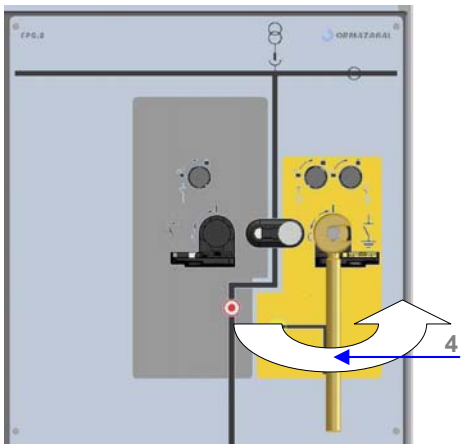


Figure 5.4: *Earthing Switch Disconnection Operation in CPG.0-S cubicle for 1250 A*

RECOMMENDATION: although the figure shows the start-up position of the operation with the lever arm vertical, it is recommended to start with the lever arm horizontal and to the left. This is to make the best use of the force applied by the operator.

5.1.2. CPG.0 Cubicle for 1600 A

Connecting the Disconnector:

1. Slide down the vertical interlock[1] to insert the Disconnector lever.

2. Carry out the Connection operation:

2.1. **Manual Operation:**
Insert the Disconnector lever in the position indicated in figure 5.5 and turn it 90º CLOCKWISE.

2.2. **Motorized Operation:**
Activate the corresponding operation command.

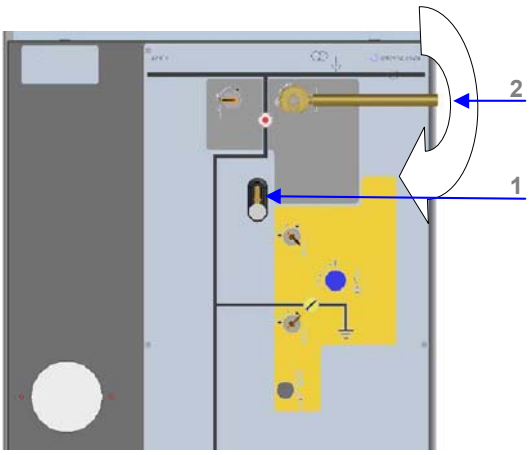


Figure 5.5: *Disconnector Connection Operation in CPG.0-S cubicle for 1600 A*

Disconnecting the Disconnector:

3. Slide down the vertical interlock[1] to insert the Disconnector lever.

4. Carry out the Disconnection Operation:

4.1. **Manual Operation:**
Insert the Disconnector lever in the position indicated in figure 5.6 and turn 90º it ANTICLOCKWISE.

4.2. **Motorized Operation:**
Activate the corresponding operation command.

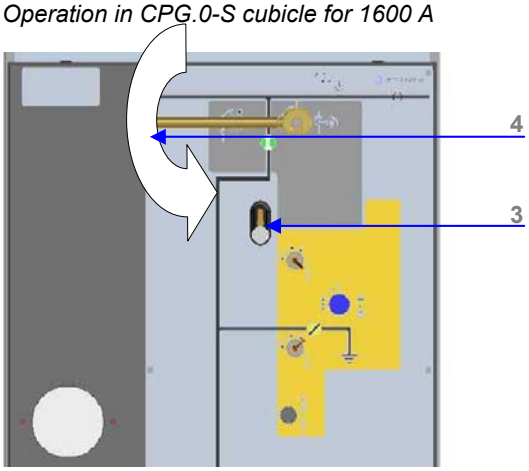


Figure 5.6: *Disconnector Disconnection Operation in CPG.0-S cubicle for 1600 A*

⚠ **IMPORTANT:**
If for any reason half way through a motorized operation the motor stops, the operation must be finished manually before restarting it. This is so that the mechanisms: sensors, controllers, etc. are in a safe, effective and logical position for the motorization control system when it is reconnected.

[1] This step is exclusively for the Manual Operation.

Earthing Switch Connection:

5: Slide down the vertical interlock to insert the Earthing Switch lever.

6: Insert the Earthing Switch lever in the position indicated in figure 5.7 and turn it 90º CLOCKWISE.

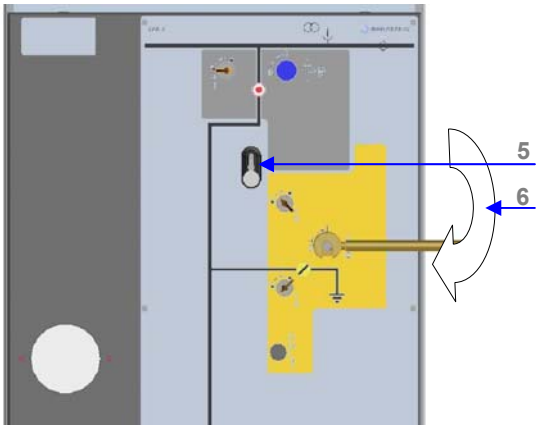


Figure 5.7: *Earthing Switch Connection Operation in CPG.0-S cubicle for 1600 A*

Earthing Switch Disconnection:

7: Slide down the vertical interlock to insert the Earthing Switch lever.

8: Insert the Earthing Switch lever in the position indicated in figure 5.8 and turn it 90º ANTICLOCKWISE.

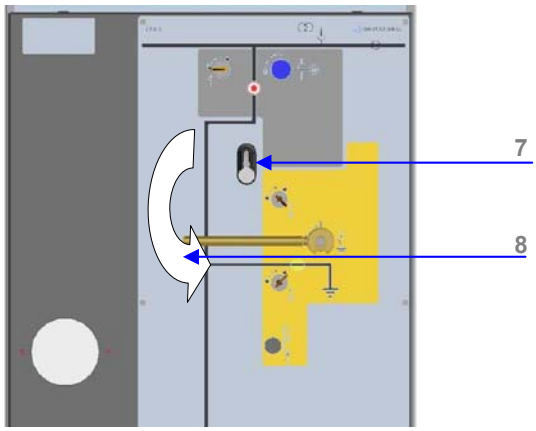


Figure 5.8: *Earthing Switch Disconnection Operation in CPG.0-S cubicle for 1600 A*

5.2. CPG.0-V CIRCUIT-BREAKER CUBICLE

Circuit Breaker Disconnection and Medium Voltage Cable Earthing:

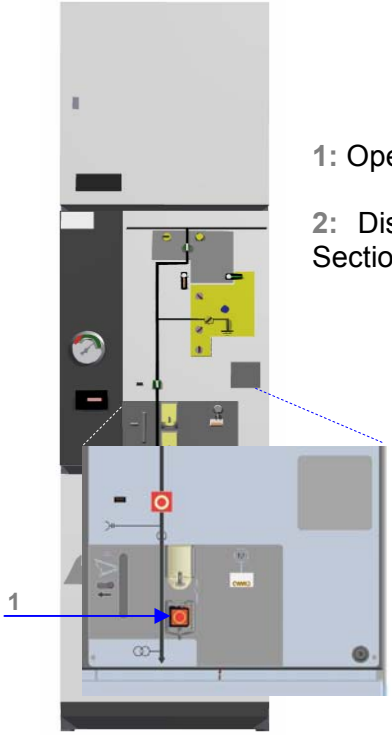


Figure 5.9: *Location of Circuit Breaker "O" push button in CPG.0-V cubicle*

1: Open the Circuit Breaker by pressing the open push button "O".

2: Disconnect the Disconnector following the sequence indicated in Section 5.1.

⚠ IMPORTANT!:
For Motorized Disconnectors, the **MOTOR / NO MOTOR** selector, connected to the Disconnector command, must be interlocked in the MOTOR (M) position to perform the operation: *(see figures 5.10 and 5.11)*

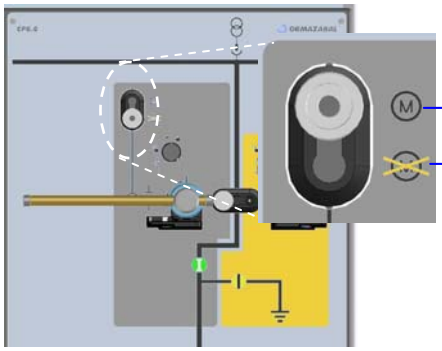


Figure 5.10: *Location of Motor/No motor selector in CPG.0-V cubicle for 1250 A*

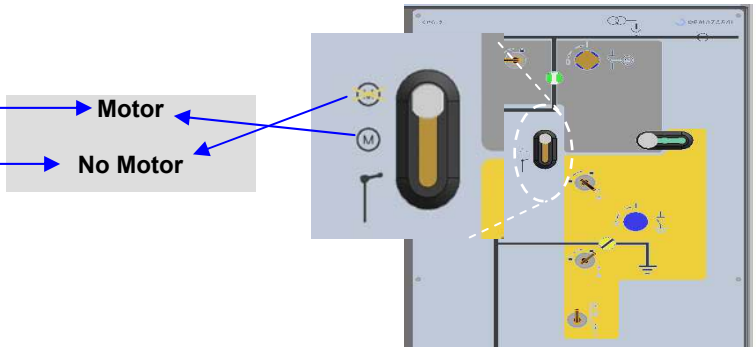


Figure 5.11: *Location of Motor/No motor selector in CPG.0-V cubicle for 1600 A*

3: Connect the Earthing Switch following the sequence indicated in Section 5.1.

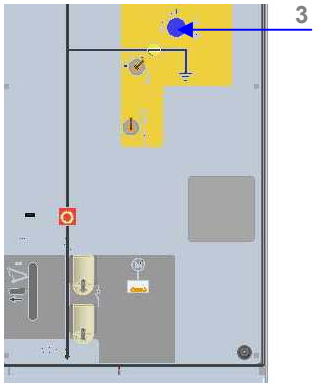


Figure 5.12: *Location of the Earthing Switch shaft in CPG.0-Vcubicle*

4: Close the Circuit Breaker by pressing the close push button “I”.

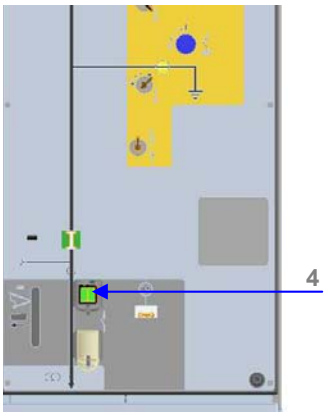


Figure 5.13: *Location of Circuit Breaker "I" push button in CPG.0-V cubicle*

In this situation the cable compartment can be accessed by lifting and removing its cover.

Connection and Commissioning of the Circuit Breaker from the Earthing Position:

Once the cables compartment cover has been correctly placed, proceed in the reverse order, i.e.:

1. Open the Circuit Breaker by pressing the open push button “O”.

2. Disconnect the Earthing Switch following the sequence indicated in Section 5.1.

3. Connect the Disconnector following the sequence indicated in Section 5.1.

4. Close the Circuit Breaker by pressing the close push button “I”.

5.2.1. Cable Test Operation Sequence

Preparation of the Cubicle to Carry Out the Cable Test:

1. Connect the MV cables to earth, following the sequence indicated in chapter 5.2.

2. Remove the cable cover.

3. Press through the “door open” interlock groove on the Circuit Breaker with a thin screwdriver or similar tool, dropping the interlock and freeing the operation push buttons.

4. Open the Circuit Breaker by pressing the open push button “O”.

5. Open the Earthing Switch following the sequence indicated in Section 5.1.

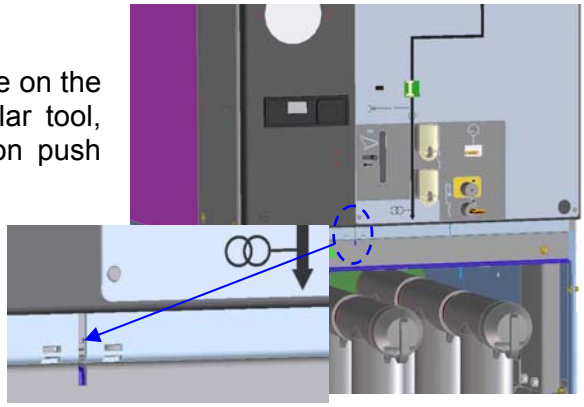


Figure 5.14: *Location of the door interlock groove in CPG.0-V cubicle*

For safety reasons, it is recommended to padlock the access to the Disconnectors operation.

6. Close the Circuit Breaker by pressing the close push button “I”.

Return to the Commissioning after Carrying out the Cable Test:

To return to the "Commissioning" the reverse sequence must be carried out:

1. Open the Circuit Breaker by pressing the open push button "O".

2. Close the Earthing Switch following the sequence indicated in Section 5.1.

3. Close the Circuit Breaker by pressing the close push button "I".

4. Lift the door interlock using a fine screwdriver or similar tool, and position the cable compartment door.

5. Open the Circuit Breaker by pressing the open push button "O".

6. Open the Earthing Switch following the sequence indicated in Section 5.1.

7. Close the Disconnector following the sequence indicated in Section 5.1.

8. Close the Circuit Breaker by pressing the close push button "I".

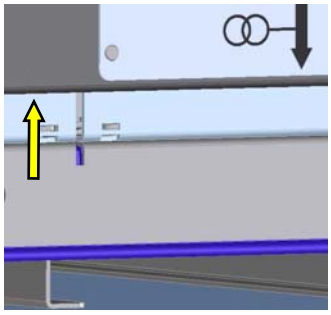


Figure 5.15: *Door interlock rearming in CPG.0-V*

5.3. CPG.0-C BUSBAR COUPLING CUBICLE

Busbars Earthing on the RIGHT of the breaking point:

1. Open the Circuit Breaker by pressing the open push button “O”.

2. Open the Disconnector of the operating mechanism on the left side, following the sequence shown in Section 5.1.

3. Close the Earthing Switch of the operating mechanism on the left side, following the sequence shown in Section 5.1.

4. Close the Circuit Breaker by pressing the close push button “I”.

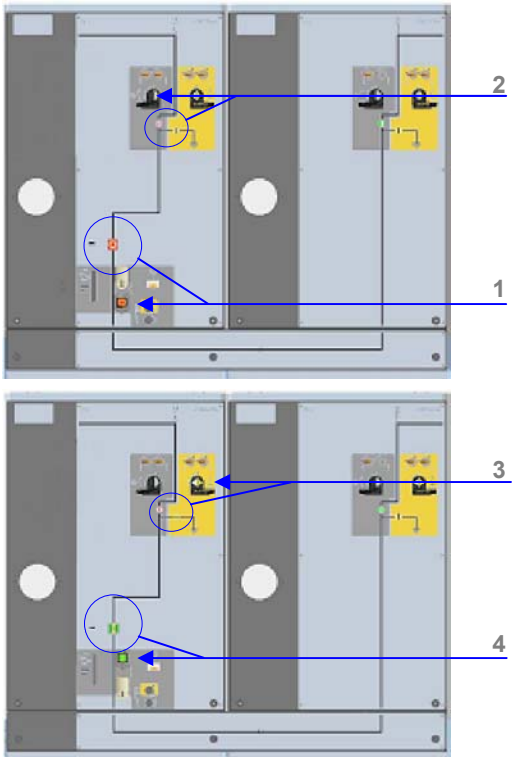


Figure 5.16: *Busbar Earthing Sequence on the Right of the breaking point in CPG.0-C*

Busbars Earthing on the LEFT of the breaking point:

5. Open the Circuit Breaker by pressing the open push button “O”.

6. Open the Disconnector of the operating mechanism on the right side, following the sequence shown in Section 5.1.

7. Close the Earthing Switch of the operating mechanism on the right side, following the sequence shown in section 5.1.

8: Close the Circuit Breaker by pressing the close push button “I”.

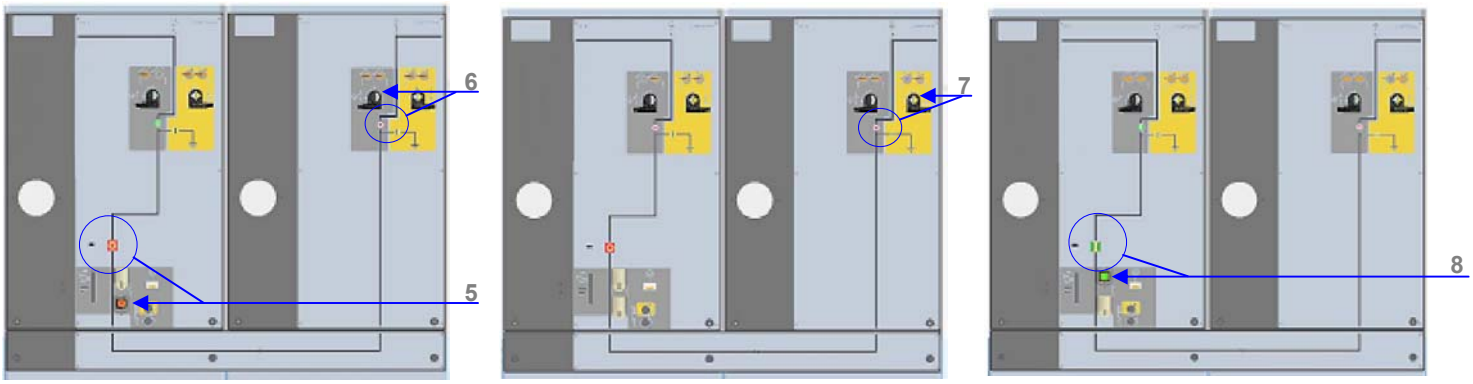


Figure 5.17: *Busbar Earthing Sequence on the Left of the breaking point in CPG.0-C*

5.4. CPG.0-F FUSE PROTECTION CUBICLE

Connecting and Disconnecting the Switch-Disconnector:

1: **CONNECTION:** Insert the lever in the Disconnector shaft and turn it 90º CLOCKWISE.

2: Turn the lever again 90º ANTICLOCKWISE to load the opening springs.
(The lever can not be removed until the operation has been completed, i.e. steps 2 and 3)

3: **DISCONNECTION**: To open the Switch-Disconnector, turn the opening handle ANTICLOCKWISE.

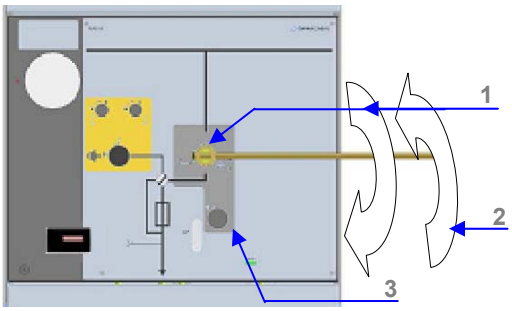


Figure 5.18: *Switch-Disconnector Connection - Disconnection Sequence in CPG.0-F*

Earthing Switch Connection and Disconnection:

4: **CONNECTION**: Insert the lever and turn it 90º ANTICLOCKWISE.

5: **DISCONNECTION**: Insert the Earthing Switch lever and turn it 90º CLOCKWISE.

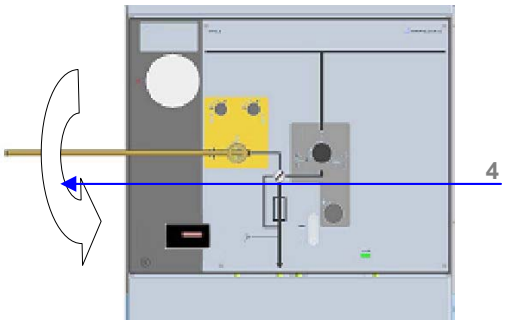


Figure 5.19: *Earthing Switch Connection Sequence in CPG.0-F*

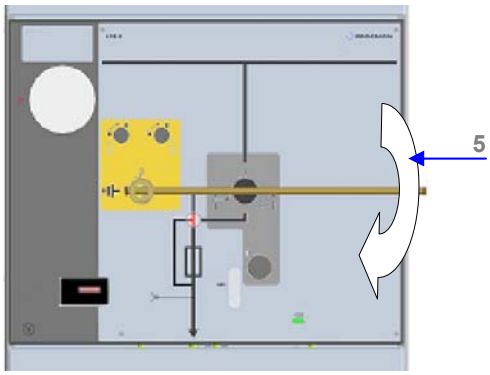


Figure 5.20: *Earthing Switch Disconnection Sequence in CPG.0-F*

5.4.1. Selection of Recommended Fuses for CPG.0-F

The fuses recommended for CPG.0-F cubicles are defined according to the tests carried out by the manufacturers. The following table shows the recommended fuse ratings according to the $U_r/P_{transf.}$:

U_r (Network) [kV]	U_r (Cubicle) [kV]	TRANSFORMER POWER [kVA]											
		100	125	160	200	250	315	400	500	630	800	1000	1250
10	**24**	16	25	25	40	40	40	63	63	100	100	125	160
13.8	**24**	10	16	16	25	25	40	40	63	63	100	100	125
15	**24**	10	16	16	25	25	40	40	40	63	63	100	100
20	**24**	10	16	16	25	25	25	40	40	63	63	63	100
25	**36**	10	10	16	25	25	25	40	40	40	40	40	63
30	**36**	10	10	16	16	25	25	40	40	40	40	40	63

General conditions of use: Overload < 20% and Temperature < 40 ºC
Shaded areas: Overload < 30% and Temperature < 50 ºC
Maximum admissible fuse losses: < 75 W (55 W when U = 10 kV)

Transfer Currents in compliance with IEC 420 (IEC 62271-105)

The transfer currents have been tested using the following parameters:

U_r Fuse [kV]	U_r Cubicle [kV]	I_r Fuse [A]	$I_{transfer}$ [A]
12	24	125	**1500**
24	24	63	**800**
36	36	40	**800**

5.4.2. Fuse Replacement Sequence in CPG.0-F

1. As this is a Combined Switch-Fuse cubicle, if any of the three fuses blows, the Switch-Disconnector will automatically open.

2. The unmistakable signal for a blown fuse is indicated with the red flag which appears on the front of the driving mechanism compartment.

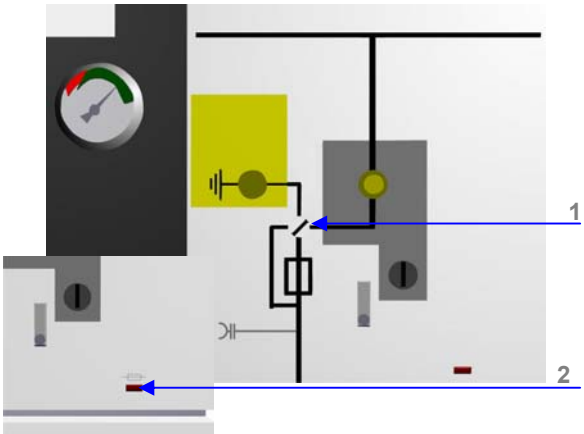


Figure 5.21: *Trip indication by fuses in CPG.0-F*

3. Close the Earthing Switch following the sequence shown in Section 5.4.

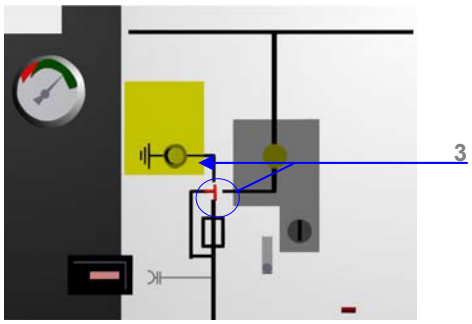


Figure 5.22: *Earthing Switch closing sequence in CPG.0-F*

4. Open the cable and fuse compartment access door, by sliding up the corresponding interlock.

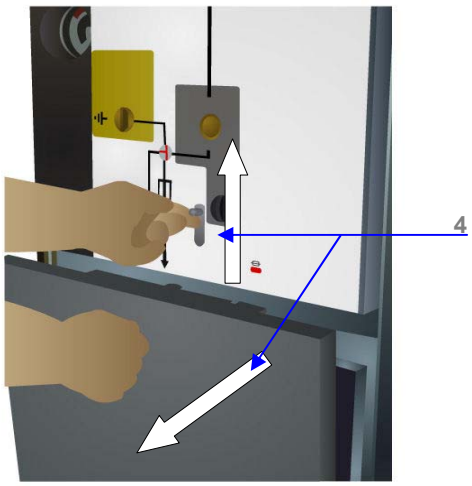


Figure 5.23: *Cable compartment cover opening in CPF.0-F*

5. Turn up the fuse holder cover handle until the locking clip opens and then firmly pull out.

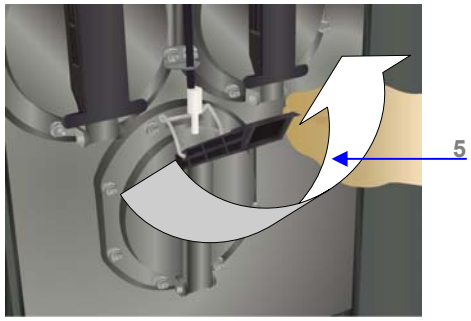


Figure 5.24: *Fuse holder tube opening in CPG.0-F*

6. Remove the fuse holder trolley.

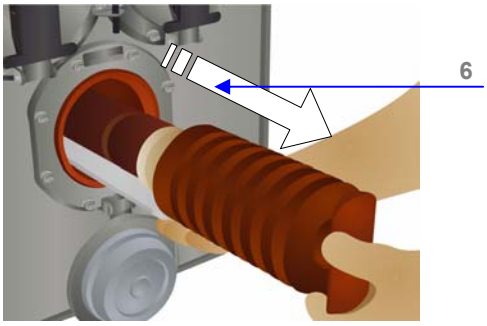


Figure 5.25: *Extraction of the fuse holder trolley in CPG.0-F*

7. Replace the blown fuse.

> ⚠ **IMPORTANT:**
> Ensure that the side of the new fuse striker pin faces forward (the side of the trolley handle).
>
> It is recommended to replace the three fuses even though they do not appear to have suffered damage.

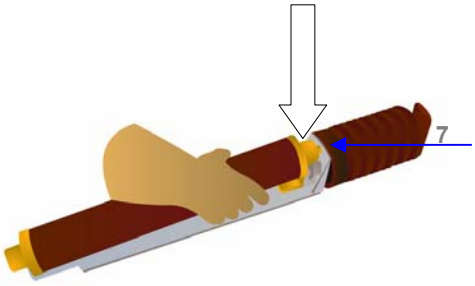


Figure 5.26: *Replacement of the MV fuse*

8. Insert the fuse holder trolley.

> ⚠ **IMPORTANT:**
> Before inserting the trolley, it is important to ensure that both the trolley and the interior of the fuse holder are clean.

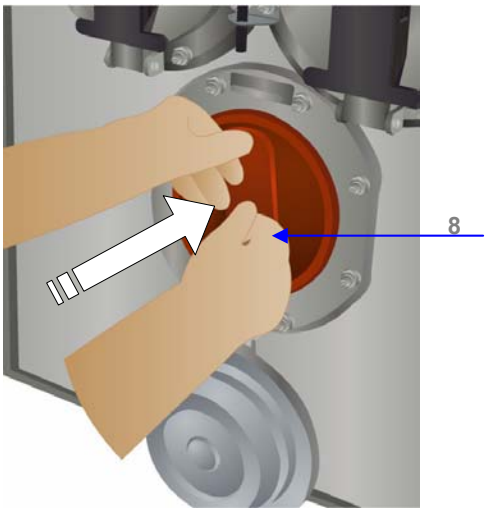


Figure 5.27: *Introduction of the fuse holder trolley in CPG.0-F*

9. Before closing it, reset the cover striker pin by pushing it down.

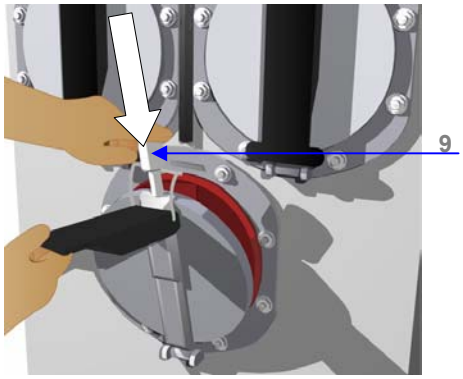


Figure 5.28: *Rearming of the fuse holder cover striker in CPG.0-F*

10. To close the cover, first ensure that the clip (10a) is correctly attached and then pull the handle down until it is upright (10 b).

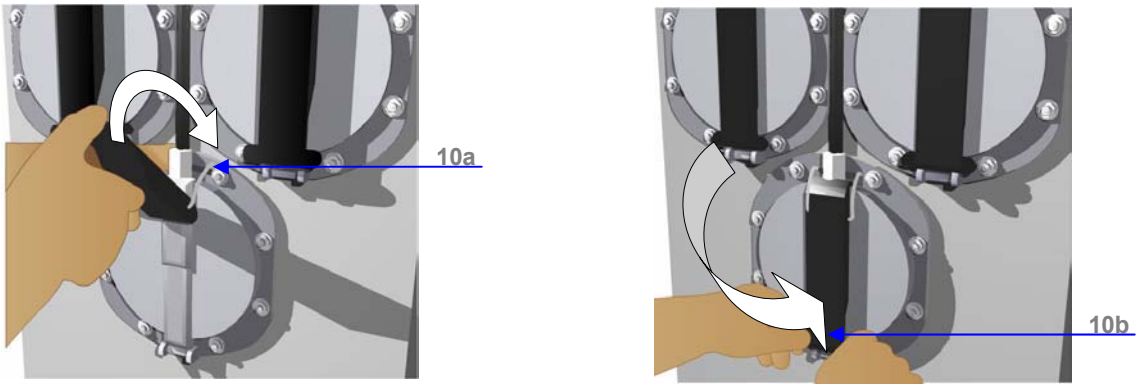


Figure 5.29: *Closing of the fuse holder in CPG.0-F*

11. Place the fuse and cable compartment access door, sliding the door interlock down.

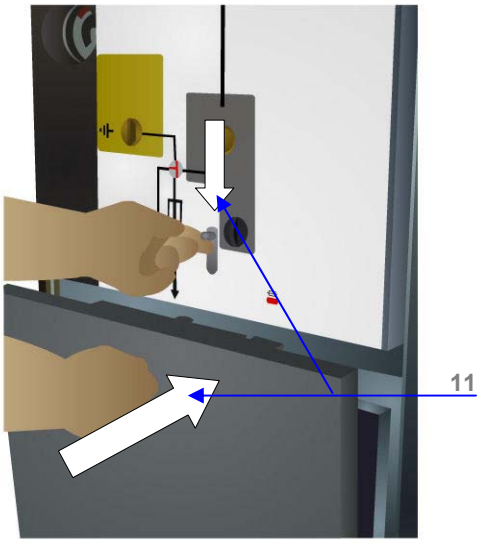


Figure 5.30: *Closing of the cable compartment door in CPF.0-F*

12: Commission the cubicle, following the instructions indicated in Section 5.4.

6. MAINTENANCE

6.1. GENERAL INFORMATION

Thanks to their configuration in totally leak-proof tanks, **CPG.0** cubicles MV circuits do not require any electrical maintenance.

Although the driving mechanism mechanical endurance has been tested in 10 000 operations, preventive maintenance is recommended every 5 years or 2000 cycles, unless determined otherwise by the user together with Ormazabal, with respect to the conditions of use.

For safety reasons, the following should be taken into account during maintenance operations:

- Switch open and Earthing Switch connected.
- Auxiliary circuit supply cut.
- Disconnection of the operation control signalling.
- Check opening and closing springs are unloaded.

⚠ **IMPORTANT:**
The driving mechanism sealed adjustment elements such as: limiting shaft, shock absorber, plugs, nuts and bolts, must not be manipulated.
Do not use any solvent with pressurised air for general cleaning.

The entire operation takes one hour approximately and the following materials are necessary:

Loctite A-270.
Torque wrench.
”Super-Lube” lubricant spray.
Antirust spray.

6.2. VISUAL INSPECTION

Check that interlocking elastic rings, split pins and retracting springs are correctly in place, and have not come loose or detached. Special attention should be paid to the main transmission chain elements.

Check that the sealed adjustments are unchanged, in particular the limiting shaft and the securing nuts of the phase transmission and output shaft.

Ensure that the connection cables are not close to transmission movement areas.

If the condition of surface protection is damaged by rust or dust, apply the indications in the lubrication section. Pay special attention to the operation and physical appearance of the components inside of the chassis: transmission, ratchets and cams, etc.

Take note of the meter's number of operations, installation date, location characteristics, if this is the first service, corrective maintenance, in order to plan the next services.

6.3. VERIFICATION OPERATIONS

The aim is to check the state of the equipment before carrying out the maintenance.

Carry out **two manual operations**:

First:
- Load spring manually, checking that it holds on the closing ratchet in a stable position and that the opening retainer "returns" below the retainer shaft quickly and with a minimum play of 2 mm.
- Close switch and check that the opening retainer is stable.
- Open switch.

Second:
- Load closing spring.
- Close.
- Load closing spring.
- Open.
- Close and Open.
- With the same observations and checks as on the first operation.

Next carry out two **motorized operations with coil (or coils)**

First:
- Load with motorization (check micro switches M0, M1 and M6) and close with closing coil.
- Open with opening coil.

Second:
- Load closing spring and close with coil. Load closing spring.
- Open-Close and Open with coils.

Check the rearming device.

6.4. FIXING NUTS AND BOLTS TIGHTENING

Check that there are no loose nuts and bolts, particularly the bolted joints supporting the frame, chassis support to the cubicle structure and those which form the driving mechanism.

It is not necessary to retighten to the assigned tightening torque without checking that the joint requires so. It is enough to hand check it, using a standard wrench.

If any loose bolts are found, use Loctite A-270. Apply the nominal torque corresponding to the design requirements.

6.5. ADJUSTMENTS CHECK

The driving mechanism is set by the manufacturer for the whole service life. Therefore, those adjustments, which must not be manipulated, are sealed.

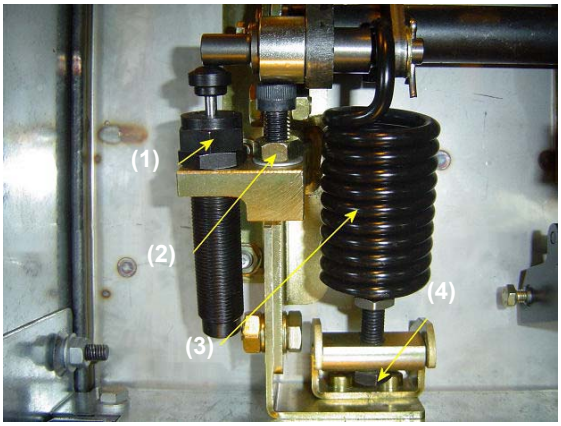


Figure 6.1: *Driving mechanism*

Main adjustment for limiting shaft:
Check that it is not loose or unsealed.

IMPORTANT:
Do not manipulate except in the presence of Ormazabal Technicians.

(1): Damper	(3): Opening spring
(2): Nut	(4): Nut

Shock absorber adjustment:
Check that this is sealed. For greater shock absorption, raise shock absorber body.

Coil adjustment:
Do not manipulate limiting shafts or positions, without the correct time measurement equipment.

6.6. LUBRICATION

Lubricate all turning points of: shafts, bearings, bushings, rollers, and generally any sliding elements.

Use Super-Lube teflon-based lubricant spray with application tube to ensure the product is applied only where needed.

If any non-functional rust is observed on any component, apply antirust spray.

Do not use aggressive liquids such as solvent, etc., or high pressure air to remove small particles or dust.

6.7. VERIFICATION OPERATIONS

If any correction has been made to the driving mechanism, the verification operations must be carried out twice.

Otherwise, a few operations are sufficient to lubricate the components evenly.

6.8. ekorIVDS MAINTENANCE

The ekorIVDS voltage presence-absence detection unit does not require any maintenance tests, as the device constantly checks if each phase voltage is higher than the value established by IEC 61243-5, indicating it by means of the led activation.

If the ekorIVDS unit operation needs to be checked or the unit needs to be replaced, just remove the two screws located in the upper, right-hand and left-hand corners. The unit can now be removed without the need to disconnect the line voltage.

To check the correct operation of the indication unit, 220 V_{ac} are applied between the earth test point and the test point of each of the phases. Operation is correct if a flashing is observed on each checked phase.

To install the unit in the cubicle again, just introduce the indicator in the cubicle and replace the two screws previously removed.

Figure 6.2: *ekorIVDS fixing points*

7. ADDITIONAL INFORMATION

7.1. SPARE PARTS

Although all the components of the **CPG.0** cubicle are tested, in both the certification tests and the manufacturer's routine tests, some components may be changed, replaced or even newly introduced:

- Circuit-breaker opening or closing coil.
- Fuse protection cubicle opening coil.
- Circuit-breaker spring loading motor.
- ekorIVDS voltage presence / absence indicator
- Actuating levers.

If any of the auxiliary parts indicated needs to be changed, order the corresponding spare parts kit to Ormazabal's Technical-Commercial department, and follow the corresponding documentation instructions.

7.2. INTERLOCKING IN CPG.0

The disconnector, the Circuit Breaker and the Earthing Switch are interlocked together in accordance with the criteria defined in section 5.11 of IEC 62271-200.

The operation over the Disconnector shafts is performed with levers. The levers of both disconnectors can only be inserted if the Circuit-Breaker is in the open position. The operation on the Circuit Breaker is only possible if a Disconnector operation lever has been previously removed. In addition, all electrical operations will be cancelled if any of the levers are in the operating shaft.

The Circuit Breaker can only be connected in the end positions (connected) of the Disconnector or Earthing Switch. It also has an effective earthing operation checked with protections.

Access to the cable compartment is only allowed with the Earthing Switch and Circuit Breaker connected (effective earthing).

For functions including fuses (combined switch-fuse protection and voltage metering on busbars with disconnection and fuses), the access to the fuse compartment is interlocked with the corresponding disconnector in such a way that the compartment can only be accessed with the Earthing Switch in the closed position.

The following are available as an option:

- Earthing Switch Electromagnetic Interlocking.
- Interlocks by locking for:

  - Earthing Switch closed.
  - Earthing Switch open.
  - Disconnector open.

NOTES

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