MV Switchgear for Substation Solutions

**CPG.0 & CPG.1**

Single and double busbar panel type GIS system

- Up to 36 kV 31.5 kA 2500 A (IEC Standards)
- Up to 38 kV 31.5 kA 2250 A (IEEE Standards)

Reliable innovation. Personal solutions.

www.ormazabal.com
The quality of the products designed, manufactured and installed by Ormazabal is backed by the implementation and certification of a quality management system, based on international standard ISO 9001:2008.

Our commitment to the environment is reaffirmed with the implementation and certification of an environmental management system as laid down in international standard ISO 14001.

In view of the constant evolution in standards and design, the characteristics of the elements contained in this catalogue are subject to change without prior notification. These characteristics, as well as the availability of components, are subject to confirmation by Ormazabal.
Preface

**MV/MV** and **HV/MV** substations are one of the most critical nodes in any electrical network.

The increasing demand for electricity, and for more power in these substations, requires that **MV** panels have to guarantee maximum reliability and service continuity for rated current levels.

Following the long years of design, development, manufacturing and commissioning experience in gas insulated switchgear (GIS) in secondary distribution, in 2005 **Ormazabal** introduced into the world markets the **CPG** system:

High duty, flexible and extensible single and double busbars GIS panels up to 36 kV.

During the recent years **CPG** has been extended to higher electrical ratings, e.g. up to 2500 A and up to 38 kV.

**CPG** system has already been integrated into several utility, RES, industry and big infrastructure applications. Currently more than 5,000 functional units of this system have been in service in more than 25 countries.

**Ormazabal** is the leading provider of personalized solutions to electrical utilities, to energy end users as well as renewable energy systems applications based on our own technology.

We encourage the development of the electrical sector concerning the challenges of the future energy needs. We cooperate with the world’s leading local, regional and global companies in the electrical sector with a strong commitment to innovation for personal safety, network reliability, energy efficiency, and sustainability.

Our highly qualified and focused team of professionals thrilled by innovation have developed our own products and solutions during our more than a century long consolidated history, always by establishing close relationship with our clients towards achieving mutual long term benefits.

**Velatia** is an international industrial and technological group which operates in the areas of electrical networks, electronics and communication networks as well as in the consulting, security and aviation sectors, where security, efficiency and reliability are valued.

**Grupo Ormazabal is now called Velatia**. We have combined our forces to transform ourselves into a stronger group. Made up of companies with more than a hundred years of experience and committed to innovation to meet the present and future needs of our customers, wherever they may be.

The solutions of the companies in Velatia seek to make the world a more connected, more sustainable, smarter, better connected, safer, more humane place.
Your Electrical Network

"Your dedicated partner for reliable and intelligent electrical network"

Your Business and SSS Applications

Close relationship with our customers and the profound knowledge of the electrical business are the keys to success that enable us to offer Substation Solutions (SSS) based on high added value products and services adapted to the needs of the electrical utilities, electrical energy end users and renewable energies.
Our Product Map (SSS & DNS)

We believe that excellence does not lie solely in offering effective products and services, but also in the ability to respond to individual requirements and demands.

We provide our clients with personalised projects for efficient energy management via Primary and Secondary Distribution equipment and solutions.

Our Business Lines

SSS: Substation Solution for primary distribution

DNS: Distribution Network Solutions for secondary distribution

Our products for your segment
Main features

Safety
Protection for people, environment and your electrical installations.
Special attention paid to the personal safety of the operators and the general public, even under fault conditions.

Internal arc
The CPG panels have been designed to withstand the effects of an internal arc according to IEC 62271-200 (IAC class) / IEEE Std C37.20.7 (1D-S class).

Gas insulated and screened
The breaking and making devices are housed in independent sealed for life stainless steel gas tanks. It provides resistance against harsh environmental conditions and protection against indirect contacts.
The whole power circuit is fully insulated, including the cable terminals, and entirely screened, earthed (grounded) and installed inside a metal enclosure.

Interlocks
CPG panels have mechanical and electrical interlocks as standard in accordance to IEC 62271-200 to enable safe and reliable service.
Interlocks prevent unsafe operations:
- It makes impossible to close the switch-disconnector and the earthing (grounding) switch at the same time.
- It permits the opening of the access cover to the MV cables when the earthing (grounding) switch is closed.
Optional locks, key interlocks and electrical locks based on customers’ specifications are available.

Indicators
Additional safety by using:
- Switchgear position indicators: Visual indication on the mimic diagram, validated by the kinematic chain test in accordance with current standards (IEC 62271-102).
- Capacitive voltage presence / absence indicators (IEC 61243-5)
- Permanent indication (multi-LED) and optional contacts for remote display and/or use of electromagnetic interlocks
- Temperature-compensated monitoring of the gas pressure inside each of the panel tanks.

Reliability
Help to maintain uninterrupted supply of your electrical network

Sealed for life insulation
Insulation inside a stainless steel gas tank provides long service life (30 years) and absence of maintenance in live parts.

Installation, assembly on site, extension and replacement without gas handling.

Suitable for any environment
Resistance to harsh conditions (humidity, salinity, dust, pollution…). Uninterrupted supply even in case of flooding.

100% Routine tested
All the switchgear is subject to 100% electrical and mechanical routine tests according to the relevant standards. Also gas tightness test has been carried out 100% of our switchgear as a routine test to guarantee the reliability throughout its operational life.
- Gas tightness test
- Power-frequency test
- Measurement of the resistance of the main circuit
- Mechanical endurance test
- Measurement of the partial discharge

Other tests performed:
- Salt & fog tested for 500 hours
- Seismic tested as per Richter
Efficiency
High valuable features that make your task easier

Modularity
CPG design is totally modular. It offers flexible diagram configurations, easy extension to both sides without gas handling.

Extensibility and replaceability
Extensibility on both sides allows a fast and economic installation process, in reduced space, not having to move adjacent panels to remove a central one.

Ergonomics
CPG presents the following user-friendly features:
- Front access to install MV cables and fuses
- Easy connection and testing cables
- Simple interface with operators
- Horizontal fuse holders
- Effortless operation of driving mechanisms
- Optimized dimensions
- Safe access to the control and signalling area
- Reliability of connecting the control and signalling circuits via connectors.

Sustainability
Continuous efforts in gas emission reduction
Commitment to the environment:
- Incessant decrease in use of greenhouse gases
- Negligible SF₆ emission in manufacturing processes
- Switchgear gas leakage rates reduction
- No SF₆ gas use during installation
- Unceasing measures to reduce our environmental footprint
- End-of-life management
- Use of highly recyclable materials
- Constant research investment in alternative materials and own technology
- Reduction of the panel room dimension, due to its frontal access and design without removable switchgear, clearance.

Continuous innovation
Help to maintain uninterrupted supply of your electrical network
A focused team of professionals dedicated to innovation leads to a constant offer of new developments and upgrades, such as:
- New modules for 2500 A
- Voltage and current sensors for metering and protection
- Integrated in panel own protection and automation units
- Preventive cable fault diagnosis
- Partial discharge (PD) detection for network diagnosis
- Optional monitoring system to watch the switch position inside the gas tank
Technical details

Family

CPG.0 & CPG.1
Single and double busbar panel type GIS system

MV Switchgear for Substation Solutions

Applicable electrical standards

<table>
<thead>
<tr>
<th>IEC</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IEC 62271-1</td>
<td>Common specifications for high voltage switchgear and controlgear standards.</td>
</tr>
<tr>
<td>IEC 62271-200</td>
<td>Alternating current metal-enclosed switchgear and controlgear for rated voltages above 1 kV and up to and including 52 kV.</td>
</tr>
<tr>
<td>IEC 62271-103</td>
<td>Switches for rated voltages above 1 kV up to and including 52 kV.</td>
</tr>
<tr>
<td>IEC 62271-102</td>
<td>Alternating current disconnectors and earthing switches.</td>
</tr>
<tr>
<td>IEC 62271-105</td>
<td>High voltage alternating current switch-fuse combinations.</td>
</tr>
<tr>
<td>IEC 62271-100</td>
<td>High voltage alternating current circuit-breakers.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IEEE / ANSI</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IEEE C37.74</td>
<td>IEEE Standard Requirements for Subsurface, Vault, and Pad-Mounted Load-Interrupter Switchgear and Fused Load-Interrupter Switchgear for Alternating Current Systems Up to 38 kV</td>
</tr>
<tr>
<td>IEEE C37.20.3</td>
<td>IEEE Standard for Metal-Enclosed Interrupter Switchgear</td>
</tr>
<tr>
<td>IEEE 1247</td>
<td>Standard for Interrupter Switches for Alternating Current, Rated Above 1000 Volts</td>
</tr>
<tr>
<td>IEEE Std C37 20.4</td>
<td>IEEE Standard for Indoor AC Switches (1 kV-38 kV) for Use in Metal-Enclosed Switchgear</td>
</tr>
<tr>
<td>IEEE C37.04</td>
<td>IEEE Standard Rating Structure for AC High-Voltage Circuit Breakers</td>
</tr>
<tr>
<td>IEEE C37.06</td>
<td>AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis- Preferred Ratings and Related Required Capabilities</td>
</tr>
<tr>
<td>IEEE Std C37 09</td>
<td>IEEE Standard Test Procedure for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis</td>
</tr>
<tr>
<td>IEEE Std C37 20.7</td>
<td>IEEE Guide for Testing Medium-Voltage Metal-Enclosed Switchgear for Internal Arcing Faults</td>
</tr>
</tbody>
</table>
## Technical data

### Electrical characteristics

<table>
<thead>
<tr>
<th>Metric</th>
<th>CPG.0</th>
<th>CPG.1</th>
<th>ANSI / IEEE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rated Voltage</strong></td>
<td>U_d [kV]</td>
<td>24 / 36</td>
<td>27 / 38</td>
</tr>
<tr>
<td><strong>Rated frequency</strong></td>
<td>f [Hz]</td>
<td>50 / 60</td>
<td></td>
</tr>
<tr>
<td><strong>Rated normal current</strong></td>
<td>I [A]</td>
<td>Up to 2500</td>
<td>Up to 2250</td>
</tr>
<tr>
<td><strong>Outgoing line</strong></td>
<td></td>
<td>Up to 2250</td>
<td>Up to 2200</td>
</tr>
<tr>
<td><strong>Rated short-time withstand current</strong></td>
<td>I_k [kA]</td>
<td>25 / 25 / 31.5</td>
<td>25 / 25 / 31.5</td>
</tr>
<tr>
<td><strong>Peak value (max)</strong></td>
<td>I_p [kA]</td>
<td>65 / 65 / 80</td>
<td>65 / 65 / 80 / 85</td>
</tr>
<tr>
<td><strong>Rated insulation level</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Rated power-frequency withstand voltage</strong></td>
<td>U_d [kV]</td>
<td>50 / 60 / 70 / 80</td>
<td>50 / 60 / 70 / 80</td>
</tr>
<tr>
<td><strong>Rated lightning impulse withstand voltage</strong></td>
<td>U_p [kV]</td>
<td>125 / 145 / 170 / 195</td>
<td>125 / 145 / 170 / 195</td>
</tr>
<tr>
<td><strong>Internal arc classification according to IEC 62271-200</strong></td>
<td>IAC</td>
<td>AFL(R) 25 kA 1 s</td>
<td>AFL(R) 31.5 kA 1 s</td>
</tr>
<tr>
<td><strong>Degree of protection</strong></td>
<td></td>
<td>IP3X</td>
<td></td>
</tr>
<tr>
<td><strong>Degree of protection</strong></td>
<td></td>
<td>LSC</td>
<td></td>
</tr>
<tr>
<td><strong>Loss of service continuity category</strong></td>
<td></td>
<td>LSC2</td>
<td></td>
</tr>
<tr>
<td><strong>Partition class</strong></td>
<td></td>
<td>PM</td>
<td></td>
</tr>
<tr>
<td><strong>Fuse protection panel</strong></td>
<td></td>
<td>200 A</td>
<td></td>
</tr>
<tr>
<td><strong>Equivalent to IEEE C37.20.7 for 1D-S</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>For higher values, please consult Ormazabal</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Driving mechanism

#### Vacuum circuit breaker

<table>
<thead>
<tr>
<th>Metric</th>
<th>CPG.0</th>
<th>CPG.1 (≥1250 A)</th>
<th>CPG.1 (≥1250 A)</th>
<th>CPG.0</th>
<th>CPG.1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Auxiliary circuits</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Tripping coil</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Rated voltage</strong></td>
<td>U [V]</td>
<td>24 / 48 / 110 / 125 / 220 Vdc</td>
<td>110 / 220 Vac</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Max. consumption</strong></td>
<td>W</td>
<td>170</td>
<td>288</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Minimum voltage coil</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Rated voltage</strong></td>
<td>U [V]</td>
<td>24 / 48 / 110 / 125 / 220 Vdc</td>
<td>110 / 220 Vac</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Max. peak current</strong></td>
<td>A</td>
<td>18</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Motorised units</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Max. consumption</strong></td>
<td>W</td>
<td>30</td>
<td>220</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td><strong>Motor operation time</strong></td>
<td>[s]</td>
<td>&lt;12</td>
<td>&lt;5</td>
<td>&lt;5</td>
<td>&lt;10</td>
</tr>
<tr>
<td><strong>Peak current</strong></td>
<td>A</td>
<td>&lt;3</td>
<td>&lt;11</td>
<td>&lt;5</td>
<td>≤3.5</td>
</tr>
</tbody>
</table>

**Service conditions**

<table>
<thead>
<tr>
<th>Metric</th>
<th>IEC</th>
<th>ANSI / IEEE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of switchgear</strong></td>
<td>Indoor</td>
<td></td>
</tr>
<tr>
<td><strong>Ambient temperature</strong></td>
<td>-25 °C *</td>
<td>+40 °C **</td>
</tr>
<tr>
<td><strong>Relative humidity</strong></td>
<td></td>
<td>&lt;95 %</td>
</tr>
<tr>
<td><strong>Maximum height above sea level</strong></td>
<td>1,000 m **</td>
<td>3,250 feet **</td>
</tr>
<tr>
<td><strong>Solar radiation</strong></td>
<td>Negligible</td>
<td>Insignificant</td>
</tr>
<tr>
<td><strong>Environmental air pollution (dust, salinity, etc.)</strong></td>
<td>Negligible **</td>
<td></td>
</tr>
</tbody>
</table>

* Consult availability and other values. ** For special conditions, altitudes, please consult Ormazabal
Constructive structure

CPG.0
Front view  Side view

1. Gas tank/s
   1.1. Vacuum circuit breaker
   1.2. Three-position switch-disconnector (CPG.0) / Disconnectors (CPG.1)
   1.3. Earthing switch (CPG.1)
   1.4. Pressure relief duct

2. Busbar compartment
   2.1. Main busbars

3. Base: Cable compartment
   3.1. Bushings
   3.2. Current transformers
   3.3. Voltage transformers
   3.4. Phase segregation assembly
   3.5. Terminals

4. Low voltage compartment
   4.1. Protection, control and signalling devices

5. Operation interface
   5.1. Circuit-breaker driving mechanism
   5.2. Disconnector/s driving mechanism
   5.3. Earthing (grounding) switch mechanism
   5.4. Pressure switch (CPG.0)
   5.5. Voltage presence/absence indicator
   5.6. Mimic diagram

CPG
ANSI / IEEE type
Design characteristics

Key components

Vacuum circuit breaker (VCB)

Circuit-breaker with vacuum breaking technology, compact and with excellent reliability, certified in accordance to IEC 62271-100 standard, including extended electrical endurance (class E2) with rapid reclosing cycle and hence maintenance-free during its whole service life.

Circuit-breaker

<table>
<thead>
<tr>
<th></th>
<th>CPG.0</th>
<th>CPG.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breaking capacity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Short-circuit (asymmetry) [kA]</td>
<td>25</td>
<td>25 / 31.5</td>
</tr>
<tr>
<td>DC</td>
<td>&gt;34%</td>
<td>&gt;45%</td>
</tr>
<tr>
<td>No-load cable-charging breaking capacity [A]</td>
<td>31.5 (24 kV) 50 (36 kV)</td>
<td></td>
</tr>
<tr>
<td>Capacitor bank breaking capacity [A]</td>
<td>400</td>
<td></td>
</tr>
<tr>
<td>Electrical endurance</td>
<td>E2</td>
<td></td>
</tr>
<tr>
<td>Reclosing sequence</td>
<td>O-0.3”-CO-15”-CO</td>
<td></td>
</tr>
<tr>
<td>Mechanical endurance</td>
<td>M2 10000</td>
<td></td>
</tr>
</tbody>
</table>

Rated current [A]

<table>
<thead>
<tr>
<th></th>
<th>CPG.0</th>
<th>CPG.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated short-time withstand current [kA / 1 s - 3 s]</td>
<td>25</td>
<td>25 / 31.5</td>
</tr>
<tr>
<td>Operating time [ms]</td>
<td>&lt;45</td>
<td></td>
</tr>
</tbody>
</table>

Characteristics:

- Vacuum breaking
  - Manual operation through push-button (lockable with a padlock)
- Motor driving mechanism
  - Spring loading time <15 seconds
- Operating coils:
  - 1 (CPG.0) and 2 (CPG.1) shunt trip opening coils. 2nd optional coil.
  - 1 closing coil
  - 1 undervoltage coil (optional)

Disconnector

Puffer type high duty disconnector designed and developed by Ormazabal.

The switch-disconnector includes the functions of switch-disconnector and earthing (grounding) switch in a single three-position unit.

Disconnector and earthing (grounding) switch:

<table>
<thead>
<tr>
<th></th>
<th>CPG.0</th>
<th>CPG.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical endurance</td>
<td>MD-1000</td>
<td>MD-1000</td>
</tr>
<tr>
<td>Earthing (grounding) switch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Making capacity [kA]</td>
<td>63 (50 Hz) / 65 (60 Hz)</td>
<td>63-80 (50 Hz) / 65-85 (60 Hz)</td>
</tr>
<tr>
<td>Electrical endurance</td>
<td>E0</td>
<td>E0</td>
</tr>
<tr>
<td>Rated current [A]</td>
<td>25 (24 kV) 2500 (36 kV)</td>
<td>63-80 (50 Hz) / 65-85 (60 Hz)</td>
</tr>
<tr>
<td>Short-time current [kA / 1 s - 3 s]</td>
<td>25</td>
<td>25 / 31.5</td>
</tr>
</tbody>
</table>

Main busbars

The function of the main busbars is to connect panel-to-panel electrically. They are single-phase arranged and located outside the sealed gas tank. It allows modularity and future extensibility without gas handling on site or moving adjacent panels.

The upper busbar set consists of three separate cylindrical copper conductors with solid and shielded insulation. Every phase is connected using a busbar segment and “T” or “L” shaped connectors.

The whole set is protected against dirt and condensation; in addition, it has a metal cover to protect it against impacts.

The busbars are prepared to withstand thermal and dynamic forces of rated short-time currents (CPG.0: 25 kA / 1 or 3 s and CPG.1 up to 25-31.5 kA / 1 or 3 s) and rated continuous current up to 2500 A.

Characteristics:

- 3 positions (connection - disconnection - earthing)
- Independent actuation and levers for the operations:
  - Connection - disconnection (motor driving mechanism option)
  - Disconnection – earthing (grounding) (motor driving mechanism option)
Main compartments

**CPG.0 & CPG.1**

**Single and double busbar panel type GIS system**

**Switch / CB compartment**

The switch compartment, sealed for life, houses the switching and breaking switchgear, where the insulating medium is SF₆ gas.

**CPG.0** contains one single gas tank, whereas **CPG.1** is characterised by having one tank for the Circuit-Breaker and earthing (grounding) switch and one tank for each feeder disconnectors depending on whether it corresponds to single or double busbar.

Built in stainless steel, it is designed to withstand an internal arc. The gas generated as a result of an internal arc is cooled down and can be channelled towards the top of the panel through a relief duct located on the rear side.

The following elements are located inside, depending on the functionality:

- Disconnector and earthing (grounding) switch.
- Vacuum circuit-breaker.
- Fuse holders

This compartment can be connected to the busbar and the medium voltage cables respectively by means of cable bushings at the top and bottom.

The gas pressure is tested by means of a temperature-compensated pressure gauge, with a potential-free contact, allowing it to be used as a remote alarm.

**Features:**

- Sealed-for-life insulation system (30 years)
- Internal arc tested
- Stainless steel – IP65 rating
- Switching, breaking and main circuit devices
- Outer-cone bushing plug-in type terminal
- Pressure gauge
- Pressure relief diaphragm valve

**Driving mechanism**

The driving mechanism is used to perform making and breaking operations in the MV circuits.

The front layout of the driving mechanisms and the use of anti-reflex levers permits safe, comfortable, simple operations with a minimum of effort.

The front mimics include the position indicating devices. Maximum reliability verified using the kinematic chain test of the signalling mechanism in accordance with IEC 62271-102.

**Features:**

- Mimic diagram and pushbuttons
- Position display (Kinematic chain)
  - Switching devices
  - Fuse tripping
- Capacitive voltage indicator
- Interlocks (electrical and mechanical)
- Optimized operator interface
Busbar compartment

Located in the upper part of the panel, it is used to house the busbar (electrical connection between the Medium Voltage panels).

Each one of the phases that make up the busbar has solid and shielded insulation, earthed (grounded) by means of the compartment’s specific earthing bar.

Because of this single-phase arrangement, the panel offers excellent reliability in terms of service continuity.

The installation of a phase segregation assembly using earthed (grounded) metal plates, allows this compartment to withstand internal arcs.

Optionally, toroidal-core current transformers and/or plug-in voltage transformers can be installed in this compartment, without needing metering panels.

Features:
- Single-phase arrangement
- Solid and shielded busbars
- Externally assembled
- Optional: Toroidal-core current transformers and plug-in voltage transformers

Cable compartment

The cable compartment, located in the lower front section of the panel, has a cover interlocked with the earthing (grounding) switch, thus allowing front access to the Medium Voltage cables.

The external cone-type bushings allow the installation of toroidal-core current transformers on them and the connection of MV insulated cables.

Features:
- Up to 4* reinforced shielded connection terminals (screw-in) per phase.
- Cable bushings up to 2500 A (CPG.0)
- Cable clamps for the medium voltage cables
- Earthing (grounding) bars.
- Toroidal-core current transformers.
- Plug-in voltage transformers.
- Surge arresters.
- Effortless connections

(*) Up to 6 terminals in CPG.0 (2000/2500 A)

Base

The low voltage compartment placed in the upper part of the panel and independent of the MV compartments, is defined for installing protection relays, as well as metering and control devices.

Features:
- Independent compartment from MV area
- Ready for installing protection relays, control and metering equipment
- Factory assembled and tested according to customer needs
- Standard and compact design for installing Ormazabal’s protection relays and automation units
- High adaptation capabilities for other manufacturers’ protection relays, control and metering units as well as customers’ provided equipment
- Customized size and design

Attachable low voltage compartments can be supplied optionally, for the location of signalling elements and the activation of motorised functions.
Protection & Automation

CPG switchgear is used in a very wide range of areas in power distribution and mostly includes comprehensive protection and control systems to provide the related functions for the application.

CPG is suitable to utilize in substations with conventional protection relays as well as where complex combination of several protection relays and controls systems are required. The devices are installed in the low-voltage compartment of the panels. Indicators and controls are integrated into the front door of the low voltage compartment.

Protection

- Protection functions such as
  - Differential protection
  - Distance protection
  - Overcurrent time protection
  - Earth fault protection
  - Overload protection
  - Over/under voltage protection
  - Over/under frequency protection
  - Directional power protection
  - Load unbalance protection
  - Automatic re-starting, etc.
- Substation protection
- Supply to MV customers
- Protection of switching substations and industrial customers
- Generator set protection unit

Automation

- Automation and remote control
- Remote control
- Automatic transfer
- Fault detection

Communication

A wide range of interfaces and protocol structures are available for communication with the control system depending on the device variants used. The connection is made using a data cable or fibre optic cable depending on the system.

ekorSYS Family

ekorSYS family is the generic name of all the protection relays, automation, control and communication components and systems that are designed, developed and manufactured by Ormazabal.

The basic products and systems that can be integrated into CPG panels are as follows:

Protection

ekorRPG

- Current: Amperimeter Function
- Protection Functions
  - Phase overcurrent: 50-51
  - Earth overcurrent: 50N-51N
  - Ultrasensitive earth leakage protection: 50Ns-51Ns
  - Thermometer (external trip): 49T
  - Recloser (79)
- Communications
  - Front port configuration: DB9 RS232
  - Rear port remote control RS485 (5kV) – RJ45
  - Protocol: MODBUS (RTU)
  - Setup and monitoring program ekorSOFT (optional)

ekorRPS-TCP

- Ports: RS-232, RS-485, FOC
- Protocols:
  - MODBUS, PROCOME, IEC-60870-5-101, IEC-60870-5-103, DNP3.0, IEC-61850

Protection ekorRPS-DC and ekorRPS-DD

- Phase overcurrent: (3 x 50/51)
- Earth overcurrent: (50N/51N)
- Current unbalance/ negative sequence current: (46-46FA)
- Breaker failure: (50BF)
- 2nd harmonic restraint
- Ultrasensitive earth overcurrent: (50Ns/51Ns)
- Ultrasensitive earth overcurrent (3 x 67)
- Directional earth fault and sensitive earth fault: (67N), (67Ns)
- Isolated earth directional function: (67NA)
- Voltage restrained overcurrent: (51V)
- Fuse failure
- Thermal image: (49)

ekorSYS Family

ekorSYS family is the generic name of all the protection relays, automation, control and communication components and systems that are designed, developed and manufactured by Ormazabal.

The basic products and systems that can be integrated into CPG panels are as follows:

Protection

ekorRPG

- Current: Amperimeter Function
- Protection Functions
  - Phase overcurrent: 50-51
  - Earth overcurrent: 50N-51N
  - Ultrasensitive earth leakage protection: 50Ns-51Ns
  - Thermometer (external trip): 49T
  - Recloser (79)
- Communications
  - Front port configuration: DB9 RS232
  - Rear port remote control RS485 (5kV) – RJ45
  - Protocol: MODBUS (RTU)
  - Setup and monitoring program ekorSOFT (optional)

ekorRPS-TCP

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- Protocols:
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- Current unbalance/ negative sequence current: (46-46FA)
- Breaker failure: (50BF)
- 2nd harmonic restraint
- Ultrasensitive earth overcurrent: (50Ns/51Ns)
- Ultrasensitive earth overcurrent (3 x 67)
- Directional earth fault and sensitive earth fault: (67N), (67Ns)
- Isolated earth directional function: (67NA)
- Voltage restrained overcurrent: (51V)
- Fuse failure
- Thermal image: (49)
Additional protection ekorRPS-DD
- Maximum frequency / minimum frequency / frequency-derived: (81M / 81m / 81R)
- Directional power: (32)
- Phase overvoltage / phase undervoltage / negative sequence overvoltage (3 x 59 / 3 x 27 / 47)
- Neutral overvoltage: (59N/64)

Control functions
- Three-phase recloser: (79)
- Recloser for single-phase trips due to overcurrent: (79)
- Trip/closure coil supervision: (74)
- Recloser for restart after trip due to frequency trip: (79)
- Synchrocheck: (25)
- Protection status self-diagnosis

Measurements
- Phase, neutral and sensitive neutral currents
- Power factor
- Simple and compound voltages
- Current maximeter
- Energies
- Inverse sequence
- Powers
- Harmonic distortion (THD)

Data acquisition
- Chronological event log
- History log of maximum and minimum measurements
- Chronological fault log
- Oscillography

ekorSYS: Automation and remote control
- Remote control
  - ekorUCT
  - ekorCCP
  - ekorRCI
- Automatic transfer
  - ekorSTP
  - ekorCCP
  - ekorRTK
- Fault detection
  - ekorRCI

Advanced Meter Management and communication
  - ekorGID

Dispatching center

Software
  - ekorSOFT

For further information, please refer to Ormazabal or visit www.ormazabal.com
Type of modules

CPG.0-V

Single busbar circuit-breaker panel
Includes a vacuum circuit-breaker and a three position disconnector in series with it. Both components are located inside the switch compartment.

<table>
<thead>
<tr>
<th>Electrical characteristics</th>
<th>IEC 62271-100</th>
<th>ANSI / IEEE C37.74</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated voltage</td>
<td>U&lt;sub&gt;r&lt;/sub&gt; [kV]</td>
<td>24 / 36 / 27 / 38</td>
</tr>
<tr>
<td>Rated frequency</td>
<td>f&lt;sub&gt;r&lt;/sub&gt; [Hz]</td>
<td>50 / 60 / 120 / 60</td>
</tr>
<tr>
<td>Rated current</td>
<td>I&lt;sub&gt;o&lt;/sub&gt; [A]</td>
<td>1250 / 1600 / 2000 / 2500</td>
</tr>
<tr>
<td></td>
<td></td>
<td>630 / 1250 / 1600 / 2000 / 2500(*)</td>
</tr>
<tr>
<td>Rated short-duration power frequency withstand voltage (1 min)</td>
<td>U&lt;sub&gt;d&lt;/sub&gt; [kV]</td>
<td>50 / 70 / 60 / 80</td>
</tr>
<tr>
<td></td>
<td>Across isolating distance</td>
<td>60 / 80 / 66 / 88</td>
</tr>
<tr>
<td>Rated lightning impulse withstand voltage</td>
<td>U&lt;sub&gt;p&lt;/sub&gt; [kV]</td>
<td>125 / 170 / 125 / 170</td>
</tr>
<tr>
<td></td>
<td>Across isolating distance</td>
<td>145 / 195 / 145 / 195</td>
</tr>
<tr>
<td>Internal arc classification</td>
<td>IAC</td>
<td>All(R) 25 kA 1 s</td>
</tr>
<tr>
<td>Circuit-breaker</td>
<td></td>
<td>IEC 62271-100</td>
</tr>
<tr>
<td>Rated short-time withstand current (main circuit)</td>
<td>I&lt;sub&gt;k&lt;/sub&gt; [kA]</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Peak value</td>
<td>63 [50 Hz] / 65 [60 Hz]</td>
</tr>
<tr>
<td>Rated breaking capacity and making capacity</td>
<td>I&lt;sub&gt;sc&lt;/sub&gt; [kA]</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Capacitive current capacity (50 Hz), Capacitor banks</td>
<td>400</td>
</tr>
<tr>
<td>Rated operating sequence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Without reclosing</td>
<td>CO-15 sCO / CO-3 min-CO</td>
<td></td>
</tr>
<tr>
<td>With reclosing</td>
<td>O0,3 sCO15 xCO / O0,3 sCO3 min-CO</td>
<td></td>
</tr>
<tr>
<td>Circuit-breaker category</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mechanical endurance (operations-class)</td>
<td>10000-M2</td>
<td>10000</td>
</tr>
<tr>
<td>Electrical endurance (class)</td>
<td>E2-C2</td>
<td></td>
</tr>
<tr>
<td>Switch-disconnector</td>
<td></td>
<td>IEEE C37.74</td>
</tr>
<tr>
<td>Rated short-time withstand current (main circuit)</td>
<td>I&lt;sub&gt;k&lt;/sub&gt; [kA]</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Peak value</td>
<td>65</td>
</tr>
<tr>
<td>Switch-disconnector Category</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mechanical endurance</td>
<td>2000-M1</td>
<td>1000</td>
</tr>
<tr>
<td>Cycles of operations (Short-circuit making current)-class</td>
<td>E0</td>
<td></td>
</tr>
<tr>
<td>Earthing (grounding) Switch</td>
<td></td>
<td>IEC 62271-102</td>
</tr>
<tr>
<td>Rated short-time withstand current (earthing circuit)</td>
<td>I&lt;sub&gt;ma&lt;/sub&gt; [kA]</td>
<td>63 (50 Hz) / 65 (60 Hz)</td>
</tr>
<tr>
<td></td>
<td>Peak value</td>
<td>65</td>
</tr>
<tr>
<td>Earthing (grounding) Switch Category</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mechanical endurance</td>
<td>2000-M1</td>
<td>1000</td>
</tr>
<tr>
<td>Cycles of operations (Short-circuit making current)-class</td>
<td>E0</td>
<td></td>
</tr>
</tbody>
</table>

Applications
Main transformer protection, feeder protection, busbar coupling protection, capacitor bank protection and auxiliary services transformer protection.
**Configuration**

**Panel structure**
- Internal arc
  - IAC AFL 25 kA 1 s (IEC)
  - IAC AFLR 25 kA 1 s (IEC)

**Gas tank**
- Pressure gauge with potential-free contact
- Voltage presence indicator
- Auxiliary contact
- Visual inspection device

**Busbar compartment**
- Up to 2500 A – 24 kV
- Up to 1250 A – 36 kV
- Up to 2250 A – 27 kV
- Up to 1250 A – 38 kV
- Current Transformers
- Voltage Transformers

**Driving mechanism**
- Three-position disconnector
  - Disconnector motorization
  - Earthing (grounding) switch motorization
- Vacuum circuit-breaker
  - Motor
  - Tripping coil
  - 2nd Tripping coil
  - Closing coil
  - Undervoltage coil
  - Opening/closing push-button blocking

**Additional interlocks**
- Electrical interlocks
- Key lock interlocks
- Pad locks

**Cable compartment**
- Up to 4 cables per phase
- Toroidal-core current transformers
- Plug-in voltage transformer

**Low voltage compartment**
- Panel height
  - 2425
  - 2245
  - Protection, automation, control and signalling devices

**Dimensions**

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Kg</strong></td>
<td><strong>Lbm</strong></td>
</tr>
<tr>
<td>24 kV 630 A</td>
<td>&lt;300</td>
</tr>
<tr>
<td>Up to 38 kV ≤ 1600 A</td>
<td>&lt;750</td>
</tr>
<tr>
<td>Up to 27 kV 2000 A</td>
<td>&lt;1100</td>
</tr>
<tr>
<td>Up to 24 kV 2500 A</td>
<td>&lt;1200</td>
</tr>
<tr>
<td>Up to 27 kV 2250 A</td>
<td></td>
</tr>
</tbody>
</table>
CPG.0-F
Single busbar fuse protection panel

It has a three-position switch-disconnector (closed/open/earthing-grounding), including fuse protection. The fuses are housed in sealed fuse holders, which in turn are inside the switch compartment, reinforcing the level of insulation.

The three-pole opening switch with combined actuation by fuse blow is optionally motorisable.

### Electrical characteristics

<table>
<thead>
<tr>
<th></th>
<th>IEC</th>
<th>ANSI / IEEE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated voltage</td>
<td>$U_r$ [kV]</td>
<td>24 / 36 / 27 / 38</td>
</tr>
<tr>
<td>Rated frequency</td>
<td>$f_r$ [Hz]</td>
<td>50 / 60 / 60</td>
</tr>
<tr>
<td>Rated current</td>
<td>$I_r$ [A]</td>
<td>1250 / 1600 / 2000 / 2500 / 1250(<em>) / 1250 / 1600 / 2250(</em>) / 1250(*)</td>
</tr>
<tr>
<td>Output to transformer</td>
<td>$I_r$ [A]</td>
<td>200</td>
</tr>
<tr>
<td>Rated short-duration power frequency withstand voltage (1 min)</td>
<td>$U_{d}$ [kV]</td>
<td>50 / 70 / 60 / 80</td>
</tr>
<tr>
<td></td>
<td>$U_{d}$ [kV]</td>
<td>60 / 80 / 66 / 88</td>
</tr>
<tr>
<td>Rated lightning impulse withstand voltage</td>
<td>$U_{p}$ [kV]</td>
<td>125 / 170 / 125 / 170</td>
</tr>
<tr>
<td></td>
<td>$U_{p}$ [kV]</td>
<td>145 / 195 / 145 / 195</td>
</tr>
<tr>
<td>Internal arc classification</td>
<td>IAC</td>
<td>A/I[R] 25 kA 1 s</td>
</tr>
</tbody>
</table>

#### Switch-disconnector

**IEC 62271-103 + IEC 62271-102**

**IEEE C37.74**

| Rated short-time withstand current (main circuit) | $I_{k}$ [kA] | 25 |
| Main switch making capacity (peak value) | $I_{ma}$ [kA] | 63 (50 Hz) / 65 (60 Hz) |

#### Earthing (grounding) Switch

**IEC 62271-102**

**IEEE C37.74**

| Rated short-time withstand current (earthing circuit) | $I_{k}$ [kA] | 1 |
| Main switch making capacity (peak value) | $I_{ma}$ [kA] | 2.5 / 2.6 / 2.5 / 2.6 |

### Applications

Feeder/transformer disconnection, busbar coupling rise and busbar voltage metering.
Configuration

Panel structure

Internal arc
- IAC AFL 25 kA 1 s (IEC)
- IAC AFLR 25 kA 1 s (IEC)

Gas tank
- Fuses combined with the switch-disconnector
- Pressure gauge with potential-free contact
- Voltage presence indicator
- Auxiliary contact
- Visual inspection device

Busbar compartment
- Up to 2500 A – 24 kV
- Up to 1250 A – 36 kV
- Up to 2250 A – 27 kV
- Up to 1250 A – 38 kV
- Current Transformers
- Voltage Transformers

Driving mechanism

Three-position disconnector
- Disconnector motorization

Additional interlocks
- Electrical interlocks
- Key lock interlocks
- Pad locks

Cable compartment
- Up to 4 cables per phase
- Toroidal-core current transformers
- Plug-in voltage transformer

Low voltage compartment

Panel height
- 2425
- 2245
- Protection, automation, control and signalling devices

Dimensions

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kg</td>
<td>Lbm</td>
</tr>
<tr>
<td>&lt;550</td>
<td>&lt;250</td>
</tr>
</tbody>
</table>
## CPG.O-S

**Single busbar Disconnector panel**

Includes a three-position disconnector without load breaking capacity.

### Electrical characteristics

<table>
<thead>
<tr>
<th></th>
<th>IEC</th>
<th>ANSI / IEEE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rated voltage</strong></td>
<td>U_r [kV]</td>
<td>24</td>
</tr>
<tr>
<td><strong>Rated frequency</strong></td>
<td>f_r [Hz]</td>
<td>50 / 60</td>
</tr>
<tr>
<td><strong>Rated current</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General busbar</td>
<td>I_r [A]</td>
<td>1250 / 1600 / 2000 / 2500</td>
</tr>
<tr>
<td>Feeder</td>
<td>I_r [A]</td>
<td>1250 / 1600</td>
</tr>
<tr>
<td><strong>Rated short-duration power frequency withstand voltage (1 min)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phase-to-earth (ground) and between phases</td>
<td>U_d [kV]</td>
<td>50</td>
</tr>
<tr>
<td>Across isolating distance</td>
<td>U_d [kV]</td>
<td>60</td>
</tr>
<tr>
<td><strong>Rated lightning impulse withstand voltage</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phase-to-earth (ground) and between phases</td>
<td>U_pp [kV]</td>
<td>125</td>
</tr>
<tr>
<td>Across isolating distance</td>
<td>U_pp [kV]</td>
<td>145</td>
</tr>
<tr>
<td><strong>Internal arc classification</strong></td>
<td>IAC</td>
<td>AF(R) 25 kA 1 s</td>
</tr>
</tbody>
</table>

### Switch-disconnector

<table>
<thead>
<tr>
<th>IEC 62271-103 + IEC 62271-102</th>
<th>IEEE C37.74</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rated short-time withstand current (main circuit)</strong></td>
<td></td>
</tr>
<tr>
<td>Value t = 1 s or 3 s</td>
<td>I_k [kA]</td>
</tr>
<tr>
<td>Peak value</td>
<td>I_p [kA]</td>
</tr>
<tr>
<td><strong>Switch-disconnector Category</strong></td>
<td></td>
</tr>
<tr>
<td>Mechanical endurance</td>
<td>2000-M1</td>
</tr>
<tr>
<td>Cycles of operations (Short-circuit making current): class</td>
<td>E0</td>
</tr>
</tbody>
</table>

### Earthing (grounding) Switch

<table>
<thead>
<tr>
<th>IEC 62271-102</th>
<th>IEEE C37.74</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rated short-time withstand current (earthing circuit)</strong></td>
<td></td>
</tr>
<tr>
<td>Value t = 1 s or 3 s</td>
<td>I_k [kA]</td>
</tr>
<tr>
<td>Peak value</td>
<td>I_p [kA]</td>
</tr>
<tr>
<td><strong>Main switch making capacity (peak value)</strong></td>
<td></td>
</tr>
<tr>
<td>Value</td>
<td>I_m [kA]</td>
</tr>
<tr>
<td><strong>Earthing (grounding) Switch Category</strong></td>
<td></td>
</tr>
<tr>
<td>Mechanical endurance</td>
<td>2000-M1</td>
</tr>
<tr>
<td>Cycles of operations (Short-circuit making current): class</td>
<td>E0</td>
</tr>
</tbody>
</table>

* With forced ventilation  ** For higher values, please consult Ormazabal

### Applications

Feeder/transformer disconnection, busbar coupling rise and busbar voltage metering.
Configuration

Panel structure
- Internal arc
  - IAC AFL 25 kA 1 s (IEC)
  - IAC AFLR 25 kA 1 s (IEC)

Gas tank
- Pressure gauge with potential-free contact
- Voltage presence indicator
- Auxiliary contact
- Visual inspection device

Busbar compartment
- Up to 2500 A – 24 kV
- Up to 1250 A – 36 kV
- Up to 2250 A – 27 kV
- Up to 1250 A – 38 kV
- Current Transformers
- Voltage Transformers

Driving mechanism
- Three-position disconnector
  - Disconnector motorization
  - Earthing (grounding) switch motorization

Additional interlocks
- Electrical interlocks
- Key lock interlocks
- Pad locks

Cable compartment
- Up to 4 cables per phase
- Toroidal-core current transformers
- Plug-in voltage transformer

Low voltage compartment
- Panel height
  - 2245
  - 2425
  - Protection, automation, control and signalling devices

Dimensions

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Weight</th>
<th>Kg</th>
<th>Lbm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;550</td>
<td></td>
<td>&lt;250</td>
</tr>
</tbody>
</table>
CPG.0 & CPG.1
Single and double busbar panel type GIS system

**CPG.0-C**

Single busbar coupling panel

It includes a vacuum circuit-breaker with two three-position disconnectors in series with it, one upstream and the other downstream from the circuit-breaker.

These elements are located inside the switch compartments.

<table>
<thead>
<tr>
<th>Electrical characteristics</th>
<th>IEC</th>
<th>ANSI / IEEE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated voltage</td>
<td>$U_r$ [kV]</td>
<td>24 / 36</td>
</tr>
<tr>
<td>Rated frequency</td>
<td>$f_r$ [Hz]</td>
<td>50 / 60</td>
</tr>
<tr>
<td>Rated current</td>
<td>$I_r$ [A]</td>
<td>1250 / 1600 / 1250 / 2000 / 2250 / 1250</td>
</tr>
<tr>
<td>Rated short-duration power frequency withstand voltage (1 min)</td>
<td>$U_d$ [kV]</td>
<td>50 / 70</td>
</tr>
<tr>
<td></td>
<td>Across isolating distance</td>
<td>60 / 80</td>
</tr>
<tr>
<td>Rated lightning impulse withstand voltage</td>
<td>$U_p$ [kV]</td>
<td>125 / 170</td>
</tr>
<tr>
<td></td>
<td>Across isolating distance</td>
<td>145 / 195</td>
</tr>
<tr>
<td>Internal arc classification</td>
<td>IAC 25 kA 1 s</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Circuit-breaker</th>
<th>IEC 62271-100</th>
<th>IEEE C37.20.3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated short-time withstand current (main circuit)</td>
<td>$I_k$ [kA]</td>
<td>25</td>
</tr>
<tr>
<td>Value $t_k$ = 1 s or 3 s</td>
<td>$I_p$ [kA]</td>
<td>63 / 65</td>
</tr>
<tr>
<td>Peak value</td>
<td></td>
<td>65</td>
</tr>
<tr>
<td>Rated breaking capacity and making capacity</td>
<td>$I_1$ [A]</td>
<td>630 / 1250 / 1600 / 1250 / 2250</td>
</tr>
<tr>
<td>Mainly active current rated breaking capacity</td>
<td>$I_s$ [kA]</td>
<td>630 / 1250 / 1250 / 2250 / 2500</td>
</tr>
<tr>
<td>Short-circuit breaking capacity</td>
<td>$I_m$ [kA]</td>
<td>25</td>
</tr>
<tr>
<td>Rated operating sequence</td>
<td></td>
<td>CO-15 sCO / CO-3 minCO</td>
</tr>
<tr>
<td>Without reclosing</td>
<td></td>
<td>00,3 sCO-15 sCO / 00,3 sCO-3 minCO</td>
</tr>
<tr>
<td>With reclosing</td>
<td></td>
<td>00,3 sCO-15 sCO / 00,3 sCO-3 minCO</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Switch-disconnector</th>
<th>IEC 62271-103 + IEC 62271-102</th>
<th>IEEE C37.74</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated short-time withstand current (main circuit)</td>
<td>$I_k$ [kA]</td>
<td>25</td>
</tr>
<tr>
<td>Value $t_k$ = 1 s or 3 s</td>
<td>$I_p$ [kA]</td>
<td>63 / 65</td>
</tr>
<tr>
<td>Peak value</td>
<td></td>
<td>65</td>
</tr>
<tr>
<td>Switch-disconnector Category</td>
<td>Mechanical endurance</td>
<td>2000 M1</td>
</tr>
<tr>
<td>Cycles of operations (Short-circuit making current) - class</td>
<td>E0</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Earthing (grounding) Switch</th>
<th>IEC 62271-102</th>
<th>IEEE C37.74</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated short-time withstand current (earthing circuit)</td>
<td>$I_k$ [kA]</td>
<td>25</td>
</tr>
<tr>
<td>Value $t_k$ = 1 s or 3 s</td>
<td>$I_p$ [kA]</td>
<td>63 / 65</td>
</tr>
<tr>
<td>Peak value</td>
<td></td>
<td>65</td>
</tr>
<tr>
<td>Main switch making capacity (peak value)</td>
<td>$I_{ma}$ [kA]</td>
<td>63 / 65</td>
</tr>
<tr>
<td>Earthing (grounding) Switch Category</td>
<td>Mechanical endurance</td>
<td>2000 M1</td>
</tr>
<tr>
<td>Cycles of operations (Short-circuit making current) - class</td>
<td>E0</td>
<td></td>
</tr>
</tbody>
</table>

* With forced ventilation

**Applications**

Longitudinal busbar coupling.
Configuration

Panel structure
- Internal arc
  - IAC AFL 25 kA 1 s (IEC)
  - IAC AFLR 25 kA 1 s (IEC)

Gas tank
- Pressure gauge with potential-free contact
- Auxiliary contact
- Visual inspection device

Busbar compartment
- Up to 2500 A – 24 kV
- Up to 1250 A – 36 kV
- Up to 2250 A – 27 kV
- Up to 1250 A – 38 kV
- Current Transformers
- Voltage Transformers

Driving mechanism
- Three-position disconnector
  - Disconnector motorization
  - Earthing (grounding) switch motorization

Vacuum circuit-breaker
- Motor
- Tripping coil
- 2nd Tripping coil
- Closing coil
- Undervoltage coil
- Opening/closing push-button blocking

Additional interlocks:
- Electrical interlocks
- Key lock interlocks
- Pad locks

Cable compartment
- Lower busbar
- Toroidal-core current transformers

Low voltage compartment
- Panel height
  - 2245
  - 2425
  - Protection, automation, control and signalling devices

Dimensions

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kg</td>
<td>Lbm</td>
</tr>
<tr>
<td>Up to 38 kV ≤ 1600 A</td>
<td>&lt;1300</td>
</tr>
<tr>
<td>Up to 27 kV 2000 A</td>
<td>&lt;2200</td>
</tr>
<tr>
<td>Up to 24 kV 2500 A</td>
<td>&lt;2400</td>
</tr>
</tbody>
</table>
CPG.0 & CPG.1
Single and double busbar panel type GIS system

CPG.0-RB
Single busbar rise panel
Allows the lateral cable feeder incoming or outgoing for communication with the busbar of the general cubicle assembly and its earthing (grounding).

<table>
<thead>
<tr>
<th>Electrical characteristics</th>
<th>IEC</th>
<th>ANSI / IEEE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated voltage U_r [kV]</td>
<td>24</td>
<td>36</td>
</tr>
<tr>
<td>Rated frequency f_r [Hz]</td>
<td>50 / 60</td>
<td>60</td>
</tr>
<tr>
<td>Rated current I_r [A]</td>
<td>2500</td>
<td>1250(*)</td>
</tr>
<tr>
<td>Feeder</td>
<td>1250 / 1600</td>
<td>1250</td>
</tr>
<tr>
<td>Rated short-duration power frequency withstand voltage (1 min)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phase-to-earth (ground) and between phases U_d [kV]</td>
<td>50</td>
<td>70</td>
</tr>
<tr>
<td>Rated lightning impulse withstand voltage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phase-to-earth (ground) and between phases U_p [kV]</td>
<td>125</td>
<td>170</td>
</tr>
<tr>
<td>Internal arc classification IAC</td>
<td>AFL(R) 25 kA 1 s</td>
<td></td>
</tr>
</tbody>
</table>

* For higher values, please consult Ormazabal

Applications
Busbar lateral feeder.
**Configuration**

**Panel structure**

- Internal arc
  - IAC AFL 25 kA 1 s (IEC)
  - IAC AFLR 25 kA 1 s (IEC)

**Gas tank**

- Pressure gauge with potential-free contact
- Voltage presence indicator
- Auxiliary contact

**Busbar compartment**

- Up to 2500 A – 24 kV
- Up to 1250 A – 36 kV
- Up to 2250 A – 27 kV
- Up to 1250 A – 38 kV
- Current Transformers
- Voltage Transformers

**Additional interlocks:**

- Electrical interlocks
- Key lock interlocks
- Pad locks

**Cable compartment**

- Toroidal-core current transformers

**Low voltage compartment**

- Panel height
  - 2245
  - 2425
  - Protection, automation, control and signalling devices

---

**Dimensions**

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Weight Kg</th>
<th>Lbm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;500</td>
<td>&lt;227</td>
</tr>
</tbody>
</table>
**CPG.0 & CPG.1**  
Single and double busbar panel type GIS system

---

**CPG.1-V**

Single (V1) and double (V2) busbar circuit-breaker panel

It includes, in separate compartments, both a circuit-breaker with vacuum breaking technology and an earthing (grounding) switch in series with it, and also feeder disconnectors.

### Electrical characteristics

<table>
<thead>
<tr>
<th></th>
<th>IEC (CPG.1-V1 &amp; V2)</th>
<th>ANSI/IEEE (CPG.1-V1)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rated voltage</strong></td>
<td>$U_r$ [kV]</td>
<td>24, 36, 27, 38</td>
</tr>
<tr>
<td><strong>Rated frequency</strong></td>
<td>$f_r$ [Hz]</td>
<td>50 / 60</td>
</tr>
<tr>
<td><strong>Rated short-duration power frequency withstand voltage (1 min)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phase-to-earth (ground) and between phases</td>
<td>$U_{d}$ [kV]</td>
<td>50, 70, 60, 80</td>
</tr>
<tr>
<td>Across isolating distance</td>
<td>$U_{d}$ [kV]</td>
<td>60, 80, 66, 88</td>
</tr>
<tr>
<td><strong>Rated lightning impulse withstand voltage</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phase-to-earth (ground) and between phases</td>
<td>$U_{p}$ [kV]</td>
<td>125, 170, 125, 170</td>
</tr>
<tr>
<td>Across isolating distance</td>
<td>$U_{p}$ [kV]</td>
<td>145, 195, 145, 195</td>
</tr>
<tr>
<td><strong>Internal arc classification</strong></td>
<td>IAC</td>
<td></td>
</tr>
<tr>
<td><strong>Circuit-breaker</strong></td>
<td>IEC 62271-100</td>
<td>IEEE C37.20.3</td>
</tr>
<tr>
<td><strong>Rated short-time withstand current (main circuit)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Value $t_k = 1$ s or $3$ s</td>
<td>$I_{k}$ [kA]</td>
<td>25 / 31.5, 25/31.5</td>
</tr>
<tr>
<td>Peak value</td>
<td>$I_{p}$ [kA]</td>
<td>63 / 80 (50 Hz), 65 / 85 (60 Hz)</td>
</tr>
<tr>
<td><strong>Rated breaking capacity and making capacity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main active current rated breaking capacity</td>
<td>$I_1$ [A]</td>
<td>630 / 1250 / 1600 / 2000, 2000</td>
</tr>
<tr>
<td>Short-circuit breaking capacity</td>
<td>$I_{sc}$ [kA]</td>
<td>25 / 31.5</td>
</tr>
<tr>
<td>Capacitive current capacity (50 Hz), Capacitor banks</td>
<td>$I_{ma}$ [A]</td>
<td>400</td>
</tr>
<tr>
<td><strong>Rated operating sequence</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With reclosing</td>
<td></td>
<td>O0,3 sCO3 sCO</td>
</tr>
<tr>
<td></td>
<td></td>
<td>O0,3 sCO3 min sCO</td>
</tr>
<tr>
<td><strong>Switch-disconnector</strong></td>
<td>IEC 62271-103</td>
<td>IEEE C37.74</td>
</tr>
<tr>
<td><strong>Rated short-time withstand current (main circuit)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Value $t_k = 1$ s or $3$ s</td>
<td>$I_{k}$ [kA]</td>
<td>25 / 31.5</td>
</tr>
<tr>
<td>Peak value</td>
<td>$I_{p}$ [kA]</td>
<td>63 / 80 (50 Hz), 65 / 85 (60 Hz)</td>
</tr>
<tr>
<td><strong>Switch-disconnector Category</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mechanical endurance</td>
<td>10000, M2</td>
<td>10000</td>
</tr>
<tr>
<td>Electrical endurance (class)</td>
<td>E2C2</td>
<td></td>
</tr>
<tr>
<td><strong>Earthing (grounding) Switch</strong></td>
<td>IEC 62271-102</td>
<td>IEEE C37.74</td>
</tr>
<tr>
<td><strong>Rated short-time withstand current (earthing circuit)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Value $t_k = 1$ s or $3$ s</td>
<td>$I_{k}$ [kA]</td>
<td>25/31.5</td>
</tr>
<tr>
<td>Peak value</td>
<td>$I_{p}$ [kA]</td>
<td>63 / 80 (50 Hz), 65 / 85 (60 Hz)</td>
</tr>
<tr>
<td><strong>Earthing (grounding) Switch Category</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mechanical endurance</td>
<td>2000, M1</td>
<td>1000</td>
</tr>
<tr>
<td>Cycles of operations (Short-circuit making current) - class</td>
<td>E0</td>
<td></td>
</tr>
</tbody>
</table>

### Applications

Main transformer protection, feeder protection, capacitor bank protection, auxiliary service transformer protection, longitudinal coupling with MV cables.
Configuration

Panel structure
- Internal arc
- IAC AFL 31.5 kA 1 s (IEC)

Gas tank
- Voltage presence indicator
- Visual inspection device

Busbar compartment
- Up to 2000 A - 38 kV
- Current Transformers
- Voltage Transformers

Driving mechanism
- Feeder disconnector motorization
- Earthing (grounding) switch motorization

Vacuum circuit-breaker
- Motor
- Tripping coil
- 2nd Tripping coil
- Closing col
- Undervoltage coil
- Opening/closing push-button blocking

Additional interlocks
- Electrical
- Key lock
- Pad locks

Cable compartment
- Up to 4 cables per phase
- Up to 3 cables per phase and 1 surge arrester
- Toroidal-core current transformers
- Plug-in voltage transformer

Low voltage compartment
- Panel height
- 2725
- Protection, automation, control and signalling devices

Dimensions

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Kg</td>
</tr>
<tr>
<td>CPG.1-V1</td>
<td>1100</td>
</tr>
<tr>
<td>CPG.1-V2</td>
<td>1400</td>
</tr>
</tbody>
</table>
CPG.0 & CPG.1
Single and double busbar panel type GIS system

CPG.1-F

Single (F1) and double (F2) fuse protection panel

The single busbar variant is equipped with a switchgear compartment with a three-position switch-disconnector (closed / open / earthing), including fuse protection, whereas the double busbar variant is equipped with another two separate switchgear compartments with feeder disconnectors.

The fuses are housed inside sealed fuse holders, these are housed inside the switchgear compartment, and enhance its insulation level. The combined fuse blow action enables three-pole opening of the switch.

### Electrical characteristics

<table>
<thead>
<tr>
<th></th>
<th>IEC (CPG.1-F1 &amp; F2)</th>
<th>ANSI/IEEE (CPG.1-F1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated voltage U_r [kV]</td>
<td>24</td>
<td>36</td>
</tr>
<tr>
<td>Rated frequency f [Hz]</td>
<td>50 / 60</td>
<td>27 / 38</td>
</tr>
<tr>
<td>Output to transformer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated short-duration power frequency withstand voltage (1 min) U_d [kV]</td>
<td>50</td>
<td>70</td>
</tr>
<tr>
<td>Across isolating distance U_d [kV]</td>
<td>60</td>
<td>80</td>
</tr>
<tr>
<td>Rated lightning impulse withstand voltage U_p [kV]</td>
<td>125</td>
<td>170</td>
</tr>
<tr>
<td>Across isolating distance U_p [kV]</td>
<td>145</td>
<td>195</td>
</tr>
<tr>
<td>Internal arc classification</td>
<td>IAC</td>
<td>AFL 31.5 kA / 1 s</td>
</tr>
</tbody>
</table>

### Switch-disconnector

<table>
<thead>
<tr>
<th>Rated short-time withstand current (main circuit)</th>
<th>IEC 62271-103</th>
<th>IEEE C37.74</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value t_k = 1 s or 3 s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peak value</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main switch making capacity (peak value) I_m [kA]</td>
<td>63 / 80 [50 Hz]</td>
<td>65 / 85</td>
</tr>
<tr>
<td>Switch-disconnector Category</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mechanical endurance</td>
<td>1000-M1</td>
<td>1000</td>
</tr>
<tr>
<td>Cycles of operations (Short-circuit making current)- class</td>
<td>5E3</td>
<td>3</td>
</tr>
</tbody>
</table>

### Earthing (grounding) Switch

<table>
<thead>
<tr>
<th>Rated short-time withstand current (earthing circuit)</th>
<th>IEC 62271-102</th>
<th>IEEE C37.74</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value t_k = 1 s or 3 s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peak value</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main switch making capacity (peak value) I_m [kA]</td>
<td>2.5</td>
<td>2.6</td>
</tr>
</tbody>
</table>

### Applications

Auxiliary service transformer protection.
Configuration

Panel structure
- Internal arc
  - IAC AFL 31.5 kA 1 s (IEC)

Gas tank
- Fuses combined with the switch-disconnector
- Voltage presence indicator
- Visual inspection device

Busbar compartment
- Up to 2000 A – 38 kV
- Current Transformers
- Voltage Transformers

Driving mechanism
- Feeder disconnector motorization
- Earthing (grounding) switch motorization

Additional interlocks
- Electrical
- Key lock
- Pad locks

Cable compartment
- Up to 4 cables per phase
- Toroidal-core current transformers
- Plug-in voltage transformer

Low voltage compartment
Panel height
- 2725
- Protection, automation, control and signalling devices

Dimensions

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPG.1-F1</td>
<td>1000</td>
</tr>
<tr>
<td>CPG.1-F2</td>
<td>1300</td>
</tr>
<tr>
<td>CPG.1-F1</td>
<td>2425</td>
</tr>
<tr>
<td>CPG.1-F2</td>
<td>2866</td>
</tr>
</tbody>
</table>
### CPG.1-S

**Single (S1) and double (S2) disconnector panel**

It incorporates feeder disconnectors and earthing (grounding) switches, located in separate compartments.

<table>
<thead>
<tr>
<th>Electrical characteristics</th>
<th>IEC (CPG.1-S1 &amp; S2)</th>
<th>ANSI/IEEE (CPG.1-S1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated voltage</td>
<td>U_r [kV]</td>
<td>24</td>
</tr>
<tr>
<td>Rated frequency</td>
<td>f [Hz]</td>
<td>50 / 60</td>
</tr>
<tr>
<td>Rated current</td>
<td>I [A]</td>
<td>27</td>
</tr>
<tr>
<td>General busbar and cubicle interconnection</td>
<td>I [A]</td>
<td>1250 / 1600 / 2000</td>
</tr>
<tr>
<td>Feeder</td>
<td>I [A]</td>
<td>630 / 1250 / 1600 / 2000</td>
</tr>
<tr>
<td>Rated short-duration power frequency withstand voltage (1 min)</td>
<td>U_p [kV]</td>
<td>60 / 80</td>
</tr>
<tr>
<td>Across isolating distance</td>
<td>U_d [kV]</td>
<td>60 / 80</td>
</tr>
</tbody>
</table>

**Switch-disconnector**

<table>
<thead>
<tr>
<th>Rated short-time withstand current (main circuit)</th>
<th>Value t_k = 1 s or 3 s</th>
<th>25 / 31.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak value</td>
<td>I_p [kA]</td>
<td>63 / 80 (50 Hz)</td>
</tr>
<tr>
<td>Switch-disconnector Category</td>
<td>Mechanical endurance</td>
<td>1000 M1</td>
</tr>
<tr>
<td>Cycles of operations (Short-circuit making current) class</td>
<td>E3</td>
<td>3</td>
</tr>
</tbody>
</table>

**Earthing (grounding) Switch**

<table>
<thead>
<tr>
<th>Rated short-time withstand current (earthing circuit)</th>
<th>Value t_k = 1 s or 3 s</th>
<th>25 / 31.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak value</td>
<td>I_p [kA]</td>
<td>63 / 80 (50 Hz)</td>
</tr>
<tr>
<td>Main switch making capacity (peak value)</td>
<td>I_m [kA]</td>
<td>65</td>
</tr>
<tr>
<td>Earthing (grounding) Switch Category</td>
<td>Mechanical endurance</td>
<td>2000 M1</td>
</tr>
<tr>
<td>Cycles of operations (Short-circuit making current) class</td>
<td>E0</td>
<td>80</td>
</tr>
</tbody>
</table>

### Applications

Longitudinal busbar coupling with MV cables, busbar voltage metering with disconnection of the voltage transformers.
**Configuration**

**Panel structure**
- Internal arc
  - IAC AFL 31.5 kA 1 s (IEC)

**Gas tank**
- Voltage presence indicator
- Visual inspection device

**Busbar compartment**
- Up to 2000 A – 38 kV
- Current Transformers
- Voltage Transformers

**Driving mechanism**
- Feeder disconnector motorization
- Earthing (grounding) switch motorization

**Additional interlocks**
- Electrical
- Key lock
- Pad locks

**Cable compartment**
- CPG.1-S1: Up to 4 cables per phase
- CPG.1-S1: Up to 3 cables per phase and 1 surge arrester
- CPG.1-S2: Up to 3+3 cables per phase
- CPG.1-S2: Up to 1+1 cables per phase and 1+1 surge arrester

**Low voltage compartment**
- Panel height
  - 2725
- Protection, automation, control and signalling devices

**Dimensions**

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Kg</td>
</tr>
<tr>
<td>CPG.1-S1</td>
<td>1000</td>
</tr>
<tr>
<td>CPG.1-S2</td>
<td>1200</td>
</tr>
</tbody>
</table>
**CPG.1-C**

**Longitudinal single (C) and double (CL) busbar coupling panel**

Includes the following components for each busbar in separate compartments: A vacuum circuit-breaker and the earthing (grounding) switches in series with it in a switchgear compartment and two feeder disconnectors in their corresponding compartments.

### Electrical characteristics

<table>
<thead>
<tr>
<th>Component</th>
<th>IEC (CPG.1-C &amp; CL)</th>
<th>ANSI/IEEE (CPG.1-C*)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated voltage $U_r$ [kV]</td>
<td>24</td>
<td>36</td>
</tr>
<tr>
<td>Rated frequency $f_r$ [Hz]</td>
<td>50 / 60</td>
<td>27 / 38</td>
</tr>
<tr>
<td></td>
<td>Feeder: 630 / 1250 / 1600 / 2000</td>
<td>2000</td>
</tr>
<tr>
<td>Rated short-duration power frequency withstand voltage (1 min) $U_d$ [kV]</td>
<td>Phase-to-earth (ground) and between phases: 50 / 70</td>
<td>60 / 80</td>
</tr>
<tr>
<td></td>
<td>Across isolating distance $U_d$ [kV]</td>
<td>60 / 80</td>
</tr>
<tr>
<td>Rated lightning impulse withstand voltage $U_p$ [kV]</td>
<td>Phase-to-earth (ground) and between phases: 125 / 170</td>
<td>125 / 170</td>
</tr>
<tr>
<td></td>
<td>Across isolating distance $U_p$ [kV]</td>
<td>145 / 195</td>
</tr>
<tr>
<td>Internal arc classification IAC</td>
<td>$A1[R]$</td>
<td>31.5 kA / 1 s</td>
</tr>
</tbody>
</table>

#### Circuit-breaker

**IEC 62271-100**

<table>
<thead>
<tr>
<th>Value $I_k$ = 1 s or 3 s</th>
<th>IEC 62271-100</th>
<th>IEEE C37.20.3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak value $I_p$ [kA]</td>
<td>63 / 80 (50 Hz)</td>
<td>65 / 85</td>
</tr>
<tr>
<td></td>
<td>65 / 85 (60 Hz)</td>
<td>65 / 85</td>
</tr>
</tbody>
</table>

#### Switch-disconnector

**IEC 62271-103**

<table>
<thead>
<tr>
<th>Value $I_k$ = 1 s or 3 s</th>
<th>IEEE C37.74</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak value $I_p$ [kA]</td>
<td>63 / 80 (50 Hz)</td>
</tr>
<tr>
<td></td>
<td>65 / 85 (60 Hz)</td>
</tr>
</tbody>
</table>

#### Earthing (grounding) Switch

**IEC 62271-102**

<table>
<thead>
<tr>
<th>Value $I_k$ = 1 s or 3 s</th>
<th>IEEE C37.74</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak value $I_p$ [kA]</td>
<td>63 / 80 (50 Hz)</td>
</tr>
<tr>
<td></td>
<td>65 / 85 (60 Hz)</td>
</tr>
</tbody>
</table>

### Applications

Longitudinal busbar coupling.
### Configuration

**Panel structure**
- Internal arc
  - IAC AFL 31.5 kA 1 s (IEC)

**Gas tank**
- Voltage presence indicator
- Visual inspection device

**Busbar compartment**
- Up to 2000 A – 38 kV
- Current Transformers
- Voltage Transformers

**Driving mechanism**
- Feeder disconnector motorization
- Earthing (grounding) switch motorization

**Additional interlocks**
- Electrical
- Key lock
- Pad locks

**Low voltage compartment**
- Panel height
  - 2725
- Protection, automation, control and signalling devices

### Options

**IEC**
- CPG.1-CL

**ANSI/IEEE**
- CPG.1-C (M type)

### Dimensions

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Weight Kg</th>
<th>Lbm</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPG.1-C</td>
<td>1400</td>
<td>3086</td>
</tr>
<tr>
<td>CPG.1-C (type C)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CPG.1-C (type M)</td>
<td>2800</td>
<td>6172</td>
</tr>
</tbody>
</table>
Transversal busbar coupling panel

Includes the following components in separate switchgear compartments:

A vacuum circuit-breaker and two earthing (grounding) switches inserted with it in the switchgear compartment, and feeder disconnectors in its corresponding compartments.

### Electrical characteristics

<table>
<thead>
<tr>
<th>Parameter</th>
<th>IEC (CPG.1-CT)</th>
<th>IEC (CPG.1-CT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated voltage</td>
<td>U_r [kV]</td>
<td>24</td>
</tr>
<tr>
<td>Rated frequency</td>
<td>f_r [Hz]</td>
<td>50 / 60</td>
</tr>
<tr>
<td>Rated current</td>
<td>I_r [A]</td>
<td>1250 / 1600 / 2000</td>
</tr>
<tr>
<td>Rated short-duration power frequency withstand voltage (1 min)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phase-to-earth (ground) and between phases</td>
<td>U_d [kV]</td>
<td>50</td>
</tr>
<tr>
<td>Across isolating distance</td>
<td>U_d [kV]</td>
<td>60</td>
</tr>
<tr>
<td>Rated lightning impulse withstand voltage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phase-to-earth (ground) and between phases</td>
<td>U_p [kV]</td>
<td>125</td>
</tr>
<tr>
<td>Across isolating distance</td>
<td>U_p [kV]</td>
<td>145</td>
</tr>
<tr>
<td>Internal arc classification</td>
<td>IAC</td>
<td>AFL 31.5 kA / 1 s</td>
</tr>
</tbody>
</table>

### Circuit-breaker

**IEC 62271-100**

**Rated short-time withstand current (main circuit)**

| Value t = 1 s or 3 s | I_k [kA] | 25 / 31.5 | 25 / 31.5 |
| Peak value | I_p [kA] | 63 / 80 (50 Hz) | 65 / 85 (60 Hz) |

**Rated breaking capacity and making capacity**

| Value | I_k [kA] | 1250 / 1600 / 2000 |
| Main switch breaking capacity | I_m [kA] | 25 / 31.5 |

**Rated operating sequence**

Without reclosing | CO-15 s-CO
With reclosing | 0,3 xCO-15 sCO

**Circuit-breaker category**

Mechanical endurance (operations-class) | 10000 - M2
Electrical endurance (class) | E2-C2

### Switch-disconnector

**IEC 62271-103**

**Rated short-time withstand current (main circuit)**

| Value t = 1 s or 3 s | I_k [kA] | 25 / 31.5 |
| Peak value | I_p [kA] | 63 / 80 (50 Hz) | 65 / 85 (60 Hz) |

**Switch-disconnector Category**

Mechanical endurance | 1000M1
Cycles of operations (Short-circuit making current) class | 5E3

### Earthing (grounding) Switch

**IEC 62271-102**

**IEEE C37.74**

**Rated short-time withstand current (earthing circuit)**

| Value t = 1 s or 3 s | I_k [kA] | 25 / 31.5 |
| Peak value | I_p [kA] | 63 / 80 (50 Hz) | 65 / 85 (60 Hz) |

**Main switch making capacity (peak value)**

| Value | I_m [kA] | 65 / 85 (60 Hz) |

**Earthing (grounding) Switch Category**

Mechanical endurance | 2000M1
Cycles of operations (Short-circuit making current) class | 0

### Applications

Transversal busbar coupling.
**Configuration**

**Panel structure**
- Internal arc
  - IAC AFL 31.5 kA 1 s (IEC)

**Gas tank**
- Voltage presence indicator
- Visual inspection device

**Busbar compartment**
- Up to 2000 A – 38 kV
- Current Transformers
- Voltage Transformers

**Driving mechanism**
- Feeder disconnector motorization
- Earthing (grounding) switch motorization

**Additional interlocks**
- Electrical
- Key lock
- Pad locks

**Low voltage compartment**
- Panel height
  - 2275
- Protection, automation, control and signalling devices

---

**Dimensions**

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPG.1-CT</td>
<td>2200</td>
</tr>
</tbody>
</table>
Other components and accessories

Indicators
Voltage presence indicator
Each panel includes a voltage presence/absence detector with permanent light indication and an optional free auxiliary contact for remote display of the corresponding indication.

The indicator, with fixed installation, has been designed according to standard IEC 61243-5 and VDE 0682 Part 415.

Pressure switch
The gas pressure in CPG.0 panels is tested by means of a temperature-compensated pressure gauge, with a potential-free contact, allowing it to be used as a remote alarm.

Optionally in CPG.1, pressure switches for each gas tank can be installed.

CTs and VTs
Current transformers
Transformers designed by Ormazabal whose main characteristics are:
- Toroidal type
- Encapsulated
- Installed outside the switch compartment, upstream of the medium voltage connectors
- Protected against environmental conditions
- Simple assembly and free of errors during installation (earths)

Installation:
- Busbar compartment and/or cable compartment

Voltage transformers
Characteristics:
- Plug-in type
- Single-phase
- Insulated
- Shielded
- Inductive operation
- Installed outside the switch compartment
- Protected against environmental conditions

Installation:
- Busbar compartment and/or cable compartment

HRC Fuses
Protection against short circuits in the Medium Voltage network is made by means of the fuse protection functions.

The fuse holder tubes reach a uniform temperature all along the tube when they are placed horizontally inside the gas tank. When the cover is closed, they are fully sealed against floods and external pollution.

Features:
- Horizontal fuse holders
- Front access
- Phase-independent compartments
- Protected within the gas tank
- Insulation and sealing against external agents (pollution, temperature changes, adverse weather conditions, including floods)
- Internal interlocks for a safe access to the fuse holder area

Please consult Ormazabal for further information about fuse selection.
Handling, installation and after sales

Handling

- Reduced size and weight make easier manipulation and installation tasks
- Safe panel delivery:
  - Upright position on a pallet, wrapped in protective plastic with polystyrene corner pieces

Connection between panels

The interconnection between panels is external to the switch compartment and is made with busbars with solid and shielded insulation, designed to allow uninstalling a functional unit without having to move the adjacent units and without gas handling.

Spare parts

Metal enclosure
- Lateral cover

- CPG.1 Front door

Operating levers

Fuse protection
- Fuse holder carriage

Handling methods:
- Lifting: Forklift truck or hand-operated pallet jack
- Raising: Slings & lifting beams

For handling and installation instructions request the corresponding manuals to OrmaZabal.
Inside buildings

- Easy handling with pallet jack.
- Reduced dimensions and minimum space required for its location, due to its careful design and use of SF₆ gas as insulating medium.
- Modularity and extensibility on both sides, allowing a fast and economic installation process, in reduced space and without using gas on site, not having to move adjacent panels to remove a central panel.
- Reduction of the panel room dimension, due to its frontal access and design without removable switchgear, and not requiring a rear access space.
- Optimisation of installation and civil work costs due to its reduced dimensions and little need of operation space.

The minimum distances [mm] (inch) recommended for a correct installation, once placed in their final location, are:

For CPG.0:

- * Not required with pressure relief duct.
- ** According to Annex A of standard IEC 62271-200 (Cable trench depth depending on cable bend radius)

For CPG.1:

- * Not needed with pressure relief duct.
- *** In accordance with Appendix A of standard IEC 62271-200 (Cable trench depth depending on cable bend radius).

For other dimensions, please consult Ormazabal.

Inside mobile substations

CPG panels can also be installed inside mobile substations.

Inside wind turbines and wind farm substations

CPG panels can also be installed inside wind turbines and wind farm substations.
Commissioning and After Sales

Services
- Technical assistance
- Engineering
- Procurement
- Contracting
- Installation
  o Cubicle connection
  o Earthing (grounding)
  o Cable/busbar connection
- Commissioning
  o Relay configuration
  o Phase comparison
  o Energizing
  o Tests
- After sales support
  o Maintenance
  o Training

Recycling and end-of-life

As a part of its after sales services, Ormazabal provides electrical utilities and electrical end users recycling services for its switchgear.

The Ormazabal production centres have introduced the corresponding environmental management systems, conforming to the requirements of the international ISO 14001 standard and endorsed by the Environmental Management Certificate AENOR CGM-00/38 among others.

CPG system cubicles have been designed and manufactured in accordance with the requirements of international standard IEC 62271-200.

By design, and depending on the models, they have a sealed compartment with SF₆ which allows full operation of the equipment throughout its service life, estimated at 30 years (IEC 62271-200).

At the end of the product life cycle, the SF₆ gas content must not be released into the atmosphere. It is recovered and treated for reuse, in accordance with the instructions given in standards IEC 62271-303, IEC 60480 and the CIGRE 117 guide. Ormazabal will provide the additional information required to carry out this task correctly, out of respect for the safety of individuals and that of the environment.