

OPERATING SAFETY



DRIVING MECHANISMS

The driving mechanism frontal placing allows operations to be carried out safely, simply and easily.

Its position is indicated reliably on the synoptic, as well as is validated by the kinematic chain test, in accordance with the standard IEC 62271-102.

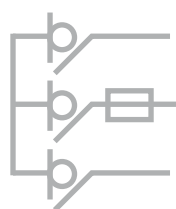
The leak-proof gastank maintains optimum operating conditions during the service life of the cubicle, according to the IEC 60694 standard. Likewise, the enclosure has been designed and tested to withstand the effects of internal arcs for personal and equipment protection.



INTERLOCKS

The **CGM-CGC** system has inner interlocks that allow for reliable and safe service, in accordance with the requirements of the IEC 60298 (IEC 62271-200) standard. These interlocks make impossible, for example, to close simultaneously the switch-disconnector and the earthing switch or to open the cable access cover while the earthing switch is not connected, etc.

Furthermore, cubicles allow switching to be disabled by padlocks and optionally by locks.



EKORSYS FAMILY

This family includes a series of units, which can be integrated in the **CGM-CGC** system to provide protection, measuring, control and signalling functions in the Medium Voltage Distribution Networks.

The different units, composed by a group of elements: relays, measuring sensors, power supply cards, toroidal transformers, low energy bistable tripping devices, etc., provide added value to the facilities by extending their service life, while ensuring equipment and personal safety and enhancing the quality of service:

- Power supply **card**.
- Bistable **tripping** device.
- **ekorVPIS**: Integrated voltage presence indicator.
- **ekorSPC**: Phase comparator. Device to indicate phase coincidence between two cubicles.
- **ekorCCP**: Programmable cubicle controller.
- **ekorSTP**: Automatic feeder transfer.
- **ekorSOFT**: ekorSYS family management software.
- **Mercury**: Computer application for remote control and automation of transformer substations from a SCADA-based control station.

- **ekorRPT**: Protection, measuring and control unit, specifically designed for application in the fused-protection functional unit.
- **ekorRPG**: Protection, measuring and control unit, designed for application in the circuit breaker functional unit.
- **ekorRCI**: Signalling, measuring and control unit, specifically designed for application in the feeder functional unit.
- **ekorRTK**: Detection unit for three phase presence/absence of voltage.
- Measuring **sensors** and self-power **toroidal transformers**.



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- Transformer Substations
 - Prefabricated Transformer Substations up to 36 kV
 - Medium Voltage applications for Wind Farms up to 36 kV
- Medium Voltage Switchgear Secondary Distribution Networks
 - **CGM - CGC** System
 - CGMCOSMOS System
- Medium Voltage Switchgear Primary Distribution Networks
 - CPG System
- Protection, Control, Automation and Telecommand
- Electrical Distribution Transformers
- Low Voltage Boards

MV Switchgear for Secondary Distribution Networks



CGM-CGC Fully Gas-Insulated Modular and Compact (RMU) System
Up to 36 kV

OVERVIEW

The **CGM-CGC** system is composed of a series of gas-insulated modular and compact cubicles, for different secondary distribution configurations in Medium Voltage networks up to 36 kV in public or industrial applications.

Both the breaking and switching components as well as the busbar, and even the fuse holders and their connections, are housed inside a leak-proof and sealed for life, SF₆ gas filled stainless steel tank, thus building a fully insulated equipment.

The metal enclosure of each cubicle, manufactured in galvanized steel plate, is sturdy enough to prevent deformation and ensure protection under the expected operating conditions.

The **CGM-CGC** units have a front cover, properly interlocked to provide safe, convenient access to the cable terminals and the fuse holders (arranged horizontally).

Optionally, cubicles can be supplied with bushings on the side for cable incomings.



MAIN FEATURES

- Full gas-insulation, providing protection against harsh environmental elements (including flooding), long service life and maintenance-free of live parts.
- Complete modularity and future extendibility, in both sides using the **ORMALINK** connecting set.
- Personal, property and equipment protection: internal arc withstand, in accordance with IEC 60298.
- Reduced size and weight, for easy handling and installation.
- Safe and simply operation, highly ergonomic operation components and additional interlocks included.
- Possibility of assembling accessories and performing tests under voltage.
- Front access, gas-insulated, horizontal fuse holder.
- Easy cable connection, with plug-in or screwed terminals.

- Own cable trench, no need for a civil work or the installation of additional frames.
- The ekorVPIS, voltage presence light indicator according to IEC 61958, is integrated in the cubicles as a safety component.



STANDARDS

The **CGM-CGC** system complies with the following standards' requirements:

IEC 60298 (IEC 62271-200)

A.C. Metal-enclosed switchgear and controlgear for rated voltages above 1 kV and up to and including 52 kV.

IEC 60265

High-voltage switches. Part 1: High voltage switches for rated voltages over 1 kV and under 52 kV.

IEC 60129

Alternating current disconnectors and earthing switches.

IEC 62271-105

Alternating current switch-fuse combinations.

IEC 60694

Common specifications for high-voltage switchgear and controlgear standards.

IEC 62271-100

High-voltage alternating current circuit breakers.

IEC 60255

Electric relays.

The **CGM-CGC** system meets the immersion tests at 3 metres water column pressure, 24 hours at rated voltage and insulating tests at power frequency.

*Note: IEC standards are currently being updated, and therefore the nomenclature may vary in some cases.

TYPES OF MODULES

CGM-CML Incoming feeder or line functional unit.	CGM-CMP-F Fused-protection functional unit.	CGM-CMP-V Vacuum circuit breaker protection functional unit.	
CGM-CMIP Busbar switch functional unit.	CGM-CMIP-Pt Busbar switch with earthing functional unit.	CGM-CMR Cable rising functional unit.	CGM-CMM Metering functional unit.
CGM-CGC-2LP Compact cubicle with two feeder and one fused-protection functional units (RMU type).	CGM-CGC-2LIP Compact cubicle with two feeder and one busbar switch functional units.	CGM-CGC-0LP Compact cubicle with one busbar riser, one feeder and one fused-protection functional units.	

Extensibility: Left Right Both None

	CGM Modular cubicles							CGC Compact cubicles		
	CML	CMIP	CMIP-Pt	CMP-F	CMP-V	CMM	CMR	2LP	2LIP	0LP
Rated voltage [kV]	36									
Rated current [A]:	400/630									
Busbars	400/630									
Outgoing	400/630	-	-	200	400/630	-	-	400/630	400/630	400/630
Short-time current [kA]	16/20	16/20	16/20	16/20	16/20	-	-	200	16/20	200
Insulation level:										
Power frequency [kV]	70/80	70/80	70/80	70/80	70/80	-	-	70/80	70/80	70/80
Lightning impulse [kV]^{PEAK}	170/195	170/195	170/195	170/195	170/195	-	-	170/195	170/195	170/195
Rated frequency [Hz]	50/60									
PHYSICAL CHARACTERISTICS										
Height [mm]	1800	1800	1800	1800	1800	1950	1800	1800	1800	1800
Width [mm]	420	420	600	480	600	900/1100	370	1320	1440	1320
Depth [mm]	850	850	850	1035	850	1160	780	1035	850	1035
Weight [kg]	145	130	150	255	240	290*	42	490	520	480

*Transformers not included.

MODULARITY

The electrical connection between the different modules of the **CGM-CGC** system is carried out by the **ORMALINK** connecting set, patented by **Ormazabal** in 1991.

The extendible cubicles have lateral female bushings for connecting the main busbars with this assembly; this allows current to flow while also controlling the electric field by means of elastomer insulating layers, which are free of partial discharges.

Nevertheless, as long as the transformer substation is not extended, the extendible cubicles are provided with removable sealing plugs for the lateral female bushings.

Due to the **ORMALINK** design, an equipotential area is created inside which houses a series of contacts arranged in a circle to connect the standard bushings.

This achieves highly reliable and resistant electrical continuity even resistant to short circuit currents, maintaining the cubicle's functional characteristics.

A highly acknowledged feature is the quick and easy on site installation, even in transformer substations with uneven floor.



Modularity and extendibility: characteristics of the **CGM-CGC** system that enable maximum flexibility to configure any MV schemes, as for example:



(* For other configurations please contact our Technical-Commercial department.