ormazabal
velatia

Smart and digital grids

Green mobility

Sustainable buildings and infrastructure

Green generation and storage

ROUTE TO ZERO

SECONDARY DISTRIBUTION

cgm.zero24

F-gas-free insulated switchgear (GIS)

Up to 24 kV

IEC Standards

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.

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 notice.

These characteristics, as well as the availability of components, are subject to confirmation by Ormazabal.

Contents

1. Introduction

Ormazabal p. 5
Benefits of our solutions p. 6

2. F- gas-free insulated (GIS) technology

Proven experience p. 9
Moving away from SF6: the technological breakthrough p. 9
An F-gas-free solution based on five requirements p. 10
Best-in-class solution: cgm.zero24 p. 12

3. Range description

Design p. 16
Components p. 17
Technical characteristics p. 18
Functional overview p. 19
Standards and certifications p. 19
Digital native p. 20

4. Functions

Feeder function p. 22
Fuse protection function p. 24
Circuit-breaker protection p. 28
Ancillary services supply function p. 30
Metering function p. 32
Cable rise function p. 34

5. Installation and connection

6. Services

Ormazabal Services p. 42

1. Introduction

Ormazabal p. 5
Benefits of our solutions p. 6

Ormazabal

We are **experts in customized, high-tech electrical solutions, with more than 55 years´ experience**.

Our solutions are focused on **digitalizing the electrical grid** in order to integrate more renewable energy generation, enable greater sustainable mobility and guarantee efficient supply for buildings and infrastructures with critical energy needs.

Thanks to our permanent commitment to technological and industrial innovation, we have positioned our technology worldwide to become a global player. Our 17 industrial plants and a network of subsidiaries and distributors all over the world help us serve **our customers' needs in over 50 countries**.

We have a unique research and technology center and a team of **more than 2,700 highly qualified professionals**, all with a common purpose: to lead the technological evolution of electrical grids enabling the energy transition.

Benefits of our solutions

Digitalisation

We respond to new requirements in smart grids with digital native solutions. Our intelligent electronic devices enable optimal network management, guaranteeing:

- Greater safety
- Continuity of service
- High efficiency

Efficiency

We design flexible, compact equipment for easy handling, installation and replacement, minimising the impact on the environment.

Safety and reliability

We care about the safety of all people coming into contact with our solutions.

All our equipment is in accordance with the most relevant international standards, ensuring its operation and safety throughout its service life, while maintaining continuity of supply for the electrical grid.

Sustainability

Sustainability is a central pillar in our business strategy. We contribute to the decarbonisation of the planet by developing solutions that enhance electrical grid efficiency, always considering ESG (Environmental, Social, and Governance) aspects.

That's why:

- We optimise energy consumption for both our equipment and the entire manufacturing processes
- We apply eco-design criteria in our entire product portfolio
- We rationalise the use of raw materials, selecting those that can best be recycled, while continuously decreasing the most harmful ones
- We certify the sealtight integrity of our products, reducing the risk of leakage to the environment

2. F- gas-free insulated (GIS) technology

Proven experience p. 9
Moving away from SF6: the technological breakthrough p. 9
An F-gas-free solution based on five requirements p. 10
Best-in-class solution: cgm.zero24 p. 12

Proven experience

+30 years

Since the beginnings of GIS technology (Gas Insulated Switchgear), Ormazabal has been a key player as a manufacturer of distribution switchgears for the electrical grid.

Our strong determination to innovate and develop our own technology, made us more than 30 years ago, pioneers in the development of modular secondary distribution switchgears with lateral extensibility, maintaining integral SF6 insulation. This technology was later applied in our primary distribution switchgears range to complete our GIS portfolio.

Moving away from SF6: the technological breakthrough

Sustainability and development of a new technology

Our commitment to lead the sustainable transformation of electrical grids has driven us to develop an alternative and innovative technology up to 24 kV, without the use of SF6 as the dielectric gas, which guarantees a lower environmental impact on our planet.

Active listening with customers

A collaborative process to identify the key attributes and requirements our new ranges of primary and secondary switchgears should meet.

Key attributes

- Gas
- Pressure
- Operation & exploitation
- Dimensions

An F-gas-free solution based on five requirements

We have developed a state-of-the-art technology of integral gas insulation that is materialized in two new complete ranges of distribution switchgears. Engineered with zero changes in design parameters and operation, to achieve zero uncertainties in health, safety, reliability and performance. Thus, we have the best alternative for the distribution grid to meet the following requirements:

1. Natural origin gas: industrial natural air

Natural air components. Industrially manufactured. Fully accessible.

Our innovative technology is based on a gas composed uniquely of natural components existing in the air, and industrially produced in a controlled and tested environment. A combination that contains no fluorine and that avoids the humidity present in the ambient air; while being easily reproducible and accessible as it is patent-free.

2. Minimum filling pressure

Well-known behavior. Proven tightness.

This requirement is based on more than 30 years of field experience in different site conditions, thus minimising uncertainties.

3. Easy operation & exploitation

Innovative load break switch. Circuit-breaker with proven technology.

The design of this solution features an already proven and tested switching and breaking technology in our well experienced SF6 switchgear ranges.

Regarding the switching functions, the core of the cubicle is an innovative load break switch.

In particular, for circuit breaker protection functions the solution is based on experienced, vacuum breaking technology.

4. Compact dimensions

Similar footprint. Optimised dimensions.

Our new ranges maintain similar dimensions to the existing ones with SF6 insulation, thus allowing our customers the possibility of installing them in reduced spaces.

5. Digital native

Sensoring. Automation.

Our switchgears are designed to integrate sensors and remote monitoring as well as control and protection devices. Ready for automation to enhance management and digitalization of the electrical grid.

ROUTE TO ZERO

zero changes

zero uncertainties

more sustainability for your electrical grid

Best-in-class solution: cgm.zero24

The next generation F-gas-free insulated switchgear (GIS) for 24 kV secondary distribution.

Minimum filling pressure

We use the same filling pressure (< 1.5 bar absolute), as in current SF6 existing products.

Benefits:

- Unchanged routine tests
- Non additional testing requirements
- Well experienced leakage rate
- Well-known internal arc behaviour
- Rated short duration power-frequency voltage without overpressure

Natural origin gas

We select industrial natural air as insulation and switching medium.

Benefits:

- Non F-gas
- No impurities
- No humidity
- Free of patents
- GWP=0

Experienced breaking and operation

We choose experienced technological systems for switching and breaking.

Load break switch

Innovative rotating three-position switch-disconnector (close-open-earth) with double-effect blowing system. Upgraded to break in industrial natural air with well experienced overpressure.

This switch is also used in combination with fuses for protection functions.

Benefits:

- Simple and reliable device
- Switch status easy verification
- Well-known operation sequence

Circuit breaker

Circuit breaker with vacuum breaking technology, compact and well-proven reliability.

Benefits:

- Experienced technology
- Ensuring isolation distance with a disconnector in series

3. Range description

Design	p. 16
Components	p. 17
Technical characteristics	p. 18
Functional overview	p. 19
Standards and certifications	p. 19
Digital native	p. 20

Design

1 Gas tank

The gas-filled tank is sealtight and contains the busbar and the switching and breaking devices.

- Sealed for life
- Internal arc tested
- Stainless steel
- Switching, breaking and main circuit devices:
  - Switch-disconnector
  - Circuit breaker
  - Fuse holder tubes

2 Base

Composed of the cable compartment and the gas relief compartment:

Cable compartment

The cable connection compartment is located at the bottom of the cubicle and can be accessed by removing the front cover.

This compartment houses the:

- Horizontal bushing
- Connectors and cables
- Current and voltage sensors

Gas relief compartment

It conducts the gases generated as a result of an internal arc, in a fully controlled manner to avoid any possible injury to people in the equipment operation area.

3 Driving mechanism compartment

This is the compartment in which the switch-disconnector or the circuit breaker is operated, depending on the type of function.

It includes the following:

- Driving mechanism (frontal access)
- Mimic diagram(1) and position indicator for driving mechanism
- Voltage detecting and indicating system
- Protection and control unit
- Pressure gauge

Optionally, a control box can be added in the top of this compartment in order to install additional IEDs

(1) Design according to the country, regulations, etc...

Components

Driving mechanism

The driving mechanism is used to perform switching and breaking operations in the medium-voltage circuits.

There are different models depending on the applications:

Three-position (close-open-earth) switch-disconnector

Models:

B: basic mechanism with operation-independent opening or closing by lever.

BM: basic mechanism with operation-independent opening or closing by motor.

Three-position (close-open-earth) switch-fuse combination

Models

BR / AR: mechanism with opening latching system.

Circuit breaker

Models:

RAV: circuit-breaker with rapid auto-reclosing.

RAVM: motorised circuit-breaker with rapid auto-reclosing.

Interlocks

Mechanical and electrical interlocks that guarantee optimum operation of the equipment and all its elements.

Built-in functional interlocks to prevent unsafe operations (e.g. closing the switch disconnector and the earthing switch at the same time, opening the cable compartment access cover unless the earthing switch is closed).

Padlocking capabilities.

Key interlocking to optionally install locks blocking the disconnector mechanism in different positions (open- disconnected, closed, earthed, etc.).

Technical characteristics

Electrical characteristics			IEC
Rated voltage	U_r	[kV]	24
Rated frequency	f_r	[Hz]	50/60
Rated current	I_r		
Busbars and cubicle interconnection		[A]	400/630
Feeder		[A]	400/630
Transformer outgoing line		[A]	200
Rated short-time withstand current			
With t_k = (x) s	I_k	[kA]	16 (1/3 s) / 20 (1 s)
Peak value	I_p	[kA]	50/52
Rated insulation level			
Power frequency rated withstand voltage [1 min]	U_d	[kV]	50/60
Lightning impulse rated withstand voltage	U_p	[kV]	125/145
Internal arc classification according to IEC 62271-200	IAC		AFL [R][1] 16/20 kA 1s
IP rating: Gas tank			IPX8
IP rating: External enclosure			IP3X
Colour of equipment		RAL	7024/9023
Loss of service continuity category		LSC	LSC2
Partition class			PM

[1] R classification as optional.

Driving mechanisms		Three-position switch-disconnector				Vacuum circuit-breaker	
		B	BM	BR	AR	RAV	RAMV
Auxiliary circuits							
Internal insulation	[kV]	2	2	10	10		
Tripping coil							
Rated voltage	[V]	-	-	24/48/110/125 V_{dc}/230 V_{ac}		[1]	
Max. consumption	[W]	-	-	80		56	
Motorised units							
Rated voltage	[V]	-	[2]	-	-	-	[1]
Motor operation time	[s]	-	< 7	-	-	-	< 15
Rated current	[A]	-	< 4	-	-	-	-
Peak current	[A]	-	< 12[3]	-	-	-	< 8
Indicating contacts							
Switch | Earthing		-[4]	2NO + 2NC | 1NO + 1NC	2NO+1NC[4]	2NO+1NC[4] [5]	-[4]	
Circuit-breaker		n/a				2NO + 2NC[6]	9NO + 9NC
Rated voltage	[V_{ac}]	250				250	
Rated current	[A]	16				10	

[1] 24/48/60/110/125/220 V_{dc} | 110/230 V_{ac} [2] 24/48/110/125 V_{dc} | 230 V_{ac} [3] 21 A (24 V_{dc})
[4] Available as an option 2NO + 2NC | 1NO + 1NC [5] Available as an option 2NO + 2NC | 2NO + 2NC [6] Available as an option 9NO + 9NC

Service conditions according to normal service conditions of IEC 62271-1(*)	IEC
Type of switchgear	Indoor
Ambient temperature	
Minimum | Maximum	- 5 °C[1] | + 40 °C
Maximum mean ambient temperature, measured over a 24-hour period	+ 35 °C
Minimum storage temperature	- 40 °C
Relative humidity	
Maximum mean relative humidity, measured over a 24-hour period | 1-month period	< 95% | < 90 %
Vapour pressure	
Maximum mean vapour pressure, measured over a 24-hour period | 1-month period	22 hPa | 18 hPa
Maximum height above sea level	1000 m[2]
Solar radiation	No influence
Ambient air pollution (dust, smoke, corrosive and/or flammable gases, vapours or salt)	Not significant
Vibrations caused by operation of the switchgear itself or similar	Negligible

[1] - 30 °C on request.
[2] 2000 m on request.
* Other conditions on request

Functional overview

Modular cubicles

l

Feeder function

p

Fuse protection function

v

Circuit-breaker protection function

rc

Cable rise function

a

Ancillary services supply function

m

Metering function

Standards and certifications

Applicable electrical standards	
IEC	
IEC 62271-1	Common specifications for high-voltage switchgear and controlgear standards
IEC 62271-200	Alternating current metal-enclosed switchgear and controlgear for rated voltages above 1 kV and up to and including 52 kV
IEC 62271-103	Switches for rated voltages above 1 kV up to and including 52 kV
IEC 62271-102	Alternating current disconnectors and earthing switches
IEC 62271-105	High-voltage alternating current switch-fuse combinations
IEC 62271-100	High-voltage alternating current circuit-breakers
IEC 60255	Electrical relays
IEC 60529	IP ratings for enclosures
IEC 62271-213	Voltage detecting and indicating system
Local regulations	
NF C13-200	High voltage electrical installations for electrical energy production sites, industrial, commercial and agricultural sites

Digital native

cgm.zero24 is ready for the future with integrated automation and control systems for enhanced network and asset management.

1. Current & embedded voltage sensors , according to IEC 61869-10 / IEC 61869-11
2. Control & automation units
3. Condition monitoring for asset management (pressure, temperature, ...)

4. Functions

Feeder function	p. 22
Fuse protection function	p. 24
Circuit-breaker protection	p. 28
Ancillary services supply function	p. 30
Metering function	p. 32
Cable rise function	p. 34

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Feeder function

Modular feeder cubicle, equipped with a three-position switch-disconnector: closed, open or earthed.

Electrical characteristics			IEC
Rated voltage	U_r	[kV]	24
Rated frequency	f_r	[Hz]	50/60
Rated current (busbar and feeder)	I_r	[A]	400/630
Rated short-duration power frequency withstand voltage (1 min)			
Phase-to-earth	U_d	[kV]	50
Across isolating distance	U_d	[kV]	60
Rated lightning impulse withstand voltage			
Phase-to-earth	U_p	[kV]	125
Across isolating distance	U_p	[kV]	145
Internal arc classification	IAC		AFL [R][1] 16/20 kA 1 s
Withstand direct current voltage		[kV]	70
Switch-disconnector			**IEC 62271-103 + IEC 62271-102**
Admissible rated short-time withstand current (main circuit)			
Value t_k = (x) s	I_k	[kA]	16 (1-3 s) / 20 (1 s)
Peak value	I_p	[kA]	40/52
Mainly active current breaking capacity	I_1	[A]	400/630
Breaking capacity - cable charging / feeder charging	I_{4a}	[A]	50/1.5
Closed loop breaking capacity	I_{2a}	[A]	400/630
Earth fault breaking capacity	I_{6a}	[A]	160
Vacuum lines and cable breaking capacity in earth fault conditions	I_{6b}	[A]	100
Transformer magnetising switching current		[A]	21
Main switch making capacity (peak value)	I_{ma}	[kA]	40/52
Switch category			
Mechanical endurance			M1/M2
Operating cycles (short-circuit making operations)- class			E3
Earthing switch			**IEC 62271-102**
Admissible rated short-time withstand current (earthing circuit)			
Value t_k = (x) s	I_k	[kA]	16 (1-3 s) / 20 (1 s)
Peak value	I_p	[kA]	40/52
Earthing switch making capacity (peak value)	I_{ma}	[kA]	40/52
Earthing switch category:			
Mechanical endurance (manual)			M0
Operating cycles (short-circuit making operations)- class			E2

[1] Rear classification as optional.

Dimensions

146/154 kg

IEC

Available options

Gas tank

Gas pressure indicator:

○ Pressure gauge without contact
○ Pressure gauge with temperature compensation and contacts

Front connection:

○ Cable bushing

Extensibility:

○ On both sides

Type of side connection:

Female bushing
○ Right ○ Left ○ Both

Bushing
○ Right ○ Left ○ Both

Driving mechanisms

○ B type manual mechanism
○ BM type motorised mechanism

Additional interlocks:

○ Electrical interlocks
○ Keylock interlocks

Indicators

○ Voltage detecting and indicating system (vdis)

Gas pressure relief

○ Pressure relief downwards
○ Base frame and rear pressure relief duct

Some specific configurations may be incompatible with each other.

cgm.zero24-p

Fuse protection function

Fuse protection modular cubicle, equipped with a three-position switch-disconnector fuse combination: closed, open or earthed and protection with HRC MV fuses.

Electrical characteristics			IEC
Rated voltage	U_r	[kV]	24
Rated frequency	f_r	[Hz]	50/60
Rated current			
General busbar and cubicle interconnection	I_r	[A]	400/630
Transformer outgoing line	I_r	[A]	200
Rated short duration power frequency withstand voltage (1 min)			
Phase-to-earth	U_d	[kV]	50
Across isolating distance	U_d	[kV]	60
Rated lightning impulse withstand voltage			
Phase-to-earth	U_p	[kV]	125
Across isolating distance	U_p	[kV]	145
Internal arc classification	IAC		AFL [R][1] 16/20 kA 1 s
Switch-disconnector			**IEC 62271-103 + IEC 62271-102**
Admissible rated short-time withstand current (main circuit)			
Value t_k = (x) s	I_k	[kA]	16 (1-3 s) / 20 (1 s)
Peak value	I_p	[kA]	40/52
Mainly active current breaking capacity	I_1	[A]	200
Main switch making capacity (peak value)	I_{ma}	[kA]	40/52
Switch category			
Mechanical endurance			M1
Operating cycles (short-circuit making operations)- class			E3
Earthing switch			**IEC 62271-102**
Admissible rated short-time withstand current (earthing circuit)			
Value t_k = (x) s	I_k	[kA]	16 (1-3 s) / 20 (1 s)
Peak value	I_p	[kA]	40/52
Earthing switch making capacity (peak value)	I_{ma}	[kA]	40/52
Earthing switch category:			
Mechanical endurance (manual)			M0
Operating cycles (short-circuit making operations)- class			E2

[1] Rear classification as optional.

Dimensions

210/218 kg

IEC

Available options

Gas tank

Gas pressure indicator:

○ Pressure gauge without contacts
○ Pressure gauge with temperature compensation and contacts

Front connection:

○ Cable bushing

Extensibility:

○ On both sides

Type of side connection:

Female bushing
○ Right ○ Left ○ Both

Bushing
○ Right ○ Left ○ Both

Fuse compartment

Fuse tripping:

○ Via combined fuses
○ Via associated fuses

Fuse holder:

○ 24 kV
○ 12 kV

Driving mechanisms

○ BR type manual mechanism
○ AR type manual mechanism
○ Tripping coil

Additional interlocks:

○ Electrical interlocks
○ Keylock interlocks

Indicators

○ Voltage detecting and indicating system (vdis)

Gas pressure relief

○ Pressure relief downwards
○ Base frame and rear pressure relief duct

Some specific configurations may be incompatible with each other.

Fuse compartment

Characteristics

- 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 safe access to the fuse holder area

Type of protection

In accordance with Standard IEC 62271-105, the switch-fuse combination may be either "associated" or "combined" type.

The combined switch-fuse option enables the opening of the switch-disconnector caused by an external signal, e.g. that sent by the transformer thermostat in the event of overheating.

Tripping of the fuses is shown on the cubicle's front mimic diagram.

		Rated transformer power without overload [kVA] (*)															
U_r Network [kV]	U_r Fuse [kV]	25	50	75	100	125	160	200	250	315	400	500	630	800	1000	1250	1600
		Rated fuse current (IEC 60282-1) [A]															
10	6/12[1]	6.3	10	16	16	20	20	25	31.5	40	50	63	63	80	100	-	-
13.5	10/24	6.3	6.3	10	16	16	20	20	25	31.5	40	50	63	63	80	100	-
15	10/24	6.3	6.3	10	16	16	16	20	20	25	31.5	40	50	63	80	80	-
20	10/24	6.3	6.3	6.3	10	16	16	16	20	20	25	31.5	40	50	50	63	80

[1] A fuse-holder carriage of 292 mm, adapted to the 6/12 kV fuses size. For the rest of fuses 10/24 kV, the fuse-holder carriage will be for 442 mm fuse size.

* The values above mentioned are meant for combined fuses according to IEC 62271-105.

Remarks

- HRC fuses recommended: SIBA brand with medium type striker, according to IEC 60282-1 (low power loss fuses)
- The fuse-switch assembly has been temperature-rise tested under normal service conditions according to IEC 62271-1
- Changing all three units is recommended if any of the fuses blow (according to IEC 60282-1)
- For overload conditions of the transformer or other brands of fuse, check with Ormazabal

cgm.zero24-v

Circuit-breaker protection

Modular cubicle with circuit-breaker protection, equipped with a vacuum circuit-breaker in series with a three-position disconnector.

Electrical characteristics			IEC
Rated voltage	U_r	[kV]	24
Rated frequency	f_r	[Hz]	50/60
Rated current			
General busbar and cubicle interconnection	I_r	[A]	400/630
Feeder	I_r	[A]	400/630
Rated short duration power frequency withstand voltage (1 min)			
Phase-to-earth	U_d	[kV]	50
Across isolating distance	U_d	[kV]	60
Rated lightning impulse withstand voltage			
Phase-to-earth	U_p	[kV]	125
Across isolating distance	U_p	[kV]	145
Internal arc classification	IAC		AFL[R] [1] 16/20 kA 1 s
Withstand direct current voltage		[kV]	48
Circuit-breaker			**IEC 62271-100**
Admissible rated short duration withstand current (main circuit)			
Value t_k = (x) s	I_k	[kA]	16 (1-3 s) / 20 (1 s)
Peak value	I_p	[kA]	40/52
Making and breaking rated capacity			
Mainly active current rated breaking capacity	I_1	[A]	400/630
Short-circuit breaking capacity	I_{sc}	[kA]	16/20
Main switch making capacity (peak value)	I_{ma}	[kA]	40/52
Capacitive current capacity (50 Hz). Cable charging	[A]		31.5
Rated operating sequence			
With rapid auto-reclosing			O-0.3 s-CO-15 s-CO O-0.3 s-CO-3 min-CO
Circuit-breaker category			
Mechanical endurance (operations class)			M2
Electrical endurance (class)			E2-C2
Disconnector			**IEC 62271-102**
Admissible rated short-time withstand current (main circuit)			
Value t_k = (x) s	I_k	[kA]	16 (1-3 s) / 20 (1 s)
Peak value	I_p	[kA]	40/52
Switch category			
Mechanical endurance			M1
Earthing switch			**IEC 62271-102**
Admissible rated short-time withstand current (earthing circuit)			
Value t_k = (x) s	I_k	[kA]	16 (1-3 s) / 20 (1 s)
Peak value	I_p	[kA]	40/52
Main switch making capacity (peak value)	I_{ma}	[kA]	40/52
Earthing switch category:			
Mechanical endurance			M1
Operating cycles (short-circuit making operations)- class			E2

[1] Rear classification as optional.

Dimensions

207/223 kg

IEC

Available options

Gas tank

Gas pressure indicator:

- ○ Pressure gauge without contacts
- ○ Pressure gauge with temperature compensation and contacts

Front connection:

- ○ Cable bushing

Extensibility:

- ○ On both sides

Type of side connection:

Female bushing

○ Right ○ Left ○ Both

Bushing

○ Right ○ Left ○ Both

Driving mechanisms

- ○ B type mechanism
- ○ RAV type manual mechanism with rapid auto-reclosing
- ○ RAMV type motorised mechanism with rapid auto-reclosing
- ○ Tripping coil
- ○ 2nd tripping coil
- ○ Closing coil

Additional interlocks:

- ○ Electrical interlocks
- ○ Keylock interlocks

Indicators

- ○ Voltage detecting and indicating system (vdis)

Gas pressure relief

- ○ Pressure relief downwards
- ○ Base frame and rear pressure relief duct

Some specific configurations may be incompatible with each other.

cgm.zero24-a

Ancillary services supply function

Fuse protection modular cubicle, equipped with a three-position switch-disconnector: closed, open or earthed and protection with HRC MV fuses.

Electrical characteristics			IEC
Rated voltage	U_r	[kV]	24
Rated frequency	f_r	[Hz]	50/60
Rated current			
General busbar and cubicle interconnection	I_r	[A]	400/630
Transformer outgoing line	I_r	[A]	200
Rated short duration power frequency withstand voltage (1 min)			
Phase-to-earth	U_d	[kV]	50
Across isolating distance	U_d	[kV]	60
Lightning impulse rated withstand voltage			
Phase-to-earth	U_p	[kV]	125
Across isolating distance	U_p	[kV]	145
Internal arc classification	IAC		AFL 16/20 kA 1 s
Switch-disconnector			**IEC 62271-103 + IEC 62271-102**
Admissible rated short-time withstand current (main circuit)			
Value t_k = (x) s	I_k	[kA]	16 (1-3 s) / 20 (1 s)
Peak value	I_p	[kA]	40/52
Mainly active current breaking capacity	I_1	[A]	200
Main switch making capacity (peak value)	I_{ma}	[kA]	40/52
Switch category			
Mechanical endurance			M1
Operating cycles (short-circuit making operations)- class			E3
Earthing switch			**IEC 62271-102**
Admissible rated short-time withstand current (earthing circuit)			
Value t_k = (x) s	I_k	[kA]	16 (1-3 s) / 20 (1 s)
Peak value	I_p	[kA]	40/52
Earthing switch making capacity (peak value)	I_{ma}	[kA]	40/52
Earthing switch category			
Mechanical endurance (manual)			M0
Operating cycles (short-circuit making operations)- class			E2

Dimensions

265/273 kg

IEC

Available options

Gas tank

Gas pressure indicator:

○ Pressure gauge without contacts
○ Pressure gauge with temperature compensation and contacts

Front connection:

○ Cable bushing

Extensibility:

○ On both sides

Type of side connection:

Female bushing
○ Right ○ Left ○ Both

Bushing
○ Right ○ Left ○ Both

Fuse compartment

Fuse tripping:

○ Via combined fuses

Fuse holder:

○ 24 kV
○ 12 kV

Driving mechanisms

○ BR type manual mechanism
○ AR type manual mechanism
○ Tripping coil

Additional interlocks:

○ Electrical interlocks
○ Keylock interlocks

Indicators

○ Voltage detecting and indicating system (vdis)

Gas pressure relief

○ Pressure relief downwards

Some specific configurations may be incompatible with each other.

cgm.zero24-m

Metering function

Modular air-insulated metering cubicle.

Electrical characteristics			IEC
Rated voltage	U_r	[kV]	24
Rated frequency	f_r	[Hz]	50/60
Rated current			
General busbar and cubicle interconnection	I_r	[A]	400/630
Rated short duration power frequency withstand voltage (1 min)			
Phase-to-earth	U_d	[kV]	50
Rated lightning impulse withstand voltage			
Phase-to-earth	U_p	[kV]	125
Internal arc classification	IAC		AFL 16/20 kA 1 s
Rated short duration withstand current Value t_k = (x) s	I_r	[kA]	16 (1-3 s) / 20 (1 s)

Available options

Type connections

- ○ Busbar-busbar
- ○ Flexible cable-flexible cable
- ○ Busbar/flexible cable

Metering transformers

- ○ Current transformers installed (3 CTs)
- ○ Voltage transformers installed (3 VTs)
- ○ No transformers

Optional elements

- ○ Heater element
- ○ Protection mesh
- ○ Keylocks/interlocks
- ○ Voltage detecting and indicating system (vdis)

Some specific configurations may be incompatible with each other.

Dimensions

400/165* kg
(*) Empty enclosure

IEC

Options

cgm.zero24-rc

Cable rise function

Cable rise modular air-insulated cubicle (through to main busbar).

Electrical characteristics			IEC
Rated voltage	U_r	[kV]	24
Rated frequency	f_r	[Hz]	50/60
Rated current			
Feeder	I_r	[A]	400/630
Internal arc classification	IAC		AFL [R][1] 16/20 kA 1 s

[1] Rear classification as optional.

Dimensions

23/40 kg

IEC

Available options

Extensibility

- ○ Right (rcd)
- ○ Left (rci)

Indicators

- ○ Voltage detecting and indicating system (vdis)

Gas pressure relief

- ○ Pressure relief downwards
- ○ Base frame and rear pressure relief duct

Some specific configurations may be incompatible with each other.

5. Installation and connection

Handling and transport

- Dimensions compatible with road, air or sea container transport
- Reduced size and weight
- Adapted packaging:
  - Vertical plastic on pallet protected with polystyrene.
  - Pallet pack with reinforced cardboard box
  - Wooden box

Handling methods (up to 5 functional units/ max. 2300 mm):

- Lifting: Forklift truck or manual pallet jack
- Lifting: Slings and lifting beams

Installation

- Indoor, outdoor installation, transformer substations, wind power applications (on/offshore), etc.
- Easy handling
- Operation, extensibility(*) and removal in reduced space
- Ergonomic design for easy cubicle connection and floor fastening
- No gas manipulation *on site*
- Installation on auxiliary profiles in the case of uneven floors or to avoid digging cable trenches

For handling and installation instructions, check with Ormazabal.

(*) cgm.zero24 can only be extended with cgm.zero24.

Gas pressure relief

Configurable gas relief according to the characteristics of the facility:

- Downward gases, directing gases into the trench
- Upward gases, directing gases from the base frame and rear pressure relief duct

For other configurations, check with Ormazabal.

Installation distances

cgm.zero24 cubicles can be configured to best suit your needs and available space. It is important to take into account the minimum installation distances, which are defined by accessibility and the required protection conditions.

Minimum installation distances(*) [mm]	
Side wall (a)	100
Roof (b)	260/600/900[1]
Front clearance (c)	800
Rear wall (d)	100[2]

* Consult minimum installation distances for upward gases relief.
[1] Depending on the switchgear height: 1740/1400/1100 mm.
[2] Except for cgm.zero24-v (60 mm), cgm.zero24-p/-a (80 mm) and cgm.zero24-m 1740 mm (0 mm)
The space required to extend the assembly with an additional cubicle is 150 mm plus the width of the new cubicle.

Trench dimensions

The recommended minimum dimensions for the trench are defined on the basis of those used in IEC standard tests. These dimensions may vary, in accordance with the radius of curvature of the cables.

For specific dimensions for your product, check with Ormazabal.

Cable connection

Screwable or plug-in epoxy resin horizontal bushings, IEC type. Complaint with dielectric and partial discharge tests.

There are three types:

- Plug-in up to 250 A
- Plug-in up to 400 A
- Screwable up to 630 A

Located in the cable compartment. Optionally, they can be located in the side of the cubicles for direct supply to the main busbar.

Option to install more than one connector per phase, depending on the model and manufacturer. Check with Ormazabal for availability.

		Distance (d)
cgm.zero24-l	[mm]	310
cgm.zero24-v	[mm]	360/430/470*
cgm.zero24-p	[mm]	310
cgm.zero24-rc	[mm]	355

* Depending on the bushings type.

cgm.zero24	IEC bushings type	
	plug-in	screwable
-l	√	√
-p	√	-
-v	-	√

6. Services

Ormazabal Services p. 42

Ormazabal Services

Engineering and technical advice

Advice during the project's initial stages, providing solutions tailored to our customers' needs through innovative, efficient, sustainable products.

Assembly and commissioning

We accompany our customers at all times, from equipment factory acceptance tests through to delivery and commissioning on site.

Training and certification

Continuous personalised training for our customers, with official operation and maintenance certification for our equipment.

Ormazabal provides a wide range of services and support for its customers throughout the product's service life: from preliminary design and customisation, through to end of service life.

For further information, please check with Ormazabal.

Inspection and maintenance

Predictive, preventive and corrective inspections and maintenance of equipment in order to ensure maximum efficiency and optimal service life.

Manage parts and accessories

Availability of spare parts and accessories in order to offer a quick response on site and reduce downtime.

Modernisation and digitalisation

Upgrade equipment to the latest technologies in order to improve performance and extend service life, as well as providing remote monitoring and support for your facility.

ROUTE TO ZERO

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