ormazabal
velatia

Smart and digital grids

Green mobility

Sustainable buildings and infrastructure

Green generation and storage

SECONDARY DISTRIBUTION CUBICLES

cgmcosmos

Modular compact system with full gas insulation

Up to 24 kV
Up to 27 kV

IEC Standards
IEEE / ANSI 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 notification.
These characteristics, as well as the availability of components, are subject to confirmation by Ormazabal.

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1. Introduction

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Ormazabal

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

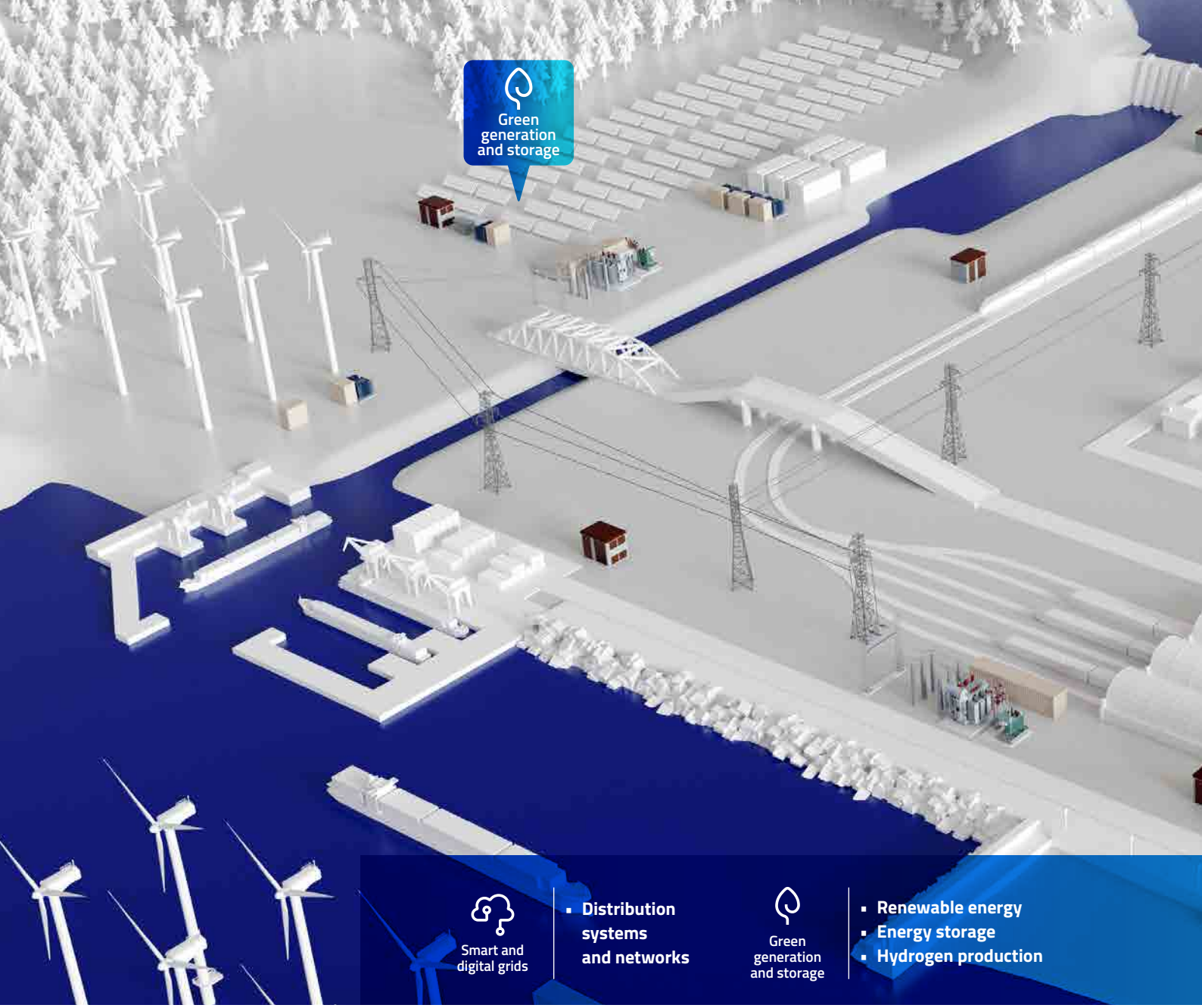
Our solutions are focused on digitalising the power grid in order to integrate more renewable energy generation, enable greater sustainable mobility, and guarantee supply for buildings and infrastructure with critical energy needs.

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

We have a unique research and technology centre and a team of more than **2400 highly qualified professionals**, all with a common purpose: to lead the technological evolution of electricity grids and enable energy transition toward a sustainable model.

We are the origin of Velatia, a **family-run, industrial and technology group with international standing** made up of companies offering advanced technological solutions in line with the development of smart cities.

Velatia is present in electricity networks, helping in the deployment of smart grids. It accompanies its customers in their digital transformation process and offers its expertise in sectors such as aeronautics, energy services, electromechanical engineering and the manufacture of electronic components.



Benefits of our solutions

Digitalisation

We respond to new requirements in smart grids with native digital solutions. Our equipment incorporates the sensors, electronics and communications necessary to ensure optimal network management:

- Greater safety
- Continuity of service
- Greater 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 validated in accordance with the most important international standards, thereby ensuring it works and operates safely throughout its service life, while also helping to maintain continuity of supply for the electrical network.

Sustainability

We strive to ensure our environmental footprint is as small as possible, which we achieve thanks to an ISO 14001-certified environmental management system that monitors our impact on the environment. That is why:

- We rationalise our use of primary products, selecting those materials that can best be recycled while continuously cutting down on the most harmful ones.
- We certify the sealtight integrity of our products, minimising the risk of leakage to the environment.
- We apply eco-design criteria in all our products.
- We optimise energy consumption for both our equipment and the entire manufacturing process.

2. General product characteristics

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Introduction to cgmcosmos

Rated voltage **cgmcosmos** cubicles up to **24 kV / 27 kV (IEC/IEEE)** have a wide variety of functions, both modular and compact, designed according to the most important international standards.
The cgmcosmos cubicle's design includes a hermetically sealed stainless steel gas tank throughout the product's service life.

Resistance to internal arcing

Internal arc classification IAC AFL(R)
up to **25 kA - 1 s** to ensure maximum safety.

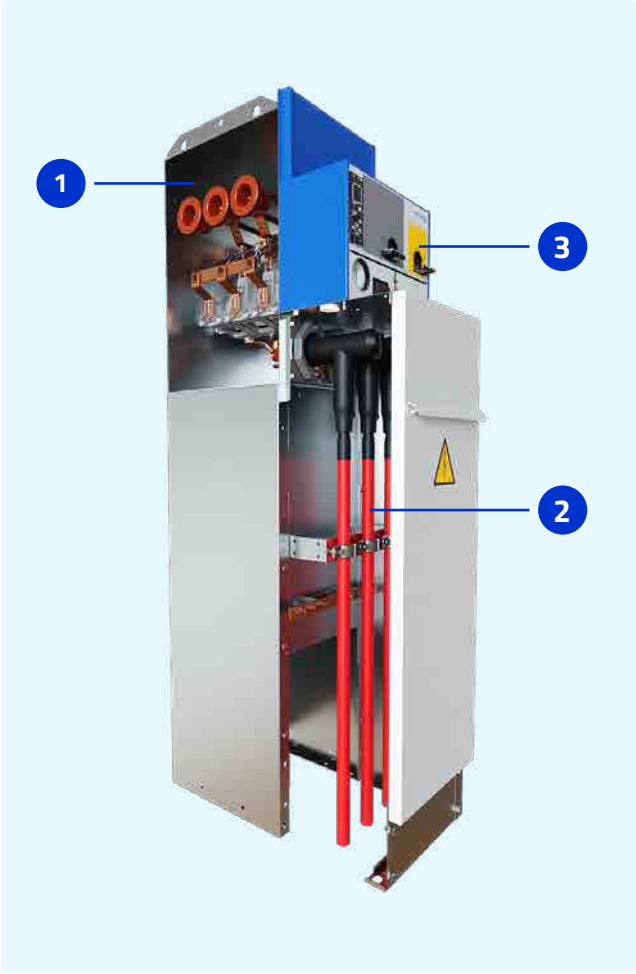
Extensibility

cgmcosmos cubicles are optionally **extendable** on both sides. Our **ormalink** connecting set makes cgmcosmos an easily scalable system thanks to a simple connection system.

Designed for smart grids

Ormazabal offers a complete solution with the integration of ekorsys automation, protection and sensor systems in cgmcosmos cubicles.

Construction structure



1 Gas tank

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

2 Cable compartment

The medium-voltage input/output cable connection compartment is located at the bottom of the cubicle and can be accessed by removing the front cover.
This compartment houses the:

- Bushing
- Connectors and cables
- Cable clamp bracket
- Horizontal earthing bar

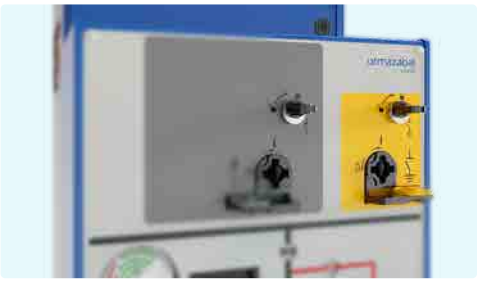
3 Control compartment

Area for making and breaking operations in medium-voltage circuits. It includes the following:

- Driving mechanism
- Single-wire diagram and position indicator
- Voltage indicator
- Protection, control and metering relay
- Pressure gauge

Optionally, a control box can be added in the top of this compartment in order to install protection relays and metering and control devices.

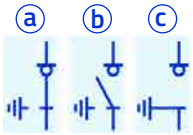
Components



Switches

3-position switch-disconnector

Switch-disconnector with load breaking capacity.



a. Closed
b. Open
c. Earthed

Types:

B: basic mechanism with independent manual drive

BM: basic mechanism with motorised drive

BR/AR: mechanism with manual operation and latching on opening

ARM: mechanism with motorised operation and latching on opening

Circuit-breaker

Circuit-breaker with vacuum switching technology. Configurable reclosing and mechanical endurance M1/M2 according to IEC 62271-100.

Types:

AV: circuit-breaker

AVM: motorised circuit-breaker

RAV: circuit-breaker with reclosing

RAVM: circuit-breaker and motorised reclosing

Interlocks

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

- They make it impossible to close the switch-disconnector and the earthing switch at the same time.
- They allow safe opening of the cable compartment access cover.

Technical characteristics

Electrical characteristics			IEC		ANSI/IEEE	
Rated voltage	Ur	[kV]	12	24[1]	15.5	27
Rated frequency	fr	[Hz]	50/60		50/60	
Rated current	Ir					
Busbars and cubicle interconnection		[A]	400/630		600	
Feeder Transformer outgoing line		[A] [A]	400/630 200		600 200	
Short-time withstand current						
With t_k = (x) s	Ik	[kA]	16/20[2]-(1/3 s) / 25-(1 s)		20[2]-(1/3 s)/25 (1 s)	
Peak value	Ip	[kA]	40/52[2]/62.5	40/52[2]/62.5	52[2]/62.5	
Rated insulation level						
Power frequency rated withstand voltage [1 min]	Ud	[kV]	28/32	50/60	35/60	
Lightning impulse rated withstand voltage	Up	[kV]	75/85	125/145	95/125	
Internal arc classification according to IEC 62271-200	IAC		AF/AFL 16 kA-1s / $20_{2)}$ kA-1s / 25 kA-1s | AFL[R] $20_{2)}$ kA-1s		$AFL_{3)}$ 16 kA-1s / $20_{2)}$ kA 1s / 25 kA-1 s	
IP rating: Gas tank			IPX8			
IP rating: External enclosure			IP 2XD			
Colour of equipment		RAL	Grey 7035 / Blue 5005			
Category of loss of service continuity		LSC	LSC2			
Compartmentalisation class			PM			

1) For metering cubicle with earthing switch up to 17.5 kV 2) Tests performed at 21 kA/52.5 kA (50 Hz) - 54.6 kA (60 Hz)
3) Equivalent to IEEE C37.20.7 for 1D-S

Driving mechanism		Three-position switch-disconnector					Vacuum circuit-breaker			
		B	**BM[1]**	**BR**	**AR**	**ARM**	**AV**	**AMV**	**RAV**	**RAMV**
Auxiliary circuits										
Internal insulation	[kV]	2	2	10	10	2				
Tripping coil										
Rated voltage	[V]	-	-	$24_{2)}$/48/$110_{2)}$ V_{dc}/230 V_{ac}			24/48/60/110/220 V_{dc} 110/230 V_{ac}			
Max. consumption	[W]	-	-	80			56			
Motorised units										
Rated voltage	[V]	-	3)	-	-	3)	-	4)	-	4)
Motor operation time	[s]	-	< 7	-	-	< 7	-	< 15	-	< 15
Rated current	[A]	-	< 4	-	-	< 4	-	-	-	-
Peak current	[A]	-	< $12_{5)}$	-	-	<12	-	< 8	-	< 8
Indicating contacts										
Switch | Earthing		6)	2NO + 2NC | 1NO + 1NC				2NO + 2NC | 1NO + 1NC			
Circuit-breaker		n/a					9 NO + 9 NC			
Rated voltage	[V]	250					250			
Rated current	[A]	16					10			

1) Check availability for Ik = 25 kA 2) Check availability for ARM 3) 24/48/110/125 Vdc | 220 Vac
4) 24/48/60/110/220 Vdc | 110/230 Vac 5) 21 A (24 Vdc) 6) Optional 2NO + 2NC | 1NO + 1NC

Service conditions according to normal service conditions of IEC 62271-1	IEC	ANSI/IEEE
Type of switchgear	Indoor	
Ambient temperature		
Minimum | Maximum	-5/-15/-30 °C* | + 40 °C**	23/5/- 22 °F* | 104 °F**
Maximum mean ambient temperature, measured over a 24-hour period	+35 °C	95 °F
Minimum storage temperature	-40 °C	-40 °F
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	2000 m**	6500 feet**
Solar radiation	Negligible	
Environmental air pollution (dust, smoke, corrosive and/or flammable gases, vapours or salt)	Not significant	
Vibrations caused to the switchgear by external causes or earthquakes	Negligible**	

* Check availability and other values ** For special conditions or altitudes, please check with Ormazabal

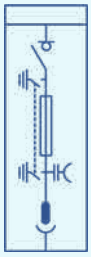
Functions of the cgmcosmos system

Modular cubicles

I

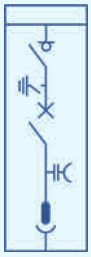
Feeder function

p



Fuse protection function

v



Circuit-breaker protection function

s

Busbar switch function

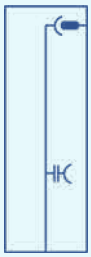
a

Auxiliary services supply

rb

Busbar rise function

rc

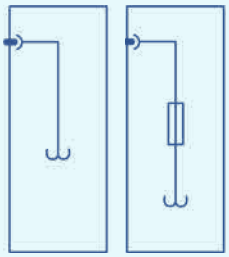


Cable rise function

m

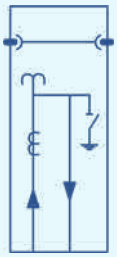
Metering function

ma



Metering function and auxiliary services

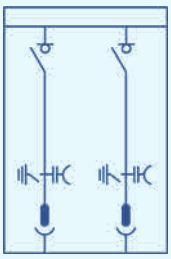
m-pt



Metering function with earthing switch

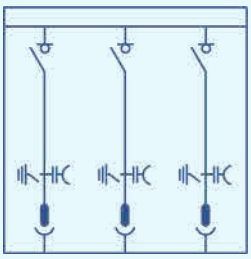
Compact cubicles

2I



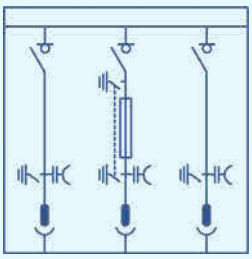
Double feeder functions

3I



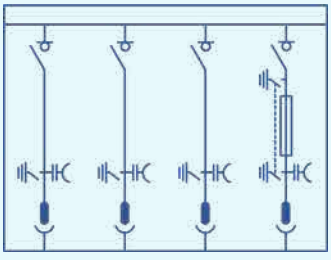
Triple feeder functions

2Ip



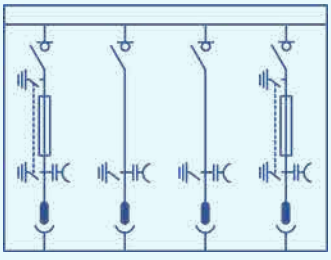
Fuse protection and double feeder functions

3Ip



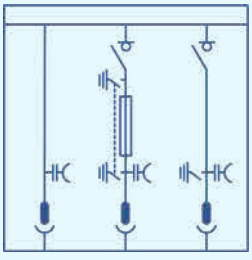
Fuse protection and triple feeder functions

2I2p



Double fuse protection and double feeder functions

rIp



Fuse, rise and feeder protection functions

Standard

cgmcosmos cubicles have been designed and certified according to the following international standards:

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 62271-206	Voltage presence indicating systems (vpis)
IEC 61243-5	Voltage detection systems (vds)
IEEE/ANSI	
IEEE C37.74	IEEE Standard requirements for load break and fused under-pole, underground and subsurface load break switchgear for alternating current systems up to 38 kV
IEEE C37.20.3	IEEE Standard for metal-enclosed interrupter switchgear
IEEE 1247	Standard for alternating current switches in the range above 1000 volts
IEEE C37.123	IEEE specifications guide for gas-filled, electric power substation equipment
IEEE C37.20.4	IEEE Standard for indoor AC switches (1 kV-38 kV) for use in metal-enclosed switchgear
IEEE C37.04	IEEE Standard Rating Structure for AC High-Voltage circuit-breakers
IEEE C37.06	AC high-voltage circuit-breakers rated on a symmetrical current basis-preferred ratings and related required capacitances
IEEE C37.09	IEEE standard test procedures for AC high-voltage circuit-breakers with rated values based on a symmetrical current
IEEE C37.20.7	IEEE guide for testing metal-enclosed medium-voltage switchgear for internal arc faults
IEEE C37.20.9	Standard for 1 kV to 52 kV metal-enclosed switchgear with gas insulation system.

(*) Check options and availability for other standards: SANS, HN, GB, SDMS...

Special applications

Outdoor

cgmcosmos outdoor cubicles are designed to be installed outside, in service conditions, including pollution, condensation and solar radiation, as defined in normal outdoor service conditions, according to IEC 62271-1 or IEEE C37.20.9.

There are two gas output options:

- Gas output to trench
- Upward gas output

Internal arc classification up to **IAC AFLR 25 kA - 1s**, according to IEC 62271-200.

Outdoor Characteristics	
IP rating	IP54*
Impact protection	IK10
Corrosion category	C5H

** For other options, check with Ormazabal.*

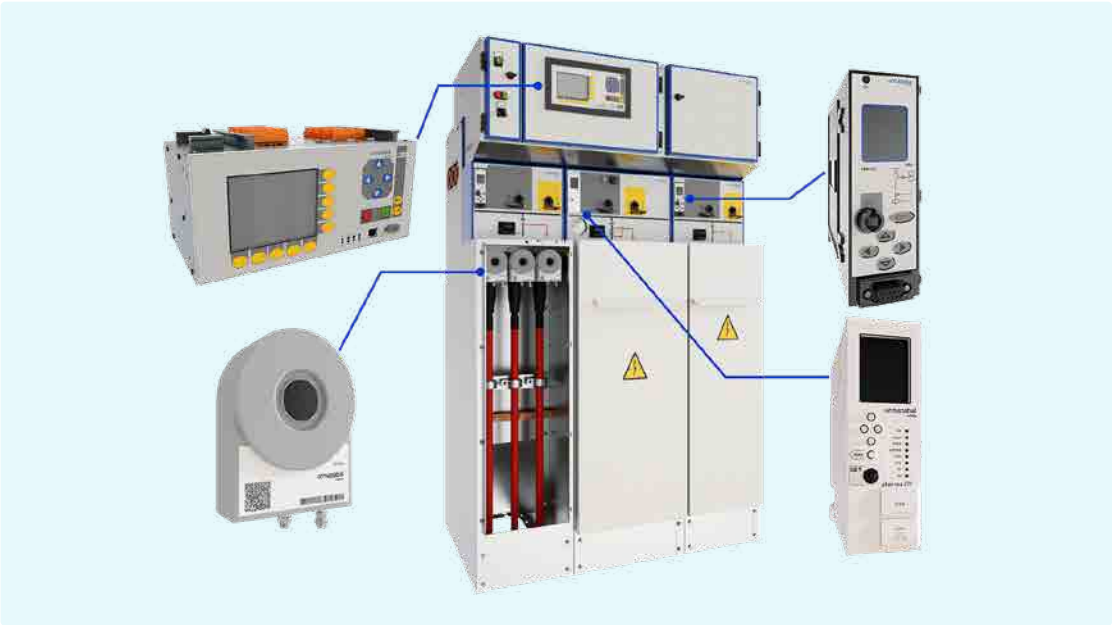
High Corrosion Resistant (HCR)

High corrosion resistant (HCR) cubicles have been designed for harsh environmental conditions, and are recommended for installation in indoor applications with non-standard environmental conditions such as offshore or near-shore facilities, facilities in tropical climates, or industrial environments with high pollution levels.

Ormazabal has developed an in-house testing procedure which guarantees corrosion category **C5-M**, "**High**" durability according to ISO 12944-2, and "**Level 6**" salinity according to IEC 60068-2-52.

Protection and automation

Extensive range of **ekorsys** integrated equipment associated with cgmcosmos cubicles, with protection, control and automation functions to meet the needs of the electrical network.



Voltage sensing units

Voltage presence/absence sensing system, with the option to include high-frequency outputs for measuring signals associated with partial discharges.

Protection, metering and control units

Multifunction protection, including control and metering (with self-powering option).

Voltage and current sensors

Toroidal current sensors and capacitive and resistive voltage sensors for protection and monitoring.

Medium-voltage control and automation, units

Remote control and automation of the medium-voltage network.

Software

Configuration tools for ekorsys family protection, control and metering units.

3. Characteristics and configuration

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cgmcosmos-l

Feeder function

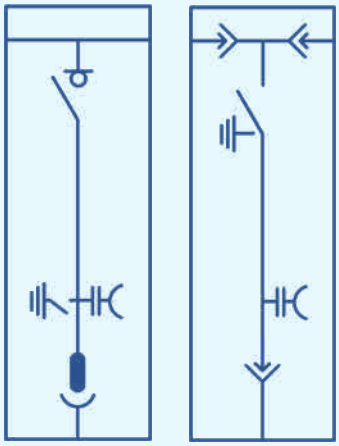
Modular feeder cubicle, equipped with a three-position switch-disconnector: closed, open or earthed.

Electrical characteristics			IEC		ANSI/IEEE	
Rated voltage	U_r	[kV]	12*	24	15.5	27
Rated frequency	fr	[Hz]	50/60		50/60	
Rated current (busbar and feeder)	I_r	[A]	400/630		600	
Rated short-time power frequency withstand voltage (1 min)						
Phase-to-earth	U^d	[kV]	28	50	35	60
Across isolating distance	U^d	[kV]	32	60	38.5	66
Lightning impulse rated withstand voltage						
Phase-to-earth	U^p	[kV]	75	125	95	125
Across isolating distance	U^p	[kV]	85	145	104.5	137.5
Internal arc classification	IAC		AFL 16 kA 0.5 s/16 kA 1 s/20** kA 1 s/ 25 kA 1 s AFL[R***] 20** kA 1 s		AFL 16 kA 0.5 s/16 kA 1 s/ 20** kA 1 s/25 kA 1 s	
Withstand direct current voltage		[kV]	48 kV without cable testing device 50 kV with cable testing device		53	78
Switch-disconnector			IEC 62271-103 + IEC 62271-102		IEEE C37.74	
Admissible rated short-time withstand current (main circuit)						
Value t^k = (x) s	I^k	[kA]	16/20** (1/3 s)/25 (1 s)		20** (1/3 s)/25 (1 s)	
Peak value	I^P	[kA]	50 Hz: 40/52**/62.5 60 Hz: 41.6/52**/65		50 Hz: 52**/62.5 60 Hz: 54.6**/65	
Mainly active current breaking capacity	I^1	[A]	400/630		600	
Breaking capacity - cable charging / feeder charging	I^{4a}	[A]	50/1.5		15	
Closed loop breaking capacity	I^{2a}	[A]	400/630		600	
Earth fault breaking capacity	I^{6a}	[A]	300		n/a	
Vacuum lines and cable breaking capacity in earth fault conditions	I^{6b}	[A]	100		n/a	
Transformer magnetising switching current		[A]	21		21	
Main switch making capacity (peak value)	I^{ma}	[kA]	50 Hz: 40/52**/62.5 60 Hz: 41.6/52**/65		50 Hz: 52**/62.5 60 Hz: 54.6**/65	
Switch category						
Mechanical endurance			1000-M1/5000-M2		1000/5000	
Operating cycles (short-circuit making operations)- class			5-E3		3	
Earthing switch			IEC 62271-102		IEEE C37.74	
Admissible rated short-time withstand current (earthing circuit)						
Value t^k = (x) s	I^k	[kA]	16/20** (1/3 s)/25 (1 s)		20** (1/3 s)/25 (1 s)	
Peak value	I^P	[kA]	50 Hz: 40/52**/62.5 60 Hz: 41.6/52**/65		50 Hz: 52**/62.5 60 Hz: 54.6**/65	
Earthing switch making capacity (peak value)	I^{ma}	[kA]	50 Hz: 40/52**/62.5 60 Hz: 41.6/52**/65		50 Hz: 52**/62.5 60 Hz: 54.6**/65	
Earthing switch category:						
Mechanical endurance (manual)			1000-M0		1000	
Operating cycles (short-circuit making operations)- class			5-E2		3	

* Also available with Ur = 7.2 kV on request
** Tests conducted at 21 kA/52.5 kA and 25 kA/65 kA
*** With gas relief upwards through a duct for 1740 mm high cubicles and to a trench for 1300 mm high cubicles.

Dimensions

90/100 kg
198/220 Lb



Configuration

◉ Standard ○ Optional

IAC Rating

Internal arc IAC AFLR
- ○ 20 kA 1 s

Internal arc IAC AF/AFL
- ○ 16 kA 1 s ○ 20 kA 1 s ○ 25 kA 1 s

Internal arc: tank
- ○ 16 kA 0.5 s ○ 20 kA 0.5 s
- ○ 16 kA 1 s ○ 20 kA 1 s ○ 25 kA 1 s

Cubicle height

- ◉ 1740 mm
- ○ 1450 mm (with cable testing device)
- ○ 1300 mm

Gas tank

Gas pressure indicator:
- ◉ Pressure gauge without contact
- ○ Pressure gauge with temperature compensation and contacts

Front connection:
- ◉ Cable bushing

Extensibility:
- ◉ On both sides
- ○ Left extensibility/right blind
- ○ Right extensibility/left blind

Type of side connection:

Female bushing
- ○ Right ○ Left ◉ Both

Bushing
- ○ Right ○ Left ○ Both

Driving mechanisms

- ◉ Actuating levers
- ◉ B type manual mechanism
- BM type motorised mechanism

Additional interlocks:
- ○ Electrical interlocks
- ○ Keylock interlocks
- ○ Padlocks

Indicators

- ◉ Acoustic alarm ekor.sas
- ◉ Voltage presence capacitive indicator ekor.vpis
- ○ Voltage presence/absence capacitive indicator ekor.ivds
- ○ Voltage presence/absence capacitive indicator ekor.ivds-pd with high-frequency output (HF)

Gas pressure relief duct

- ○ Rear duct

Some specific configurations may be incompatible with each other.

cgmcosmos-p

Fuse protection function

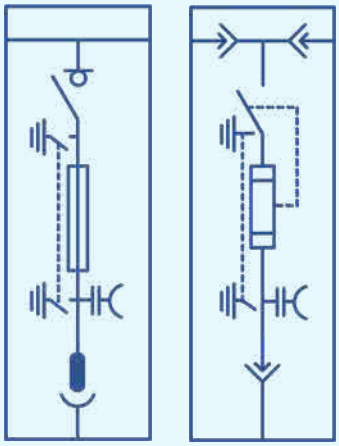
Fuse protection modular cubicle, equipped with a three-position switch-disconnector: closed, open or earthed and protection with limiting fuses.

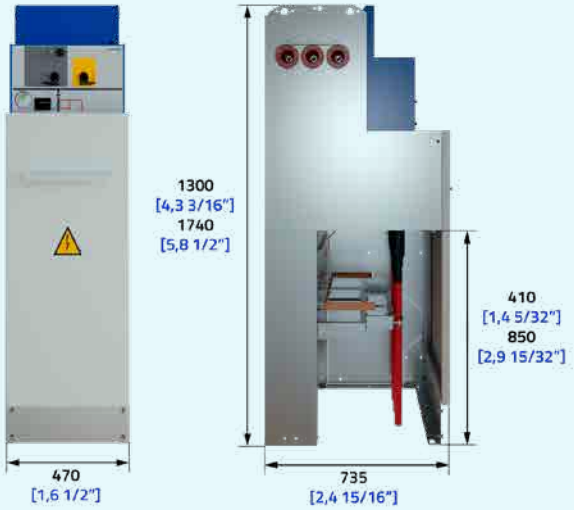
Electrical characteristics			IEC		ANSI/IEEE	
Rated voltage	Ur	[kV]	12*	24	15.5	27
Rated frequency	fr	[Hz]	50/60		50/60	
Rated current						
General busbar and cubicle interconnection	Ir	[A]	400/630		600	
Transformer outgoing line	Ir	[A]	200		200	
Rated short-time power frequency withstand voltage (1 min)						
Phase-to-earth	Ud	[kV]	28	50	35	60
Across isolating distance	Ud	[kV]	32	60	38.5	66
Lightning impulse rated withstand voltage						
Phase-to-earth	Up	[kV]	75	125	95	125
Across isolating distance	Up	[kV]	85	145	104.5	137.5
Internal arc classification	IAC		AFL 16 kA 0.5 s/16 kA 1 s/ 20** kA 1 s/25 kA 1 s AFL[R***] 20** kA 1 s		AFL 16 kA 0.5 s/16 kA 1 s/ 20** KA 1 s/25 kA 1 s	
Withstand direct current voltage		[kV]	n/a		53	78
Switch-disconnector			IEC 62271-103 + IEC 62271-102		IEEE C37.74	
Admissible rated short-time withstand current (main circuit)						
Value t_k = (x) s	Ik	[kA]	16/20** (1/3 s)/25 (1 s)		20** (1/3 s)/25 (1 s)	
Peak value	Ip	[kA]	50 Hz: 40/52**/62.5 60 Hz: 41.6/52**/65	50 Hz: 40/52**/62.5 60 Hz: 41.6/52**/65	50 Hz: 52**/62.5 60 Hz: 52**/65	
Mainly active current breaking capacity	I1	[A]	200		200	
Main switch making capacity (peak value)	Ima	[kA]	50 Hz: 40/52**/62.5 60 Hz: 41.6/52**/65	50 Hz: 40/52**/62.5 60 Hz: 41.6/52**/65	50 Hz: 52**/62.5 60 Hz: 52**/65	
Switch category						
Mechanical endurance			1000-M1/2000/5000-M2		1000/5000	
Operating cycles (short-circuit making operations)- class			5-E3		3	
Combined switch-relay (ekor.rpt) take-over current						
Breaking I_{max} according to TDito IEC 62271-105		[A]	1700	1300	n/a	n/a
Switch-fuse combination transfer current						
Breaking I_{max} according to TDItransfer IEC 62271-105		[A]	2300	1600	n/a	n/a
Earthing switch			IEC 62271-102		IEEE C37.74	
Admissible rated short-time withstand current (earthing circuit)						
Value t_k = (x) s	Ik	[kA]	1 (1/3 s)/3 (1 s)		1 (1/3 s)/3 (1 s)	
Peak value	Ip	[kA]	50 Hz: 2.5/7.5 60 Hz: 2.6/7.8		50 Hz: 2.5/7.5 60 Hz: 2.6/7.8	
Earthing switch making capacity (peak value)	Ima	[kA]	50 Hz: 2.5/7.5 60 Hz: 2.6/7.8		50 Hz: 2.5/7.5 60 Hz: 2.6/7.8	
Earthing switch category:						
Mechanical endurance (manual)			1000-M0		1000	
Operating cycles (short-circuit making operations)- class			5-E2		3	

* Also available with U_r = 7.2 kV on request
** Tests conducted at 21 kA/52.5 kA and 25 kA/65 kA
*** With gas relief upwards through a duct for 1740 mm high cubicles and to a trench for 1300 mm high cubicles.

Dimensions

140/150 kg
309/331 Lb





Configuration

◉ Standard ○ Optional

IAC Rating

Internal arc IAC AFLR
- ○ 20 kA 1 s

Internal arc IAC AF/AFL
- ○ 16 kA 1 s ○ 20 kA 1 s
- ○ 25*** kA 1 s

Internal arc: tank
- ○ 16 kA 0.5 s ○ 20 kA 0.5 s
- ○ 16 kA 0.5 s ○ 20 kA 0.5 s
- ○ 16 kA 1 s ○ 20 kA 1 s ○ 25 kA 1 s

Cubicle height:

- ◉ 1740 mm
- ○ 1300 mm

Gas tank

Gas pressure indicator:
- ◉ Pressure gauge without contacts
- ○ Pressure gauge with temperature compensation and contacts

Front connection:
- ◉ Cable bushing

Extensibility:
- ◉ On both sides
- ○ Left extensibility/right blind
- ○ Right extensibility/left blind

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

- ◉ Actuating levers
- ◉ BR type manual mechanism
- ○ AR type manual mechanism
- ○ ARM type motorised mechanism
- ◉ Tripping coil

Additional interlocks:
- ○ Electrical interlocks
- ○ Keylock interlocks
- ○ Padlocks

Indicators

- ○ Acoustic alarm ekor.sas
- ◉ Voltage presence capacitive indicator ekor.vpis
- ○ Voltage presence/absence capacitive indicator ekor.ivds
- ○ Voltage presence/absence capacitive indicator ekor.ivds-pd with high-frequency output (HF)

Gas pressure relief duct

- ○ Rear 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 each of the fuses is shown on the cubicle's front mimic diagram.

HHD fuse selection according to IEC standards

U_r Network [kV]	U_r Fuse [kV]	Rated transformer power without overload [kVA]																
		25	50	75	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000
		Rated fuse current (IEC 60282-1) [A]																
10	6/12	**6.3**	**10**	**16**	**16**	**20**	**20**	**25**	**31.5**	**40**	**50**	**63**	**63**	**80**	**100**	**160**	200	-
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	125

Fuse selection according to IEEE standards

U_r Network [kV]	U_r Fuse [kV]	Rated transformer power without overload [kVA]																
		25	50	75	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000
		Rated fuse current [A]																
7.2	6/12	**6.3**	**16**	**16**	**20**	**20**	**25**	**40**	**40**	**50**	**63**	**80**	**100**	**160**	200	250	-	-
12.5	10/24	6.3	6.3	16	16	16	20	20	25	31.5	40	50	63	80	80	125	-	-
13.2	10/24	6.3	6.3	10	16	16	20	20	25	31.5	40	50	63	63	80	100	-	-
14.4	10/24	6.3	6.3	10	16	16	16	20	20	25	40	40	50	63	80	80	-	-
25	10/24	6.3	6.3	6.3	6.3	10	16	16	16	20	20	25	31.5	40	50	50	80	80

- fuse length: 292 mm (11 1/2")
- fuse length: 442 mm (1' 5 13/32")

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
- A fuse-holder carriage adapted for 292 mm 6/12 kV fuses is available (11 1/2")
- 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

cgmcosmos-v

Circuit-breaker protection

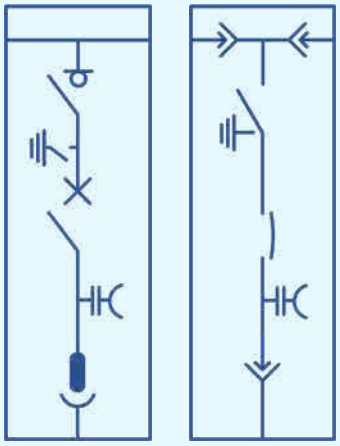
Modular cubicle with circuit-breaker protection, equipped with a vacuum circuit-breaker in series with a three-position switch-disconnector.

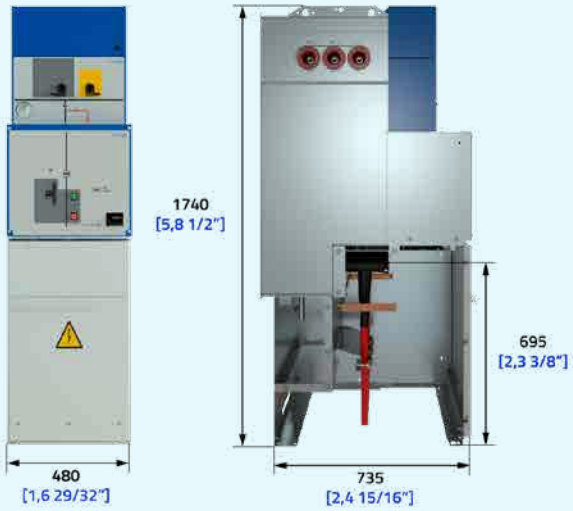
Electrical characteristics			IEC		ANSI/IEEE	
Rated voltage	Ur	[kV]	12	24	15.5	27
Rated frequency	fr	[Hz]	50/60		50/60	
Rated current						
General busbar and cubicle interconnection	Ir	[A]	400/630		600	
Feeder	Ir	[A]	400/630		600	
Rated short-time power frequency withstand voltage (1 min)						
Phase-to-earth	Ud	[kV]	28	50	35	60
Across isolating distance	Ud	[kV]	38	60	38.5	66
Lightning impulse rated withstand voltage						
Phase-to-earth	Up	[kV]	75	125	95	125
Across isolating distance	Up	[kV]	85	145	104.5	137.5
Internal arc classification	IAC		AFL 16 kA 1 s/20* kA 1 s/25 kA 1 s AFL[R**] 20 kA 1 s		AFL 16 kA 1 s/20* kA 1 s/25 kA 1 s AFL[R**] 20 kA 1 s	
Withstand direct current voltage		[kV]	48		53	78
Circuit-breaker			IEC 62271-100		IEEEC37.20.3	
Admissible rated short-time withstand current (main circuit)						
Value tk = (x) s	Ik	[kA]	16/20* (1/3 s)/25 (1 s)		20* (1/3 s)/25 (1 s)	
Peak value	Ip	[kA]	50 Hz: 40/52*/62.5 60 Hz: 41.6/52*/65		50 Hz: 52.5*/62.5 60 Hz: 54.6*/65	
Making and breaking rated capacity						
Mainly active current rated breaking capacity	I1	[A]	400/630		600	
Short-circuit breaking capacity	Isc	[kA]	16/20*/25		20/25	
Main switch making capacity (peak value)	Ima	[kA]	50 Hz: 40/52*/62.5 60 Hz: 41.6/52*/65		50 Hz: 52.5*/62.5 60 Hz: 54.6*/65	
Capacitive current capacity (50 Hz). Cable charging		[A]	31.5		31.5	
Rated operating sequence						
Without quick auto-reclosing			CO-15 s-CO O-3 min-CO-3 min-CO		CO-15 s-CO O-3 min-CO-3 min-CO	
With quick auto-reclosing			O-0.3 s-CO-15 s-CO O-0.3 s-CO-3 min-CO		O-0.3 s-CO-15 s-CO O-0.3 s-CO-3 min-CO	
Circuit-breaker category						
Mechanical endurance (operations class)			10,000-M2 / 2000-M1		10,000-M2 / 2000-M1	
Electrical endurance (class)			E2-C2		E2-C2	
Switch-disconnector			IEC 62271-103 + IEC 62271-102		IEEE C37.74	
Admissible rated short-time withstand current (main circuit)						
Value tk = (x) s	Ik	[kA]	16/20* (1/3 s)/25 (1 s)		20* (1/3 s)/25 (1 s)	
Peak value	Ip	[kA]	50 Hz: 40/52*/62.5 60 Hz: 41.6/52*/65		50 Hz: 52.5*/62.5 60 Hz: 54.6*/65	
Mainly active current rated breaking capacity	I1	[A]	400/630		600	
Main switch making capacity (peak value)	Ima	[kA]	50 Hz: 40/52*/62.5 60 Hz: 41.6/52*/65		50 Hz: 52.5*/62.5 60 Hz: 54.6*/65	
Switch-disconnector category						
Mechanical endurance			1000-M1 / 5000-M2		1000 / 5000	
Earthing switch			IEC 62271-102		IEEE C37.74	
Admissible rated short-time withstand current (earthing circuit)						
Value tk = (x) s	Ik	[kA]	16/20* (1/3 s)/25 (1 s)		20* (1/3 s)/25 (1 s)	
Peak value	Ip	[kA]	50 Hz: 40/52*/62.5 60 Hz: 41.6/52*/65		50 Hz: 52.5*/62.5 60 Hz: 54.6*/65	
Main switch making capacity (peak value)	Ima	[kA]	50 Hz: 40/50*/62.5 60 Hz: 41.6/52*/65		50 Hz: 52*/62.5 60 Hz: 41.6/52*/65	
Earthing switch category:						
Mechanical endurance			2000-M1		2000	
Operating cycles (short-circuit making operations)- class			5-E2		3	

* Tests conducted at 21 kA/52.5 kA ** With gas relief upwards via duct *** For cable charging switching and capacitor banks

Dimensions

240 kg
529 Lb





Configuration

◉ Standard ○ Optional

IAC Rating

Internal arc IAC AFLR
- ○ 20 kA 1 s

Internal arc IAC AF/AFL
- ○ 16 kA 1 s
- ○ 20 kA 1 s
- ○ 25 kA 1 s

Cubicle height

- ○ 1740 mm

Gas tank

Gas pressure indicator:
- ○ Pressure gauge without contacts
- ○ Pressure gauge with temperature compensation and contacts

Front connection:
- ○ Cable bushing

Extensibility:
- ○ On both sides
- ○ Left extensibility/right blind
- ○ Right extensibility/left blind

Type of side connection:

Female bushing
- ○ Right ○ Left ◉ Both

Bushing
- ○ Right ○ Left ○ Both

Driving mechanisms

- ○ Actuating levers
- ○ B type switch mechanism
- ○ BM type motorised mechanism
- ○ AV type manual mechanism
- ○ RAV type manual mechanism with reclosing
- ○ AVM type motorised mechanism
- ○ RAVM type motorised mechanism for reclosing
- ○ Tripping coil
- ○ Bistable coil
- ○ 2nd tripping coil
- ○ Closing coil

Additional interlocks:
- ○ Electrical interlocks
- ○ Keylock interlocks
- ○ Padlocks

Indicators

- ○ Acoustic alarm ekor.sas
- ○ Voltage presence capacitive indicator ekor.vpis
- ○ Voltage presence/absence capacitive indicator ekor.ivds
- ○ Voltage presence/absence capacitive indicator ekor.ivds-pd with high-frequency output (HF)

Gas pressure relief duct

- ○ Rear duct

Some specific configurations may be incompatible with each other.

cgmcosmos-s

Busbar switch function

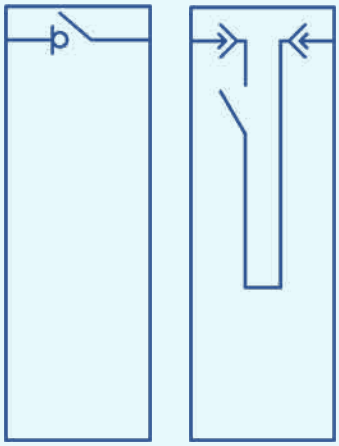
Busbar switch modular cubicle, equipped with a two-position switch-disconnector (closed and open). Optional earthing switch (s-pt).

Electrical characteristics			IEC		ANSI/IEEE	
Rated voltage	Ur	[kV]	12*	24	15.5	27
Rated frequency	fr	[Hz]	50/60		50/60	
Rated current						
General busbar and cubicle interconnection	Ir	[A]	400/630		600	
Feeder	Ir	[A]	400/630		600	
Rated short-time power frequency withstand voltage (1 min)						
Phase-to-earth	Ud	[kV]	28	50	35	60
Across isolating distance	Ud	[kV]	32	60	38.5	66
Lightning impulse rated withstand voltage						
Phase-to-earth	Up	[kV]	75	125	95	125
Across isolating distance	Up	[kV]	85	145	104.5	137.5
Internal arc classification	IAC		AFL 16 kA 1 s/20** kA 1 s		AFL 16 kA 1 s/20** kA 1 s	
Withstand direct current voltage		[kV]	n/a		53	78
Switch-disconnector			IEC 62271-103 + IEC 62271-102		IEEE C37.74	
Admissible rated short-time withstand current (main circuit)						
Value tk = (x) s	Ik	[kA]	16 (1/3 s)/20** (1 s)		20** (1 s)	
Peak value	Ip	[kA]	40/52**	40/52**	52**	
Mainly active current breaking capacity	I1	[A]	400/630		600	
Breaking capacity - cable charging / feeder charging breaking capacity	I4a	[A]	50/1.5		15	
Rated closed loop breaking capacity	I2a	[A]	400/630		600	
Earth fault breaking capacity	I6a	[A]	300		n/a	
Transformer magnetising switching current		[A]	21		21	
Vacuum lines and cable breaking capacity in earth fault conditions	I6b	[A]	100		n/a	
Main switch making capacity (peak value)	Ima	[kA]	40/52**	40/52**	52**	
Switch category						
Mechanical endurance			1000-M1/5000-M2		1000/5000	
Operating cycles (short-circuit making operations)- class			5-E3		3	
Earthing switch [optional]			IEC 62271-102		IEEE C37.74	
Admissible rated short-time withstand current (earthing circuit)						
Value tk = (x) s	Ik	[kA]	16 (1/3 s)/20** (1 s)		20**	
Peak value	Ip	[kA]	40/52**	40/52**	52**	
Earthing switch making capacity (peak value)	Ima	[kA]	40/52**	40/52**	52**	
Earthing switch category						
Mechanical endurance (manual)			1000-M0		1000	
Operating cycles (short-circuit making operations)- class			5-E2		3	

* Also available with Ur = 7.2 kV on request
** Tests conducted at 21 kA/52.5 kA.

Dimensions

110/115 kg
243/253 Lb



Configuration

◉ Standard ○ Optional

IAC Rating

Internal arc IAC AF/AFL

○ 16 kA 1 s ○ 20 kA 1 s

Internal arc tank

○ 16 kA 0.5 s ○ 20 kA 0.5 s

Cubicle height

○ 1300 mm

◉ 1740 mm

Gas tank

Gas pressure indicator:

◉ Pressure gauge without contacts

○ Pressure gauge with temperature compensation and contacts

Side connection:

◉ Two-side extensibility

Type of side connection:

Female bushing

○ Right ○ Left ◉ Both

Bushing

○ Right ○ Left ○ Both

Earthing:

○ With earthing switch on left s-pti*

○ With earthing switch on right s-ptd

Driving mechanisms

◉ Actuating levers

◉ B type manual mechanism

○ BM type motorised mechanism

Additional interlocks:

○ Electrical interlocks

○ Keylock interlocks

○ Padlocks

Indicators

○ Acoustic alarm ekor.sas

○ Voltage presence capacitive indicator ekor.vpis (with earthing)

○ Voltage presence/absence capacitive indicator ekor.ivds (with earthing)

Gas pressure relief duct

○ Rear duct

Some specific configurations may be incompatible with each other.
** Option only available with manual control.*

cgmcosmos-a

Auxiliary services supply function

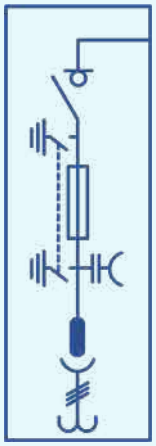
Fuse protection modular cubicle, equipped with a three-position switch-disconnector: closed, open or earthed and protection with limiting fuses.

Electrical characteristics			IEC	
Rated voltage	Ur	[kV]	12*	24
Rated frequency	fr	[Hz]	50/60	
Rated current				
General busbar and cubicle interconnection	Ir	[A]	400/630	
Transformer outgoing line	Ir	[A]	200	
Rated short-time power frequency withstand voltage (1 min)				
Phase-to-earth	Ud	[kV]	28	50
Across isolating distance	Ud	[kV]	32	60
Lightning impulse rated withstand voltage				
Phase-to-earth	Up	[kV]	75	125
Across isolating distance	Up	[kV]	85	145
Internal arc classification	IAC		AFL 16 kA 0.5 s (auxiliary services) 20** kA 1 s (busbar voltage metering)	
Switch-disconnector			IEC 62271-103 + IEC 62271-102	
Admissible rated short-time withstand current (main circuit)				
Value tk = (x) s	Ik	[kA]	16/20** (1/3 s)/25 (1 s)	16/20** (1/3 s)/25 (1 s)
Peak value	Ip	[kA]	50 Hz: 40/52**/62.5# 60 Hz: 41.6/52**/65#	50 Hz: 40/52**/62.5 60 Hz: 41.6/52**/65
Mainly active current breaking capacity	I1	[A]	200	
Main switch making capacity (peak value)	Ima	[kA]	50 Hz: 40/52**/62.5# 60 Hz: 41.6/52**/65#	50 Hz: 40/52**/62.5 60 Hz: 41.6/52**/65
Switch category				
Mechanical endurance			1000-M1	
Operating cycles (short-circuit making operations)- class			5-E3	
Earthing switch			IEC 62271-102	
Admissible rated short-time withstand current (earthing circuit)				
Value tk = 1 s or 3 s	Ik	[kA]	1/3	
Peak value	Ip	[kA]	50 Hz: 2.5/7.5 60 Hz: 2.6/7.8	
Earthing switch making capacity (peak value)	Ima	[kA]	50 Hz: 2.5/7.5 60 Hz: 2.6/7.8	
Earthing switch category				
Mechanical endurance (manual)			1000-M0	
Operating cycles (short-circuit making operations)- class			5-E2	

* Also available with Ur = 7.2 kV on request
** Tests conducted at 21 kA/52.5 kA and 25 kA/65 kA
# Value only valid for tk = 1 s

Dimensions

140/150 kg
309/331 Lb



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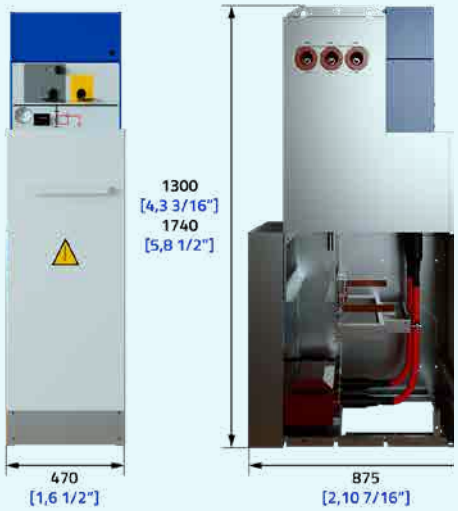


Configuration

◉ Standard ○ Optional

IAC Rating

Internal arc IAC AFL

○ 16 kA 0.5 s ○ 20 kA 1 s

Internal arc: tank

○ 16 kA 0.5 s ○ 20 kA 0.5 s

○ 16 kA 1 s ○ 20 kA 1 s ○ 25 kA 1 s

Cubicle height

◉ 1740 mm
(auxiliary services supply or busbar voltage metering)

○ 1300 mm
(auxiliary services supply)

Gas tank

Gas pressure indicator:

◉ Pressure gauge without contacts

○ Pressure gauge with temperature compensation and contacts

Extensibility:

◉ Left extensibility/right blind

○ Right extensibility/left blind

Type of side connection:

Female bushing

○ Right ○ Left

Bushing

○ Right ○ Left.

Fuse tripping:

◉ Via combined fuses

Fuse holder:

○ 24 kV

○ 12 kV

Driving mechanisms

◉ Actuating levers

◉ BR type manual mechanism

◉ AR type manual mechanism

◉ Tripping coil

Additional interlocks:

○ Electrical interlocks

○ Keylock interlocks

○ Padlocks

Indicators

◉ Voltage presence capacitive indicator ekor.vpis

○ Voltage presence/absence capacitive indicator ekor.ivds

○ Other voltage capacitive indicators

Gas pressure relief duct

○ Rear duct

Some specific configurations may be incompatible with each other.

cgmcosmos-rb

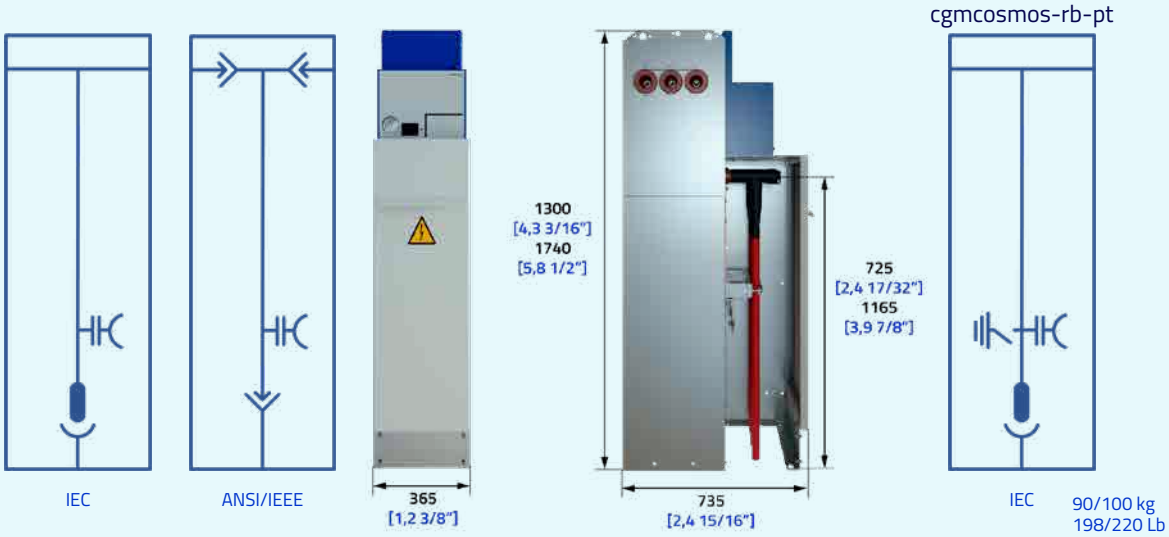
Busbar rise function

Modular cubicle with gas insulation and busbar rise. Optional earthing switch (rb-pt).

Electrical characteristics			IEC		ANSI/IEEE	
Rated voltage	Ur	[kV]	12*	24	15.5	27
Rated frequency	fr	[Hz]	50/60		50/60	
Rated current						
General busbar and cubicle interconnection	Ir	[A]	400/630		600	
Feeder	Ir	[A]	400/630		600	
Rated short-time power frequency withstand voltage (1 min)						
Phase-to-earth	Ud	[kV]	28	50	35	60
Lightning impulse rated withstand voltage						
Phase-to-earth	Up	[kV]	75	125	95	125
Internal arc classification	IAC		AFL 16 kA 1 s/20** kA 1 s/25 kA 1 s AFL[R***] 16 kA 1 s/20 kA 1 s		AFL 16 kA 1 s/20** kA 1 s/25 kA 1 s	
Earthing switch [optional]			IEC 62271-102		IEEE C37.74	
Rated short-time withstand current						
Value tk = 1 s	Ik	[kA]	16/20**/25	16/20**/25	20**/25	
Peak value	Ip	[kA]	40/52**/62.5	40/52**/62.5	52**/62.5	
Earthing switch making capacity (peak value)	Ima	[kA]	40/52**/62.5	40/52**/62.5	52**/62.5	
Earthing switch category						
Mechanical endurance			1000-M0		1000	
Operating cycles (short-circuit making operations)- class			5-E2		3	

* Also available with Ur = 7.2 kV on request
** Tests conducted at 21 kA/52.5 kA and 25 kA/65 kA
*** With gas relief upwards through a duct for 1740 mm high cubicles and to a trench for 1300 mm high cubicles

Dimensions



Options

cgmcosmos-rb-pt

90/100 kg
198/220 Lb

Configuration

◉ Standard ○ Optional

IAC Rating

Internal arc IAC AFLR
- ○ 20 kA 1 s

Internal arc IAC AF/AFL
- ○ 16 kA 1 s ○ 20 kA 1 s
- ○ 25 kA 1 s

Internal arc: tank
- ○ 16 kA 0.5 s ○ 20 kA 0.5 s
- ○ 16 kA 1 s ○ 20 kA 1 s
- ○ 25 kA 1 s

Cubicle height

- ◉ 1740 mm
- ○ 1300 mm

Gas tank

Gas pressure indicator:
- ◉ Pressure gauge without contacts
- ○ Pressure gauge with temperature compensation and contacts

Front connection:
- ◉ Cable bushing

Extensibility:
- ◉ On both sides: rba
- ○ Right extensibility/left blind: rba

Type of side connection:

Female bushing
- ○ Right ○ Left ◉ Both

Bushing
- ○ Right ○ Left ○ Both

Earthing:
- ○ With earthing switch

Driving mechanisms

- ◉ B type manual mechanism
- ○ BM type motorised mechanism

Additional interlocks:
- ○ Electrical interlocks
- ○ Keylock interlocks
- ○ Padlocks

Indicators

- ○ Acoustic alarm ekor.sas
- ◉ Voltage presence capacitive indicator ekor.vpis (with earthing)
- ○ Voltage presence/absence capacitive indicator ekor.ivds (with earthing)
- ○ Other voltage capacitive indicators

Gas pressure relief duct

- ○ Rear duct

Some specific configurations may be incompatible with each other.

cgmcosmos-m

Metering function

Modular air-insulated metering cubicle.

Applications

Electrical characteristics			IEC	
Rated voltage	Ur	[kV]	12*	24
Rated voltage	Ur	[kV]	12*	24
Rated frequency	fr	[Hz]	50/60	50/60
Rated current				
General busbar and cubicle interconnection	Ir	[A]	400/630	400/630
Rated short-time power frequency withstand voltage (1 min)				
Phase-to-earth	Ud	[kV]	28	50
Lightning impulse rated withstand voltage				
Phase-to-earth	Up	[kV]	75	125
Internal arc classification	IAC		AFL 20** kA 0.5 s/20** kA 1 s	
Rated short-time withstand current Value t_k = (x) s	Ir	[kA]	16/20** (1/3 s) / 25 (3 s)	

* Also available with Ur = 7.2 kV on request ** Tests conducted at 21 kA/52.5 kA

Configuration

◉ Standard ○ Optional

IAC Rating

○ IAC AFL 20 kA 0.5 s
○ IAC AFL 20 kA 1 s

Busbar connections

◉ Rigid unscreened top connection
◉ Rigid unscreened bottom connection

Metering transformers

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

Indicators

○ Voltage capacitive indicator ekor.vips
○ Voltage capacitive indicator ekor.ivds

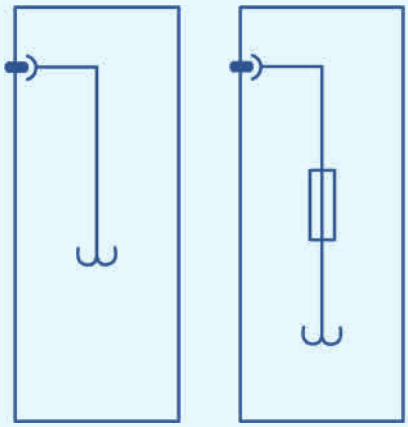
Optional elements.

○ Heater element
○ Protection mesh
○ Keylocks/interlocks

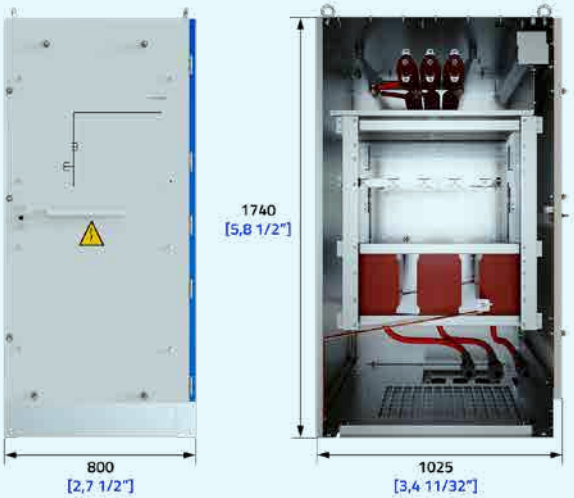
Some specific configurations may be incompatible with each other.

Dimensions

165* kg
363* Lb
(*) Empty enclosure

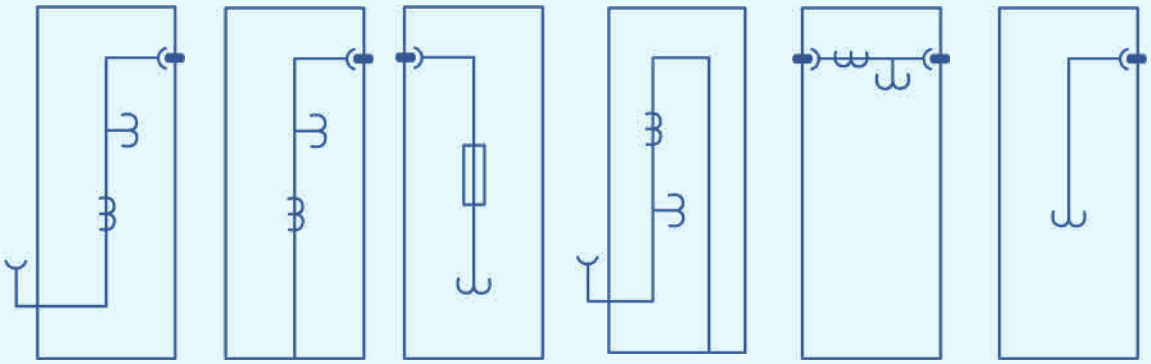


IEC

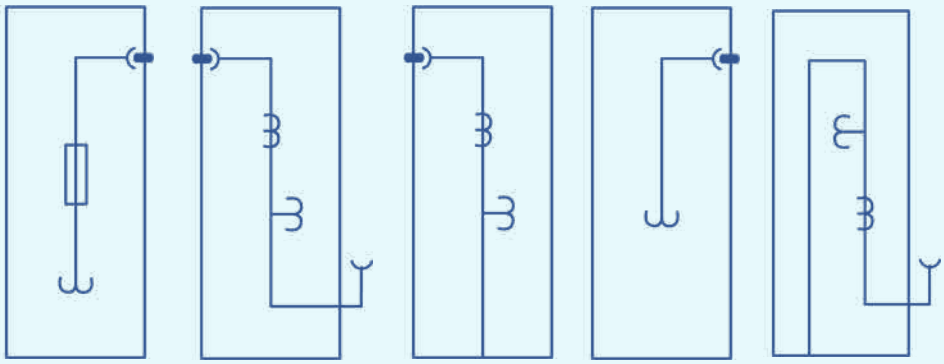


Options

cgmcosmos-rb-pt



Type* 03/07 | Type 22 | Type 14 | Type* 05-12/09-18 | Type 11 | Type 17



Type 15 | Type* 04/08 | Type 21 | Type 17 | Type* 06-13/10-19

* Except for connection with cgmcosmos-l

cgmcosmos-m-pt

Metering function with earthing switch

Modular air-insulated metering cubicle.

Applications

Electrical characteristics			IEC
Rated voltage	Ur	[kV]	17.5
Rated frequency	fr	[Hz]	50/60
Rated current			
General busbar and cubicle interconnection	Ir	[A]	400/630
Rated short-time power frequency withstand voltage (1 min)			
Phase-to-earth	Ud	[kV]	38
Lightning impulse rated withstand voltage			
Phase-to-earth	Up	[kV]	95
Internal arc classification	IAC		16 kA/1s
Rated short-time withstand current Value t_k = (x) s	Ir	[kA]	16 (1 s)

Configuration

◉ Standard ○ Optional

IAC Rating

○ IAC AFL 20 kA 1 s

Busbar connections

◉ Rigid unscreened top connection
◉ Rigid unscreened bottom connection

Cable connections

○ Cable bottom connection

Metering transformers

◉ Current transformers installed (3 CTs)
◉ Voltage transformers installed (3 VTs)

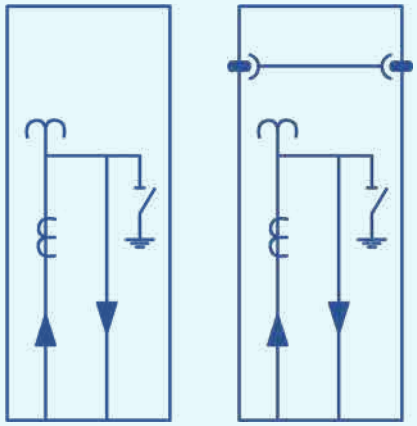
Optional elements.

○ Heater element
○ Protection mesh
○ Keylocks/interlocks

Some specific configurations may be incompatible with each other.

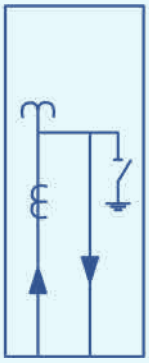
Dimensions

180* kg
397 Lb
(*) Empty enclosure

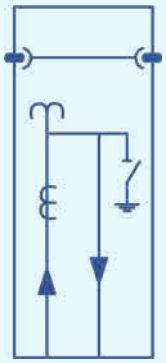


IEC

Options



Type 05EPE/09EPE



Type 11EPE

cgmcosmos-ma

Metering function and auxiliary services

Modular air-insulated metering cubicle.

Electrical characteristics			IEC
Rated voltage	Ur	[kV]	24
Rated frequency	fr	[Hz]	50/60
Rated current			
General busbar and cubicle interconnection	Ir	[A]	630
Rated short-time power frequency withstand voltage (1 min)			
Phase-to-earth and between phases	Ud	[kV]	50
Lightning impulse rated withstand voltage			
Phase-to-earth and between phases	Up	[kV]	125
Internal arc classification	IAC		AFL 16 kA-1s / 20 kA-1s / 25 kA-1s

Configuration

◉ Standard ○ Optional

IAC Rating

○ IAC AFLR 16/20/25 kA 1 s

Cable connections

○ Unscreened rigid top connection

Metering transformers and/or auxiliary services

○ Voltage transformers (3 VTs)

○ Two-phase auxiliary services transformer

Control box

○ Other metering and automation components

Optional elements.

○ Heater element

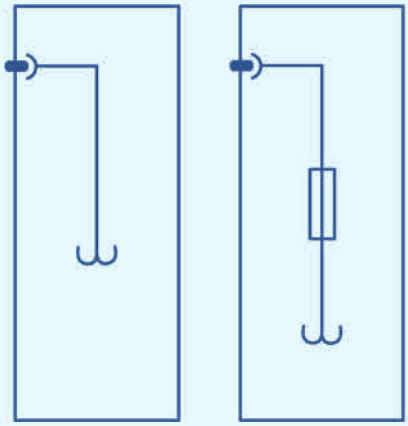
○ Protection mesh

○ Keylocks/interlocks

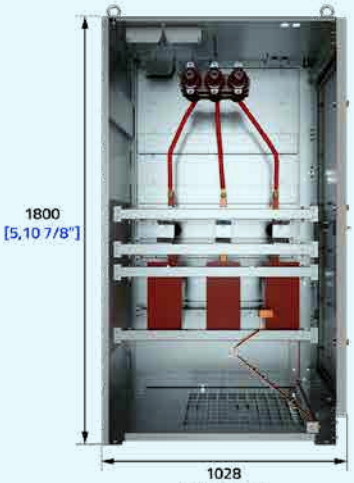
Some specific configurations may be incompatible with each other.

Dimensions

125 kg*
(*) Empty enclosure



IEC



Options

Type 4MA, 11MA

Type 3MA, 10MA

Type 1MA, 8MA

Type 5MA, 12MA

Type 2MA, 9MA

cgmcosmos-rc

Cable rise function

Cable rise modular air-insulated cubicle (through to main busbar). Optional double cable rise function (r2c)

Electrical characteristics			IEC		ANSI/IEEE	
Rated voltage	Ur	[kV]	12*	24	15.5	27
Rated frequency	fr	[Hz]	50/60		50/60	
Rated current						
Feeder	Ir	[A]	400/630		600	
Internal arc classification	IAC		AFL 20** kA 1 s/25 kA 1 s AFL[R] 20** kA 1s		AFL 16 kA 1 s/20** kA 1 s/ 25 kA 1 s	

* Also available with U_r = 7.2 kV on request
** Tests performed at 21 kA/52.5 kA.

Configuration

◉ Standard ○ Optional

IAC Rating

○ IAC AFL 20 kA 1 s
○ IAC AFL 25 kA 1 s
○ IAC AFLR 20 kA 1 s

Cubicle height

◉ 1740 mm

Extensibility

○ Right (rcd)
○ Left (rci)

Indicators

○ Voltage capacitive indicator ekor.vips
○ Voltage capacitive indicator ekor.ivds
○ Keylock interlocks

Options

cgmcosmos-r2c

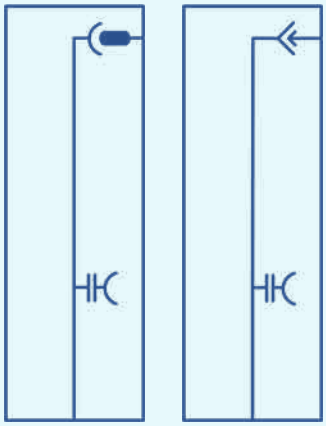
(without IAC class option)
○ Double cable rise functional unit (width=550 mm/1' 9 21/32", weight=60 kg/132 Lbm)

cgmcosmos-cl

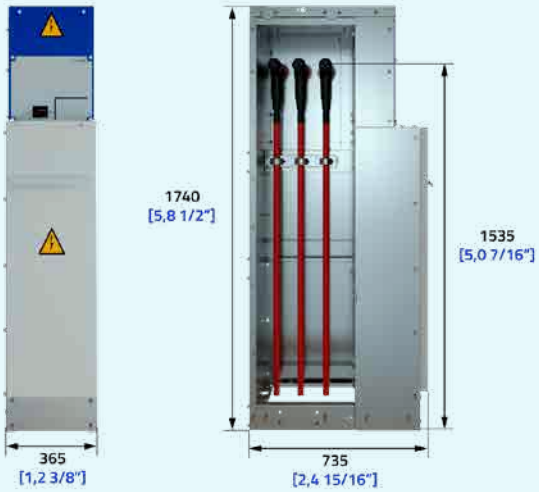
○ Side connection box (width=365 mm/1' 2 3/8", weight=20 kg/44 Lbm)

Dimensions

40 kg
88 Lb



IEC ANSI/IEEE



Options

Some specific configurations may be incompatible with each other.

cgmcosmos-2l

Two feeder functions

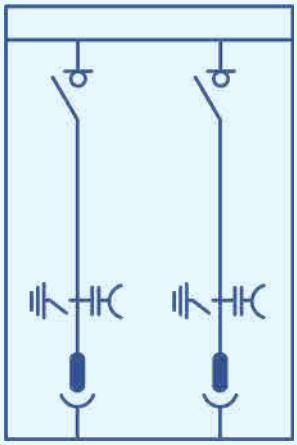
Compact cubicle (RMU) with two feeder functions housed in a single gas tank.

Electrical characteristics			IEC	
Rated voltage	Ur	[kV]	12*	24
Rated frequency	fr	[Hz]	50/60	
Rated current				
General busbar and cubicle interconnection	Ir	[A]	400/630	
Feeder	Ir	[A]	400/630	
Transformer outgoing line	Ir	[A]	-	
Rated short-time power frequency withstand voltage (1 min)				
Phase-to-earth	Ud	[kV]	28	50
Across isolating distance	Ud	[kV]	32	60
Lightning impulse rated withstand voltage				
Phase-to-earth	Up	[kV]	75	125
Across isolating distance	Up	[kV]	85	145
Internal arc classification	IAC		AFL 20** kA 1 s	
Withstand direct current voltage		[kV]	48 kV without cable testing device 50 kV with cable testing device	
Switch-disconnector			**IEC 62271-103**	
Admissible rated short-time withstand current (main circuit)				
Value tk = (x) s	Ik	[kA]	16/20** (1/3 s)	
Peak value	Ip	[kA]	50 Hz: 40/52** 60 Hz: 41.6/52**	
Mainly active current rated breaking capacity	I1	[A]	400/630	
Cable charging-breaking capacity/line-charging breaking capacity	I4a	[A]	50/1.5	
Closed loop breaking capacity	I2a	[A]	400/630	
Rated breaking capacity in the event of fault to earth	I6a	[A]	300	
Cable rated breaking capacity / vacuum lines in earth fault conditions	I6b	[A]	100	
Main switch making capacity (peak value)	Ima	[kA]	50 Hz: 40/52** 60 Hz: 41.6/52**	
Switch-disconnector category				
Mechanical endurance			1000-M1/5000-M2	
Operating cycles (short-circuit making operations)- class			5-E3	
Earthing Switch			**IEC 62271-102**	
Admissible rated short-time withstand current (earthing circuit)				
Value tk = (x) s	Ik	[kA]	16/20** (1/3 s)	
Peak value	Ip	[kA]	50 Hz: 40/52** 60 Hz: 41.6/52**	
Main switch making capacity (peak value)	Ima	[kA]	50 Hz: 40/52** 60 Hz: 41.6/52**	
Earthing switch category				
Mechanical endurance (manual)			1000-M0	
Operating cycles (short-circuit making operations)- class			5-E2	

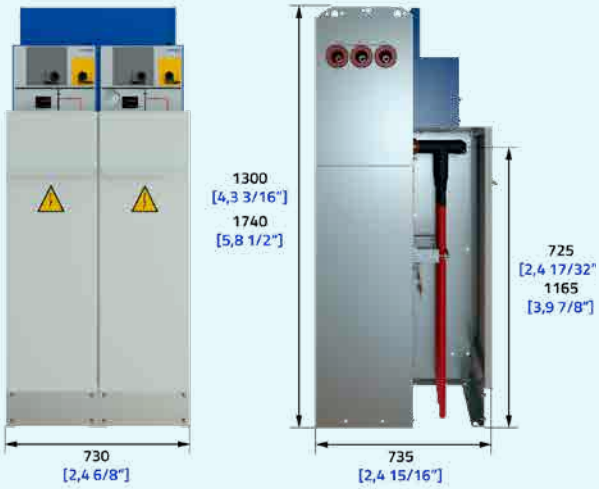
* Also available with Ur = 7.2 kV on request ** Tests conducted at 21 kA/52.5 kA

Dimensions

210 kg
463 Lb



IEC



Configuration

◉ Standard ○ Optional

IAC Rating

Internal arc IAC AF/AFL

○ 20* kA 1s

Internal arc: tank

○ 16 kA 0.5 s ○ 20 kA 0.5 s

○ 16 kA 1 s ○ 20 kA 1 s

Cubicle height

◉ 1740 mm

○ 1300 mm

Gas tank

Gas pressure indicator:

◉ Pressure gauge without contacts

○ Pressure gauge with temperature compensation and contacts

Front connection

◉ Cable bushing

Extensibility

◉ On both sides

○ Blind both sides

Type of side connection:

Female bushing

○ Right ○ Left ◉ Both

Driving mechanisms

◉ Actuating levers

◉ B type manual mechanism

○ BM type motorised mechanism

Additional interlocks:

○ Electrical interlocks

○ Keylock interlocks

○ Padlocks

Indicators

◉ Acoustic alarm ekor.sas

◉ Voltage presence capacitive indicator ekor.vpis

○ Voltage presence/absence capacitive indicator ekor.ivds-pd with high-frequency output (HF)

○ Voltage presence/absence capacitive indicator ekor.ivds

○ Other voltage capacitive indicators

Some specific configurations may be incompatible with each other.

cgmcosmos-3l

Three feeder functions

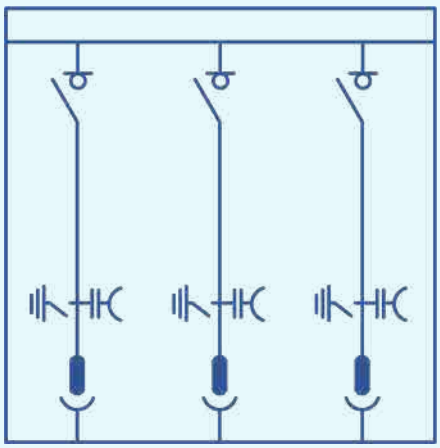
Compact cubicle with three feeder functions, housed in a single gas tank.

Electrical characteristics			IEC	
Rated voltage	Ur	[kV]	12*	24
Rated frequency	fr	[Hz]	50/60	
Rated current				
General busbar and cubicle interconnection	Ir	[A]	400/630	
Feeder	Ir	[A]	400/630	
Transformer outgoing line	Ir	[A]	-	
Rated short-time power frequency withstand voltage (1 min)				
Phase-to-earth	Ud	[kV]	28	50
Across isolating distance	Ud	[kV]	32	60
Lightning impulse rated withstand voltage				
Phase-to-earth	Up	[kV]	75	125
Across isolating distance	Up	[kV]	85	145
Internal arc classification	IAC		AFL 16 kA 0.5 s/16 kA 1 s/20** kA 1 s AFL[R***] 20** kA 1 s	
Withstand direct current voltage		[kV]	48 kV without cable testing device 50 kV with cable testing device	
Switch-disconnector			IEC 62271-103	
Admissible rated short-time withstand current (main circuit)				
Value tk = (x) s	Ik	[kA]	16/20** (1/3 s)	
Peak value	Ip	[kA]	50 Hz: 40/52** 60 Hz: 41.6/52**	
Mainly active current rated breaking capacity	I1	[A]	400/630	
Cable charging-breaking capacity/line-charging breaking capacity	I4a	[A]	50/1.5	
Closed loop breaking capacity	I2a	[A]	400/630	
Rated breaking capacity in the event of fault to earth	I6a	[A]	300	
Cable rated breaking capacity / vacuum lines in earth fault conditions	I6b	[A]	100	
Main switch making capacity (peak value)	Ima	[kA]	50 Hz: 40/52** 60 Hz: 41.6/52**	
Switch-disconnector category				
Mechanical endurance			1000-M1/5000-M2	
Operating cycles (short-circuit making operations)- class			5-E3	
Earthing switch			IEC 62271-102	
Admissible rated short-time withstand current (earthing circuit)				
Value tk = (x) s	Ik	[kA]	16/20** (1/3 s)	
Peak value	Ip	[kA]	50 Hz: 40/52** 60 Hz: 41.6/52**	
Main switch making capacity (peak value)	Ima	[kA]	50 Hz: 40/52** 60 Hz: 41.6/52**	
Earthing switch category				
Mechanical endurance (manual)			1000-M0	
Operating cycles (short-circuit making operations)- class			5-E2	

* Also available with Ur = 7.2 kV on request ** Tests conducted at 21 kA/52.5 kA
*** With gas relief upwards through a duct for 1740 mm high cubicles and to a trench for 1300 mm high cubicles.

Dimensions

320/340 kg
662/750 Lb



IEC

Configuration

◉ Standard ○ Optional

IAC Rating

Internal arc IAC AF/AFL
- ○ 20* kA 1s

Internal arc: tank
- ○ 16 kA 0.5 s ○ 20 kA 0.5 s
- ○ 16 kA 1 s ○ 20 kA 1 s

Cubicle height

- ◉ 1740 mm
- ○ 1300 mm

Gas tank

Gas pressure indicator:
- ◉ Pressure gauge without contacts
- ○ Pressure gauge with temperature compensation and contacts

Front connection
- ◉ Cable bushing

Extensibility
- ◉ On both sides
- ○ Blind both sides

Type of side connection:

Female bushing
- ○ Right ○ Left ◉ Both

Driving mechanisms

- ◉ Actuating levers
- ◉ B type manual mechanism
- ○ BM type motorised mechanism

Additional interlocks:
- ○ Electrical interlocks
- ○ Keylock interlocks
- ○ Padlocks

Indicators

- ○ Acoustic alarm ekor.sas
- ○ Voltage presence capacitive indicator ekor.vpis
- ○ Voltage presence/absence capacitive indicator ekor.ivds
- ○ Voltage presence/absence capacitive indicator ekor.ivds-pd with high-frequency output (HF)
- ○ Other voltage capacitive indicators

Some specific configurations may be incompatible with each other.

cgmcosmos-2lp

Fuse and two feeder protection functions

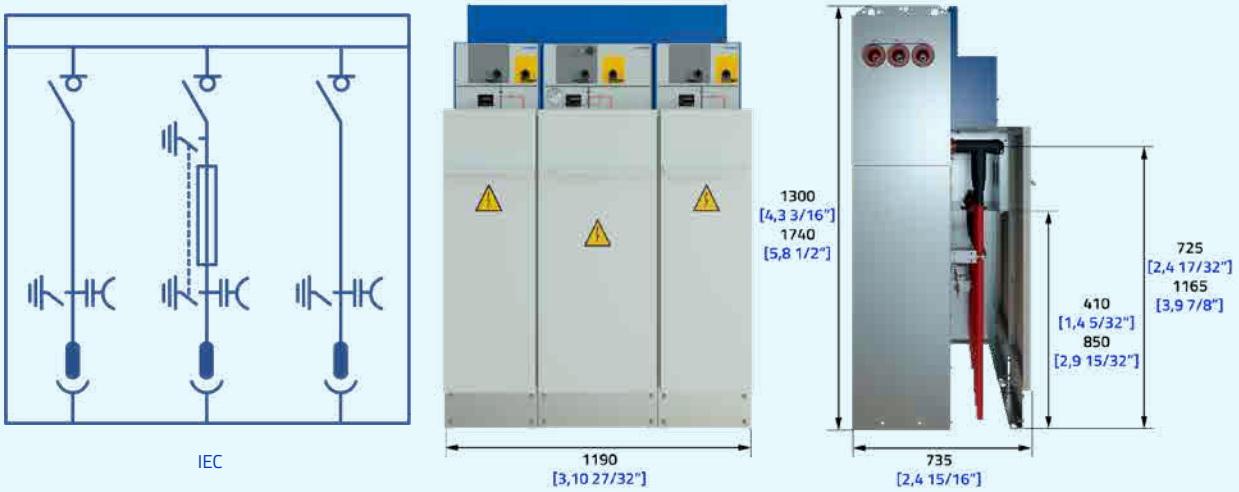
Compact cubicle (RMU) with two feeder functions and one fuse protection function, housed in a single gas tank.

Electrical characteristics		IEC	I		P	
Rated voltage	Ur	[kV]	12*	24	12	24
Rated frequency	fr	[Hz]	50/60		50/60	
Rated current						
General busbar and cubicle interconnection	Ir	[A]	400/630		400/630	
Feeder	Ir	[A]	400/630		-	
Transformer outgoing line	Ir	[A]	-		200	
Rated short-time power frequency withstand voltage (1 min)						
Phase-to-earth	Ud	[kV]	28	50	28	50
Across isolating distance	Ud	[kV]	32	60	32	60
Lightning impulse rated withstand voltage						
Phase-to-earth	Up	[kV]	75	125	75	125
Across isolating distance	Up	[kV]	85	145	85	145
Internal arc classification		IAC	AFL 16 kA 0.5 s/16 kA 1 s/20** kA 1 s/25 kA 1 s AFL[R***] 20** kA 1 s			
Withstand direct current voltage		[kV]	48 kV without cable testing device 50 kV with cable testing device		n/a	
Switch-disconnector			IEC 62271-103			
Admissible rated short-time withstand current (main circuit)						
Value tk = (x) s	Ik	[kA]	16/20** (1/3 s)/25 (1 s)		16/20** (1/3 s)/25 (1 s)	
Peak value	Ip	[kA]	50 Hz: 40/52**/62.5 60 Hz: 41.6/52**/65		50 Hz: 40/52**/62.5 60 Hz: 41.6/52**/65	
Mainly active current rated breaking capacity	I1	[A]	400/630		200	
Cable charging-breaking capacity/line-charging breaking capacity	I4a	[A]	50/1.5		50/1.5	
Closed loop breaking capacity	I2a	[A]	400/630		400	
Rated breaking capacity in the event of fault to earth	I6a	[A]	300		300	
Cable rated breaking capacity / vacuum lines in earth fault conditions	I6b	[A]	100		100	
Main switch making capacity (peak value)	Ima	[kA]	50 Hz: 40/52**/62.5 60 Hz: 41.6/52**/65		50 Hz: 40/52**/62.5 60 Hz: 41.6/52**/65	
Switch-disconnector category						
Mechanical endurance			1000-M1/5000-M2			
Operating cycles (short-circuit making operations)- class			5-E3			
Combined switch-relay (ekor.rpt) take-over current						
Breaking Imax according to TDito IEC 62271-105		[A]	-		1700	1300
Switch-fuse combination transfer current						
Breaking Imax according TDItransfer IEC 62271-105		[A]	-		2300	1600
Earthing switch			IEC 62271-102			
Admissible rated short-time withstand current (earthing circuit)						
Value tk = (x) s	Ik	[kA]	16/20** (1/3 s)/25 (1 s)		1/3 (1/3 s)	
Peak value	Ip	[kA]	50 Hz: 40/52**/62.5 60 Hz: 41.6/52**/65		50 Hz: 2.5/7.5 60 Hz: 2.6/7.8	
Main switch making capacity (peak value)	Ima	[kA]	50 Hz: 40/52**/62.5 60 Hz: 41.6/52**/65		50 Hz: 2.5/7.5 60 Hz: 2.6/7.8	
Earthing switch category						
Mechanical endurance (manual)			1000-M0			
Operating cycles (short-circuit making operations)- class			5-E2			

* Also available with Ur = 7.2 kV on request ** Tests performed at 21 kA/52.5 kA and 25 kA/65 kA
*** With gas relief upwards through a duct for 1740 mm high cubicles and to a trench for 1300 mm high cubicles.

Dimensions

290/310 kg
639/683 Lb



Configuration

◉ Standard ○ Optional

IAC Rating

Internal arc IAC AFLR
- ○ 20 kA 1 s

Internal arc IAC AF/AFL
- ○ 16 kA 1 s ○ 20 kA 1 s
- ○ 25*** kA 1 s

Internal arc: tank
- ○ 16 kA 0.5 s ○ 20 kA 0.5 s
- ○ 16 kA 1 s ○ 20 kA 1 s ○ 25 kA 1 s

Cubicle height

- ◉ 1740 mm
- ○ 1300 mm

Gas tank

Gas pressure indicator:
- ◉ Pressure gauge without contacts
- ○ Pressure gauge with temperature compensation and contacts

Front connection
- ◉ Cable bushing

Extensibility
- ○ Two-side extensibility
- ○ Extensibility to the left/right blind
- ○ Right extensibility/left blind
- ○ Blind both sides

Type of side connection:

Female bushing
- ○ Right ○ Left ◉ Both

Bushing
- ○ Right ○ Left ○ Both

Driving mechanisms

- ◉ Actuating levers
- ◉ B and BR type manual mechanism
- ○ BM type motorised mechanism
- ○ AR type manual mechanism
- ○ ARM type motorised mechanism

Additional interlocks:
- ○ Electrical interlocks
- ○ Keylock interlocks
- ○ Padlocks

Indicators

- ◉ Acoustic alarm ekor.sas
- ◉ Voltage presence capacitive indicator ekor.vpis
- ○ Voltage presence/absence capacitive indicator ekor.ivds
- ○ Voltage presence/absence capacitive indicator ekor.ivds-pd with high-frequency output (HF)
- ○ Other voltage capacitive indicators

Some specific configurations may be incompatible with each other.

cgmcosmos-3lp

Fuse and three feeder protection functions

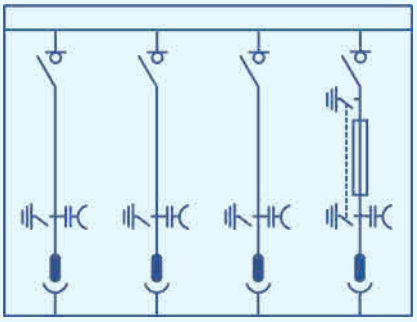
Compact cubicle with three feeder functions and one fuse protection function, housed in a single gas tank.

Electrical characteristics		IEC	I		P	
Rated voltage	Ur	[kV]	12*	24	12	24
Rated frequency	fr	[Hz]	50/60		50/60	
Rated current						
General busbar and cubicle interconnection	Ir	[A]	400/630		400/630	
Feeder	Ir	[A]	400/630		-	
Transformer outgoing line	Ir	[A]	-		200	
Rated short-time power frequency withstand voltage (1 min)						
Phase-to-earth	Ud	[kV]	28	50	28	50
Across isolating distance	Ud	[kV]	32	60	32	60
Lightning impulse rated withstand voltage						
Phase-to-earth	Up	[kV]	75	125	75	125
Across isolating distance	Up	[kV]	85	145	85	145
Internal arc classification		IAC	AFL 16 kA 0.5 s			
Withstand direct current voltage		[kV]	48 kV without cable testing device 50 kV with cable testing device		n/a	
Switch-disconnector			IEC 62271-103			
Admissible rated short-time withstand current (main circuit)						
Value tk = (x) s	Ik	[kA]	16/20** (1 s)		16/20** (1 s)	
Peak value	Ip	[kA]	50 Hz: 40/52** 60 Hz: 41.6/52**		50 Hz: 40/52** 60 Hz: 41.6/52**	
Mainly active current rated breaking capacity	I1	[A]	400/630		200	
Cable charging-breaking capacity/line-charging breaking capacity	I4a	[A]	50/1.5		50/1.5	
Closed loop breaking capacity	I2a	[A]	400/630		400	
Rated breaking capacity in the event of fault to earth	I6a	[A]	300		300	
Cable rated breaking capacity / vacuum lines in earth fault conditions	I6b	[A]	100		100	
Main switch making capacity (peak value)	Ima	[kA]	50 Hz: 40/52** 60 Hz: 41.6/52**		50 Hz: 40/52** 60 Hz: 41.6/52**	
Switch-disconnector category						
Mechanical endurance			1000-M1/5000-M2			
Operating cycles (short-circuit making operations)- class			5-E3			
Combined switch-relay (ekor.rpt) take-over current						
Breaking Imax according to TDito IEC 62271-105		[A]	-		1700	1300
Switch-fuse combination transfer current						
Breaking Imax according TDItransfer IEC 62271-105		[A]	-		2300	1600
Earthing switch			IEC 62271-102			
Admissible rated short-time withstand current (earthing circuit)						
Value tk = (x) s	Ik	[kA]	16/20** (1 s)		1/3 (1 s)	
Peak value	Ip	[kA]	50 Hz: 40/52** 60 Hz: 41.6/52**		50 Hz: 2.5/7.5 60 Hz: 2.6/7.8	
Main switch making capacity (peak value)	Ima	[kA]	50 Hz: 40/52** 60 Hz: 41.6/52**		50 Hz: 2.5/7.5 60 Hz: 2.6/7.8	
Earthing switch category						
Mechanical endurance (manual)			1000-M0			
Operating cycles (short-circuit making operations)- class			5-E2			

* Also available with Ur = 7.2 kV on request ** Tests conducted at 21 kA/52.5 kA and 25 kA/65 kA

Dimensions

355 kg
783 Lb



IEC

Configuration

◉ Standard ○ Optional

IAC Rating

Internal arc IAC AF/AFL

○ 20* kA 1s

Internal arc: tank

○ 16 kA 0.5 s ○ 20 kA 0.5 s

○ 16 kA 1 s ○ 20 kA 1 s

Cubicle height

◉ 1740 mm

○ 1300 mm

Gas tank

Gas pressure indicator:

◉ Pressure gauge without contacts

○ Pressure gauge with temperature compensation and contacts

Front connection

◉ Cable bushing

Extensibility

◉ On both sides

○ Blind both sides

Type of side connection:

Female bushing

○ Right ○ Left ◉ Both

Driving mechanisms

◉ Actuating levers

◉ B and BR type manual mechanism

○ BM type motorised mechanism

○ AR type manual mechanism

○ ARM type motorised mechanism

Additional interlocks:

○ Electrical interlocks

○ Keylock interlocks

○ Padlocks

Indicators

◉ Acoustic alarm ekor.sas

◉ Voltage presence capacitive indicator ekor.vpis

○ Voltage presence/absence capacitive indicator ekor.ivds

○ Other voltage capacitive indicators

Some specific configurations may be incompatible with each other.

cgmcosmos-2l2p

Two fuse protection and two feeder functions

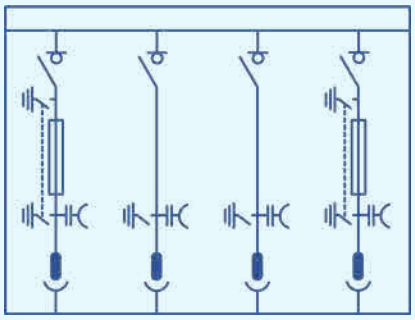
Compact cubicle (RMU) with two feeder functions and two fuse protection functions, housed in a single gas tank.

Electrical characteristics		IEC	I		P	
Rated voltage	Ur	[kV]	12*	24	12	24
Rated frequency	fr	[Hz]	50/60		50/60	
Rated current						
General busbar and cubicle interconnection	Ir	[A]	400/630		400/630	
Feeder	Ir	[A]	400/630		-	
Transformer outgoing line	Ir	[A]	-		200	
Rated short-time power frequency withstand voltage (1 min)						
Phase-to-earth	Ud	[kV]	28	50	28	50
Across isolating distance	Ud	[kV]	32	60	32	60
Lightning impulse rated withstand voltage						
Phase-to-earth	Up	[kV]	75	125	75	125
Across isolating distance	Up	[kV]	85	145	85	145
Internal arc classification		IAC	AFL 16 kA 0.5 s			
Withstand direct current voltage		[kV]	48 kV without cable testing device 50 kV with cable testing device		n/a	
Switch-disconnector			IEC 62271-103			
Admissible rated short-time withstand current (main circuit)						
Value tk = (x) s	Ik	[kA]	16/20** (1 s)		16/20** (1 s)	
Peak value	Ip	[kA]	50 Hz: 40/52** 60 Hz: 41.6/52**		50 Hz: 40/52** 60 Hz: 41.6/52**	
Mainly active current rated breaking capacity	I1	[A]	400/630		200	
Cable charging-breaking capacity/line-charging breaking capacity	I4a	[A]	50/1.5		50/1.5	
Closed loop breaking capacity	I2a	[A]	400/630		400	
Rated breaking capacity in the event of fault to earth	I6a	[A]	300		300	
Cable rated breaking capacity / vacuum lines in earth fault conditions	I6b	[A]	100		100	
Main switch making capacity (peak value)	Ima	[kA]	50 Hz: 40/52** 60 Hz: 41.6/52**		50 Hz: 40/52** 60 Hz: 41.6/52**	
Switch-disconnector category						
Mechanical endurance			1000-M1/5000-M2			
Operating cycles (short-circuit making operations)- class			5-E3			
Combined switch-relay (ekor.rpt) take-over current						
Breaking Imax according to TDito IEC 62271-105		[A]	-		1700	1300
Switch-fuse combination transfer current						
Breaking Imax according TDItransfer IEC 62271-105		[A]	-		2300	1600
Earthing switch			IEC 62271-102			
Admissible rated short-time withstand current (earthing circuit)						
Value tk = (x) s	Ik	[kA]	16/20** (1 s)		1/3 (1 s)	
Peak value	Ip	[kA]	50 Hz: 40/52** 60 Hz: 41.6/52**		50 Hz: 2.5/7.5 60 Hz: 2.6/7.8	
Main switch making capacity (peak value)	Ima	[kA]	50 Hz: 40/52** 60 Hz: 41.6/52**		50 Hz: 2.5/7.5 60 Hz: 2.6/7.8	
Earthing switch category						
Mechanical endurance (manual)			1000-M0			
Operating cycles (short-circuit making operations)- class			5-E2			

* Also available with Ur = 7.2 kV on request ** Tests performed at 21 kA/52.5 kA and 25 kA/65 kA

Dimensions

400 kg
882 Lb



IEC

Configuration

◉ Standard ○ Optional

IAC Rating

Internal arc IAC AF/AFL

○ 20* kA 1s

Internal arc: tank

○ 16 kA 0.5 s ○ 20 kA 0.5 s

○ 16 kA 1 s ○ 20 kA 1 s

Cubicle height

◉ 1300 mm

◉ 1740 mm

Gas tank

Gas pressure indicator:

◉ Pressure gauge without contacts

○ Pressure gauge with temperature compensation and contacts

Front connection

◉ Cable bushing

Extensibility

○ Right extensibility/left blind

○ Blind both sides

Type of side connection:

Female bushing

○ Right ○ Left ◉ Both

Driving mechanisms

◉ Actuating levers

◉ B and BR type manual mechanism

○ BM type motorised mechanism

○ AR type manual mechanism

○ ARM type motorised mechanism

Additional interlocks:

○ Electrical interlocks

○ Keylock interlocks

○ Padlocks

Indicators

◉ Acoustic alarm ekor.sas

◉ Voltage presence capacitive indicator ekor.vpis

○ Voltage presence/absence capacitive indicator ekor.ivds

○ Other voltage capacitive indicators

Some specific configurations may be incompatible with each other.

cgmcosmos-rlp

Fuse, rise and feeder protection functions

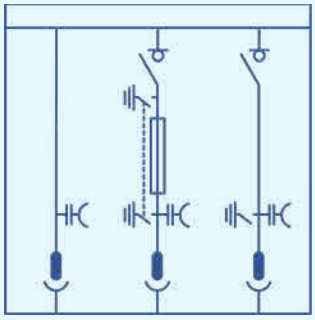
Compact cubicle with one busbar rise function, one fuse protection function and one feeder function, housed in a single tank.

Electrical characteristics			I-r		p	
Rated voltage	Ur	[kV]	12*	24	12*	24
Rated frequency	fr	[Hz]	50/60		50/60	
Rated current						
General busbar and cubicle interconnection	Ir	[A]	400/630		400/630	
Feeder	Ir	[A]	400/630		-	
Transformer outgoing line	Ir	[A]	-		400/630	
Rated short-time power frequency withstand voltage (1 min)						
Phase-to-earth	Ud	[kV]	28	50	28	50
Across isolating distance	Ud	[kV]	32	60	32	60
Lightning impulse rated withstand voltage						
Phase-to-earth	Up	[kV]	75	125	75	125
Across isolating distance	Up	[kV]	85	145	85	145
Internal arc classification	IAC		AFL 16 kA 1 s/20** kA 1 s/25 kA 1 s AFL[R***] 20 kA 1 s			
			I		p	
Switch-disconnector			IEC 62271-103		IEC 62271-103	
Admissible rated short-time withstand current (main circuit)						
Value tk = (x) s	Ik	[kA]	16/20** (1/3 s)/25 (1 s)		16/20** (1/3 s)/25 (1 s)	
Peak value	Ip	[kA]	50 Hz: 40/52**/62.5# 60 Hz: 41.6/52**/65#	50 Hz: 40/52**/62.5# 60 Hz: 41.6/52**/65#	50 Hz: 40/52**/62.5# 60 Hz: 41.6/52**/65#	50 Hz: 40/52**/62.5# 60 Hz: 41.6/52**/65#
Mainly active current rated breaking capacity	I1	[A]	400/630		200	
Rated vacuum cable breaking capacity	I4a	[A]	50/1.5		-	-
Closed loop breaking capacity	I2a	[A]	400/630		-	-
Rated breaking capacity in the event of fault to earth	I6a	[A]	300		-	-
Cable rated breaking capacity / vacuum lines in earth fault conditions	I6b	[A]	100		-	-
Main switch making capacity (peak value)	Ima	[kA]	50 Hz: 40/52**/62.5# 60 Hz: 41.6/52**/65#	50 Hz: 40/52**/62.5 60 Hz: 41.6/52**/65#	50 Hz: 40/52**/62.5# 60 Hz: 41.6/52**/65#	50 Hz: 40/52**/62.5 60 Hz: 41.6/52**/65#
Switch category						
Mechanical endurance			1000-M1/5000-M2			
Operating cycles (short-circuit making operations)- class			5-E3			
Combined switch-relay (ekor.rpt) take-over current						
Breaking Imax according to TDito IEC 62271-105		[A]	-	-	1700	1300
Switch-fuse combination transfer current						
Breaking Imax according TDItransfer IEC 62271-105		[A]	-	-	2300	1600
			I-r		p	
Earthing switch			IEC 62271-102			
Admissible rated short-time withstand current (earthing circuit)						
Value tk = (x) s	Ik	[kA]	16/20** (1/3 s)/25 (1 s)		1/3 (1/3 s)	
Peak value	Ip	[kA]	50 Hz: 40/52**/62.5# 60 Hz: 41.6/52**/65#	50 Hz: 40/52**/62.5 60 Hz: 41.6/52**/65#	50 Hz: 2.5/7.5 60 Hz: 2.6/7.8	
Earthing switch making capacity (peak value)	Ima	[kA]	50 Hz: 40/52**/62.5# 60 Hz: 41.6/52**/65#	50 Hz: 40/52**/62.5 60 Hz: 41.6/52**/65#	50 Hz: 2.5/7.5 60 Hz: 2.6/7.8	
Earthing switch category						
Mechanical endurance (manual)			1000-M0			
Operating cycles (short-circuit making operations)- class			5-E2			

* Also available with Ur = 7.2 kV on request ** Tests performed at 21 kA/52.5 kA and 25 kA/65 kA *** With gas relief upwards through a duct

Dimensions

275/295 kg
606/650 Lb



IEC

Configuration

◉ Standard ○ Optional

IAC Rating

Internal arc IAC AFLR

○ 20 kA 1 s

Internal arc IAC AF/AFL

○ 16 kA 1 s ○ 20 kA 1 s ○ 25 kA 1 s

Internal arc: tank

○ 16 kA 0.5 s ○ 20 kA 0.5 s

○ 16 kA 1 s ○ 20 kA 1 s ○ 25 kA 1 s

Cubicle height

◉ 1740 mm

○ 1300 mm

Gas tank

Gas pressure indicator:

◉ Pressure gauge without contacts

○ Pressure gauge with temperature compensation and contacts

Extensibility

○ On both sides

○ Left extensibility/right blind

○ Right extensibility/left blind

○ Blind both sides

Type of side connection:

Female bushing

○ Right ○ Left ◉ Both

Bushing

○ Right ○ Left ○ Both

Driving mechanisms

◉ Actuating levers

◉ B and BR type manual mechanism

○ BM type motorised mechanism

○ AR type manual mechanism

○ ARM type motorised mechanism

Additional interlocks:

○ Electrical interlocks

○ Keylock interlocks

○ Padlocks

Indicators

◉ Acoustic alarm ekor.sas

◉ Voltage presence capacitive indicator ekor.vpis

○ Voltage presence/absence capacitive indicator ekor.ivds

Some specific configurations may be incompatible with each other.

Installation and connection

Handling and transport

- Dimensions compatible with road, sea or air 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):

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

For handling and installation instructions, check with Ormazabal.

Installation

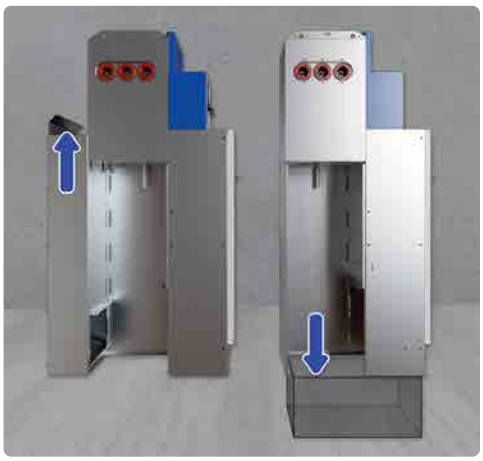
- Indoor, outdoor installation, transformer substations, wind power applications (on/offshore), etc.
- Easy handling (passes through standard doors and elevators)
- Operation, extensibility and removal in reduced space
- Ergonomic design for easy cubicle connection and floor fastening
- No gas handled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

Installation distances

cgmcosmos family 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 (IAC classification, gas output, etc.).

Minimum installation distances [mm] (feet inches)	
Side wall (a)	[100] (4)
Roof (b)	[500] (1' 7 5/8")
Front clearance (c)	[500] (1' 7 5/8")
Rear wall (d)	[> 100] (> 4") *

* Except for cgmcosmos-v (> 50 mm/2 inches) and cgmcosmos-m (0 mm/inches)
In the case of rear duct = 0 mm/inches. The space required to extend the assembly with an additional cubicle is 150 mm / 5 7/8" plus the width of the new cubicle.



Gas output

Configurable gas relief according to the characteristics of the facility:

- Downward gases, directing gases into the trench
- Upward gases, directing gases from the rear to the top of the cubicle

For other configurations, check with Ormazabal.

Trench dimensions

The recommended minimum dimensions for the trench are defined on the basis of those used in IEC/IEEE 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 bushing, IEC or IEEE type. Complaint with dielectric and partial discharge tests.

There are three types:

- Plug-in up to 250 A (IEC) and 200 A (IEEE)
- Plug-in up to 400 A
- Screwable up to 630 A (IEC) and 600 A (IEEE)

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)
cgmcosmos-l/rb[1]	[mm] (feet/inches)	[310] (1'-1/4")
cgmcosmos-v[1]	[mm]z (feet/inches)	[500] (1' 7 11/16")
cgmcosmos-p	-	Connection vertical

1) Option to extend the available distance using the extended cover option [+ 200 mm] (+ 7 7/8").

cgmcosmos	IEC type cable		IEEE type cable	Extended cover	
	plug-in	screwable	screwable	2 cables/phase	cable + surge arrester
-l	-	√	√	√	√
-p[1]	√	√	√	√	√
-v	√	√	√	√	√
-s	-	-	-	-	-
-a	√	-	√	-	-
rb	√	√	√	-	-
-m	-	-	-	-	-
-rc	√	√	√	√*	-
-2l	-	√	-	√	√
-3l	-	√	-	√	√
-2lp[1]	-	√	√	√	√
-3lp[1]	-	√	√	√	√
-2l2p[1]	-	√	-	√	√
rlp[1]	-	√	√	√	√

[1] 250 A plug-in connectors (straight or angled for cable output at the rear) in outputs to the transformer (cable compartment) for fuse protection functions.
* cgmcosmos-r2c: double cable rise functional unit.

4. Services

Ormazabal Services p. 56

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.

Installation 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 variety of services and support for its customers throughout the product's service life: from its preliminary design and customisation, through to the end of its working life.

For further information, 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.

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velatia

Technology for a new electric world

Parque Científico y
Tecnológico de Bizkaia, Edif. 104.
48170 Zamudio. Spain
Tel.: +34 94 431 77 77
ormazabal@ormazabal.com

More info

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