



Technical Specification code: GRI-GRI-MAT-E&C-0009
Version no. 1 dated 11/10/2022

Subject: GSCM009 MV AIS with withdrawable MV Circuit Breaker for HV/MV and MV/MV substation

Application Areas

Perimeter: *Global*
Staff Function: -
Service Function: -
Business Line: *Enel Grids*

CONTENTS

1	DOCUMENT AIMS AND APPLICATION AREA	2
2	DOCUMENT VERSION MANAGEMENT	2
3	UNITS IN CHARGE OF THE DOCUMENT	3
4	REFERENCES	3
5	ORGANIZATIONAL PROCESS POSITION IN THE PROCESS TAXONOMY	6
6	DEFINITIONS AND ACRONYMS	7
7	DESCRIPTION	8
8	ANNEXES.....	28

THE HEAD OF GLOBAL NETWORK COMPONENTS
Fabrizio Gasbarri



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1 DOCUMENT AIMS AND APPLICATION AREA

This document provides technical specifications for MV Air Insulated Switchgear (AIS) with withdrawable MV Circuit Breaker Ur= 12/17,5/24/36 kV to be installed as indoor equipment in the HV/MV and MV/MV substations of the Enel Group Distribution Companies, listed below:

Country	Distribution Company
Argentina	Edesur
Brazil	Enel Distribuição Rio Enel Distribuição Ceará Enel Distribuição Goiás Enel Enel Distribuição São Paulo
Chile	Enel Distribución Chile
Colombia	Enel Codensa
Iberia	e-distribución
Italy	e-distribuzione
Peru	Enel Distribución Peru
Romania	Enel Distributie Banat Enel Distributie Dobrogea Enel Distributie Muntenia

Table 1 - Distribution Companies

This document shall be implemented and applied to the extent possible within the Enel Grids Business Line and in compliance with any applicable laws, regulations and governance rules, including any stock exchange and unbundling-relevant provisions, which in any case prevail over the provisions contained in this document.

1.1 RELATED DOCUMENTS TO BE IMPLEMENTED AT COUNTRY LEVEL

This document doesn't require implementation of further documents.

2 DOCUMENT VERSION MANAGEMENT

Version	Date	Main changes description
1	11/10/2022	Issuing of "GSCM009 "MV AIS with withdrawable MV Circuit Breaker for HV/MV and MV/MV substation" technical specification



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3 UNITS IN CHARGE OF THE DOCUMENT

Responsible for drawing up the document:

- Enel Grids: Engineering and Construction / Components and Devices Design/ Network Components unit.

Responsible for authorizing the document:

- Enel Grids: Head of Network Components unit.
- Enel Grids: Head of Quality unit.

4 REFERENCES

Reference documents listed below (amendments included) shall be the edition in-force at the contract date.

In case which standard edition and paragraph are indicated in this technical specification, Manufacturer shall consider the edition in force at the contract date and relative paragraph.

For South America destinations, the reference standards are the IEC/ISO, whilst for Europe destinations the reference standards are the correspondent European ones (EN).

- Code of Ethics of Enel Group;
- Enel Human Right Policy;
- The Enel Group Zero Tolerance of Corruption (ZTC) Plan;
- Organization and management model as per Legislative Decree No. 231/2001;
- Enel Global Compliance Program (EGCP);
- Integrated Policy for Quality, Health and Safety, Environment, Anti-Bribery and Information Security;
- ISO 9001:2015 - Quality Management System – Requirements;
- ISO 14001:2015 - Environmental Management System - Requirements with guidance for use;
- ISO 45001:2018 - Occupational Health and Safety Management System - Requirements with guidance for use;
- ISO 37001:2016 - Anti-bribery Management System - Requirements with guidance for use;
- ISO 27001:2017 - Information Security Management System – Requirements;
- MAT-O&M-NCS-2021-0033-EGIN “GSCG002 Technical Conformity Assessment”;
- MAT-E&C-NC-2021-0057-GIN “GSCG003 Employer’s Information Requirements for supplier components”;
- WKI-QPT-CMQ-2020-0019-EGIN “Contractual Requirements for Components and Materials Quality management”;
- CNS-O&M-S&L-2021-0032-EGIN “Barcode specification”;
- GSCM010 “LV schemes for MV GIS GSCM011 and for AIS GSCM009”;



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- GSC001 “Underground Medium voltage cables”;
- GSCC023 “Single phase medium voltage cables for primary substations and special applications”;
- GSCT005 “Technical characteristic of LPITs for RGDM/RGDAT”;
- ISO/IEC 17000:2020 - Conformity assessment – Vocabulary and general principles;
- ISO/IEC 17020:2012 - General criteria for the operation of various types of bodies performing inspection;
- ISO/IEC 17025:2017 - General requirements for the competence of testing and calibration laboratories;
- ISO/IEC 17050-1:2004 - Conformity assessment - Supplier’s declaration of conformity - Part 1: General requirements (ISO/IEC 17050-1:2004, corrected version 2007-06-15);
- ISO/IEC 17050-2:2004 - Conformity assessment - Supplier’s declaration of conformity - Part 2: Supporting documentation (ISO/IEC 17050-2:2004);
- ISO/IEC 17065:2012 - Conformity assessment – Requirements for bodies certifying products, processes and services;
- IEC 62271-1 “High-voltage switchgear and controlgear - Part 1: Common specifications for alternating current switchgear and controlgear”;
- IEC 62271-100 “High-voltage switchgear and controlgear - Part 100: Alternating current circuit-breakers”;
- IEC 62271-102 “High-voltage switchgear and controlgear - Part 100: Alternating current disconnectors and earthing switches”;
- IEC 62271-200 “High-voltage switchgear and controlgear - Part 200: AC metal-enclosed switchgear and controlgear for rated voltages above 1 kV and up to and including 52 kV”;
- IEC/TS 62271-210 “High-voltage switchgear and controlgear - Part 210: Seismic qualification for metal enclosed and solid-insulation enclosed switchgear and controlgear assemblies for rated voltages above 1 kV and up to and including 52 kV”;
- IEC 62271-213 “High-voltage switchgear and controlgear - Part 213: Voltage detecting and indicating system”;
- IEC 62271-304 “High-voltage switchgear and controlgear - Part 304: Classification of indoor enclosed switchgear and controlgear for rated voltages above 1 kV up to and including 52 kV related to the use in special service conditions with respect to condensation and pollution.”
- IEC 61243-5 “Live working - Voltage detectors - Part 5: Voltage detecting systems (VDS)”;
- IEC 61869-1 “Instrument transformers - Part 1: General requirements”;
- IEC 61869-2 “Instrument transformers - Part 2: Additional requirements for current transformers”;
- IEC 61869-3 “Instrument transformers - Part 3: Additional requirements for inductive voltage



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transformers”;

- IEC 61869-6 “Instrument transformers - Part 6: Additional general requirements for low-power instrument transformers”;
- IEC 61869-10 “Instrument transformers - Part 10: Additional requirements for low-power passive current transformers”;
- IEC 61869-11 “Instrument transformers - Part 11: Additional requirements for low power passive voltage transformers”;
- IEC 61869-3 “Instrument transformers - Part 3: Additional requirements for inductive voltage transformers”;
- IEC 60332-1-2 “Tests on electric and optical fiber cables under fire conditions - Part 1-2: Test for vertical flame propagation for a single insulated wire or cable - Procedure for 1 kW pre-mixed flame”;
- EN 50399 “Common test methods for cables under fire conditions - Heat release and smoke production measurement on cables during flame spread test - Test apparatus, procedures, results”;
- IEC 60445 “Basic and safety principles for man-machine interface, marking and identification - Identification of equipment terminals, conductor terminations and conductors”;
- ISO 12944 “Paints and varnishes — Corrosion protection of steel structures by protective paint systems”;
- Regulation (EU) of the European Parliament and of the Council 517/2014 of the April 16th 2014.

Argentina

Brazil

- NR-10 – Segurança em instalações e serviços em eletricidade.

Chile

- Norma técnica de calidad de servicios para sistema de distribución, Comisión Nacional de Energía, Diciembre 2019;
- ETG-1020 “Requisitos de Diseño Sísmico para Equipo Eléctrico”;
- IEEE 693-2005 “Recommended Practice for Seismic Design of Substations”;
- Norma Técnica de Seguridad y Calidad de Servicio, Comisión Nacional de Energía, Septiembre 2020;
- Reglamento de producción, transporte y distribución de energía eléctrica – Decreto N°109;
- Pliego Técnico normativo RPTD N°15 Operación y Mantenimiento. Decreto N°109;
- Pliego Técnico normativo RPTD N°17 Sistema de Gestión de integridade de instalaciones eléctricas. Decreto N°109.



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Colombia

- RETIE – Reglamento Técnico de Instalaciones Eléctricas.

Peru

Italy

- D.Lgs n. 81 of the 9 of April 2008 and subsequent modifications;
- D.P.R. n. 43 of the 27th of January 2012;
- Nota Operativa PVR001 – Rev. 2 – Ott. 2012 - Gestione Garanzie dei materiali di ENEL Distribuzione.
- GUI 101 “Caratteristiche generali e prescrizioni di impiego del pallet in legno da utilizzare per imballo di trasporto”.

Spain

- R.D. 614/2001, de 8 de junio, sobre disposiciones mínimas para la protección de la salud y seguridad de los trabajadores frente al riesgo eléctrico;
- R.D. 337/2014, de 9 de mayo, por el que se aprueban el Reglamento sobre condiciones técnicas y garantías de seguridad en instalaciones eléctricas de alta tensión y sus Instrucciones Técnicas Complementarias ITC-RAT 01 a 23;
- R.D. 223/2008, de 15 de febrero, por el que se aprueban el Reglamento sobre condiciones técnicas y garantías de seguridad en líneas eléctricas de alta tensión y sus instrucciones técnicas complementarias ITC-LAT 01 a 09.

Romania

- Prescriptia Energetica PE 101/85 – Normativ pentru construcția instalațiilor electrice de conexiuni și transformare cu tensiuni peste 1 kV;
- GUI 101RO "Caracteristicile generale și cerințele de utilizare ale paletului de lemn care urmează să fie utilizat pentru ambalarea de transport.

5 ORGANIZATIONAL PROCESS POSITION IN THE PROCESS TAXONOMY

Value Chain/Process Area: Engineering and Construction

Macro Process: Devices and Components Development

Process: Standard Catalog Management



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6 DEFINITIONS AND ACRONYMS

Acronym and Key words	Description
Air Insulated Switchgear (AIS)	A general term covering switching devices and their combination with associated control, measuring, protective and regulating equipment, also assemblies of such devices and equipment with associated interconnections, accessories, enclosures and supporting structures, intended in principle for use in connection with generation, transmission, distribution and conversion of electric energy, with Air insulation
High Voltage (HV)	Electrical system with 230kV to 35kV nominal operative voltage between the phases
Medium Voltage (MV)	System with a nominal operative voltage between the phases higher than 1 kV to 35 kV included. NOTE: The boundary value between medium voltage and high voltage depends on local and historical circumstances or on common usage. Nevertheless for internal standardization purposes, medium voltage is defined as a system with a nominal operative voltage between the phases higher than 1 kV to 35 kV included”
Technical Conformity Assessment (TCA)	A “conformity assessment” ¹ with respect to “specified requirements” ² consists in functional, dimensional, constructional and test characteristics required for a product (or a series of products) and quoted in technical specifications and quality requirements issued by Enel Group distribution companies. This also includes the verification of conformity with respect to local applicable regulation and laws and possession of relevant requested certifications
Type A documentation	Not confidential documents used for product manufacturing and management from which it is possible to verify the product conformity to all technical specification requirements, directly or indirectly
TCA report	Document describing the activities carried out for TCA

¹ Definition 2.1 of ISO/IEC 17000

² Definition 3.1 of ISO/IEC 17000



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7 DESCRIPTION

7.1 List of Component

Family	Type code	Description	Family	Type code	Description
1	GSCM009/1	Line/Auxiliary services functional unit switchgear 17,5kV 4000A 31,5kA	5	GSCM009/37	Transformer functional unit switchgear 24kV 1600A 25kA
1	GSCM009/2	Active line functional unit switchgear 17,5kV 4000 A 31,5kA	5	GSCM009/38	Longitudinal Bus Bar-tie with riser functional unit switchgear 24kV 1600A 25kA
1	GSCM009/3	Neutral maker transformer functional unit switchgear 17,5kV 4000A 31,5kA	5	GSCM009/39	Transversal Bus Bar-tie functional unit switchgear 24kV 1600A 25kA
1	GSCM009/4	Capacitor bank functional unit switchgear 17,5kV 4000A 31,5kA	5	GSCM009/40	Bus Bar measures functional unit switchgear 24kV 1600A 25kA
1	GSCM009/5	Transformer functional unit switchgear 17,5kV 4000A 31,5kA	6	GSCM009/41	Line/Auxiliary services functional unit switchgear 36kV 2500A 25kA
1	GSCM009/6	Longitudinal Bus Bar-tie with riser functional unit switchgear 17,5kV 4000A 31,5kA	6	GSCM009/42	Active line functional unit switchgear 36kV 2500A 25kA
1	GSCM009/7	Transversal Bus Bar-tie functional unit switchgear 17,5kV 4000A 31,5kA	6	GSCM009/43	Neutral maker transformer functional unit switchgear 36kV 2500A 25kA
1	GSCM009/8	Bus Bar measures functional unit switchgear 17,5kV 4000A 31,5kA	6	GSCM009/44	Capacitor bank functional unit switchgear 36kV 2500A 25kA
2	GSCM009/9	Line/Auxiliary services functional unit switchgear 17,5kV 3150A 25kA	6	GSCM009/45	Transformer functional unit switchgear 36kV 2500A 25kA
2	GSCM009/10	Active line functional unit switchgear 17,5kV 3150A 25kA	6	GSCM009/46	Longitudinal Bus Bar-tie with riser functional unit switchgear 36kV 2500A 25kA
2	GSCM009/11	Neutral maker transformer functional unit switchgear 17,5kV 3150A 25kA	6	GSCM009/47	Transversal Bus Bar-tie functional unit switchgear 36kV 2500A 25kA
2	GSCM009/12	Capacitor bank functional unit switchgear 17,5kV 3150A 25kA	6	GSCM009/48	Bus Bar measures functional unit switchgear 36kV 2500A 25kA
2	GSCM009/13	Transformer functional unit switchgear 17,5kV 3150A 25kA	7	GSCM009/49	Line/Auxiliary services functional unit switchgear 36kV 2000A 25kA
2	GSCM009/14	Longitudinal Bus Bar-tie with riser functional unit switchgear 17,5kV 3150A 25kA	7	GSCM009/50	Active line functional unit switchgear 36kV 2000A 25kA
2	GSCM009/15	Transversal Bus Bar-tie functional unit switchgear 17,5kV 3150A 25kA	7	GSCM009/51	Neutral maker transformer functional unit switchgear 36kV 2000A 25kA
2	GSCM009/16	Bus Bar measures functional unit switchgear 17,5kV 3150A 25kA	7	GSCM009/52	Capacitor bank functional unit switchgear 36kV 2000A 25kA
3	GSCM009/17	Line/Auxiliary services functional unit switchgear 24kV 2500A 25kA	7	GSCM009/53	Transformer functional unit switchgear 36kV 2000A 25kA
3	GSCM009/18	Active line functional unit switchgear 24kV 2500A 25kA	7	GSCM009/54	Longitudinal Bus Bar-tie with riser functional unit switchgear 36kV 2000A 25kA
3	GSCM009/19	Neutral maker transformer functional unit switchgear 24kV 2500A 25kA	7	GSCM009/55	Transversal Bus Bar-tie functional unit switchgear 36kV 2000A 25kA
3	GSCM009/20	Capacitor bank functional unit switchgear 24kV 2500A 25kA	7	GSCM009/56	Bus Bar measures functional unit switchgear 36kV 2000A 25kA
3	GSCM009/21	Transformer functional unit switchgear 24kV 2500A 25kA	8	GSCM009/57	Line/Auxiliary services functional unit switchgear 36kV 1600A 25kA
3	GSCM009/22	Longitudinal Bus Bar-tie with riser functional unit switchgear 24kV 2500A 25kA	8	GSCM009/58	Active line functional unit switchgear 36kV 1600A 25kA
3	GSCM009/23	Transversal Bus Bar-tie functional unit switchgear 24kV 2500A 25kA	8	GSCM009/59	Neutral maker transformer functional unit switchgear 36kV 1600A 25kA
3	GSCM009/24	Bus Bar measures functional unit switchgear 24kV 2500A 25kA	8	GSCM009/60	Capacitor bank functional unit switchgear 36kV 1600A 25kA
4	GSCM009/25	Line/Auxiliary services functional unit switchgear 24kV 2000A 25kA	8	GSCM009/61	Transformer functional unit switchgear 36kV 1600A 25kA
4	GSCM009/26	Active line functional unit switchgear 24kV 2000A 25kA	8	GSCM009/62	Longitudinal Bus Bar-tie with riser functional unit switchgear 36kV 1600A 25kA
4	GSCM009/27	Neutral maker transformer functional unit switchgear 24kV 2000A 25kA	8	GSCM009/63	Transversal Bus Bar-tie functional unit switchgear 36kV 1600A 25kA
4	GSCM009/28	Capacitor bank functional unit switchgear 24kV 2000A 25kA	8	GSCM009/64	Bus Bar measures functional unit switchgear 36kV 1600A 25kA
4	GSCM009/29	Transformer functional unit switchgear 24kV 2000A 25kA	9	GSCM009/65	Line/Auxiliary services functional unit switchgear 12kV 2500A 25kA
4	GSCM009/30	Longitudinal Bus Bar-tie with riser functional unit switchgear 24kV 2000A 25kA	9	GSCM009/66	Active line functional unit switchgear 12kV 2500A 25kA
4	GSCM009/31	Transversal Bus Bar-tie functional unit switchgear 24kV 2000A 25kA	9	GSCM009/67	Neutral maker transformer functional unit switchgear 12kV 2500A 25kA
4	GSCM009/32	Bus Bar measures functional unit switchgear 24kV 2000A 25kA	9	GSCM009/68	Capacitor bank functional unit switchgear 12kV 2500A 25kA
5	GSCM009/33	Line/Auxiliary services functional unit switchgear 24kV 1600A 25kA	9	GSCM009/69	Transformer functional unit switchgear 12kV 2500A 25kA
5	GSCM009/34	Active line functional unit switchgear 24kV 1600A 25kA	9	GSCM009/70	Longitudinal Bus Bar-tie with riser functional unit switchgear 12kV 2500A 25kA
5	GSCM009/35	Neutral maker transformer functional unit switchgear 24kV 1600A 25kA	9	GSCM009/71	Transversal Bus Bar-tie functional unit switchgear 12kV 2500A 25kA
5	GSCM009/36	Capacitor bank functional unit switchgear 24kV 1600A 25kA	9	GSCM009/72	Bus Bar measures functional unit switchgear 12kV 2500A 25kA

Table 2 – Type codes



Technical Specification code: GRI-GRI-MAT-E&C-0009
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7.2 SERVICE CONDITIONS

MV Air Insulated Switchgear with withdrawable MV Circuit Breaker, shall be compliant with normal service conditions for indoor installation, as defined in IEC 62271-1, considering as minimum value of ambient temperature -5°C .

The Manufacturer shall consider de-ratings related to altitude more than 1000 m for specific installation, these de-ratings shall be subjected to **enel** approval.

Seismic level of apparatuses shall be:

- seismic severity 1 (seismic severity 2 is required for equipment to be supplied for Chile);
- acceptance class 2;

as defined in IEC/TS 62271-210.

MV AIS shall be suitable for installation in three-phases MV effectively and non-effectively earthed neutral system (solidly earthed, isolated, impedance earthed, resonant earthed and arc-suppression-coil-earth neutral system).

Apparatuses shall be compliant with design class 2 of IEC 62271-304.

The carpentry shall have a protective coating compliant with ISO 12944 with the following features:

- Durability: High (H);
- Atmospheric corrosivity category: C3.

7.3 TECHNICAL CHARACTERISTICS

7.3.1 MV Air Insulated Switchgear

MV Air Insulated Switchgear shall be compliant with IEC 62271-200.

MV Air Insulated Switchgear shall be compatible only with withdrawable MV Circuit Breaker, built or defined by same Manufacturer.

The different functional units of Air Insulated Switchgear shall be fit to be assembled to respect the HV-MV and MV-MV substation requirement.

Air forced and cooling solutions are not generally allowed but they could be evaluated by **enel** only for equipment with $I_r \geq 2500$ A.

The following main components and compartment are foreseen inside the functional units (each one or a subset):

- MV Bus Bar;
- Withdrawable MV Circuit Breaker (CB);
- Earthing switch (ES) for MV cables;
- Current transformers (CTs) and Voltage transformers (VTs);



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- MV cables compartment;
- LV cabinet.

In the par. 8.5 annex E, minimum electrical ratings are defined for each functional unit GSCM009 **enel** type.

7.3.2 MV Bus Bar

MV Bus Bar shall be air insulated or solid insulation, other solution could be evaluated by **enel**.

7.3.3 MV Circuit Breaker

MV Circuit Breaker shall be compliant with IEC 62271-100 and be of the withdrawable type.

Arc extinction shall be performed by vacuum bottle, other type of extinction could be evaluated by **enel**.

In the par. 8.6 annex F, minimum electrical ratings of MV CB are defined for each functional unit GSCM009 **enel** type.

Minimum electrical ratings (classes) for each MV CB are described below:

- Circuit breaker class: S1;
- Mechanical endurance class: M2;
- Electrical endurance class: E2;
- Probability of restrike during capacitive current breaking class: C2.

The following electrical ratings of MV CB shall be the same defined for the entire functional unit GSCM009 **enel** type where MV CB is installed, see par. 8.5 annex E:

- Rated frequency f_r (Hz);
- Rated voltage U_r (kV);
- Rated lightning impulse withstand voltage U_p (kV);
- Rated supply voltage of auxiliary and control circuits U_a (Vdc);
- Rated duration of short circuit t_k (s);
- Rated peak withstand current I_p (kA);

7.3.4 Earthing switch for MV cables

ES shall be compliant with IEC 62271-102, manually operated compliant with IEC 62271-1.

Minimum electrical ratings electrical ratings (classes) for each ES are described below:

- Electrical endurance class: E1;
- Mechanical endurance class: M0.

The following electrical ratings of ES shall be the same defined for the entire functional unit GSCM009 **enel** type where ES is installed, see par. 8.5 annex E:

- Rated frequency f_r (Hz);



Technical Specification code: GRI-GRI-MAT-E&C-0009
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Business Line: *Enel Grids*

- Rated current I_r (A);
- Rated lightning impulse withstand voltage U_p (kV);
- Rated short-time withstand current I_k (kA) and Rated establishment short circuit current I_{ma} (kA) (same value);
- Rated duration of short circuit t_k (s);
- Rated peak withstand current I_p (kA);

7.3.5 MV cable compartment

MV cable compartment shall be accessible only after the ES is closed.

MV cable terminations compliant to GSCC005 and MV cable lugs shall be defined by the Manufacturer and shall be supplied for each functional unit GSCM009 **enel** type.

MV aluminum cable up to 400 mm² shall be compliant with GSC001 **enel** technical specification.

MV copper cable up to 630 mm² shall be compliant with GSCC023 **enel** technical specification.

In the following table, minimum quantities, and maximum sections of MV cables for each functional unit are defined.

I_r (A)	4000	2500/3150	2000	1600	630
Number of MV cables	15 (5 per phase)	12 (4 per phase)	9 (3 per phase)	6 (2 per phase)	3 (1 per phase)
Section (mm²)	630 (CU)				400(AL)

Table 3 – MV cables compartment features

7.3.6 LV cabinet

LV cabinet shall be designed foreseeing adequate space for terminal blocks and cabling.

Cabling and terminal blocks shall be installed according **enel** LV schemes GSCM010 .

Previous schemes are intended as general indication that could be subjected at modifications due to:

- Country's needs;
 - E.g for Colombia humidity sensor and smoke detector presences;
- Type technical specification for protection relay and I/O modules;
- Modifications protection relay and I/O module technical specifications.

LV cabinet shall be designed to allow the protection relay, remote I/O module, and energy meter installation with the following maximum dimensions for protection relay hole:

- Width of 19 inch;
- 6U of height.



Technical Specification code: GRI-GRI-MAT-E&C-0009
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If **enel** does not require protection relay installation, its hole shall be closed.

LV cabinet shall have a minimum IP degree of 3XD, 2X IP degree shall be guaranteed for LV devices placed in the LV cabinet.

The minimum insulation level shall be 0,6/1kV for cable and 450/750V for conductor (single core).

The minimum fire reaction of LV cable and conductors shall be Cca-s1b, d1, a1 as described below

- Cca: EN 50399: Flame Spread (FS) $\leq 2,00\text{m}$; Total Heat Release (THR) $\leq 30\text{MJ}$; Maximum Heat Release Rate (HHR) $\leq 60\text{kW}$; Fire Growth Rate, index of heat release rate (FIGRA) $\leq 300\text{Ws}^{-1}$ /// IEC 60332-1-2: Flame Spread, vertical flame propagation $H \leq 425\text{ mm}$;
- s1b: Total Smoke Production (TSP1200) $\leq 50\text{ m}^2$; Smoke Production Rate, maximum smoke (SPR) $0,25\text{ m}^2/\text{s}$; transmittance $\geq 60\% < 80\%$;
- a1: electrical conductivity $< 2,5\ \mu\text{S}/\text{mm}$; pH $> 4,3$;
- d1: No flaming droplets/particles persisting longer than 10 s within 1200 s.

LV conductors shall be of proper dimension and shall be protected by LV MCB (Miniature Circuit Braker) according to Manufacturer's design.

Each MCBs shall have an auxiliary contact for trip and open MCB signaling.

At least 90 degrees of opening shall be guaranteed for LV compartment door.

Internal light of LV cabinet shall be foreseen.

7.4 CONSTRUCTION CHARACTERISTICS

7.4.1 Dimensions

MV Air Insulated Switchgear shall be installed as "free-standing" solution.

The Manufacturer shall indicate wall distances and gas duct type of installation.

MV Air Insulated Switchgear shall be fixed at the floor.

In the table below the maximum dimensions for each **enel** type are present.



Technical Specification code: GRI-GRI-MAT-E&C-0009
Version no. 1 dated 11/10/2022

Subject: GSCM009 MV AIS with withdrawable MV Circuit Breaker for HV/MV and MV/MV substation

Application Areas

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Enel Grids*

Functional unit	Family	High(mm) *	Depth(mm)	Width(mm)
Transformer switchgear	1-2-3-4-5-9	3000	2500	1000
Transversal Bus-bar-tie switchgear				
Line/Auxiliary services switchgear	1-2-3-4-5-9	3000	2500	800
Active line switchgear				
Neutral maker transformer switchgear				
Capacitor bank switchgear				
Bus Bar measures functional				
Transformer switchgear				
Transformer switchgear	6-7-8	3300	3300	1400
Transversal Bus-bar-tie switchgear				
Line/Auxiliary services switchgear	6-7-8	3300	3300	1200
Active line switchgear				
Neutral maker transformer switchgear				
Capacitor bank switchgear				
Bus Bar measures functional				
Longitudinal Bus-bar-tie with riser switchgear				
Longitudinal Bus-bar-tie with riser switchgear	6-7-8	3300	3300	2600

Table 4 – Functional unit switchgear maximum dimension

* maximum high with eventually gas duct included.

Longitudinal Bus-bar-tie with riser functional unit switchgear could be two physical MV switchgears accoupled. Different dimensions could be evaluated by **enel**.

7.4.2 Insulator

Post and bushing insulator present shall be compliant with the main standards applicable.

Insulators shall be made by insulating material, considering par. 6.18 of IEC 62271-1 ed. 2 to minimize the risk of fire.

7.4.3 Interlocks and locking devices

Interlocks and locking devices compliant with IEC 62271-200 shall be present.

Interlock between VDIS and earthing switch shall be present for earthing maneuver of the MV cables.



Technical Specification code: GRI-GRI-MAT-E&C-0009
Version no. 1 dated 11/10/2022

Subject: GSCM009 MV AIS with withdrawable MV Circuit Breaker for HV/MV and MV/MV substation

Application Areas

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Enel Grids*

Earthing Switch shall be able to be locked in both positions, open and close (for e.g with padlock).

Removable keys for earthing switch in both positions, open and close, are required for all functional unit.

Interlock between 2 transversal bus bar tie functional units, connected each other with MV cables shall be request (e.g using earthing switch removable keys and MV circuit breaker position removable keys).

If removable keys are not available in the manufacturer design alternative solution could be evaluated by **enel**.

Procedure for MV cables test, with MV cables connected to switchgear functional unit is required; this procedure shall be easy and safe for the operator and shall be described in the manual.

The maximum $U_{ct(DC)}$ and $U_{ct(AC)}$ shall defined by the Manufacturer and present in the manual and nameplate.

7.4.4 VIDS

VDIS for detecting MV cables voltage compliant with IEC 62271-213 or IEC 61243-5 (VDS only LRM type, until apparatuses compliant to IEC 62271-213 will be available) with capacitive sensor shall be present for each MV Air Insulated Functional unit switchgear.

Below are present the different minimum U_n range for each VDIS(VDS):

- VDIS (VDS) for $U_r=12kV$ apparatuses shall have an U_n (Rated Voltage) range equal to 6 -11 kV.
- VDIS (VDS) for $U_r=17,5kV$ apparatuses shall have an U_n (Rated Voltage) range equal to 6-15 kV.
- VDIS (VDS) for $U_r=24kV$ apparatuses shall have an U_n (Rated Voltage) range equal to 15-22 kV.
- VDIS (VDS) for $U_r=36kV$ apparatuses shall have a U_n (Rated Voltage) range equal to 22-33 kV.

Labeling of VDIS shall be translated in the local language of destination of equipment.

VDIS shall be in visible position and unambiguously checked before operations.

7.4.5 Earthing of enclosure

Earthing of enclosure (functional unit) shall be compliant with par.6.3. of IEC 62271-200 ed.3 and shall be coupled with the earthing system of the HV-MV or MV-MV substation.

7.5 SINGLE LINE DIAGRAM

In the figures below there are the single line diagrams for each **enel** type.

Subject: GSCM009 MV AIS with withdrawable MV Circuit Breaker for HV/MV and MV/MV substation

Application Areas

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Enel Grids*

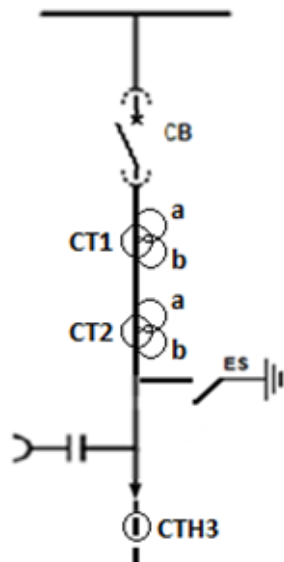


Figure 1- Line/Auxiliary services, Neutral Maker Transformer, Capacitor Bank and Transversal bus bar tie functional unit single line diagram

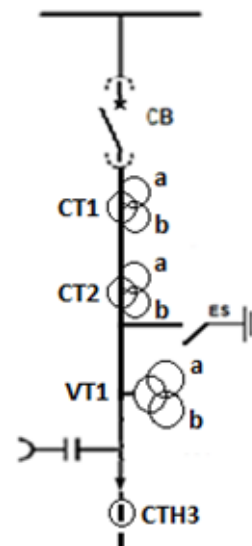


Figure 2 – Active Line and Transformer functional unit single line diagram

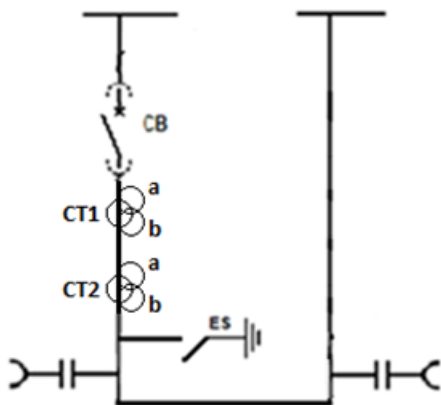


Figure 4 – Longitudinal Bus Bar tie functional unit single line diagram

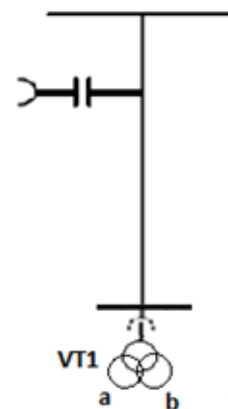


Figure 3 – Bus Bar Measurement functional unit single line diagram

Different VT's configurations shall be evaluated by *enel*, for example VT trolley or VT installed using fuse and/or ES.

In case of VT trolley adoption, the dimensions, protection panel, earthing contact and lifting devices defined for MV CB shall be followed (see par. 7.6).

Current (CTs) and Voltage Transformer (VTs) shall be compliant with IEC 61869 series; the maximum number of transformers (CTs and VTs) and their secondary windings are indicated in the single-line diagrams.



Technical Specification code: GRI-GRI-MAT-E&C-0009
Version no. 1 dated 11/10/2022

Subject: GSCM009 MV AIS with withdrawable MV Circuit Breaker for HV/MV and MV/MV substation

Application Areas

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Enel Grids*

CTs number, function, rated frequency, rated transformation ratio and rated output and accuracy class will be described by each country of AIS supply filling the table in paragraph 8.3 annex C and made available during tender phase.

CTH3 shall be included in the supply; it is a homopolar current transformer to be installed inside functional unit switchgear if allowed by Manufacturer design or under the functional unit switchgear if not.

CTH3 shall be designed by Manufacturer considering the maximum dimensions of MV cables (see table 3).

VTs number, function, rated frequency, rated transformation ratio, rated output and accuracy class and rated voltage factor shall be described by each country of AIS supply filling the table in paragraph 8.4 annex D available during tender phase.

In case that CTs and VTs are dedicated units (for specific function e.g. fiscal measurement) it will be indicated in the tables in paragraphs 8.3 annex C and 8.4 annex D.

To avoid ferroresonance effect for VTs, the induction value shall be kept below 0.7 T when rated voltage is applied, alternative solution could be evaluated by **enel**.

Installation of CTs and VTs compliant with IEC 61869-6-10-11 and GSCT005 (LPIT) shall be evaluated by **enel**.

7.6 MV CIRCUIT BREAKER

7.6.1 Dimensions

MV CB dimensions shall be compliant with the MV Air Insulated functional unit switchgear where it is installed.

Insertion and de-insertion of MV CB shall be easy and safe for operators.

MV CB shall be provided of the trolley for its handling where applicable.

In case MV CB and trolley are two separated devices, the Manufacturer shall supply for each site of installation at least 2 trolleys for each MV CB type.

7.6.2 Protection panel

MV CB command shall be equipped, in front and sides, with a metallic protection (other materials shall be considered) panel of adequate resistance to mechanical stress and internal fault. Panel shall be without sharp corners at the edges. The design of the lowest part of the panel shall also take in consideration the maneuverability of the handles for extraction of the MV CB.

7.6.3 Earthing contact

Earthing shall be compliant with par.6.3 of IEC 62271-200 ed.3

7.6.4 Lifting devices

Removable lifting devices shall be installed on MV CB (for example eyebolts or similar), for the lifting of the complete MV CB.

Lifting operation shall be described in the manual.



Technical Specification code: GRI-GRI-MAT-E&C-0009
Version no. 1 dated 11/10/2022

Subject: GSCM009 MV AIS with withdrawable MV Circuit Breaker for HV/MV and MV/MV substation

Application Areas

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Enel Grids*

7.6.5 Power contacts

Power contacts movement of the MV CB shall be mechanical, energy storage device shall be mechanical type (springs command).

Alternative constructive solutions for energy storage device can be taken in consideration, given the respect of all functional requirements of this specification.

Charging of energy storage devices shall be obtained in two ways:

- 1) DC electric engine;
- 2) mechanical device manually activated by operator.

CB command shall achieve the following rated operating cycles:

- with DC engine working:
 - O – 0,3" – CO – 15" – CO, starting by condition of circuit breaker closed and springs of closing charged;
- with DC engine out of working:
 - O – 0,3" – CO, starting by condition of circuit breaker closed and springs of closure load;
 - CO, starting by condition of circuit breaker open and springs of closure charged;
 - O, starting by condition of circuit breaker closed and springs of closure not charged.

Maximum values of DC engine absorption (without rush value) shall not exceed 3A.

When MV CB is close, opening springs shall always be charged.

In case that during a maneuver, opposite maneuver request appears, the consents to actuation for the last request shall be given after completion of maneuver on going.

Functional conditions for release, both closure and open (by launch and under voltage), and maximum actuating force required for restoration of mechanical device shall be as indicated in IEC 62271-100.

LV cabling shall be compliant with par.7.3.6.

7.6.6 Types of command

MV CB shall be equipped with a three-polar command:

- Type "A" command for all functional units, excluding the point below;
- Type "B" command for transformer, neutral maker transformer, longitudinal and transversal CB supplied in Italy and Romanian;

Type "A" command shall be equipped with following circuit and devices:

- Three-polar shunt closing release by launch of voltage;
- 2-Three-polar shunt opening release by launch of voltage;



Technical Specification code: GRI-GRI-MAT-E&C-0009
Version no. 1 dated 11/10/2022

Subject: GSCM009 MV AIS with withdrawable MV Circuit Breaker for HV/MV and MV/MV substation

Application Areas

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Enel Grids*

- Anti-reclosing device (anti-pumping) with the scope of inhibiting further closures after the first, in case there is an opening command during the initial request of closing. This device cannot be de-activated by functional inhibitions.

Type “B” command shall be equipped with same devices of type “A” replacing one three-polar shunt opening release by launch of voltage with:

- Three-polar opening under-voltage release.

Three-polar shunt opening, closing and opening under-voltage releases shall have a maximum power of 1200VA, eventually higher values shall be evaluated by **enel**.

For more details see par.8.1 annex A and GSCM010, in case of use Circuit Breaker with GAS, terminal blocks 25-26 and 27-28 should be used for gas alarm and block signals (parallel contacts of each pole).

7.6.7 Inhibit and interlocks circuits

During the insertion and de-insertion MV CB shall be only in the open position and the closing command (mechanical and electric) shall be avoided.

Mechanical and electrical inhibitions/interlocks shall be equipped with electrical signaling (e.g see electrical contact “BCP” see par.8.1 annex A).

Circuits and/or devices shall be foreseen that shall inhibit command of closing when there is at least one of follow events:

- not enough energy for closing maneuver (springs not charged);
- during insertion or de-insertions of MV CB;
- opening command and/or maneuverer on going;
- under-voltage release active with under-voltage coil is not energized for absence of Vdc or for fault conditions (only for type “B”).

7.7 LV SUPPLY AND AUXILIARY DEVICES

Auxiliary devices of MV Air Insulated Switchgear shall be compliant with IEC 62271-1.

MV Air Insulated Switchgear and equipment installed it shall be compliant with 110 Vdc or 125 Vdc (both if it is possible) DC rated supply voltage of auxiliary and control circuits Ua with the tolerance described by IEC standard.

DC and AC rated supplies voltage of auxiliary and control circuits Ua for each country of supply are listed in the table below.



Technical Specification code: GRI-GRI-MAT-E&C-0009
Version no. 1 dated 11/10/2022

Subject: GSCM009 MV AIS with withdrawable MV Circuit Breaker for HV/MV and MV/MV substation

Application Areas

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Enel Grids*

Country	Rated supply DC voltage of auxiliary circuits Ua (VDC)	Rated supply AC voltage of auxiliary circuits Ua (VAC)
Italy	110	230 single phase 50 Hz
Romanian	110	230 single phase 50 Hz
Spain	125	230 single phase 50 Hz
Brazil*	125	127 single phase (SP/RJ) 60Hz 220 single phase (CE/GO) 60Hz
Colombia	125	120 single phase 60 Hz
Peru	125	220 between phases 60 Hz
Chile	125	220 single phase 50 Hz
Argentina	125	220 single phase - 50 Hz

Table 5 – DC and AC rated supplies voltage of auxiliary circuits Ua

*For Brasil, RJ=Enel Distribuição Rio; CE=Enel Distribuição Ceará; GO=Enel Distribuição Goiás Enel SP= Enel Distribuição São Paulo.

The ground connection of 110 and 125 Vdc polarity is not allowed.

7.7.1 Auxiliary contacts

Auxiliary contacts of MV CB and earthing switch state shall be mechanically joint to main contacts as described by IEC 62271-200.

Electrical features of auxiliary contacts shall be compliant with the class 1 table 6 of IEC 62271-1.

Auxiliary contacts of MV CB are defined in the par.8.1 annex A; for earthing switch see GSCM010.

7.7.2 Anti-reclosing device (anti-pumping) for MV CB

If the device is designed with relays, these shall be compliant with IEC 61810-1 with electric life of 100.000 maneuverers.

Relays shall be of extractable type, with insertion on the base having frontal sockets fixed by screws and protection degree at least IP2X.

Auxiliary contacts of relays shall be compliant with the class 1 table 6 of IEC 62271-1.

7.7.3 Devices to be installed on front of MV AIS and MV CB

Devices to be installed on front MV Air Insulated Switchgear be visible also with frontal cover removed.

Following devices compliant to IEC 62271-1 shall be installed:



Technical Specification code: GRI-GRI-MAT-E&C-0009
Version no. 1 dated 11/10/2022

Subject: GSCM009 MV AIS with withdrawable MV Circuit Breaker for HV/MV and MV/MV substation

Application Areas

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Enel Grids*

- functional unit switchgear single line diagram with MV circuit breaker and earthing switch position indicator. The device used for position indication shall be mechanically connected with main mobile contacts compliant with IEC 62271-200;
- inspection windows of proper dimension for MV CB.
MV CB nameplate, position indicator, energy storage device state and operation counter (see points below) shall be visible. IP and IK degrees of MV Air Insulated Switchgear shall be respected also for inspection windows;
- manual operating seat for earthing switch;
- manual operating seat for MV CB insertion and de-insertion;
- MV CB opening command:
 - symbology:

Operation	All countries except Brazil (according to IEC 62271-1)	Brazil (according to NR10)
Opening	Black (red is permitted in all countries excluded Peru)	White "D" on Green background

Table 6 - MV CB commands symbology

- MV CB opening button permits the opening maneuver of CB without using electric circuits. This button shall be equipped with protection against accidental bumps;
- opening button CB shall be equipped with a labeling in local language.
- VIDS system for MV cables;
- Local /Remote selector (excluded for Italy supply).

Devices to be installed on front of MV CB, shall be visible also when the MV CB is in service position (by inspection windows) and with the MV CB cover removed.

Following devices compliant to IEC 62271-1 shall be installed:

- MV CB commands symbology:

Operation	All countries except Brazil (according to IEC 62271-1)	Brazil (according to NR10)
Closing	White (green is permitted in all countries excluded Peru)	White "L" on Red background
Opening	Black (red is permitted in all countries excluded Peru)	White "D" on Green background

Table 7 - MV CB commands symbology



Technical Specification code: GRI-GRI-MAT-E&C-0009
Version no. 1 dated 11/10/2022

Subject: GSCM009 MV AIS with withdrawable MV Circuit Breaker for HV/MV and MV/MV substation

Application Areas

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Enel Grids*

- MV CB opening button permits the opening maneuver of CB without using electric circuits. This button shall be equipped with protection against accidental bumps;
- MV CB closing button permits the closing of CB only when the energy maneuver is full without using electric circuits. This button shall be equipped with protection against accidental bumps;
- Both buttons, opening and closing CB shall be equipped with a labeling in local language.
- position indicator of MV CB. The device used shall be mechanically connected with main mobile contacts compliant with IEC 62271-200. Position shall be visualized with symbology defined in the table below:

Position	All countries except Brazil (according to IEC 62271-1)	Brazil (according to NR10)
Close	Black "I" on white background	White "L" on Red background
Open	White "O" on black background	White "D" on Green background

Table 8 - MV CB indication symbology

- MV CB energy storage device state indicator;
- opening operation counter of MV CB, with at least five digits, un-resettable.
- All previous devices shall be positioned such as to be visible by inspection through the "Inspection windows" positioned on the door of MV switchgear;
- manual device for restoring the energy for maneuver, actuation sense shall be indicated on the command panel. For operator's safety the use of this device shall inhibit the restoring of energy by DC engine.

7.8 LV CONNECTORS

LV connector of MV CB shall be with male (M) contacts (PINS), positioned to avoid mechanical interference.

In case of using voltage transformer trolley, its LV connector shall be with female (F) contacts positioned to avoid mechanical interference.

On MV Air Insulated Functional unit switchgear shall be present an LV connector with female (F) contacts for circuit breaker connection and with male (M) contacts (PINS) for voltage transformer trolley.

To avoid incorrect insertion of MV CB or VT trolley (if any) inside of MV Air Insulated Functional unit switchgear, the connectors shall be polarized.

Other methods avoiding incorrect insertion shall be evaluated by **enel**.



Technical Specification code: GRI-GRI-MAT-E&C-0009
Version no. 1 dated 11/10/2022

Subject: GSCM009 MV AIS with withdrawable MV Circuit Breaker for HV/MV and MV/MV substation

Application Areas

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Enel Grids*

7.9 MANUALS

Manual compliant with IEC 62271-200, shall be produced by Manufacturer, it shall include all components present in the MV Air Insulated Switchgear (Circuit breaker, earthing switch, CT, VT, etc.).

Each one of the components described shall be referred to the relevant standard.

Minimum time of maintenance shall be 60 months.

The maintenance shall not include the substitution of main components as MV circuit breaker, earthing switch, CT, VT, insulators and electronic parts if present.

Following point shall be described inside the manual:

- measuring procedure for typical parameters (see paragraph 7.11), such as open and close time, current absorption and all parameters normally checked during routine tests and for maintenance operation;
- MV bus bar earthing method, e.g using transversal and longitudinal Bus Bar Tie functional units or earthing trolley;
- Procedure for MV cable testing see par.7.4.3.
- MV cable terminations and lugs references.

List of spare sparts suggested by Manufacturer shall be included in the manual or in a specific document.

7.10 NAMEPLATE

MV Air Insulated Switchgear on frontal side and visible position, shall be equipped with a nameplate where data (mass included) indicated by IEC 62271-200 shall be listed.

On each nameplate shall also be indicated the data of earthing switch compliant with IEC 62271-102.

MV CB on frontal side and visible position, shall be equipped with a nameplate where data (mass included) indicated by IEC 62271-100 shall be listed.

CTs and VTs present inside the MV Air Insulated Functional unit switchgear shall be equipped with a nameplate where data indicated by IEC 61869-1, IEC 61869-2 and IEC 61869-3 are listed.

Adhesive copies of CTs and VTs nameplates shall be installed in visible position inside each LV compartment of MV Air Insulated Functional unit switchgear.

In addition, the nameplates for each **enel** type shall be included the following indications:

- **enel** type;
- **enel** material code;
- Barcode compliant with CNS-O&M-S&L-2021-0032-EGIN (in case there is not enough space on the nameplate, barcode could be insert out of the nameplate).



Technical Specification code: GRI-GRI-MAT-E&C-0009
Version no. 1 dated 11/10/2022

Subject: GSCM009 MV AIS with withdrawable MV Circuit Breaker for HV/MV and MV/MV substation

Application Areas

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Enel Grids*

7.11 TESTING

Type, routine, and factory acceptance tests shall be performed in compliance with the main standard and the clarifications indicated in the following paragraphs.

Technical conformity assessment (TCA) process shall be compliant with GSCG002.

Drawings included in the type A documentations shall be compliant with GSCG003.

The Manufacturer shall produce a “values declared by Manufacturer” document necessary for routine and factory acceptance test to be inserted in the TCA report.

In this document at least the following values declared by the Manufacturer and derived from type test, shall be present:

- Adsorption at rated, minimum and maximum auxiliary voltage defined by IEC 62271-100 of following devices:
 - Under voltage opening release (only to rated voltage), opening and closing launch releases of MV CB;
 - Recharge spring electrical engine of MV CB.
- Timing operation at rated, minimum and maximum auxiliary voltage defined by IEC 62271-100 of following devices:
 - Under voltage opening release (only to rated voltage), opening and closing launch releases;
 - Recharge spring electrical engine.
- Resistance of main circuit of MV functional unit switchgear;
- Movement time or speed of earthing switch.

In case of GAS used as arc extinction in MV CB, rate filling pressure minimum and maximum functional pressure for operation shall be take in the account for previous values as described from IEC 62271-100.

For de-ratings related to altitude more than 1000 m, Manufacturer shall fill the table below:



Technical Specification code: GRI-GRI-MAT-E&C-0009
Version no. 1 dated 11/10/2022

Subject: GSCM009 MV AIS with withdrawable MV Circuit Breaker for HV/MV and MV/MV substation

Application Areas

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Enel Grids*

Family	Ur and Ir ratings						
	Altitude 1250 m	Altitude 1500 m	Altitude 1750 m	Altitude 2000 m	Altitude 2250 m	Altitude 2500 m	Altitude 2750 m
1 (Ur=17,5kV Ir= 4000A)							
2 (Ur=17,5kV Ir= 3150A)							
3 (Ur=24kV Ir= 2500A)							
4 (Ur=24kV Ir= 2000A)							
5 (Ur=24kV Ir= 1600A)							
6 (Ur=36kV Ir= 2500A)							
7 (Ur=36kV Ir= 2000A)							
8 (Ur=36kV Ir= 1600A)							
9 (Ur=12kV Ir= 2500A)							

Table 9 - Altitude de-ratings

The previous table shall be present as document in the TCA report.

7.11.1 Type test

MV Air Insulated Switchgear shall be tested in compliance with IEC 62271-200.

Equipment (CB, DL, ES, CTs and VTs etc) present inside the MV Air Insulated Switchgear shall be tested in compliance with their own IEC standard.

Possible overlays of single equipment type test are allowed if those foreseen by relative IEC standard are the same type tests present in the IEC 62271-200.

7.11.1.1 MV Air Insulated Switchgear type test

Each **enel** type shall be tested in compliance to IEC 62271-200.

Tests shall be performed on MV Air Insulated Functional unit switchgear equipped as ordinary use, MV circuit breaker, earthing switch, VTs and CTs shall be installed.

All type tests compliant with IEC 62271-200 shall be performed with the following additions and prescriptions:

- PDs measurements compliant with IEC 62271-200 shall be performed, and the maximum values of PDs shall be defined by the Manufacturer taking into account the annex B of IEC 62271-200 ed.3;
- Ageing and humidity test compliant with IEC 62271-304 shall be performed;
- Seismic test compliant IEC TS 62271-210 shall be performed;
- VDIS (VDS) type tests compliant with IEC 62271-213 (or IEC 61243-5) shall be performed. Services conditions defined in the paragraph 7.2 shall be checked. Alternatively, VDIS (VDS) Manufacturer IEC certification can be accepted;



Technical Specification code: GRI-GRI-MAT-E&C-0009
Version no. 1 dated 11/10/2022

Subject: GSCM009 MV AIS with withdrawable MV Circuit Breaker for HV/MV and MV/MV substation

Application Areas

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Enel Grids*

- Protective coating verifications compliant with ISO 12944-6 shall be performed.

7.11.1.2 MV CB type test

MV CB shall be tested in compliance with IEC 62271-100.

All type tests shall be performed on CB fully equipped as for ordinary use, installed inside the MV Air Insulated Functional unit switchgear.

Alternative configuration compliant with IEC standard could be evaluated by **enel**.

7.11.1.3 Earthing switch type test

Earthing switch shall be tested in compliance with IEC 62271-102.

Tests shall be performed on ES fully equipped as for ordinary use, installed inside the MV Air Insulated Functional unit switchgear.

7.11.1.4 Current and Voltage transformers type tests

CTs and VTs shall be tested in compliance with IEC 61869 series.

In case that CTs and VTs shall be substituted by LPIT's, they shall be tested in compliance to IEC 61869 series and GSCT005.

Alternatively, CTs and VTs Manufacturer IEC certification can be accepted.

7.11.2 Routine tests

Routine tests for each **enel** type shall be compliant with IEC 62271-200.

Routine test shall be performed on MV Air Insulated Functional unit switchgear equipped as ordinary use, intended with MV circuit breaker, earthing switch, VTs and CTs installed and connected.

Routine tests for each MV CB shall be compliant with IEC 62271-100.

Routine tests for ES shall be compliant with IEC62271-102, and routine tests for CTs and VTs shall be complaint with IEC 61869-1, IEC 61869-2 and IEC 61869-3.

In case that CTs and VTs shall be substituted by LPITs, they shall be tested in compliance to main components standard IEC 61869 series and GSCT005.

VDIS (VDS) routine tests compliant with IEC 62271-213 (or IEC 61243-5) shall be performed.

Possible overlays of single equipment routine test are allowed if those foreseen by relative IEC standard are the same routine tests present in the IEC 62271-200.

These tests shall be carried out by the Manufacturer on all the specimen prepared for the commissioning.

For each piece belonging to the prepared batch, the supplier shall produce a test report with the results of the tests performed.



Technical Specification code: GRI-GRI-MAT-E&C-0009
Version no. 1 dated 11/10/2022

Subject: GSCM009 MV AIS with withdrawable MV Circuit Breaker for HV/MV and MV/MV substation

Application Areas

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Enel Grids*

Values declared by the Manufacturer (see par. 7.11) shall be used as reference values and acceptability ranges.

All measured values, times and maximum values of absorption, shall be checked with type A document “values declared by the Manufacturer”; at any case they shall not exceed the tolerance defined as below:

- $\pm 10\%$ for MV CB operation time;
- $\pm 15\%$ absorption of releases and DC electric engine;
- recharge spring electrical engine operation time tolerance defined by the Manufacturer (CB rated operation cycle shall be taken in the account).

7.11.3 Factory acceptance test

Factory acceptance tests shall be the same of the Routine tests.

Factory acceptance tests shall be carried out on a sample basis, on a number of samples which depends on the consistency of the supply according to conditions establish in document WKI-QPT-CMQ-2020-0019-EGIN “Contractual Requirements for Components and Materials Quality management” and its following modifications.

7.11.4 Site acceptance tests

Site acceptance tests compliant with IEC 62271-200.

Site acceptance tests shall be performed in compliance with par. 8.104 of IEC 62271-200 ed.3 adding the following tests:

- Functional test compliant with 8.3.2 of IEC 62271-200 ed.3;
- Mechanical operation tests compliant with 8.10.2 of IEC 62271-200 ed.3;

At the end of site acceptance tests activities Manufacturer shall issue and make available a specific document where all activities are detailed and recorded confirming the equipment availability for proper service, operation and energization.

7.12 SUPPLY REQUIREMENTS

Each **enel** type devices shall be supplied to ensure a proper protection during the transportation and storage.

For each **enel** type the following elements shall be supplied:

- MV Air insulated Switchgear completely equipped, included the following apparatuses:
 - MV CB;
 - CTs;
 - VTs or VTs trolleys (if any);
 - Earthing switch;



Technical Specification code: GRI-GRI-MAT-E&C-0009
Version no. 1 dated 11/10/2022

Subject: GSCM009 MV AIS with withdrawable MV Circuit Breaker for HV/MV and MV/MV substation

Application Areas

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Enel Grids*

- All apparatuses and equipment needed for Switchgear functional unit service.
- All accessories necessary for the complete installation and commissioning of MV Air insulated Switchgear;
- Functional and cabling schemes;
- Manuals;
- Manual device for insertion and de-insertion of MV CB and VT trolley (if any);
- Energy restores manual device of springs for MV CB;
- In case MV CB and trolley are two separated devices, the Manufacturer shall supply for each site of installation at least 2 trolley for each MV CB type, this point is valid also for VTs trolley;
- Manual maneuver devices for earthing switch;
- Only for Spain, annex D.2 GSCG002 for each equipment supplied;
- MV cable terminations and lugs (see par 7.3.5) compliant with main IEC standard applicable;
- Any other device eventually needed for the service and operation of equipment.

Out of the package following indications shall be present:

- **enel** DSO;
- Name of supplier;
- Description of product;
- **enel** material and type code;
- Manufacturer type code and serial number;
- Gross weight.

7.12.1 Optional supply

Protection relays, I/O module compliant and energy meter with **enel** specification could be required.

7.12.2 Warranty

60 months of warranty period.

7.13 DOCUMENTATIONS TO BE PROVIDED IN TECHNICAL OFFER

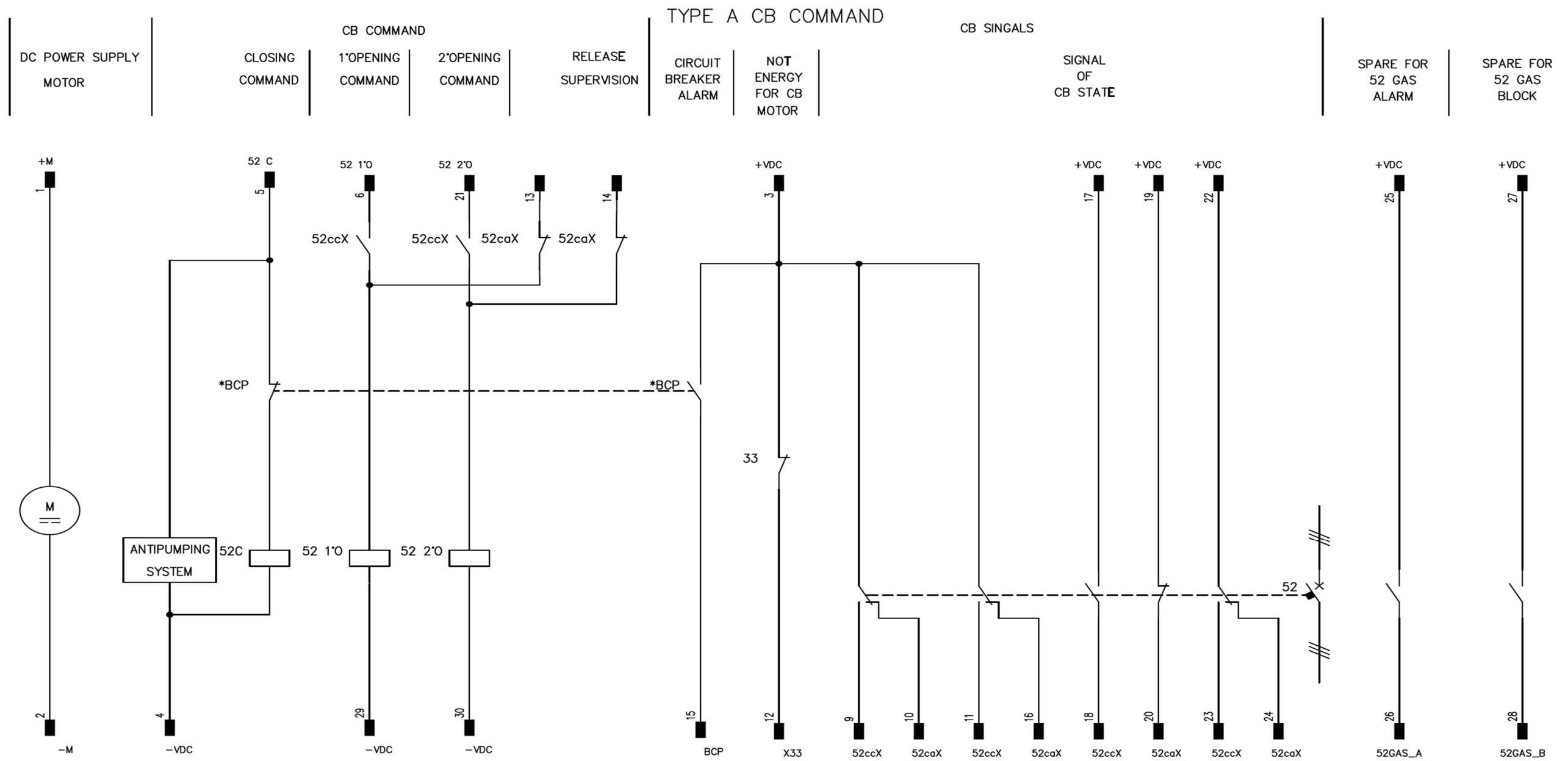
Documentations:

- Check list see par. 8.2 annex B to fill in for each **enel** type code;
- Manufacturer confirmation of tables present in paragraphs 8.3 annex C and 8.4 annex D for CTs and VTs;

Application Areas
Perimeter: *Global*
Staff Function: -
Service Function: -
Business Line: *Enel Grids*

8 ANNEXES

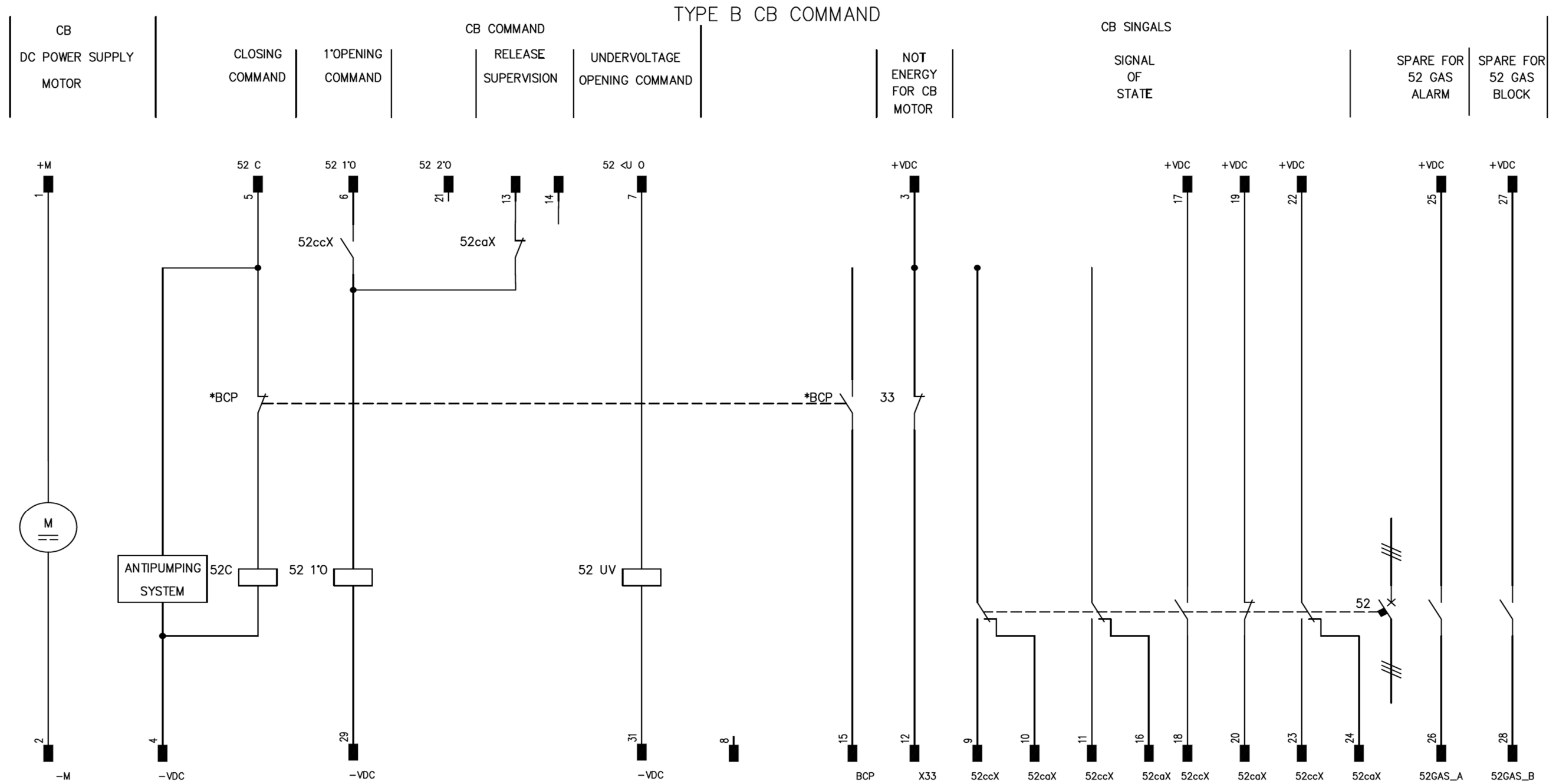
8.1 Annex A - Command Circuits



*BCP IS A BLOCK OF CLOSING COMMAND PRESENT DURING THE HORIZONTAL TRASLATION OF CB

Application Areas

Perimeter: *Global*
Staff Function: -
Service Function: -
Business Line: *Enel Grids*



This type of command shall be used in the transformer/neutral maker transformer/Longitudinal bus bar tie/Transversal bus bar tie functional unit for IT/RD Countries

*BCP IS A BLOCK OF CLOSING COMMAND PRESENT DURING THE HORIZONTAL TRASLATION OF CB



Technical Specification code: GRI-GRI-MAT-E&C-0009
Version no. 1 dated 11/10/2022

Subject: GSCM009 MV AIS with withdrawable MV Circuit Breaker for HV/MV and MV/MV substation

Application Areas

Perimeter: *Global*
Staff Function: -
Service Function: -
Business Line: *Enel Grids*

8.2 Annex B - Check list

Technical specification:		Offer number:	
Manufacturer:		Manufacturing Factory:	
enel type code:		Manufacturer type code or designation:	
enel material code:			
Technical ratings		Request	Manufacturer offer
MV Air Insulated Functional unit switchgear			
1	Service conditions	Par 7.2	
2	Minimum ambient air temperature (°C)	-5	
3	Severity degree of pollution (IEC 62271-304)	design class 2	
4	Seismic level; acceptance class	1 (2 for Chile) ;2	
5	Rated normal current I _r (A)	see par.8.5 annex E	
6	Rated frequency f _r (Hz)	50 and 60	
7	Rated voltage U _r (kV)	see par.8.5 annex E	
8	Rated voltage U _r (kV) and Rated normal current I _r (A) to 1250 m	Manufacturer information	
9	Rated voltage U _r (kV) and Rated normal current I _r (A) to 1500 m	Manufacturer information	
10	Rated voltage U _r (kV) and Rated normal current I _r (A) to 1750 m	Manufacturer information	
11	Rated voltage U _r (kV) and Rated normal current I _r (A) to 2000 m	Manufacturer information	
12	Rated voltage U _r (kV) and Rated normal current I _r (A) to 2250 m	Manufacturer information	
13	Rated voltage U _r (kV) and Rated normal current I _r (A) to 2500 m	Manufacturer information	
14	Rated voltage U _r (kV) and Rated normal current I _r (A) to 2750 m	Manufacturer information	
15	Grid rated Voltage (kV)	enel information before tender	
16	Maximum grid rated voltage (kV)	enel information before tender	
17	Rated power-frequency withstand voltage U _d (kV)	see par.8.5 annex E	
18	Rated lightning impulse withstand voltage U _p (kV)	see par.8.5 annex E	
19	Rated short-circuit breaking current (kA)	see par.8.5 annex E	
20	Rated duration of short circuit t _k (s)	1	
21	Rated short-circuit making current & Rated peak withstand current I _p (kA)	see par.8.5 annex E	
22	Rated supplies voltage of auxiliary and control circuits U _a (Vdc)	see Table 5	
23	IK degree	07	
24	IP degree	3XD	
25	Loss of service continuity category	LSC2B	
26	Class of partitions and shutters	PM	
27	Classification IAC	see par.8.5 annex E	
28	Number and section of MV cables	Table 3	
29	Overall dimension	Table 4	
31	Mass of the assembly (including any fluid) M (kg)	Manufacturer information	



Technical Specification code: GRI-GRI-MAT-E&C-0009
Version no. 1 dated 11/10/2022

Subject: GSCM009 MV AIS with withdrawable MV Circuit Breaker for HV/MV and MV/MV substation

Application Areas

Perimeter: *Global*
Staff Function: -
Service Function: -
Business Line: *Enel Grids*

32	Rated DC cable test voltage U_{ct} (DC)	Manufacturer information	
33	Rated power-frequency cable test voltage U_{ct} (AC)	Manufacturer information	
MV Circuit Breaker			
1	Rated normal current I_r (A)	see par.8.6 annex F	
2	Rated frequency f_r (Hz)	50 and 60	
3	Rated voltage U_r (kV)	see par.8.5 annex E	
4	Rated power-frequency withstand voltage U_d (kV)	see par.8.5 annex E	
5	Rated lightning impulse withstand voltage U_p (kV)	see par.8.5 annex E	
6	Rated short-circuit breaking current (kA)	see par.8.6 annex F	
7	Rated duration of short circuit t_k (s)	see par.8.6 annex F	
8	Rated short-circuit making current & Rated peak withstand current I_p (kA)	see par.8.6 annex F	
9	Rated supply voltage of auxiliary and control circuits U_a (Vdc)	see Table 5	
10	Rated operating sequence	see par.8.6 annex F	
11	Break-time (ms)	60 ±100	
12	Rated first-pole-to-clear factor k_{pp}	1,3 and 1,5	
13	TRV for terminal faults (kV)	Manufacturer information	
14	Auxiliary devices	Par. 7.7	
15	Circuit breaker class	S1	
16	Electrical endurance class	E2	
17	Mechanical endurance class	M2	
18	Probability of restriking during capacitive current breaking class	C2	
19	Rated line charging breaking current I_l (A)	see par.8.6 annex F	
20	Rated cable-charging breaking current I_c (A)	see par.8.6 annex F	
21	Rated single capacitor bank-breaking current I_{sb} (A)	see par.8.6 annex F	
22	Rated back-to-back capacitor bank breaking current I_{bb} (A)	see par.8.6 annex F	
23	Rated back-to-back capacitor bank inrush making current I_{bi} (kA) fbi 4250 Hz	see par.8.6 annex F	
24	IP degree	2X	
25	Command type	see par.8.6 annex F	
26	Filling pressure for operation p_m (MPa) (if any)	Manufacturer information	
27	Filling pressure for making and breaking p_{re} (MPa) (if any)	Manufacturer information	
28	Type and mass of fluid (liquid or gas) for insulation M_f (kg) (if any)	Manufacturer information	
29	Mass of the assembly (including any fluid) M (kg)	Manufacturer information	
Earthing Switch			
1	Rated Frequency f_r (Hz)	50 and 60	
2	Rated Voltage U_r (kV)	see par.8.5 annex E	
3	Rated power-frequency withstand voltage U_d (kV)	see par.8.5 annex E	
4	Rated lightning impulse withstand voltage U_p (kV)	see par.8.5 annex E	
5	Rated short-time withstand current I_k (kA) and Rated establishment short circuit current I_{ma} (kA)	see par.8.5 annex E	
6	Rated duration of short circuit t_k (s)	see par.8.5 annex E	



Technical Specification code: GRI-GRI-MAT-E&C-0009
Version no. 1 dated 11/10/2022

Subject: GSCM009 MV AIS with withdrawable MV Circuit Breaker for HV/MV and MV/MV substation

Application Areas

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Enel Grids*

7	Rated peak withstand current I_p (kA)	see par.8.5 annex E	
8	Electrical endurance class	E1	
9	Mechanical endurance class	M0	
10	Auxiliary devices	Par. 7.7	
Optional Supply			
Protection relay			
1	Supply included	<i>enel</i> information before tender	
2	<i>enel</i> technical specification	<i>enel</i> information before tender	
I/O module			
1	Supply included	<i>enel</i> information before tender	
2	<i>enel</i> technical specification	<i>enel</i> information before tender	
Energy meter			
1	Supply included	<i>enel</i> information before tender	
2	<i>enel</i> technical specification	<i>enel</i> information before tender	

Table 10 – Check list



Technical Specification code: GRI-GRI-MAT-E&C-0009

Version no. 1 dated 11/10/2022

Subject: GSCM009 MV AIS with withdrawable MV Circuit Breaker for HV/MV and MV/MV substation

Application Areas

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Enel Grids*

8.3 Annex C - CTs Country ratings

ene/ Type Functional unit switchgear	Country	CT	Function protection (P) or measurement (M) or fiscal measurement (FM)	Rated frequency f_r (Hz)	Rated transformation ratio k_r	Rated output	Rated accuracy class	Accuracy limit factor (ALF) or security factor (FS)	Dedicated physical CT
GSCM009/1		1a							
		1b							
		2a							
		2b							
		H3							
GSCM009/2		1a							
		1b							
		2a							
		2b							
		H3							
GSCM009/3		1a							
		1b							
		2a							
		2b							
		H3							
GSCM009/4		1a							
		1b							
		2a							
		2b							
		H3							
GSCM009/5		1a							
		1b							
		2a							
		2b							
		H3							


Technical Specification code: GRI-GRI-MAT-E&C-0009

Version no. 1 dated 11/10/2022

Subject: GSCM009 MV AIS with withdrawable MV Circuit Breaker for HV/MV and MV/MV substation
Application Areas
Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Enel Grids*

ene/ Type Functional unit switchgear	Country	CT	Function protection (P) or measurement (M) or fiscal measurement (FM)	Rated frequency f_r (Hz)	Rated transformation ratio k_r	Rated output	Rated accuracy class	Accuracy limit factor (ALF) or security factor (FS)	Dedicated physical CT
GSCM009/7		1a							
		1b							
		2a							
		2b							
GSCM009/9		1a							
		1b							
		2a							
		2b							
		H3							
GSCM009/10		1a							
		1b							
		2a							
		2b							
		H3							
GSCM009/11		1a							
		1b							
		2a							
		2b							
		H3							
GSCM009/12		1a							
		1b							
		2a							
		2b							
		H3							
GSCM009/13		1a							
		1b							
		2a							
		2b							
		H3							


Technical Specification code: GRI-GRI-MAT-E&C-0009

Version no. 1 dated 11/10/2022

Subject: GSCM009 MV AIS with withdrawable MV Circuit Breaker for HV/MV and MV/MV substation
Application Areas
Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Enel Grids*

ene/ Type Functional unit switchgear	Country	CT	Function protection (P) or measurement (M) or fiscal measurement (FM)	Rated frequency f_r (Hz)	Rated transformation ratio k_r	Rated output	Rated accuracy class	Accuracy limit factor (ALF) or security factor (FS)	Dedicated physical CT
GSCM009/14		1a							
		1b							
		2a							
		2b							
		H3							
GSCM009/15		1a							
		1b							
		2a							
		2b							
GSCM009/17		1a							
		1b							
		2a							
		2b							
		H3							
GSCM009/18		1a							
		1b							
		2a							
		2b							
		H3							
GSCM009/19		1a							
		1b							
		2a							
		2b							
		H3							
GSCM009/20		1a							
		1b							
		2a							
		2b							
		H3							


Technical Specification code: GRI-GRI-MAT-E&C-0009

Version no. 1 dated 11/10/2022

Subject: GSCM009 MV AIS with withdrawable MV Circuit Breaker for HV/MV and MV/MV substation
Application Areas
Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Enel Grids*

ene/ Type Functional unit switchgear	Country	CT	Function protection (P) or measurement (M) or fiscal measurement (FM)	Rated frequency f_r (Hz)	Rated transformation ratio k_r	Rated output	Rated accuracy class	Accuracy limit factor (ALF) or security factor (FS)	Dedicated physical CT
GSCM009/21		1a							
		1b							
		2a							
		2b							
		H3							
GSCM009/22		1a							
		1b							
		2a							
		2b							
		H3							
GSCM009/23		1a							
		1b							
		2a							
		2b							
		H3							
GSCM009/25		1a							
		1b							
		2a							
		2b							
		H3							
GSCM009/26		1a							
		1b							
		2a							
		2b							
		H3							
GSCM009/27		1a							
		1b							
		2a							
		2b							
		H3							


Technical Specification code: GRI-GRI-MAT-E&C-0009

Version no. 1 dated 11/10/2022

Subject: GSCM009 MV AIS with withdrawable MV Circuit Breaker for HV/MV and MV/MV substation

Application Areas

 Perimeter: *Global*

Staff Function: -

Service Function: -

 Business Line: *Enel Grids*

ene/ Type Functional unit switchgear	Country	CT	Function protection (P) or measurement (M) or fiscal measurement (FM)	Rated frequency f_r (Hz)	Rated transformation ratio k_r	Rated output	Rated accuracy class	Accuracy limit factor (ALF) or security factor (FS)	Dedicated physical CT
GSCM009/28		1a							
		1b							
		2a							
		2b							
		H3							
GSCM009/29		1a							
		1b							
		2a							
		2b							
		H3							
GSCM009/30		1a							
		1b							
		2a							
		2b							
		H3							
GSCM009/31		1a							
		1b							
		2a							
		2b							
GSCM009/33		1a							
		1b							
		2a							
		2b							
		H3							
GSCM009/34		1a							
		1b							
		2a							
		2b							
		H3							


Technical Specification code: GRI-GRI-MAT-E&C-0009

Version no. 1 dated 11/10/2022

Subject: GSCM009 MV AIS with withdrawable MV Circuit Breaker for HV/MV and MV/MV substation
Application Areas
Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Enel Grids*

ene/ Type Functional unit switchgear	Country	CT	Function protection (P) or measurement (M) or fiscal measurement (FM)	Rated frequency f_r (Hz)	Rated transformation ratio k_r	Rated output	Rated accuracy class	Accuracy limit factor (ALF) or security factor (FS)	Dedicated physical CT
GSCM009/35		1a							
		1b							
		2a							
		2b							
		H3							
GSCM009/36		1a							
		1b							
		2a							
		2b							
		H3							
GSCM009/37		1a							
		1b							
		2a							
		2b							
		H3							
GSCM009/38		1a							
		1b							
		2a							
		2b							
		H3							
GSCM009/39		1a							
		1b							
		2a							
		2b							
GSCM009/41		1a							
		1b							
		2a							
		2b							
		H3							


Technical Specification code: GRI-GRI-MAT-E&C-0009

Version no. 1 dated 11/10/2022

Subject: GSCM009 MV AIS with withdrawable MV Circuit Breaker for HV/MV and MV/MV substation
Application Areas
Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Enel Grids*

ene/ Type Functional unit switchgear	Country	CT	Function protection (P) or measurement (M) or fiscal measurement (FM)	Rated frequency f_r (Hz)	Rated transformation ratio k_r	Rated output	Rated accuracy class	Accuracy limit factor (ALF) or security factor (FS)	Dedicated physical CT
GSCM009/42		1a							
		1b							
		2a							
		2b							
		H3							
GSCM009/43		1a							
		1b							
		2a							
		2b							
		H3							
GSCM009/44		1a							
		1b							
		2a							
		2b							
		H3							
GSCM009/45		1a							
		1b							
		2a							
		2b							
		H3							
GSCM009/46		1a							
		1b							
		2a							
		2b							
		H3							
GSCM009/47		1a							
		1b							
		2a							
		2b							


Technical Specification code: GRI-GRI-MAT-E&C-0009

Version no. 1 dated 11/10/2022

Subject: GSCM009 MV AIS with withdrawable MV Circuit Breaker for HV/MV and MV/MV substation
Application Areas
Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Enel Grids*

ene/ Type Functional unit switchgear	Country	CT	Function protection (P) or measurement (M) or fiscal measurement (FM)	Rated frequency f_r (Hz)	Rated transformation ratio k_r	Rated output	Rated accuracy class	Accuracy limit factor (ALF) or security factor (FS)	Dedicated physical CT
GSCM009/49		1a							
		1b							
		2a							
		2b							
		H3							
GSCM009/50		1a							
		1b							
		2a							
		2b							
		H3							
GSCM009/51		1a							
		1b							
		2a							
		2b							
		H3							
GSCM009/52		1a							
		1b							
		2a							
		2b							
		H3							
GSCM009/53		1a							
		1b							
		2a							
		2b							
		H3							
GSCM009/54		1a							
		1b							
		2a							
		2b							


Technical Specification code: GRI-GRI-MAT-E&C-0009

Version no. 1 dated 11/10/2022

Subject: GSCM009 MV AIS with withdrawable MV Circuit Breaker for HV/MV and MV/MV substation

Application Areas

 Perimeter: *Global*

Staff Function: -

Service Function: -

 Business Line: *Enel Grids*

enel Type Functional unit switchgear	Country	CT	Function protection (P) or measurement (M) or fiscal measurement (FM)	Rated frequency f_r (Hz)	Rated transformation ratio k_r	Rated output	Rated accuracy class	Accuracy limit factor (ALF) or security factor (FS)	Dedicated physical CT
GSCM009/54		H3							
		1a							
GSCM009/55		1b							
		2a							
GSCM009/57		2b							
		1a							
GSCM009/58		1b							
		2a							
GSCM009/59		2b							
		H3							
GSCM009/60		1a							
		1b							
GSCM009/61		2a							
		2b							


Technical Specification code: GRI-GRI-MAT-E&C-0009

Version no. 1 dated 11/10/2022

Subject: GSCM009 MV AIS with withdrawable MV Circuit Breaker for HV/MV and MV/MV substation
Application Areas
Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Enel Grids*

ene/ Type Functional unit switchgear	Country	CT	Function protection (P) or measurement (M) or fiscal measurement (FM)	Rated frequency f_r (Hz)	Rated transformation ratio k_r	Rated output	Rated accuracy class	Accuracy limit factor (ALF) or security factor (FS)	Dedicated physical CT
GSCM009/61		H3							
		1a							
GSCM009/62		1b							
		2a							
		2b							
		H3							
GSCM009/63		1a							
		1b							
		2a							
		2b							
GSCM009/65		1a							
		1b							
		2a							
		2b							
		H3							
GSCM009/66		1a							
		1b							
		2a							
		2b							
		H3							
GSCM009/67		1a							
		1b							
		2a							
		2b							
		H3							
GSCM009/68		1a							
		1b							
		2a							



Technical Specification code: GRI-GRI-MAT-E&C-0009
Version no. 1 dated 11/10/2022

Subject: GSCM009 MV AIS with withdrawable MV Circuit Breaker for HV/MV and MV/MV substation

Application Areas

Perimeter: *Global*
Staff Function: -
Service Function: -
Business Line: *Enel Grids*

ene/ Type Functional unit switchgear	Country	CT	Function protection (P) or measurement (M) or fiscal measurement (FM)	Rated frequency f_r (Hz)	Rated transformation ratio k_r	Rated output	Rated accuracy class	Accuracy limit factor (ALF) or security factor (FS)	Dedicated physical CT
GSCM009/68		2b							
		H3							
GSCM009/69		1a							
		1b							
		2a							
		2b							
		H3							
GSCM009/70		1a							
		1b							
		2a							
		2b							
		H3							
GSCM009/71		1a							
		1b							
	2a								
	2b								

Table 11 – CTs Check list

The Manufacturer shall made the same previous table with the values offered for CTs.



Technical Specification code: GRI-GRI-MAT-E&C-0009

Version no. 1 dated 11/10/2022

Subject: GSCM009 MV AIS with withdrawable MV Circuit Breaker for HV/MV and MV/MV substation

Application Areas

Perimeter: *Global*

Staff Function: -

Service Function: -

Business Line: *Enel Grids*

8.4 Annex D - VTs Country ratings

enel Type Functional unit switchgear	Country	VT	Function protection (P) or measurement (M) or fiscal measurement (FM)	Rated frequency f_r (Hz)	Rated transformation ratio k_r	Rated output	Rated accuracy class	Rated voltage factor	
GSCM009/2		1a							
		1b							
GSCM009/5		1a							
		1b							
GSCM009/8		1a							
		1b							
GSCM009/10		1a							
		1b							
GSCM009/13		1a							
		1b							
GSCM009/16		1a							
		1b							
GSCM009/18		1a							
		1b							
GSCM009/21		1a							
		1b							
GSCM009/24		1a							
		1b							
GSCM009/26		1a							
		1b							
GSCM009/29	1a								
	1b								
GSCM009/32	1a								
	1b								
GSCM009/34	1a								
	1b								
GSCM009/37	1a								
	1b								
GSCM009/40	1a								
	1b								



Technical Specification code: GRI-GRI-MAT-E&C-0009
Version no. 1 dated 11/10/2022

Subject: GSCM009 MV AIS with withdrawable MV Circuit Breaker for HV/MV and MV/MV substation

Application Areas

Perimeter: *Global*
Staff Function: -
Service Function: -
Business Line: *Enel Grids*

enel Type Functional unit switchgear	Country	VT	Function protection (P) or measurement (M) or fiscal measurement (FM)	Rated frequency f_r (Hz)	Rated transformation ratio k_r	Rated output	Rated accuracy class	Rated voltage factor
GSCM009/42		1a						
		1b						
GSCM009/44		1a						
		1b						
GSCM009/48		1a						
		1b						
GSCM009/50		1a						
		1b						
GSCM009/52		1a						
		1b						
GSCM009/56		1a						
		1b						
GSCM009/58		1a						
		1b						
GSCM009/60		1a						
		1b						
GSCM009/64		1a						
		1b						
GSCM009/66		1a						
		1b						
GSCM009/68		1a						
		1b						
GSCM009/72		1a						
		1b						

Table 12 – VTs Check list

The Manufacturer shall made the same previous table with the values offered for VTs.

Subject: GSCM009 MV AIS with withdrawable MV Circuit Breaker for HV/MV and MV/MV substation

Application Areas

Perimeter: *Global*
Staff Function: -
Service Function: -
Business Line: *Enel Grids*

8.5 Annex E –Functional unit switchgear electrical ratings

Type code	Description	Rated frequency f _r (Hz)	Rated normal current I _r (A)	Rated Voltage U _r (kV)	Rated power-frequency withstand voltage U _d (kV)	Rated lightning impulse withstand voltage U _p (kV)	Rated short-time withstand current I _k (kA)	Rated duration of short circuit t _k (s)	Rated peak withstand current I _p (kA)	Rated supply voltage of auxiliary and control circuits U _a (Vdc)	Rated supply voltage of auxiliary circuits U _a (Vac) only for heater	Class of partitions and shutters	IK degree	IP degree	Loss of service continuity category	Classification IAC	Arc fault current and duration I _A (kA);t _A (s)
GSCM009/1	Line/Auxiliary services functional unit switchgear 17,5kV 4000A 31,5kA	50 and 60	630	17,5	38	95	31,5	1	82(with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	31,5;1
GSCM009/2	Active line functional unit switchgear 17,5kV 4000A 31,5kA	50 and 60	630	17,5	38	95	31,5	1	82 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	31,5;1
GSCM009/3	Neutral maker transformer functional unit switchgear 17,5kV 4000A 31,5kA	50 and 60	630	17,5	38	95	31,5	1	82 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	31,5;1
GSCM009/4	Capacitor bank functional unit switchgear 17,5kV 4000A 31,5kA	50 and 60	630	17,5	38	95	31,5	1	82 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	31,5;1
GSCM009/5	Transformer functional unit switchgear 17,5kV 4000A 31,5kA	50 and 60	4000	17,5	38	95	31,5	1	82(with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	31,5;1
GSCM009/6	Longitudinal Bus Bar-tie with riser functional unit switchgear 17,5kV 4000A 31,5kA	50 and 60	4000	17,5	38	95	31,5	1	82(with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	31,5;1
GSCM009/7	Transversal Bus Bar-tie functional unit switchgear 17,5kV 4000A 31,5kA	50 and 60	4000	17,5	38	95	31,5	1	82 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	31,5;1
GSCM009/8	Bus Bar measures functional unit switchgear 17,5kV 4000A 31,5kA	50 and 60	4000	17,5	38	95	31,5	1	82 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	31,5;1
GSCM009/9	Line/Auxiliary services functional unit switchgear 17,5kV 3150A 25kA	50 and 60	630	17,5	38	95	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/10	Active line functional unit switchgear 17,5kV 3150A 25kA	50 and 60	630	17,5	38	95	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/11	Neutral maker transformer functional unit switchgear 17,5kV 3150A 25kA	50 and 60	630	17,5	38	95	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/12	Capacitor bank functional unit switchgear 17,5kV 3150A 25kA	50 and 60	630	17,5	38	95	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/13	Transformer functional unit switchgear 17,5kV 3150A 25kA	50 and 60	3150	17,5	38	95	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1



Technical Specification code: GRI-GRI-MAT-E&C-0009
Version no. 1 dated 11/10/2022

Subject: GSCM009 MV AIS with withdrawable MV Circuit Breaker for HV/MV and MV/MV substation

Application Areas

Perimeter: Global
Staff Function: -
Service Function: -
Business Line: Enel Grids

Type code	Description	Rated frequency f_r (Hz)	Rated normal current I_r (A)	Rated Voltage U_r (kV)	Rated power-frequency withstand voltage U_d (kV)	Rated lightning impulse withstand voltage U_p (kV)	Rated short-time withstand current I_k (kA)	Rated duration of short circuit t_k (s)	Rated peak withstand current I_p (kA)	Rated supply voltage of auxiliary and control circuits U_a (Vdc)	Rated supply voltage of auxiliary circuits U_a (Vac) only for heater	Class of partitions and shutters	IK degree	IP degree	Loss of service continuity category	Classification IAC	Arc fault current and duration I_A (kA); t_A (s)
GSCM009/14	Longitudinal Bus Bar-tie with riser functional unit switchgear 17,5kV 3150A 25kA	50 and 60	3150	17,5	38	95	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/15	Transversal Bus Bar-tie functional unit switchgear 17,5kV 3150A 25kA	50 and 60	3150	17,5	38	95	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/16	Bus Bar measures functional unit switchgear 17,5kV 3150A 25kA	50 and 60	3150	17,5	38	95	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/17	Line/Auxiliary services functional unit switchgear 24kV 2500A 25kA	50 and 60	630	24	50	125	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/18	Active line functional unit switchgear 24kV 2500A 25kA	50 and 60	630	24	50	125	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/19	Neutral maker transformer functional unit switchgear 24kV 2500A 25kA	50 and 60	630	24	50	125	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/20	Capacitor bank functional unit switchgear 24kV 2500A 25kA	50 and 60	630	24	50	125	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/21	Transformer functional unit switchgear 24kV 2500A 25kA	50 and 60	2500	24	50	125	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/22	Longitudinal Bus Bar-tie with riser functional unit switchgear 24kV 2500A 25kA	50 and 60	2500	24	50	125	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/23	Transversal Bus Bar-tie functional unit switchgear 24kV 2500A 25kA	50 and 60	2500	24	50	125	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/24	Bus Bar measures functional unit switchgear 24kV 2500A 25kA	50 and 60	2500	24	50	125	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/25	Line/Auxiliary services functional unit switchgear 24kV 2000A 25kA	50 and 60	630	24	50	125	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/26	Active line functional unit switchgear 24kV 2000A 25kA	50 and 60	630	24	50	125	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/27	Neutral maker transformer functional unit switchgear 24kV 2000A 25kA	50 and 60	630	24	50	125	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1



Technical Specification code: GRI-GRI-MAT-E&C-0009
Version no. 1 dated 11/10/2022

Subject: GSCM009 MV AIS with withdrawable MV Circuit Breaker for HV/MV and MV/MV substation

Application Areas

Perimeter: *Global*
Staff Function: -
Service Function: -
Business Line: *Enel Grids*

Type code	Description	Rated frequency f_r (Hz)	Rated normal current I_r (A)	Rated Voltage U_r (kV)	Rated power-frequency withstand voltage U_d (kV)	Rated lightning impulse withstand voltage U_p (kV)	Rated short-time withstand current I_k (kA)	Rated duration of short circuit t_k (s)	Rated peak withstand current I_p (kA)	Rated supply voltage of auxiliary and control circuits U_a (Vdc)	Rated supply voltage of auxiliary circuits U_a (Vac) only for heater	Class of partitions and shutters	IK degree	IP degree	Loss of service continuity category	Classification IAC	Arc fault current and duration I_A (kA); t_A (s)
GSCM009/28	Capacitor bank functional unit switchgear 24kV 2000A 25kA	50 and 60	630	24	50	125	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/29	Transformer functional unit switchgear 24kV 2000A 25kA	50 and 60	2000	24	50	125	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/30	Longitudinal Bus Bar-tie with riser functional unit switchgear 24kV 2000A 25kA	50 and 60	2000	24	50	125	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/31	Transversal Bus Bar-tie functional unit switchgear 24kV 2000A 25kA	50 and 60	2000	24	50	125	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/32	Bus Bar measures functional unit switchgear 24kV 2000A 25kA	50 and 60	2000	24	50	125	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/33	Line/Auxiliary services functional unit switchgear 24kV 1600A 25kA	50 and 60	630	24	50	125	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/34	Active line functional unit switchgear 24kV 1600A 25kA	50 and 60	630	24	50	125	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/35	Neutral maker transformer functional unit switchgear 24kV 1600A 25kA	50 and 60	630	24	50	125	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/36	Capacitor bank functional unit switchgear 24kV 1600A 25kA	50 and 60	630	24	50	125	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/37	Transformer functional unit switchgear 24kV 1600A 25kA	50 and 60	1600	24	50	125	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/38	Longitudinal Bus Bar-tie with riser functional unit switchgear 24kV 1600A 25kA	50 and 60	1600	24	50	125	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/39	Transversal Bus Bar-tie functional unit switchgear 24kV 1600A 25kA	50 and 60	1600	24	50	125	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/40	Bus Bar measures functional unit switchgear 24kV 1600A 25kA	50 and 60	1600	24	50	125	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/41	Line/Auxiliary services functional unit switchgear 36kV 2500A 25kA	50 and 60	630	36	70	170	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1



Technical Specification code: GRI-GRI-MAT-E&C-0009
Version no. 1 dated 11/10/2022

Subject: GSCM009 MV AIS with withdrawable MV Circuit Breaker for HV/MV and MV/MV substation

Application Areas

Perimeter: *Global*
Staff Function: -
Service Function: -
Business Line: *Enel Grids*

Type code	Description	Rated frequency f_r (Hz)	Rated normal current I_r (A)	Rated Voltage U_r (kV)	Rated power-frequency withstand voltage U_d (kV)	Rated lightning impulse withstand voltage U_p (kV)	Rated short-time withstand current I_k (kA)	Rated duration of short circuit t_k (s)	Rated peak withstand current I_p (kA)	Rated supply voltage of auxiliary and control circuits U_a (Vdc)	Rated supply voltage of auxiliary circuits U_a (Vac) only for heater	Class of partitions and shutters	IK degree	IP degree	Loss of service continuity category	Classification IAC	Arc fault current and duration I_A (kA); t_A (s)
GSCM009/42	Active line functional unit switchgear 36kV 2500A 25kA	50 and 60	630	36	70	170	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/43	Neutral maker transformer functional unit switchgear 36kV 2500A 25kA	50 and 60	630	36	70	170	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/44	Capacitor bank functional unit switchgear 36kV 2500A 25kA	50 and 60	630	36	70	170	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/45	Transformer functional unit switchgear 36kV 2500A 25kA	50 and 60	2500	36	70	170	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/46	Longitudinal Bus Bar-tie with riser functional unit switchgear 36kV 2500A 25kA	50 and 60	2500	36	70	170	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/47	Transversal Bus Bar-tie functional unit switchgear 36kV 2500A 25kA	50 and 60	2500	36	70	170	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/48	Bus Bar measures functional unit switchgear 36kV 2500A 25kA	50 and 60	2500	36	70	170	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/49	Line/Auxiliary services functional unit switchgear 36kV 2000A 25kA	50 and 60	630	36	70	170	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/50	Active line functional unit switchgear 36kV 2000A 25kA	50 and 60	630	36	70	170	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/51	Neutral maker transformer functional unit switchgear 36kV 2000A 25kA	50 and 60	630	36	70	170	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/52	Capacitor bank functional unit switchgear 36kV 2000A 25kA	50 and 60	630	36	70	170	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/53	Transformer functional unit switchgear 36kV 2000A 25kA	50 and 60	2000	36	70	170	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/54	Longitudinal Bus Bar-tie with riser functional unit switchgear 36kV 2000A 25kA	50 and 60	2000	36	70	170	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/55	Transversal Bus Bar-tie functional unit switchgear 36kV 2000A 25kA	50 and 60	2000	36	70	170	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1



Technical Specification code: GRI-GRI-MAT-E&C-0009
Version no. 1 dated 11/10/2022

Subject: GSCM009 MV AIS with withdrawable MV Circuit Breaker for HV/MV and MV/MV substation

Application Areas

Perimeter: Global
Staff Function: -
Service Function: -
Business Line: Enel Grids

Type code	Description	Rated frequency f_r (Hz)	Rated normal current I_r (A)	Rated Voltage U_r (kV)	Rated power-frequency withstand voltage U_d (kV)	Rated lightning impulse withstand voltage U_p (kV)	Rated short-time withstand current I_k (kA)	Rated duration of short circuit t_k (s)	Rated peak withstand current I_p (kA)	Rated supply voltage of auxiliary and control circuits U_a (Vdc)	Rated supply voltage of auxiliary circuits U_a (Vac) only for heater	Class of partitions and shutters	IK degree	IP degree	Loss of service continuity category	Classification IAC	Arc fault current and duration I_A (kA); t_A (s)
GSCM009/56	Bus Bar measures functional unit switchgear 36kV 2000A 25kA	50 and 60	2000	36	70	170	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/57	Line/Auxiliary services functional unit switchgear 36kV 1600A 25kA	50 and 60	630	36	70	170	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/58	Active line functional unit switchgear 36kV 1600A 25kA	50 and 60	630	36	70	170	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/59	Neutral maker transformer functional unit switchgear 36kV 1600A 25kA	50 and 60	630	36	70	170	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/60	Capacitor bank functional unit switchgear 36kV 1600A 25kA	50 and 60	630	36	70	170	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/61	Transformer functional unit switchgear 36kV 1600A 25kA	50 and 60	1600	36	70	170	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/62	Longitudinal Bus Bar-tie with riser functional unit switchgear 36kV 1600A 25kA	50 and 60	1600	36	70	170	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/63	Transversal Bus Bar-tie functional unit switchgear 36kV 1600A 25kA	50 and 60	1600	36	70	170	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/64	Bus Bar measures functional unit switchgear 36kV 1600A 25kA	50 and 60	1600	36	70	170	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/65	Line/Auxiliary services functional unit switchgear 12kV 2500A 25kA	50 and 60	630	12	28	75	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/66	Active line functional unit switchgear 12kV 2500A 25kA	50 and 60	630	12	28	75	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/67	Neutral maker transformer functional unit switchgear 12kV 2500A 25kA	50 and 60	630	12	28	75	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/68	Capacitor bank functional unit switchgear 12kV 2500A 25kA	50 and 60	630	12	28	75	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/69	Transformer functional unit switchgear 12kV 2500A 25kA	50 and 60	2500	12	28	75	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1



Technical Specification code: GRI-GRI-MAT-E&C-0009
Version no. 1 dated 11/10/2022

Subject: GSCM009 MV AIS with withdrawable MV Circuit Breaker for HV/MV and MV/MV substation

Application Areas

Perimeter: *Global*
Staff Function: -
Service Function: -
Business Line: *Enel Grids*

Type code	Description	Rated frequency f_r (Hz)	Rated normal current I_r (A)	Rated Voltage U_r (kV)	Rated power-frequency withstand voltage U_d (kV)	Rated lightning impulse withstand voltage U_p (kV)	Rated short-time withstand current I_k (kA)	Rated duration of short circuit t_k (s)	Rated peak withstand current I_p (kA)	Rated supply voltage of auxiliary and control circuits U_a (Vdc)	Rated supply voltage of auxiliary circuits U_a (Vac) only for heater	Class of partitions and shutters	IK degree	IP degree	Loss of service continuity category	Classification IAC	Arc fault current and duration I_A (kA); t_A (s)
GSCM009/70	Longitudinal Bus Bar-tie with riser functional unit switchgear 12kV 2500A 25kA	50 and 60	2500	12	28	75	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/71	Transversal Bus Bar-tie functional unit switchgear 12kV 2500A 25kA	50 and 60	2500	12	28	75	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1
GSCM009/72	Bus Bar measures functional unit switchgear 12kV 2500A 25kA	50 and 60	2500	12	28	75	25	1	65 (with d.c. time = 45 ms)	According to table 7	According to table 7	PM	07	3XD	LSC2B	AFLR	25;1

Subject: GSCM009 MV AIS with withdrawable MV Circuit Breaker for HV/MV and MV/MV substation

Application Areas

Perimeter: *Global*
Staff Function: -
Service Function: -
Business Line: *Enel Grids*

8.6 Annex F –Circuit Breaker electrical ratings

Type code	Description	Rated normal current I _r (A)	Rated short circuit breaking current I _{sc} (kA)	Rated duration of short circuit tk (s)	Rated peak withstand current I _p (kA)	Rated operating sequence CB for rapid auto-reclosing *	Break-time (ms)	Rated first-pole-to-clear factor k _{pp}	Rated line charging breaking current I _l (A)	Rated cable-charging breaking current I _c (A)	Rated single capacitor bank-breaking current I _{sb} (A)	Rated back-to-back capacitor bank breaking current I _{bb} (A)	Rated back-to-back capacitor bank inrush making current I _{bi} (kA) fbi 4250 Hz	Circuit Breaker command
GSCM009/1	Line/Auxiliary services functional unit switchgear 17,5kV 4000A 31,5kA	630	31,5	1	82 (d.c. time = 45 ms)	O – 0,3'' – CO – 15'' – CO	60 ±100	1,3 and 1,5	10	31,5	400	NA	NA	A
GSCM009/2	Active line functional unit switchgear 17,5kV 4000A 31,5kA	630	31,5	1	82 (d.c. time = 45 ms)	O – 0,3'' – CO – 15'' – CO	60 ±100	1,3 and 1,5	10	31,5	400	NA	NA	A
GSCM009/3	Neutral maker transformer functional unit switchgear 17,5kV 4000A 31,5kA	630	31,5	1	82 (d.c. time = 45 ms)	O – 0,3'' – CO – 15'' – CO	60 ±100	1,3 and 1,5	10	31,5	400	NA	NA	A (B only for IT and RO supplies)
GSCM009/4	Capacitor bank functional unit switchgear 17,5kV 4000A 31,5kA	630	31,5	1	82 (d.c. time = 45 ms)	O – 0,3'' – CO – 15'' – CO	60 ±100	1,3 and 1,5	10	31,5	400	400	20	A
GSCM009/5	Transformer functional unit switchgear 17,5kV 4000A 31,5kA	4000	31,5	1	82 (d.c. time = 45 ms)	O – 0,3'' – CO – 15'' – CO	60 ±100	1,3 and 1,5	10	31,5	400	NA	NA	A (B only for IT and RO supplies)
GSCM009/6	Longitudinal Bus Bar-tie with riser functional unit switchgear 17,5kV 4000A 31,5kA	4000	31,5	1	82 (d.c. time = 45 ms)	O – 0,3'' – CO – 15'' – CO	60 ±100	1,3 and 1,5	10	31,5	400	NA	NA	A (B only for IT and RO supplies)
GSCM009/7	Transversal Bus Bar-tie functional unit switchgear 17,5kV 4000A 31,5kA	4000	31,5	1	82 (d.c. time = 45 ms)	O – 0,3'' – CO – 15'' – CO	60 ±100	1,3 and 1,5	10	31,5	400	NA	NA	A (B only for IT and RO supplies)
GSCM009/9	Line/Auxiliary services functional unit switchgear 17,5kV 3150A 25kA	630	25	1	65 (d.c. time = 45 ms)	O – 0,3'' – CO – 15'' – CO	60 ±100	1,3 and 1,5	10	31,5	400	NA	NA	A
GSCM009/10	Active line functional unit switchgear 17,5kV 3150A 25kA	630	25	1	65 (d.c. time = 45 ms)	O – 0,3'' – CO – 15'' – CO	60 ±100	1,3 and 1,5	10	31,5	400	NA	NA	A
GSCM009/11	Neutral maker transformer functional unit switchgear 17,5kV 3150A 25kA	630	25	1	65 (d.c. time = 45 ms)	O – 0,3'' – CO – 15'' – CO	60 ±100	1,3 and 1,5	10	31,5	400	NA	NA	A (B only for IT and RO supplies)
GSCM009/12	Capacitor bank functional unit switchgear 17,5kV 3150A 25kA	630	25	1	65 (d.c. time = 45 ms)	O – 0,3'' – CO – 15'' – CO	60 ±100	1,3 and 1,5	10	31,5	400	400	20	A
GSCM009/13	Transformer functional unit switchgear 17,5kV 3150A 25kA	3150	25	1	65 (d.c. time = 45 ms)	O – 0,3'' – CO – 15'' – CO	60 ±100	1,3 and 1,5	10	31,5	400	NA	NA	A (B only for IT and RO supplies)
GSCM009/14	Longitudinal Bus Bar-tie with riser functional unit switchgear 17,5kV 3150A 25kA	3150	25	1	65 (d.c. time = 45 ms)	O – 0,3'' – CO – 15'' – CO	60 ±100	1,3 and 1,5	10	31,5	400	NA	NA	A (B only for IT and RO supplies)



Technical Specification code: GRI-GRI-MAT-E&C-0009
Version no. 1 dated 11/10/2022

Subject: GSCM009 MV AIS with withdrawable MV Circuit Breaker for HV/MV and MV/MV substation

Application Areas

Perimeter: Global
Staff Function: -
Service Function: -
Business Line: Enel Grids

Type code	Description	Rated normal current Ir (A)	Rated short circuit breaking current Isc (kA)	Rated duration of short circuit tk (s)	Rated peak withstand current Ip (kA)	Rated operating sequence CB for rapid auto-reclosing *	Break-time (ms)	Rated first-pole-to-clear factor kpp	Rated line charging breaking current Il (A)	Rated cable-charging breaking current Ic(A)	Rated single capacitor bank-breaking current Isb (A)	Rated back-to-back capacitor bank breaking current Ibb (A)	Rated back-to-back capacitor bank inrush making current Ibi (kA) fbi 4250 Hz	Circuit Breaker command
GSCM009/15	Transversal Bus Bar-tie functional unit switchgear 17,5kV 3150A 25kA	3150	25	1	65 (d.c. time = 45 ms)	O-0,3''-CO-15''-CO	60 ±100	1,3 and 1,5	10	31,5	400	NA	NA	A (B only for IT and RO supplies)
GSCM009/17	Line/Auxiliary services functional unit switchgear 24kV 2500A 25kA	630	25	1	65 (d.c. time = 45 ms)	O-0,3''-CO-15''-CO	60 ±100	1,3 and 1,5	10	31,5	400	NA	NA	A
GSCM009/18	Active line functional unit switchgear 24kV 2500A 25kA	630	25	1	65 (d.c. time = 45 ms)	O-0,3''-CO-15''-CO	60 ±100	1,3 and 1,5	10	31,5	400	NA	NA	A
GSCM009/19	Neutral maker transformer functional unit switchgear 24kV 2500A 25kA	630	25	1	65 (d.c. time = 45 ms)	O-0,3''-CO-15''-CO	60 ±100	1,3 and 1,5	10	31,5	400	NA	NA	A (B only for IT and RO supplies)
GSCM009/20	Capacitor bank functional unit switchgear 24kV 2500A 25kA	630	25	1	65 (d.c. time = 45 ms)	O-0,3''-CO-15''-CO	60 ±100	1,3 and 1,5	10	31,5	400	400	20	A
GSCM009/21	Transformer functional unit switchgear 24kV 2500A 25kA	2500	25	1	65 (d.c. time = 45 ms)	O-0,3''-CO-15''-CO	60 ±100	1,3 and 1,5	10	31,5	400	NA	NA	A (B only for IT and RO supplies)
GSCM009/22	Longitudinal Bus Bar-tie with riser functional unit switchgear 24kV 2500A 25kA	2500	25	1	65 (d.c. time = 45 ms)	O-0,3''-CO-15''-CO	60 ±100	1,3 and 1,5	10	31,5	400	NA	NA	A (B only for IT and RO supplies)
GSCM009/23	Transversal Bus Bar-tie functional unit switchgear 24kV 2500A 25kA	2500	25	1	65 (d.c. time = 45 ms)	O-0,3''-CO-15''-CO	60 ±100	1,3 and 1,5	10	31,5	400	NA	NA	A (B only for IT and RO supplies)
GSCM009/25	Line/Auxiliary services functional unit switchgear 24kV 2000A 25kA	630	25	1	65 (d.c. time = 45 ms)	O-0,3''-CO-15''-CO	60 ±100	1,3 and 1,5	10	31,5	400	NA	NA	A
GSCM009/26	Active line functional unit switchgear 24kV 2000A 25kA	630	25	1	65 (d.c. time = 45 ms)	O-0,3''-CO-15''-CO	60 ±100	1,3 and 1,5	10	31,5	400	NA	NA	A
GSCM009/27	Neutral maker transformer functional unit switchgear 24kV 2000A 25kA	630	25	1	65 (d.c. time = 45 ms)	O-0,3''-CO-15''-CO	60 ±100	1,3 and 1,5	10	31,5	400	NA	NA	A (B only for IT and RO supplies)
GSCM009/28	Capacitor bank functional unit switchgear 24kV 2000A 25kA	630	25	1	65 (d.c. time = 45 ms)	O-0,3''-CO-15''-CO	60 ±100	1,3 and 1,5	10	31,5	400	400	20	A
GSCM009/29	Transformer functional unit switchgear 24kV 2000A 25kA	2000	25	1	65 (d.c. time = 45 ms)	O-0,3''-CO-15''-CO	60 ±100	1,3 and 1,5	10	31,5	400	NA	NA	A (B only for IT and RO supplies)
GSCM009/30	Longitudinal Bus Bar-tie with riser functional unit switchgear 24kV 2000A 25kA	2000	25	1	65 (d.c. time = 45 ms)	O-0,3''-CO-15''-CO	60 ±100	1,3 and 1,5	10	31,5	400	NA	NA	A (B only for IT and RO supplies)



Technical Specification code: GRI-GRI-MAT-E&C-0009
Version no. 1 dated 11/10/2022

Subject: GSCM009 MV AIS with withdrawable MV Circuit Breaker for HV/MV and MV/MV substation

Application Areas

Perimeter: *Global*
Staff Function: -
Service Function: -
Business Line: *Enel Grids*

Type code	Description	Rated normal current Ir (A)	Rated short circuit breaking current Isc (kA)	Rated duration of short circuit tk (s)	Rated peak withstand current Ip (kA)	Rated operating sequence CB for rapid auto-reclosing *	Break-time (ms)	Rated first-pole-to-clear factor kpp	Rated line charging breaking current Il (A)	Rated cable-charging breaking current Ic(A)	Rated single capacitor bank-breaking current Isb (A)	Rated back-to-back capacitor bank breaking current Ibb (A)	Rated back-to-back capacitor bank inrush making current Ibi (kA) fbi 4250 Hz	Circuit Breaker command
GSCM009/31	Transversal Bus Bar-tie functional unit switchgear 24kV 2000A 25kA	2000	25	1	65 (d.c. time = 45 ms)	O-0,3''-CO-15''-CO	60 ±100	1,3 and 1,5	10	31,5	400	NA	NA	A (B only for IT and RO supplies)
GSCM009/33	Line/Auxiliary services functional unit switchgear 24kV 1600A 25kA	630	25	1	65 (d.c. time = 45 ms)	O-0,3''-CO-15''-CO	60 ±100	1,3 and 1,5	10	31,5	400	NA	NA	A
GSCM009/34	Active line functional unit switchgear 24kV 1600A 25kA	630	25	1	65 (d.c. time = 45 ms)	O-0,3''-CO-15''-CO	60 ±100	1,3 and 1,5	10	31,5	400	NA	NA	A
GSCM009/35	Neutral maker transformer functional unit switchgear 24kV 1600A 25kA	630	25	1	65 (d.c. time = 45 ms)	O-0,3''-CO-15''-CO	60 ±100	1,3 and 1,5	10	31,5	400	NA	NA	A (B only for IT and RO supplies)
GSCM009/36	Capacitor bank functional unit switchgear 24kV 1600A 25kA	630	25	1	65 (d.c. time = 45 ms)	O-0,3''-CO-15''-CO	60 ±100	1,3 and 1,5	10	31,5	400	400	20	A
GSCM009/37	Transformer functional unit switchgear 24kV 1600A 25kA	1600	25	1	65 (d.c. time = 45 ms)	O-0,3''-CO-15''-CO	60 ±100	1,3 and 1,5	10	31,5	400	NA	NA	A (B only for IT and RO supplies)
GSCM009/38	Longitudinal Bus Bar-tie with riser functional unit switchgear 24kV 1600A 25kA	1600	25	1	65 (d.c. time = 45 ms)	O-0,3''-CO-15''-CO	60 ±100	1,3 and 1,5	10	31,5	400	NA	NA	A (B only for IT and RO supplies)
GSCM009/39	Transversal Bus Bar-tie functional unit switchgear 24kV 1600A 25kA	1600	25	1	65 (d.c. time = 45 ms)	O-0,3''-CO-15''-CO	60 ±100	1,3 and 1,5	10	31,5	400	NA	NA	A (B only for IT and RO supplies)
GSCM009/41	Line/Auxiliary services functional unit switchgear 36kV 2500A 25kA	630	25	1	65 (d.c. time = 45 ms)	O-0,3''-CO-15''-CO	60 ±100	1,3 and 1,5	10	50	400	NA	NA	A
GSCM009/42	Active line functional unit switchgear 36kV 2500A 25kA	630	25	1	65 (d.c. time = 45 ms)	O-0,3''-CO-15''-CO	60 ±100	1,3 and 1,5	10	50	400	NA	NA	A
GSCM009/43	Neutral maker transformer functional unit switchgear 36kV 2500A 25kA	630	25	1	65 (d.c. time = 45 ms)	O-0,3''-CO-15''-CO	60 ±100	1,3 and 1,5	10	50	400	NA	NA	A (B only for IT and RO supplies)
GSCM009/44	Capacitor bank functional unit switchgear 36kV 2500A 25kA	630	25	1	65 (d.c. time = 45 ms)	O-0,3''-CO-15''-CO	60 ±100	1,3 and 1,5	10	50	400	400	20	A
GSCM009/45	Transformer functional unit switchgear 36kV 2500A 25kA	2500	25	1	65 (d.c. time = 45 ms)	O-0,3''-CO-15''-CO	60 ±100	1,3 and 1,5	10	50	400	NA	NA	A
GSCM009/46	Longitudinal Bus Bar-tie with riser functional unit switchgear 36kV 2500A 25kA	2500	25	1	65 (d.c. time = 45 ms)	O-0,3''-CO-15''-CO	60 ±100	1,3 and 1,5	10	50	400	NA	NA	A (B only for IT and RO supplies)

Subject: GSCM009 MV AIS with withdrawable MV Circuit Breaker for HV/MV and MV/MV substation

Application Areas

Perimeter: *Global*
Staff Function: -
Service Function: -
Business Line: *Enel Grids*

Type code	Description	Rated normal current Ir (A)	Rated short circuit breaking current Isc (kA)	Rated duration of short circuit tk (s)	Rated peak withstand current Ip (kA)	Rated operating sequence CB for rapid auto-reclosing *	Break-time (ms)	Rated first-pole-to-clear factor kpp	Rated line charging breaking current Il (A)	Rated cable-charging breaking current Ic(A)	Rated single capacitor bank-breaking current Isb (A)	Rated back-to-back capacitor bank breaking current Ibb (A)	Rated back-to-back capacitor bank inrush making current Ibi (kA) fbi 4250 Hz	Circuit Breaker command
GSCM009/47	Transversal Bus Bar-tie functional unit switchgear 36kV 2500A 25kA	2500	25	1	65 (d.c. time = 45 ms)	O-0,3''-CO-15''-CO	60 ±100	1,3 and 1,5	10	50	400	NA	NA	A (B only for IT and RO supplies)
GSCM009/49	Line/Auxiliary services functional unit switchgear 36kV 2000A 25kA	630	25	1	65 (d.c. time = 45 ms)	O-0,3''-CO-15''-CO	60 ±100	1,3 and 1,5	10	50	400	NA	NA	A
GSCM009/50	Active line functional unit switchgear 36kV 2000A 25kA	630	25	1	65 (d.c. time = 45 ms)	O-0,3''-CO-15''-CO	60 ±100	1,3 and 1,5	10	50	400	NA	NA	A
GSCM009/51	Neutral maker transformer functional unit switchgear 36kV 2000A 25kA	630	25	1	65 (d.c. time = 45 ms)	O-0,3''-CO-15''-CO	60 ±100	1,3 and 1,5	10	50	400	NA	NA	A (B only for IT and RO supplies)
GSCM009/52	Capacitor bank functional unit switchgear 36kV 2000A 25kA	630	25	1	65 (d.c. time = 45 ms)	O-0,3''-CO-15''-CO	60 ±100	1,3 and 1,5	10	50	400	400	20	A
GSCM009/53	Transformer functional unit switchgear 36kV 2000A 25kA	2000	25	1	65 (d.c. time = 45 ms)	O-0,3''-CO-15''-CO	60 ±100	1,3 and 1,5	10	50	400	NA	NA	A (B only for IT and RO supplies)
GSCM009/54	Longitudinal Bus Bar-tie with riser functional unit switchgear 36kV 2000A 25kA	2000	25	1	65 (d.c. time = 45 ms)	O-0,3''-CO-15''-CO	60 ±100	1,3 and 1,5	10	50	400	NA	NA	A (B only for IT and RO supplies)
GSCM009/55	Transversal Bus Bar-tie functional unit switchgear 36kV 2000A 25kA	2000	25	1	65 (d.c. time = 45 ms)	O-0,3''-CO-15''-CO	60 ±100	1,3 and 1,5	10	50	400	NA	NA	A (B only for IT and RO supplies)
GSCM009/57	Line/Auxiliary services functional unit switchgear 36kV 1600A 25kA	630	25	1	65 (d.c. time = 45 ms)	O-0,3''-CO-15''-CO	60 ±100	1,3 and 1,5	10	50	400	NA	NA	A
GSCM009/58	Active line functional unit switchgear 36kV 1600A 25kA	630	25	1	65 (d.c. time = 45 ms)	O-0,3''-CO-15''-CO	60 ±100	1,3 and 1,5	10	50	400	NA	NA	A
GSCM009/59	Neutral maker transformer functional unit switchgear 36kV 1600A 25kA	630	25	1	65 (d.c. time = 45 ms)	O-0,3''-CO-15''-CO	60 ±100	1,3 and 1,5	10	50	400	NA	NA	A (B only for IT and RO supplies)
GSCM009/60	Capacitor bank functional unit switchgear 36kV 1600A 25kA	630	25	1	65 (d.c. time = 45 ms)	O-0,3''-CO-15''-CO	60 ±100	1,3 and 1,5	10	50	400	400	20	A
GSCM009/61	Transformer functional unit switchgear 36kV 1600A 25kA	1600	25	1	65 (d.c. time = 45 ms)	O-0,3''-CO-15''-CO	60 ±100	1,3 and 1,5	10	50	400	NA	NA	A (B only for IT and RO supplies)
GSCM009/62	Longitudinal Bus Bar-tie with riser functional unit switchgear 36kV 1600A 25kA	1600	25	1	65 (d.c. time = 45 ms)	O-0,3''-CO-15''-CO	60 ±100	1,3 and 1,5	10	50	400	NA	NA	A (B only for IT and RO supplies)
GSCM009/63	Transversal Bus Bar-tie functional unit switchgear 36kV 1600A 25kA	1600	25	1	65 (d.c. time = 45 ms)	O-0,3''-CO-15''-CO	60 ±100	1,3 and 1,5	10	50	400	NA	NA	A (B only for IT and RO supplies)

Subject: GSCM009 MV AIS with withdrawable MV Circuit Breaker for HV/MV and MV/MV substation

Application Areas
Perimeter: *Global*
Staff Function: -
Service Function: -
Business Line: *Enel Grids*

Type code	Description	Rated normal current I _r (A)	Rated short circuit breaking current I _{sc} (kA)	Rated duration of short circuit tk (s)	Rated peak withstand current I _p (kA)	Rated operating sequence CB for rapid auto-reclosing *	Break-time (ms)	Rated first-pole-to-clear factor k _{pp}	Rated line charging breaking current I _l (A)	Rated cable-charging breaking current I _c (A)	Rated single capacitor bank-breaking current I _{sb} (A)	Rated back-to-back capacitor bank breaking current I _{bb} (A)	Rated back-to-back capacitor bank inrush making current I _{bi} (kA) fbi 4250 Hz	Circuit Breaker command
GSCM009/65	Line /Auxiliary services functional unit switchgear 12,5kV 2500A	630	25	1	65 (d.c. time = 45 ms)	O – 0,3'' – CO – 15'' – CO	60 ÷100	1,3 and 1,5	10	31,5	400	NA	NA	A
GSCM009/66	Active line functional unit switchgear 12,5kV 2500A	630	25	1	65 (d.c. time = 45 ms)	O – 0,3'' – CO – 15'' – CO	60 ÷100	1,3 and 1,5	10	31,5	400	NA	NA	A
GSCM009/67	Neutral maker transformer functional unit switchgear 12,5kV 2500A	630	25	1	65 (d.c. time = 45 ms)	O – 0,3'' – CO – 15'' – CO	60 ÷100	1,3 and 1,5	10	31,5	400	NA	NA	A (B only for IT and RO supplies)
GSCM009/68	Capacitor bank functional unit switchgear 12,5kV 2500A	630	25	1	65 (d.c. time = 45 ms)	O – 0,3'' – CO – 15'' – CO	60 ÷100	1,3 and 1,5	10	31,5	400	400	20	A
GSCM009/69	Transformer functional unit switchgear 12,5kV 2500A	2500	25	1	65 (d.c. time = 45 ms)	O – 0,3'' – CO – 15'' – CO	60 ÷100	1,3 and 1,5	10	31,5	400	NA	NA	A (B only for IT and RO supplies)
GSCM009/70	Longitudinal Bus-bar-tie with riser functional unit switchgear 12,5kV 2500A	2500	25	1	65 (d.c. time = 45 ms)	O – 0,3'' – CO – 15'' – CO	60 ÷100	1,3 and 1,5	10	31,5	400	NA	NA	A (B only for IT and RO supplies)
GSCM009/71	Transversal Bus-bar-tie functional unit switchgear 12,5kV 2500A	2500	25	1	65 (d.c. time = 45 ms)	O – 0,3'' – CO – 15'' – CO	60 ÷100	1,3 and 1,5	10	31,5	400	NA	NA	A (B only for IT and RO supplies)

*O - 1s - CO – 25'' - CO -35''- CO operating cycle shall be considered for Enel Distribuição São Paulo. Manufacturer shall send a declaration for this value



Technical Specification code: GRI-GRI-MAT-E&C-0009
Version no. 1 dated 11/10/2022

Subject: GSCM009 MV AIS with withdrawable MV Circuit Breaker for HV/MV and MV/MV substation

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Service Function: -
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8.7 Annex G – Material Codes

Family	enel type	Description	Argentina	Brazil	Chile	Colombia	Italy	Peru	Rumania	Spain
1	GSCM009/1	Line/Auxiliary services functional unit switchgear 17,5kV 4000A 31,5kA	0109-0589	141755	141937	141780	140493			
1	GSCM009/2	Active line functional unit switchgear 17,5kV 4000A 31,5kA	0109-0588	141758	141936		140492			
1	GSCM009/3	Neutral maker transformer functional unit switchgear 17,5kV 4000A 31,5kA	0109-0587	141756	141935		140491			
1	GSCM009/4	Capacitor bank functional unit switchgear 17,5kV 4000A 31,5kA	0109-0586	141754	141934	141784	140490			
1	GSCM009/5	Transformer functional unit switchgear 17,5kV 4000A 31,5kA	0109-0585	141749	141933	141779	140489			
1	GSCM009/6	Longitudinal Bus Bar-tie with riser functional unit switchgear 17,5kV 4000A 31,5kA	0109-0583	141742	141931	141782	140487			
1	GSCM009/7	Transversal Bus Bar-tie functional unit switchgear 17,5kV 4000A 31,5kA	0109-0582	141743	141930	141783	140486			
1	GSCM009/8	Bus Bar measures functional unit switchgear 17,5kV 4000A 31,5kA	0109-0581	141744	141929	141781	140485			
2	GSCM009/9	Line/Auxiliary services functional unit switchgear 17,5kV 3150A 25kA	0109-0580	141745	141928		140484			
2	GSCM009/10	Active line functional unit switchgear 17,5kV 3150A 25kA	0109-0579	141746	141927		140483			
2	GSCM009/11	Neutral maker transformer functional unit switchgear 17,5kV 3150A 25kA	0109-0578	141748	141926		140482			
2	GSCM009/12	Capacitor bank functional unit switchgear 17,5kV 3150A 25kA	0109-0577	141750	141925		140481			
2	GSCM009/13	Transformer functional unit switchgear 17,5kV 3150A 25kA	0109-0576	141751	141924		140480			
2	GSCM009/14	Longitudinal Bus Bar-tie with riser functional unit switchgear 17,5kV 3150A 25kA	0109-0574	141757	141922		140478			
2	GSCM009/15	Transversal Bus Bar-tie functional unit switchgear 17,5kV 3150A 25kA	0109-0573	141753	141921		140477			
2	GSCM009/16	Bus Bar measures functional unit switchgear 17,5kV 3150A 25kA	0109-0572	141740	141920		140476			
3	GSCM009/17	Line/Auxiliary services functional unit switchgear 24kV 2500A 25kA	0109-0571	141738	141919	141774	140475	141658	140150	
3	GSCM009/18	Active line functional unit switchgear 24kV 2500A 25kA	0109-0570	141734	141918		140474	141660	140149	
3	GSCM009/19	Neutral maker transformer functional unit switchgear 24kV 2500A 25kA	0109-0569	141733	141917		140473	141661	140148	
3	GSCM009/20	Capacitor bank functional unit switchgear 24kV 2500A 25kA	0109-0568	141728	141916	141778	140472	141659	140147	
3	GSCM009/21	Transformer functional unit switchgear 24kV 2500A 25kA	0109-0567	141729	141915	141773	140471	141657	140146	
3	GSCM009/22	Longitudinal Bus Bar-tie with riser functional unit switchgear 24kV 2500A 25kA	0109-0565	141731	141889	141776	140469	141655	140142	
3	GSCM009/23	Transversal Bus Bar-tie functional unit switchgear 24kV 2500A 25kA	0109-0564	141732	141888	141777	140468	141654	140140	
3	GSCM009/24	Bus Bar measures functional unit switchgear 24kV 2500A 25kA	0109-0563	141739	141887	141775	140467	141653	140139	
4	GSCM009/25	Line/Auxiliary services functional unit switchgear 24kV 2000A 25kA	0109-0562	141737	141886		140466	141652	140138	140964
4	GSCM009/26	Active line functional unit switchgear 24kV 2000A 25kA	0109-0561	141736	141885		140465	141651	140137	140966
4	GSCM009/27	Neutral maker transformer functional unit switchgear 24kV 2000A 25kA	0109-0560	141735	141878		140464	141650	140136	
4	GSCM009/28	Capacitor bank functional unit switchgear 24kV 2000A 25kA	0109-0559	141727	141877		140463	141649	140135	140962
4	GSCM009/29	Transformer functional unit switchgear 24kV 2000A 25kA	0109-0558	141726	141876		140462	141648	140134	140967
4	GSCM009/30	Longitudinal Bus Bar-tie with riser functional unit switchgear 24kV 2000A 25kA	0109-0556	141768	141874		140460	141638	140132	140960
4	GSCM009/31	Transversal Bus Bar-tie functional unit switchgear 24kV 2000A 25kA	0109-0555	141718	141826		140459	141633	140131	140963
4	GSCM009/32	Bus Bar measures functional unit switchgear 24kV 2000A 25kA	0109-0554	141719	141825		140458	141206	140130	140965



Technical Specification code: GRI-GRI-MAT-E&C-0009
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Family	enel type	Description	Argentina	Brazil	Chile	Colombia	Italy	Peru	Rumania	Spain
5	GSCM009/33	Line/Auxiliary services functional unit switchgear 24kV 1600A 25kA	0109-0553	141720	141944		140457		140129	140943
5	GSCM009/34	Active line functional unit switchgear 24kV 1600A 25kA	0109-0552	141721	141824		140456		140128	140942
5	GSCM009/35	Neutral maker transformer functional unit switchgear 24kV 1600A 25kA	0109-0551	141723	141823		140455		140127	
5	GSCM009/36	Capacitor bank functional unit switchgear 24kV 1600A 25kA	0109-0550	141724	141822		140454		140126	140941
5	GSCM009/37	Transformer functional unit switchgear 24kV 1600A 25kA	0109-0549	141722	141821		140453		140125	140940
5	GSCM009/38	Longitudinal Bus Bar-tie with riser functional unit switchgear 24kV 1600A 25kA	0109-0547	141706	141819		140451		140123	140938
5	GSCM009/39	Transversal Bus Bar-tie functional unit switchgear 24kV 1600A 25kA	0109-0546	141716	141818		140450		140122	140937
5	GSCM009/40	Bus Bar measures functional unit switchgear 24kV 1600A 25kA	0109-0545	141715	141817		140449		140121	140936
6	GSCM009/41	Line/Auxiliary services functional unit switchgear 36kV 2500A 25kA	0109-0526	141695	141798		140430			
6	GSCM009/42	Active line functional unit switchgear 36kV 2500A 25kA	0109-0525	141698	141797		140429			
6	GSCM009/43	Neutral maker transformer functional unit switchgear 36kV 2500A 25kA	0109-0524	141693	141796		140428			
6	GSCM009/44	Capacitor bank functional unit switchgear 36kV 2500A 25kA	0109-0523	141692	141795		140427			
6	GSCM009/45	Transformer functional unit switchgear 36kV 2500A 25kA	0109-0522	141690	141794		140426			
6	GSCM009/46	Longitudinal Bus Bar-tie with riser functional unit switchgear 36kV 2500A 25kA	0109-0520	141665	141792		140417			
6	GSCM009/47	Transversal Bus Bar-tie functional unit switchgear 36kV 2500A 25kA	0109-0518	141664	141791		140416			
6	GSCM009/48	Bus Bar measures functional unit switchgear 36kV 2500A 25kA	0109-0519	141663	141790		140415			
7	GSCM009/49	Line/Auxiliary services functional unit switchgear 36kV 2000A 25kA	0109-0535	141700	141807		140439			140959
7	GSCM009/50	Active line functional unit switchgear 36kV 2000A 25kA	0109-0534	141701	141806		140438			140958
7	GSCM009/51	Neutral maker transformer functional unit switchgear 36kV 2000A 25kA	0109-0533	141694	141805		140437			
7	GSCM009/52	Capacitor bank functional unit switchgear 36kV 2000A 25kA	0109-0532	141702	141804		140436			140957
7	GSCM009/53	Transformer functional unit switchgear 36kV 2000A 25kA	0109-0531	141703	141803		140435			140954
7	GSCM009/54	Longitudinal Bus Bar-tie with riser functional unit switchgear 36kV 2000A 25kA	0109-0529	141705	141801		140433			140956
7	GSCM009/55	Transversal Bus Bar-tie functional unit switchgear 36kV 2000A 25kA	0109-0528	141696	141800		140432			140955
7	GSCM009/56	Bus Bar measures functional unit switchgear 36kV 2000A 25kA	0109-0527	141697	141799		140431			140952
8	GSCM009/57	Line/Auxiliary services functional unit switchgear 36kV 1600A 25kA	0109-0544	141714	141816	141786	140448			140951
8	GSCM009/58	Active line functional unit switchgear 36kV 1600A 25kA	0109-0543	141713	141815		140447			140950
8	GSCM009/59	Neutral maker transformer functional unit switchgear 36kV 1600A 25kA	0109-0542	141712	141814		140446			
8	GSCM009/60	Capacitor bank functional unit switchgear 36kV 1600A 25kA	0109-0541	141709	141813	141772	140445			140949
8	GSCM009/61	Transformer functional unit switchgear 36kV 1600A 25kA	0109-0540	141710	141812	141785	140444			140948
8	GSCM009/62	Longitudinal Bus Bar-tie with riser functional unit switchgear 36kV 1600A 25kA	0109-0538	141707	141810	141788	140442			140946
8	GSCM009/63	Transversal Bus Bar-tie functional unit switchgear 36kV 1600A 25kA	0109-0537	141708	141809	141789	140441			140945
8	GSCM009/64	Bus Bar measures functional unit switchgear 36kV 1600A 25kA	0109-0536	141699	141808	141787	140440			140944



Technical Specification code: GRI-GRI-MAT-E&C-0009
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Family	enel type	Description	Argentina	Brazil	Chile	Colombia	Italy	Peru	Rumania	Spain
9	GSCM009/65	Line/Auxiliary services functional unit switchgear 12kV 2500A 25kA						141767		
9	GSCM009/66	Active line functional unit switchgear 12kV 2500A 25kA						141766		
9	GSCM009/67	Neutral maker transformer functional unit switchgear 12kV 2500A 25kA						141765		
9	GSCM009/68	Capacitor bank functional unit switchgear 12kV 2500A 25kA						141764		
9	GSCM009/69	Transformer functional unit switchgear 12kV 2500A 25kA						141763		
9	GSCM009/70	Longitudinal Bus Bar-tie with riser functional unit switchgear 12kV 2500A 25kA						141761		
9	GSCM009/71	Transversal Bus Bar-tie functional unit switchgear 12kV 2500A 25kA						141760		
9	GSCM009/72	Bus Bar measures functional unit switchgear 12kV 2500A 25kA						141759		