

RM6 GIS 24KV TECHNICAL SPECIFICATION

Self-contained unit with built-in function



A. PRESENTATION

The RM6 is a “totally SF6” switchgear range with built-in functions and reduced dimensions.

This compact and self-contained totally insulated unit constitutes the MV component of the branching point of a MV network (Network points). It includes, within the same metal enclosure, the number of MV functional units required for connection, power supply and protection of transformers:

- ◆ 630 A “network” switch disconnectors,
- ◆ 200A Fuse-switches combination or circuit breaker for transformer protection,
- ◆ 630 A circuit breaker for line protection.

Active parts as well as busbars between functions are contained in a 2 mm stainless steel enclosure. Filled with SF6, full insulated and watertight, this enclosure respects the “**sealed pressure system**” criterion in accordance with the IEC 298 standard (appendix GG § 2.3).

The RM6 unit are full insulated with a metal conductive enclosure, which contains the whole power components and protects them from the atmosphere, which could be wet, dusty or polluted.

The use of controlled field connectors and the metallisation of the fuse chambers confine the electrical fields within the enclosure. So, it is possible to touch the enclosure and to flood temporary the RM6 while working.

To make sure of safety on an unlikely internal fault, the internal arc withstand of the switchgear has been validated in accordance with the recommendations of IEC 298 appendix AA §6-108, up to 20kA/3s.

The moving earthing contacts are visible through the transparent covers when the earthing switch is closed.

The RM6’s live expectancy is about 30 years, with no maintenance required for normal use. For harsher service conditions, low-maintenance is required at regular period.

B. STANDARDS

All the equipments describes in this offer have been conceived, factory-built and tested in accordance with the following IEC standards:

◆ Common clauses for MV switchgear standards	IEC 694
◆ MV metal-enclosed switchgear	IEC 298
◆ MV circuit breaker	IEC 56
◆ AC dis-connectors and earthing switches	IEC 129
◆ MV switches	IEC 265
◆ MV AC fuse-switch combination	IEC 420
◆ Current transformer	IEC 185
◆ Voltage transformer	IEC 186
◆ MV fuses	IEC 282
◆ Degrees of protection procured by enclosures (IP code)	IEC 529

C. ROUTINE TESTS

Routine tests, carried out in the factory in accordance with the IEC standards, are contained in this offer and include the following tests:

- ◆ Conformity with drawings and diagrams.
- ◆ Testing of mechanical function and control of pad-locking
- ◆ High voltage dielectric testing at industrial frequency.
- ◆ Low voltage dielectric testing.
- ◆ Control of low voltage function.

D. LIMIT OF SUPPLY

This technical offer is only valid for the supply of equipment in conformity with the quantity and the technical description included in this estimate.

All equipments or services not explicitly mentioned in our offer are not included, such as the followings:

- ◆ Cables, cable termination kits and lugs
- ◆ Site services such as : installation and commissioning.
- ◆ Upstream and downstream padlocking if not precisely described in the offer
- ◆ Auxiliary or alternatives power supply.
- ◆ Factory reception
- ◆ Type tests
- ◆ Spare parts

E. DESCRIPTION OF THE FUNCTIONAL UNITS

Each function is supplied with 1 operating lever

Each Network Switch-disconnector (FUNCTION I) includes

- ◆ A 3-pole 3-position switch, insulated in SF6, may be in one of the three positions: “open”, “closed” or “earthed”, representing a natural interlocking system that prevents incorrect operation. Moving-contact rotation is driven by a fast-acting mechanism that is independent of the action of the operator. To improve safety, the earthing switch placed in the SF6 has a short-circuit making capacity which is 2.5 times the short-time current withstand.
- ◆ A position indicator directly connected to the rod of device of the moving element using a direct and reliable connection thus getting a total safety integrated in a simple and logical synoptic diagram.
- ◆ Mechanical operating shafts of the switch and the earthing switch.
- ◆ Network connecting bushing protected in a cable compartment
- ◆ A metal compartment, having a degree of protection IP3X, and easuring the mechanical protection of the power connection

Each Transformer feeder 200A circuit breaker (FUNCTION D) includes:

- ◆ A 3-pole 3-position switch, insulated in SF6, may be in one of three positions: “open”, “closed” or “earthed”, representing a natural interlocking system that prevents incorrect operation. Moving-contact rotation is driven by a fast-acting mechanism that is independent of the action of the operator. To improve safety, the earthing switch placed in the SF6 has a short-circuit making capacity which is 2.5 times the short-time current withstand.

Each function D includes:

- ◆ 4 auxiliary contacts for switch position (2 NF + 2 NO). *(option)*
- ◆ 1 auxiliary contact for earth switch position indication. *(option)*.
- ◆ A fast-acting operating manual mechanism, independent of operator action, released by :
 - ◆ either a push-button placed in front of the switchgear.
 - ◆ or a MITOP type low energy release incorporated in the protection unit.
 - ◆ or a release coil.
- ◆ A protection unit which requires no auxiliary power and includes:
 - ◆ 3 CSP current sensors incorporated in the transformer tee-off bushings.
 - ◆ 1 MITOP type low energy release.
 - ◆ 1 electronic relay VIP45 Protection function (I>, I>>, Io> & Io>> with IDMT selectable)
- ◆ Mechanical position indication system with mimic diagram.
- ◆ Mechanical operating shafts of the switch and the earthing switch.

Each Transformer feeder fuse-switch combination (FUNCTION Q) includes:

- ◆ A 3-pole 3-position switch, insulated in SF6, may be in one of the three positions : “open”, “closed” or “earthed”, representing a natural interlocking system that prevents incorrect operation. Moving-contact rotation is driven by a fast-acting mechanism that is independent of the action of the operator. To improve safety, the earthing switch placed in the SF6 has a short-circuit making capacity which is 2.5 times the short-time current withstand.
- ◆ A fast-acting operating manual mechanism, independent of operator action, released by :
 - ◆ either a push-button placed in front of the switchgear. *(option)*
 - ◆ or a mechanism based on the blowing of one of the striker fuse.
 - ◆ or a release coil. *(option)*
- ◆ A set of three individual sealed fuse chambers metallised and insulated with a downstream side earthing switch and 200 A busbars connected to the transformer.
- ◆ A metallic cover protecting the access to the fuse chambers interlocked with earthing switch position. (Access only possible if the switch is on earth position).
- ◆ Mechanical position indication system with mimic diagram.
- ◆ Mechanical operating shafts of the switch and the earthing switch.

F. TECHNICAL DETAIL of FUNCTION UNIT

ITEM no. 01: 02 SF6 LBS 630A & 01 Switch Fuse 200A

Technical Specifications	I function	D function
Electrical Parameter		
Rated Voltage (kV)	24	24
Service Voltage (kVrms)	22	22
Frequency (Hz)	50	50
Rated withstand voltage at frequency 50Hz/1min (kV rms)	50	50
Rated impulse withstand voltage: 1,2/50µs (kV peak)	125	125
Rated Current (A)	630	200
Breaking Capacity (Active Load) (A)	630	20kA
Short time withstand current I _k (kArms/1sec)	20	20
Making Capacity I _{ma} (kA peak)	50	50
Index Protection	IP3X cable front cover (IP67 Gas Tank)	IP3X cable front cover (IP67 Gas Tank)
Humidity (%)	95	95
Utilization temperature (°C)	-25 to +40	-25 to +40
Components		
Switching Devices	3 positions LBS 630A and ES	CB 200A and ES
Bushing type	C = bolted M16 630A	C = bolted M16 630A
Interlocking of the access to the bushing compartment	Bolted type	Bolted type
Height of the cable connectors (Bottom Entry)	703 mm (std)	703 mm (std)
Type of cables	Single/Three cores, dry type	Single/Three cores, dry type
Voltage indicator	Integrated (VPIS)	Integrated (VPIS)
Gas pressure monitor	Manometer without pressure switch	Manometer without pressure switch
Operation Mechanism	Manual	Manual
Painting and Color	SF6 tank no painting, Enclosure RAL9002, Front Plate RAL9017	SF6 tank no painting, Enclosure RAL9002, Front Plate RAL9017
Relay Protection	N/A	VIP 400 (3 phases OC/EF)
Current transformer	N/A	CUa 200A
Fuse Link	N/A	N/A
Height (mm)	1142	
Depth (mm)	710	
Width (mm)	829	
Net Weight (kg)	180	
Fixing to the grounds	The RM6's plinth has got 4 anchoring points which permit direct fixing to the ground	The RM6's plinth has got 4 anchoring points which permit direct fixing to the ground

Single Line Diagram

