TGXR6-24 Series SF_6 Fully-Insulated and Fully-Sealed Metal-Enclosed Ring Main Unit

1 Overview

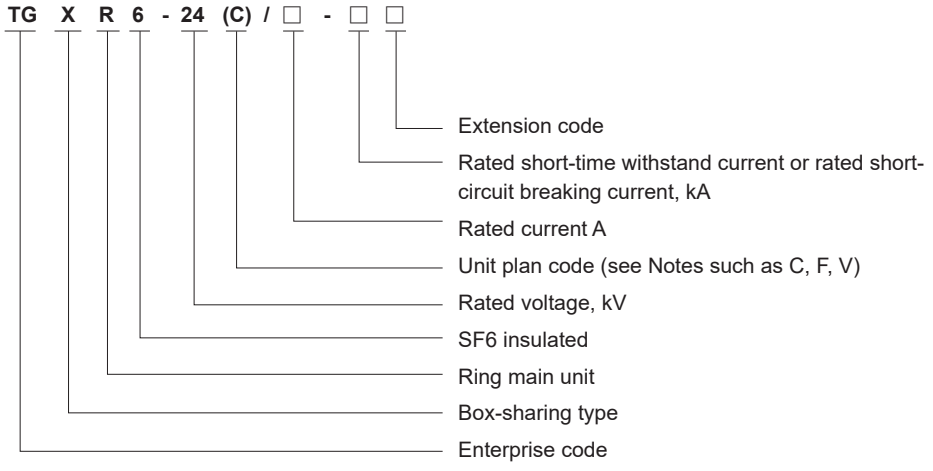
TGXR6-24 series ring main unit is a fully-sealed system, and its main circuit switch body and various live parts are enclosed in a stainless steel shell filled with SF_6 gas under a certain pressure. The entire switchgear is not affected by the external environment and ensures reliable operation and personnel safety realizing maintenance-free.

TGXR6-24 series ring main unit has standard module units and fixed combination module units. Multiple combinations can be realized through the selected extended busbars to achieve full modularization. The extended busbars are fully insulated and shielded to ensure high reliability and safety. The rich combinations of modules not only meet the needs of network nodes and end users, but also meet the needs of flexible use of compact switchgear in various secondar substations.

SF_6 gas insulated ring main unit is used in a power distribution system for control, protection, measurement, monitoring, and communication. With its many advantages such as small size, maintenance-free, and main circuit not affected by external environment, such switchgear is especially suitable for applications with high reliability requirements and with relatively harsh natural environments and conditions such as underground, plateau, and coastal areas. The product is widely used in many places such as industrial and mining enterprises, railways, airports, urban commercial centers, and residential area.

SF_6 fully insulated ring main unit complies with IEC 62271, IEC 60420, GB/T 3906, and GB/T 11022 standard.

2 Type Designation



Note: N means non-extension; L means left extension; R means right extension; LR means extension at both sides; C: Load switch unit; F: Combined apparatus unit; V: Circuit breaker unit

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3 Technical Parameters

No.	Item			Unit	Load switch unit	Combined apparatus unit	Circuit breaker unit
1	Rated voltage			kV	24	24	24
2	Rated freq.			Hz	50	50	50
3	Rated current			A	630	80 (depending on the current of fuse)	630
4	Rated insulation level	1 minute power frequency withstand volage	Phase-to-phase, phase-to-earth	kV	65	65	65
			Open contacts		79	79	79
			Control and aux. circuit		2	2	2
		Lighting impulse withstand voltage	Phase-to-phase, phase-to-earth		125	125	125
			Open contacts		145	145	145
5	Rated short-time withstand current			kA/s	25/4	—	25/4
6	Rated peak withstand current			kA	63	—	63
7	Rated short-circuit making current			kA	63	Limited by high-voltage fuse	63
8	Rated short-circuit breaking current			kA	—	Limited by high-voltage fuse	25
9	Rated transfer current			A	—	1200	—
10	Rated active load breaking current			A	630	—	—
11	Rated closed-ring breaking current			A	630	—	630
12	Mechanical life	Load switch / circuit breaker		Times	5,000	5,000	10,000
		Disconnect switch / earthing switch			3,000	3,000	3,000
13	Loop resistance			μΩ	≤150	——	≤150
14	Rated charge pressure (gauge pressure at 20°C)			MPa	0.04	0.04	0.04
15	Annual relative leakage rate of gas			Yearly	≤0.01%	≤0.01%	≤0.01%
16	Protection grade	Cabinet body			IP4X	IP4X	IP4X
		Gas box			IP67	IP67	IP67

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4 Operating Conditions

4.1 Altitude: ≤4000m (when the equipment is running at an altitude of 1,000 meters or more, please especially indicate it for adjustment of charge pressure when manufacturing).

4.2 Ambient temperature: Max. temperature: +40°C; Min. temperature: -25°C; mean temperature in 24h does not exceed 35°C.

4.3 Ambient humidity: the mean relative humidity in 24h does not exceed 95%; the mean monthly relative humidity does not exceed 90%.

4.4 Installation environment: There is no explosive or corrosive gas in the ambient air, and there is no severe vibration or shock applied in the installation site.

4.5 Seismic capacity: 8 magnitude scales.

4.6 Special conditions: The special operating conditions different from normal operating conditions must be agreed by the manufacturer and the end user. For particularly harsh operating environments, please contact the manufacturer and supplier.

5 Features

5.1 Modular design

Include load switch unit (C), load switch + fuse combined apparatus unit (F), circuit breaker unit (V), and busbar PT unit (PT). Different modules can be combined arbitrarily to form a ring main unit.

5.2 Fully insulated and fully sealed design

The primary live part (main busbar) and switch body of TGXR6 series switchgear are sealed in the gas box welded by stainless steel plate. The main circuit is connected externally through the bushing that complies with the DIN47636 standard and installed on gas box, and connected with the incoming and outgoing cables through the fully insulated and fully shielded separable connector. With the protection grade up to IP67, the inside of gas box is not affected by the external environment, and has the functions of short-time flood resistance and anti-condensation.

5.3 Flexible extensible design

TGXR6 series ring main unit can be combined into a box-sharing type non-extendable fixed ring network switchgear through various standard unit modules, and the different modules can be designed to an extensible unit to realize multiple combinations through dedicated fully insulated and fully shielded bus connectors for full modularity. The needs of different regions, different forms and different customers can be met, and a variety of power supply and distribution design solutions can be provided.

5.4 High safety and reliability

The primary live parts and switch body are sealed in a stainless steel gas box, and are connected to the outside through the bushing to avoid direct contact with the live part; the equipment has a reliable pressure release device and pressure relief channel to ensure the safety of personal equipment in case of a fault;

There is a complete mechanical interlock device to prevent misoperaiton to the full extent.

5.5 High reliability of mechanism

There is independently developed, designed and produced spring operating mechanism, and the quality of the mechanism is controlled from the entire process such as design source, production process, and running-in and debugging to ensure the reliability and stability of the mechanism, providing a high-quality operating mechanism solution for TGXR6 series ring main unit and the same type of SF6 charging cabinet.

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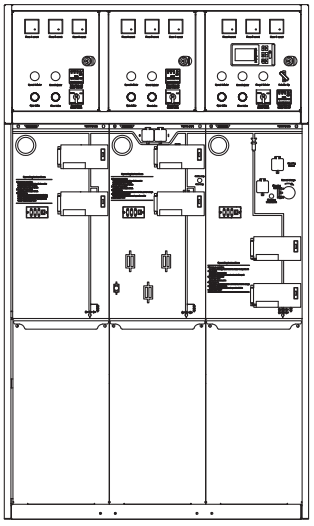
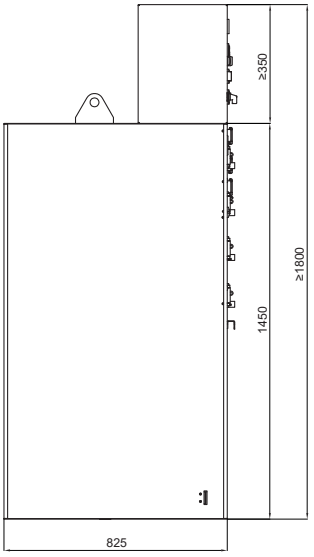
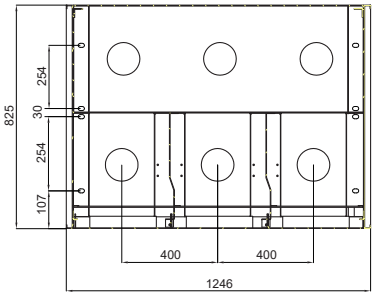
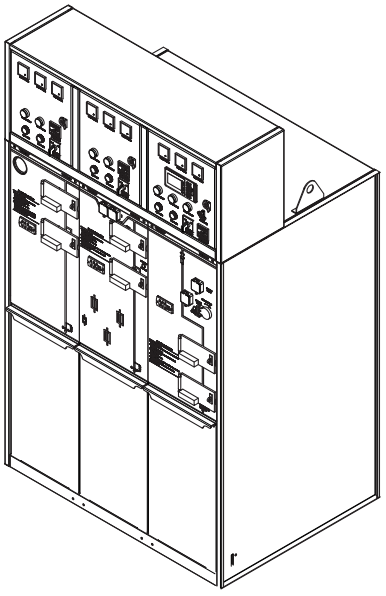
6 Outline and Installation Dimensions









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7 Ordering Technical Confirmation Form

Technical Confirmation Form for Ordering TGXR6-24 Series SF_6 Fully-Insulated and Fully-Sealed Metal-Enclosed Ring Main Unit

Confirm your requirements according to the items listed in table below:

<table>
<tr><td>Switch type</td><td colspan="3">C: Load switch cabinet V: Vacuum circuit breaker cabinet
F: Load switch + fuse combined cabinet
□ CCF □ CCCF □ CCV □ CCCV □ Others_____</td></tr>
<tr><td>Cabinet layout</td><td colspan="3">_____ (Arranged from the left to the right at the front of the operating panel)</td></tr>
<tr><td rowspan="2">Order Qty. (unit)</td><td rowspan="2"></td><td>Rated voltage (kV)</td><td>□ 24</td></tr>
<tr><td>Rated current (A)</td><td>□ 630 □ Others_____</td></tr>
<tr><td>Connector and cable accessories</td><td>□ No (standard configuration)
□ Yes (□ heat shrink □ cold shrink)
_____mm² Qty.: _____</td><td>Rated short-circuit breaking current (kA)</td><td>□ 20
□ 25 (except for fuse)</td></tr>
<tr><td>Barometer signal contact</td><td>□ No (standard configuration)
□ Yes
□ Others _____</td><td>Door panel color</td><td>□ RAL7035
□ Others_____</td></tr>
<tr><td>Gas box type</td><td colspan="3">Gas box type □ Common gas box
□ Independent gas box (extended mode: □ Top extended □ Side extended)
Others:_____</td></tr>
<tr><td rowspan="2">Shell and thickness</td><td colspan="3">Gas box: □ SU201 stainless steel (standard configuration)
□ SU304 stainless steel (standard configuration)
Thickness: □ 2.0mm (standard configuration) □ 3.0mm</td></tr>
<tr><td colspan="3">Cabinet frame: □ Carbon steel, plastic sprayed (standard configuration)
□ Al and zinc coated plate
Thickness: □ 1.5mm (standard configuration) □ 2.0mm</td></tr>
<tr><td>C load switchgear</td><td colspan="3">Earthing device: □ No (standard configuration) □ Yes
Load switch operating mode: □ Manual (standard configuration)
□ Electric (□ AC/DC220 □ DC48 Others_____)
Current transformer: □ No (standard configuration) □ Yes, transformation ratio
_____:_____ Capacity: _____ Accuracy:_____ (□ Two-phase □ Three-phase)
Zero-sequence current transformer:□ No (standard configuration)
□Yes, ransformation ratio_____ : _____ Capacity: _____ (□ Open type □ Fixed type)
Relay protection device: □ No (standard configuration)
□ Yes (□ AC/DC220 □ DC48 Others_____)
Ammeter:□ Pointer type (standard configuration) □ Electronic type
Temperature and humidity controller: □ Yes_____ □ No(standard configuration)
Other options: □Short circuit and ground fault indicator □ Lighting arrester
□ Lower door electromagnetic lock</td></tr>
<tr><td>V vacuum circuit breaker cabinet</td><td colspan="3">Disconnect switch: □ No (standard configuration) □ Yes (Grounding □ No □ Yes)
Operating mode: □ Manual(standard configuration)
Circuit breaker operating mode: □ Manual (standard configuration)
□ Electric (□ AC/DC220 □DC48 Others_____
Current transformer: □ No (standard configuration)
□Yes,transformation ratio _____ : _____
Capacity: _____ Accuracy:_____(□ Two-phase □ Three-phase)</td></tr>
</table>

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V vacuum circuit breaker cabinet	Zero-sequence current transformer: □ No (standard configuration) □Yes, transformation ratio _____ : _____ Capacity: (□ Open type □ Fixed type) Relay protection device: □ No (standard configuration) □ Yes(□ AC/DC220 □ DC48 Others ____) Ammeter: □ Pointer type (standard configuration) □ Electronic type Temperature and humidity controller: □ Yes □ No (standard configuration) Other option: □ Short circuit and ground fault indicator □Lighting arrester □ Lower door electromagnetic lock	
F load switch + fuse combined cabinet	Load switch: Earthing □ No □ Yes (standard configuration) Fuse grounding switch: □ No □ Yes (standard configuration) Operating mode: □ Manual (standard configuration) □ Electric (□ AC/DC220 □ DC48 Others_____ Rated current of fuse: _____ A Current transformer: □ No (standard configuration) □ Yes,transformation ratio _____:_____ Capacity: _____ Accuracy:_____(□ Two-phase □ Three-phase) Zero-sequence current transformer: □ No (standard configuration) □ Yes, transformation ratio _____ : _____ Capacity: (□ Open type □ Fixed type) Relay protection device: □ No (standard configuration) □Yes (□ AC/DC220 □ DC48 Others _____) Ammeter: □ Pointer type (standard configuration) □ Electronic type Temperature and humidity controller: □Yes □ No (standard configuration) Other option: □ Short circuit and ground fault indicator □Lightning arrester □ Lower door electromagnetic lock	
Dimensions	□ Standard shape (see catalog) □ Non-standard shape (figure attached)	
Other special requirements		Ordering unit (Seal) Sign:_____ Date:_____ Tel:_____

Note: Only the basic cabinet type scheme is listed above, and those options not checked shall be produced according to the TENGEN's standard configuration.