TGXR6-12 Series SF_6 Fully-Insulated and Fully-Sealed Metal-Enclosed Ring Network Switchgear

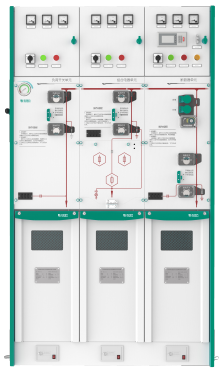


1 Overview

TGXR6-12 series SF_6 fully insulated and fully sealed metal-enclosed ring network switchgear (hereinafter referred to as "SF_6 fully insulated ring main unit") is a gas-insulated medium-voltage switchgear with three-phase AC 50Hz and rated voltage of 12kV. All live parts and switches are enclosed in a stainless-steel housing without any influence from the external environmental conditions for high reliability, safety and maintenance-free.

With modular design, SF_6 fully insulated ring main unit not only satisfies the requirements of end users and network nodes, but also meets the requirements of various distribution stations, box-type substations, and cable branch boxes., featuring with compact structure, safety and reliability, long life and maintenance-free.

SF6 fully insulated ring main unit complies with IEC 62271, IEC 60420, GB/T 3906, and GB/T 11022 standards.



2 Type Designation

TG X R 6 - 12 (C) / □ - □ □

- TG: Enterprise code
- X: Common-box type
- R: Ring main unit
- 6: SF_6 insulation
- 12: Rated voltage (kV)
- (C): Unit scheme code (such as C, F, V)
- □: Rated current (A)
- □: Rated short-time withstand current or rated short-circuit breaking current (kA)
- □: Extension code, see Note

Note: N means non-extension; L means left extension; R means right extension; D means extension at both sides.

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3 Technical Parameters

Name		Unit	Load switch unit	Combined apparatus unit	Circuit breaker unit
Rated voltage		kV	12		
Rated freq.		Hz	50		
Rated current		A	630	≤125	630/1250
Rated insulation level	Power frequency withstand voltage (phase-to-phase or phase to ground)	kV	42		
	Power frequency withstand voltage(between open contacts)		48		
	Power frequency withstand voltage (control and auxiliary circuits)		2		
	Lightning impulse withstand voltage(phase-to-phase or phase to ground)		95		
	Lightning impulse withstand voltage(between open contacts)		110		
Rated short-time withstand current	Main circuit (4s/2s)	kA	20/25	—	20/25
	Grounding circuit(2s)		17.4/21.7	—	17.4/21.7
Rated peak withstand current	Main circuit	kA	50/63	—	50/63
	Grounding circuit		43.5/54.3	—	43.5/54.3
Rated short-circuit breaking current		kA	—	31.5	20/25
Rated short-circuit making current		kA	50/63	80	50/63
Rated transfer current		A	—	1600	—
Mechanical life	Load switch / circuit breaker	Times	5000	5000	10000
	Isolating switch / grounding switch	Times	3000	3000	3000
Rated pressure of SF_6 gas(relative value at 20℃)	Rated charge pressure	MPa	0.035		
	Min. functional charge pressure		0.02		
Protection grade	Cabinet body		IP4X		
	Gas box		IP67		
Annual relative leakage rate of gas		%/Y	≤0.05		

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4 Operating Conditions

4.1 Ambient temperature: Max. temperature: +40℃; Min. temperature: -25℃; max. daily temperature difference does not exceed 25K;

4.2 Altitude: ≤1000m;

4.3 Ambient humidity: The daily mean of the relative humidity is not greater than 95%, and the monthly mean of relative humidity is not greater than 90%;

4.4 Pollution grade: Not exceed Level III;

4.5 Electromagnetic interference: The amplitude of electromagnetic interference induced in the secondary system is ≤ 1.6 kV

4.6 Seismic capacity: The seismic intensity does not exceed 8 degrees;

4.7 Installation environment: There is no explosive or corrosive gas in the ambient air. Note: Please contact the manufacturer if out of the above-mentioned working environmental conditions.

5 Product features

5.1 Standard modular design: SF6 full insulated ring main unit includes a load switch unit (C), load switch + fuse combined unit (F), circuit breaker unit (V), metering cabinet unit (M), and busbar PT unit. Different modules can be combined arbitrarily.

5.2 Fully insulated and fully sealed design: The primary live parts of the SF6 fully insulated ring main unit are fully sealed in a sealed gas box welded by stainless steel plates, and the incoming and outgoing wires are connected through a fully insulated, fully sealed, and shielded cable connectors, with the protection grade up to IP67. The inside of gas box is not affected by the external environment, and the product can run in humid environment with high altitude, high salt spray and heavy pollution.

5.3 Advanced welding and sealing technology: The stainless-steel plate used in gas box is cut by laser and welded by robot to fully guarantee the processing accuracy and welding quality. The assembled gas box adopts isobaric vacuuming and helium leak detection technology to ensure that the annual relative gas leakage rate of the gas box is less than 0.05%.

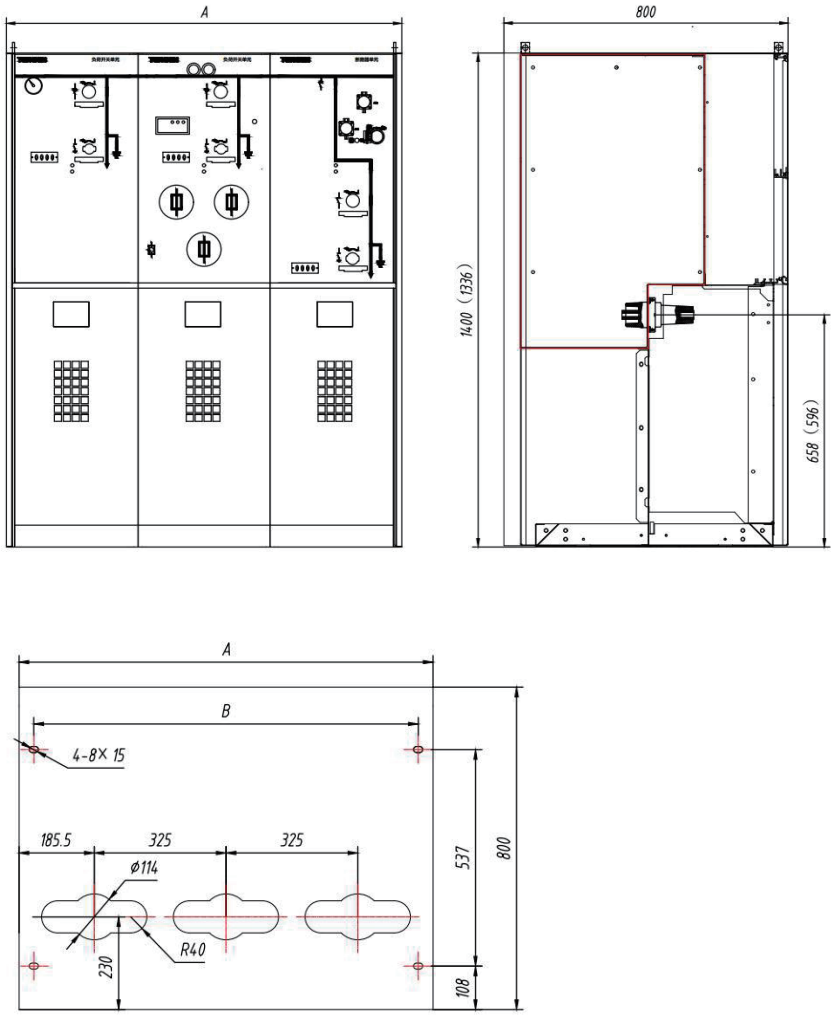
5.4 High safety and reliability: The primary live part and switch body are sealed in the stainless steel gas box, and are connected to the outside through the bushing to prevent the direct contact with the live body; the equipment has reliable pressure release channels and pressure relief channels to ensure the personal and equipment safety in case of failure.

5.5 Perfect "five-prevention" design scheme: SF6 fully insulated ring main unit is operated simply and reliably and manual and electric operations are both available. The overall structure is designed with a perfect "five-prevention" interlock design to ensure the safety of operation and usage of equipment.

5.6 Intelligent online monitoring and protection scheme realized: SF6 fully insulated ring main unit can be connected with automation system through communication network to realize telecontrol, telemetry and telecommand functions of switchgear; the fault isolation, recovery and network reconfiguration of power distribution network can also be realized.

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6 Outline and Installation Dimensions



Unit	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
Size A (mm)	371	696	1021	1346	1671	1996
Size B (mm)	297	622	947	1272	1597	1922

Note: The baffle is widened by 325mm per one additional unit, and the dimensions in parentheses are non-standard dimensions; the instrument box of different heights can be configured as required if any.

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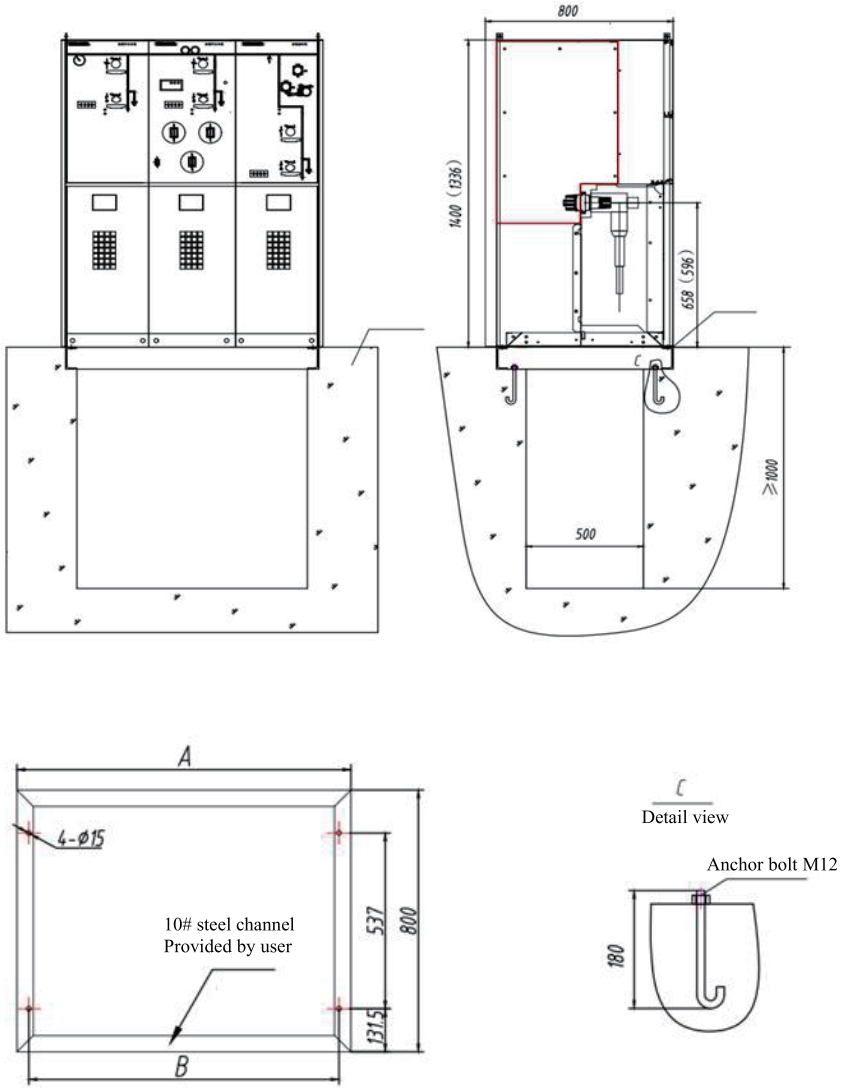


Fig. 1 Outline and installation dimensional diagram of SF6 fully insulated ring main unit

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7 Ordering Technical Confirmation Form

Technical confirmation form for ordering TGXR6-12 series SF_6 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>□ 12</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">Grounding 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 □ Lightning arrester
□ Lower door electromagnetic lock</td></tr>
<tr><td>V vacuum circuit breaker cabinet</td><td colspan="3">Isolating 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)
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</td></tr>
</table>

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F load switch + fuse combined cabinet	Load switch: Grounding □ 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 requirements!