VTM-12 Indoor High-Voltage AC Permanent Magnet Vacuum Circuit Breaker

1 Overview

1.1 Suitable for switching various loads with different properties and frequent operations in three-phase AC 50Hz, 10kV power system.

1.2 For protection and control of electrical equipment used in industrial and mining, enterprises, power plant, and substation.

1.3 With central handcart type switch cabinet and XGN fixed switch cabinet provided for KYN28A-12(GZS1).

1.4 Standard

GB/T 1984-2014 High-voltage alternating-current circuit-breakers
GB/T 11022-2011 Common specifications for high-voltage switchgear and controlgear standard
DL/T 402-2016 High-voltage alternating-current circuit-breakers

2 Type Designation

VT M - □ / M □ - □

- Rated short-circuit breaking current (kA)
- Rated current (A)
- Permanent magnet operating mechanism
- Rated voltage (kV)
- Design code
- Indoor vacuum circuit breaker

3 Technical Parameters

No.	Name	Unit	Value		
1	Rated voltage	kV	12		
2	Rated power frequency withstand voltage (1 minute)		42		
3	Rated lighting impulse withstand voltage (peak)		75		
4	Rated frequency	Hz	50		
5	Rated current	A	630 1250	630 1250 1600 2000 2500 3150	1250 1600 2000 2500 3150 4000
6	Rated circuit-breaker breaking current	kA	20、25	31.5	40
7	Rated short-circuit making current (peak)		50、63	80	100
8	Rated short-time withstand current		20、25	31.5	40
9	Rated peak withstand current		50、63	80	100
10	Rated short-circuit duration	S	4		
11	Rated operating sequence		O—0.3s—CO—180s—CO	O—180s—CO—180s—CO	
12	Rated short-circuit breaking current ON/OFF times	Times	30 (50 customized)		
13	Mechanical life		30,000		
14	Rated operating voltage	V	220/110		
15	Allowable accumulative wear thickness of dynamic and static contacts	mm	3		

Note: A forced air-cooled is required for 4000A and above rated current.

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4 Operating Conditions

4.1 The ambient air temperature does not exceed 40°C, the average measured within 24h does not exceed 35°C, and the minimum ambient air temperature is -1°C;

4.2 Altitude: Not higher than 1,000 meters;

4.3 The surrounding air is not polluted obviously by dust, smoke, corrosion or flammable gas, steam, and salt mist;

4.4 Humidity conditions: daily mean value is not greater than 95%; monthly mean value is not greater than 90%; the average of water vapor pressure is not greater than 2.2kPa; the average of the monthly water steam pressure is not greater than 1.8KPa;

4.5 Vibration or ground movement from the outside of switchgear or control equipment can be negligible;

4.6 The amplitude of the conduced electromagnetic interference in the secondary system cannot exceed 1.6kV;

4.7 Special use conditions

If the altitude at the installation site exceeds 1,000 meters, or the ambient air temperature exceeds the limit specified in the normal working conditions or the installation site is highly humid to easily cause condensation, please contact our company for customization.

5 Features

5.1 Excellent overall performance of circuit breaker

5.1.1 The arc extinguish chamber and operating mechanism of circuit breaker are configured at front and rear, and are connected into a whole through the transmission mechanism.

5.1.2 The mechanical life is not below 30,000 times.

5.2 The advanced vacuum arc extinguish chamber uses copper-chromium alloy contact and longitudinal magnetic field contact structure.

5.3 Enhanced insulating cylinder

5.3.1 The insulating cylinder is formed with new APG process.

5.3.2 The inner skirt edge and reinforced ribs are provided in the insulating cylinder, improving the insulation level and dynamic stable current resistant capacity.

5.3.3 The vacuum arc extinguish chamber is installed in an insulating cylinder to efficiently prevent damage and surface contamination due to other objects while shortening the overall size of circuit breaker obviously.

5.4 Flexible and simple operating mechanism

5.4.1 The operating mechanism uses a permanent magnet mechanism with electric closing / opening and manual emergency opening functions.

5.4.2 When the circuit breaker is working, the energy from the permanent magnet mechanism will be transferred to the link mechanism through the output cam and then to the dynamic contact through the link mechanism.

5.4.3 No adjustment is required with very little maintenance.

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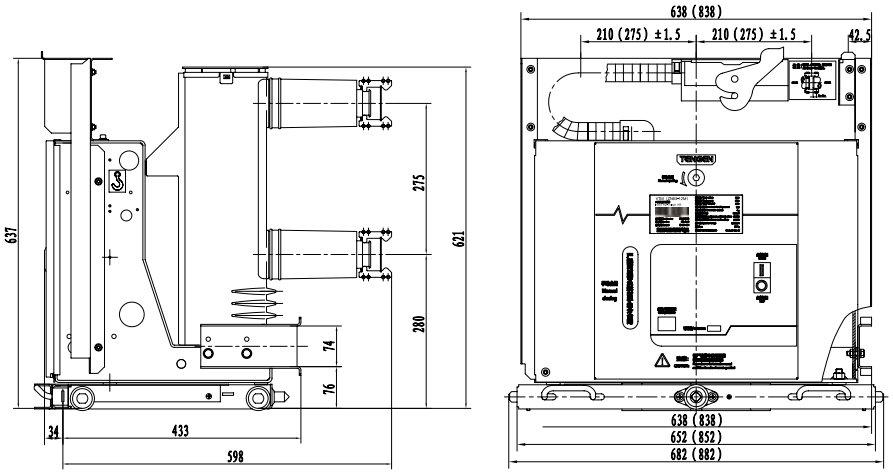
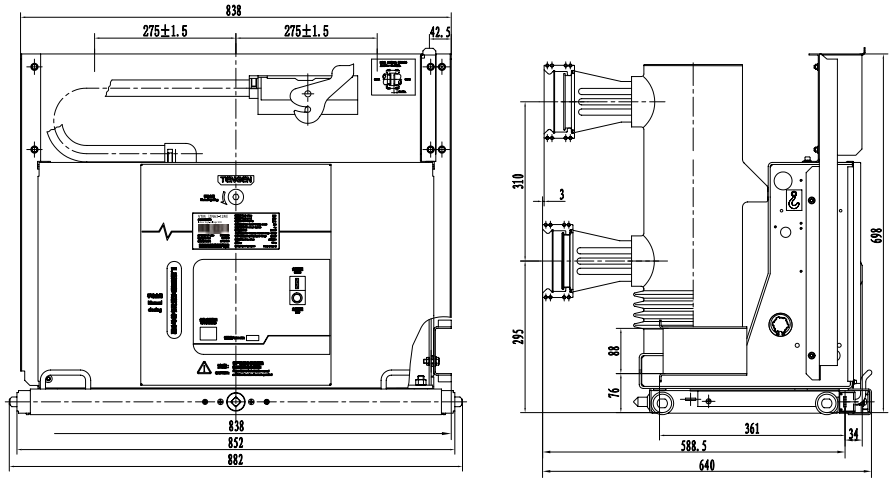
6 Outline and Installation Dimensions

6.1 Outline and installation dimensions of VTM-12 handcart type permanent magnet circuit breaker



Rated current (A)	630	1250	1600
Rated short-circuit breaking current (kA)	20/25/31.5	25/31.5/40	31.5/40
Size of matched static contact (mm)	Φ35	Φ49	Φ55
Phase distancing (mm)	210±1.5		

Note: The meshing size between dynamic and static contacts is not less than 15mm.



Rated current (A)	1600	2000	2500-4000
Rated short-circuit breaking current (kA)	31.5/40		
Size of matched static contact (mm)	Φ79		Φ109
Phase distancing (mm)	275±1.5		

Note:
1. The meshing size between dynamic and static contacts is not less than 15mm;
2. A forced air-cooled is required when the rated current is 4000A.

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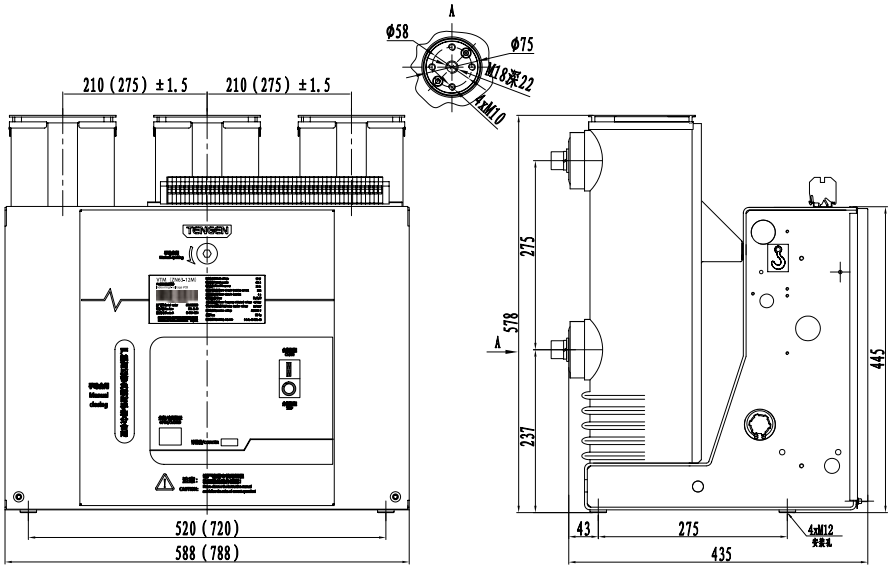
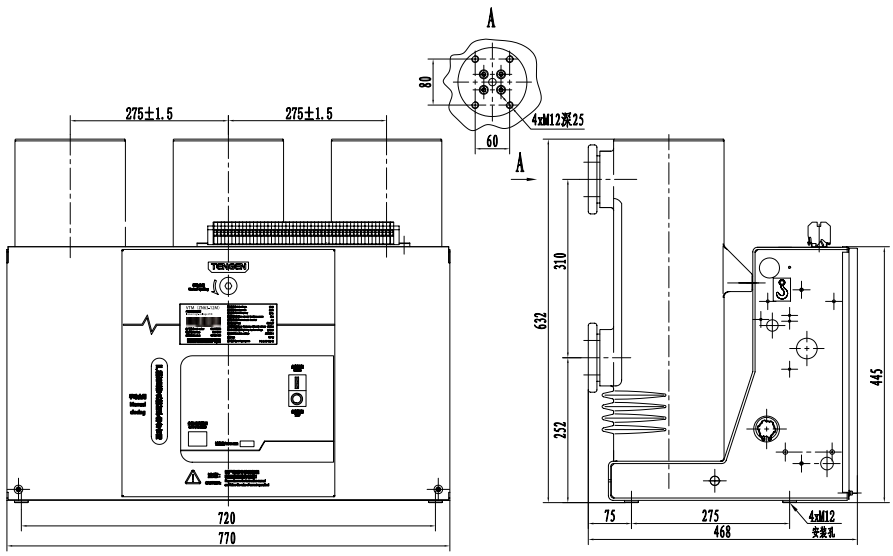
6.2 Outline and installation dimensions of VTM-12 fixed permanent magnet circuit breaker



Rated current (A)	630	1250	1600
Rated short-circuit breaking current (kA)	20/25/31.5	25/31.5/40	31.5/40
Phase distancing (mm)	210±1.5		



Rated current (A)	2000	2500	3150	4000
Rated short-circuit breaking current (kA)	31.5/40			
Phase distancing (mm)	275			

Note: A forced air-cooled is required for 4000A and above rated current.

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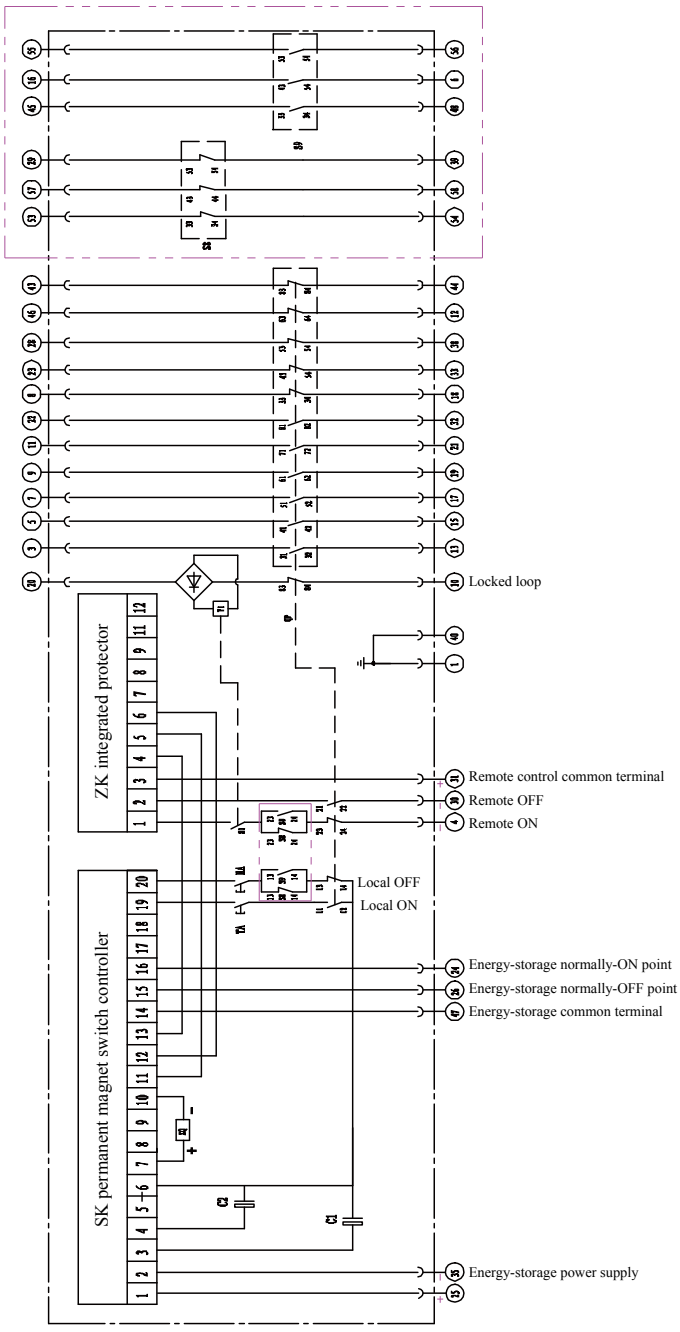
7 Secondary Scheme Schematic Diagram



Note: Handcart type is marked with double dots line. No this connector is required for fixed type; 2.5mm^2 is available for 25# and 35# lines.

S8, S9: Test position and work position	XQ: Closing and opening coils	SK: Permanent magnet switch controller	ZK: Integrated controller
HA: Local ON button	TA: Local OFF button	QF: Auxiliary switch	C1-C2: Capacitor

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8 Ordering Technical Confirmation Form

Technical Confirmation Form for Ordering VTM-12 Indoor High-Voltage AC Permanent Magnet Vacuum Circuit Breaker

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

Product model	☐ Handcart type ☐ Fixed type	
Order quantity (pcs)		Primary structure: ☐ insulated cylinder type ☐ Sealed pole type
Rated current (A)	☐ 630 ☐ 1250 ☐ Others_____	
Rated short-circuit breaking current (kA)	☐ 20 ☐ 25 ☐ 31.5 ☐ 40	
Phase distancing (mm)	☐ 210 ☐ 275	
Operating voltage (V)	☐ AC220 ☐ DC220 ☐ Others_____	
Lock device	ON lock: ☐ No lock (standard configuration) ☐ With lock, operating voltage_____V Handcart lock: ☐ No lock (standard configuration) ☐ With lock, operating voltage_____V	
Handcart type Chassis cart option (this option is not required for fixed type)	Earthing: ☐ Bottom friction earthing (standard configuration ☐ Rails earthing at both sides ☐ Contact earthing Program lock: ☐ No (standard configuration) ☐ With chassis cart locked ☐ With circuit breaker baffle locked Cabinet door interlock: ☐ No (standard configuration) ☐ With door closing interlock function	
Fixed interlock (This item is not available for handcart type)	Spindle extended: ☐ No (standard configuration)） ☐ Left____☐ Right____	
Secondary wiring scheme	☐ TENGEN's standard scheme (see catalog) ☐ No-standard scheme (scheme should be provided)）	
Outline dimensions	☐ TENGEN's standard appearance(see catalog) ☐ No-standard appearance(scheme should be provided)	
Other special requirements		Ordering unit (seal) Sign: _____ Confirmation date:_____ Tel: _____

Note: If not ticked, all options shall be manufactured according to the TENGEN's standard configurations.