

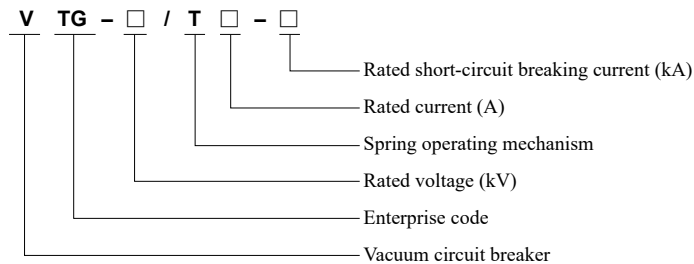
VTG-40.5 Indoor Medium-voltage AC Vacuum Circuit Breaker



1 Overview

- 1.1 Suitable for three-phase AC 50Hz, 35kV power system for switching various loads of different natures, and for occasions with frequent operations.
- 1.2 For the protection and control of electrical equipment used in industrial and mining, enterprises, power plants and substations.
- 1.3 Suitable for KYN61-40.5 handcart type switchgear.
- 1.4 Standard
 - GB/T 1984 High-voltage alternating-current circuit-breakers
 - GB/T 11022 Common specifications for high-voltage switchgear and controlgear standard
 - DL/T 402 High-voltage alternating-current circuit-breakers

2 Type Designation



3 Technical Parameters

No.	Name	Unit	Value	
1	Rated voltage	kV	40.5	
2	Rated lightning impulse withstand voltage (peak)		185	
3	1 minute power frequency withstand voltage		95	
4	Rated frequency	Hz	50	
5	Rated short-circuit breaking current	kA	25	31.5
6	Rated current	A	630A ~ 2500A	
7	Rated short-time withstand current	kA	25	31.5
8	Rated peak withstand current		63	80
9	Rated short-circuit making current (peak)	kA	63	80
10	1 minute power frequency withstand voltage of the secondary circuit	V	2000	
11	Rated operation sequence		O-0.3s-CO-180s-CO	
12	Rated short circuit duration	s	4	
13	Rated capacitor bank breaking current	A	630	
15	Mechanical life	times	10,000	
16	Rated short-circuit breaking current ON/OFF times		20	
17	Allowable cumulative wear thickness of moving and fixed contacts	mm	3	
18	Rated closing and opening operating voltage	V	AC220/110, DC220/110	

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No.	Name	Unit	Value
19	Clearance between open contacts, overtravel	mm	Clearance 18±1 Overtravel 5±1
21	Contact closing bounce time	ms	≤ 3
22	Three-phase closing and opening synchronization		≤ 2
23	Average opening speed	m/s	1.8±0.2
24	Average closing speed		0.8±0.2
25	Closing time	ms	≤ 100
26	Opening time		20 ~ 50
27	Main circuit resistance	μΩ	≤ 80(≤ 1600A), ≤ 60(≥ 2000A)
28	Rebound amplitude of breaking contact	mm	≤ 2

4 Operating Conditions

- 4.1 The ambient air temperature does not exceed +40°C, and the mean value measured within 24h does not exceed 35°C, and the min. ambient air temperature is -15°C;
- 4.2 Altitude: ≤1,000 meters.
- 4.3 There is no obvious pollutions such as dust, smoke, corrosion or flammable gas, steam gas, or salt spray in the ambient air.
- 4.4 Humidity conditions: The daily mean is not greater than 95%, and the monthly mean is not greater than 90%; the mean value of water steam pressure is not greater than 2.2KPa, and the monthly mean of water steam pressure is not greater than 1.8KPa;
- 4.5 Vibration or earthquake from the outside of the switchgear or controlgear can be omitted;
- 4.6 The magnitude of the electromagnetic interference induced in the secondary system does not exceed 1.6kV.
- 4.7 Special working conditions
 If installed at the place where the altitude exceeds 1,000 meters, the ambient air temperature is out of the limit value specified by the normal working conditions or condensation may easily occur due to high humidity, please contact our company for customization.

5 Structure And Working Principle

- 5.1 Reliable modular spring operating mechanism
 The spring operating mechanism of circuit breaker is up-down arranged with manual and electric energy storage functions. With small size, the circuit breaker has high overall rigidity and consistent operating performance providing high stable operation.
- 5.2 Main conductive circuit is of the solid-sealed type
 Main conductive circuit of circuit breaker is of the solid-sealed structure. The vacuum arc extinguish chamber and conductive parts of the primary main conductive circuit are overall solid-sealed in the pole through the advanced APG integrated forming process, suitable for various severe weather conditions. By fully considering the requirements of the harsh working conditions, this insulation structure is designed not only to prevent the influence of the external environment on the conductive circuit but also to prevent dust and foreign matters from entering main circuit. Furthermore, there is high resistance for voltage effect even in the damp-heat and severe dirty environment.

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5.3 Standard breaking and closing function module

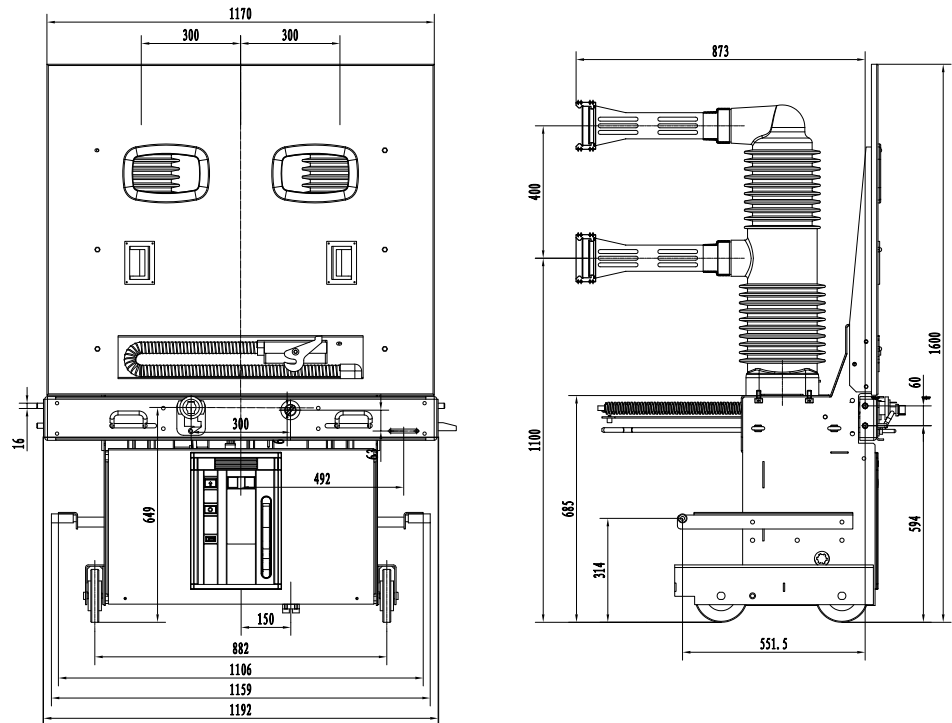
The circuit breaker is characterized by use of modular spring operating mechanism for convenient maintenance, fast replacement, and short power outage time for inspection. In addition, as the modular mechanism used as spare part has been lubricated with special grease and well-adjusted with a long storage period, no adjustment is required for replacement of the entire mechanism without changing the dynamic property of circuit breaker, minimizing the maintenance and inspection workload during operation. The failed modular structure can also be as spare part after repair and maintenance by the manufacturer.

5.4 Excellent handcart interchangeability and adaptation

The external dimensions of circuit breaker are basically consistent with those from the peer manufacturer, so that their handcarts can be interchanged conveniently for strong adaption and wide application. The circuit breaker is of the floor-mounted handcart type structure for convenient field inspection and regular maintenance by user without transferring handcart, suitable for KYN61-40.5 high-voltage complete switchgear.

6 Outline and Installation Dimensions

VTG-40.5 Outline and installation dimensions

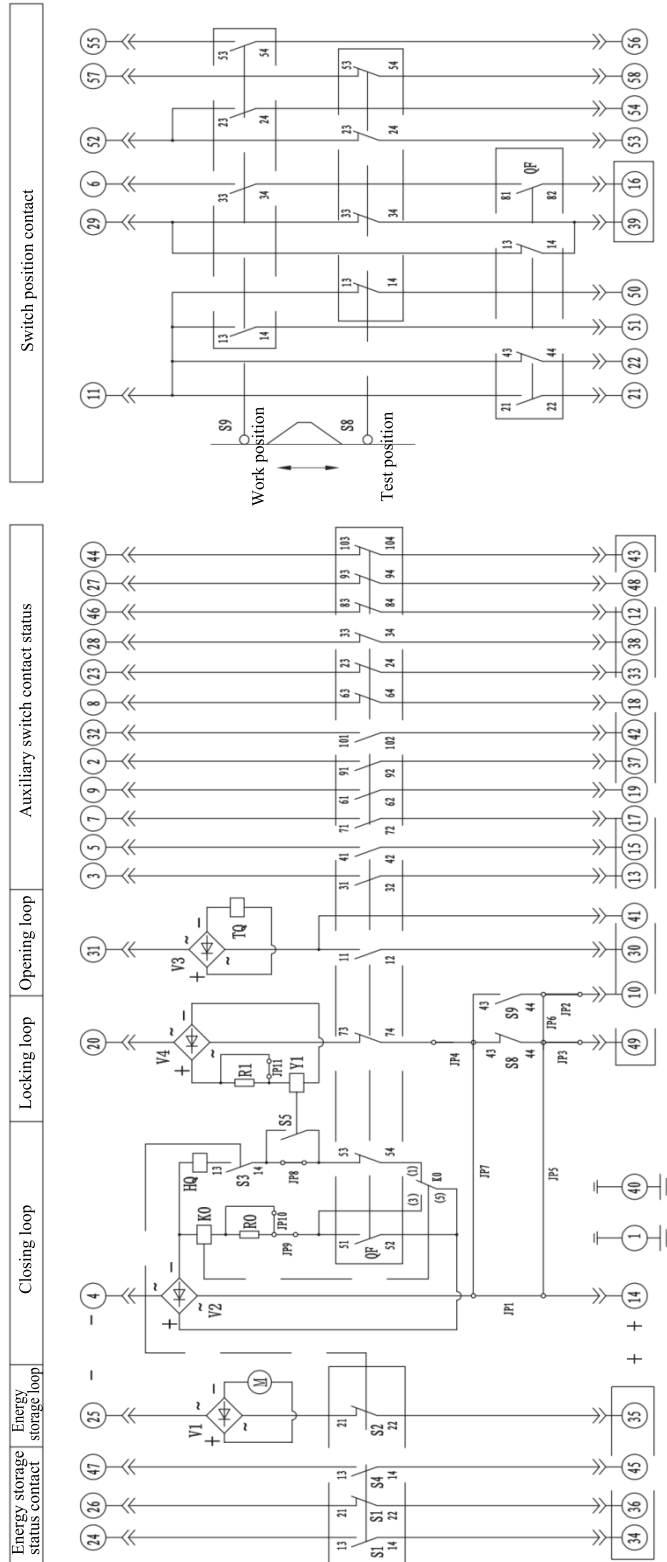


Rated current	630	1250	1600	2000	2500
Rated short-circuit breaking current	20/25/21.5			31.5	
Size of matched fixed contact	Φ35	Φ49	Φ55	Φ79	Φ109
Matched cabinet width	1400				

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7 Electrical Schematic Diagram

Electrical principle of interior of circuit breaker. The figure below shows the circuit breaker at the discharged and opening status



Operating power selector:

Jumper status	1-m	q-p
Jumper configuration	JP10	JP11
Operating power	AC/DC220V	AC/DC110V

Option wiring layout:

Jumper status	JP1	JP2	JP3	JP4	JP5	JP6	JP7	JP8	JP9
With lockout	✓	✓	✓	✓	✓	✓	✓	✓	✓
Without lockout	✓	✓	✓	✓	✓	✓	✓	✓	✓
With anti-jump	✓	✓	✓	✓	✓	✓	✓	✓	✓
Without anti-jump	✓	✓	✓	✓	✓	✓	✓	✓	✓

Notes: "✓" indicates disconnection; "—" indicates connection

Legend:

- T (1-38) 58-core aviation plug
- K0 Internal anti-jump relay (optional)
- V1-V4 Rectifier
- Y1 Locking electromagnet coil (optional)
- M Energy storage motor
- R0-R1 Resistance
- HQ Closing trip coil
- TQ Opening trip coil
- S9 Aux. switch (switched at the work position)
- S8 Aux. switch (switched at the test position)
- JP1-JP11 Jumper
- S5 Locking electromagnet microswitch (optional)
- S1-S4 Travel switch (switched after energy storage of closing spring)
- QF Aux. switch 10-NO and 10-NC (switched when opening or closing)

Notes:

- The circuit breaker is in the test position at the opening and discharged state.
- When operating under the DC power supply, the polarities in the dashed box shall be same, and the motor shall be wired according to the polarity shown in figure.

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8 Ordering Technical Confirmation Form

Technical Confirmation Form for Ordering VTG-40.5 Indoor Medium-voltage AC Vacuum Circuit Breaker

Please determine your requirements according to the items listed in table below:

Conductive part structure	<input type="checkbox"/> Solid-sealed	
Order qty. (unit)		
Rated current (A)	<input type="checkbox"/> 630 <input type="checkbox"/> 1250 <input type="checkbox"/> 1600 <input type="checkbox"/> 2000 <input type="checkbox"/> Others _____	
Rated short-circuit breaking current (kA)	<input type="checkbox"/> 20 <input type="checkbox"/> 25 <input type="checkbox"/> 31.5	
Operating voltage (V)	OFF, ON: <input type="checkbox"/> AC220 <input type="checkbox"/> DC220 <input type="checkbox"/> Others _____ Stored energy: <input type="checkbox"/> AC220 <input type="checkbox"/> DC220 <input type="checkbox"/> Others _____	
Anti-hop relay	<input type="checkbox"/> No (standard configuration) <input type="checkbox"/> Yes	
Closing lockout	<input type="checkbox"/> No (standard configuration) <input type="checkbox"/> Yes (operating voltage _____ V)	
Propelling mechanism configuration	Stroke (mm)	<input type="checkbox"/> 610(standard configuration) <input type="checkbox"/> Others _____
	Earthing switch interlock	<input type="checkbox"/> Yes (standard configuration) <input type="checkbox"/> No
	Position aided	<input type="checkbox"/> Yes S8, S9 (standard configuration) <input type="checkbox"/> No
Earthing device	Bottom fiction grounding (standard configuration)	<input type="checkbox"/> Others _____
	<input type="checkbox"/> Left <input type="checkbox"/> Right	
Aviation plug	<input type="checkbox"/> Standard configuration 58-core (outlet at middle) <input type="checkbox"/> 46-core (outlet at left)	
Hose length (mm)	<input type="checkbox"/> Standard configuration: 1.4m outgoing line at middle; 1m outgoing line at side <input type="checkbox"/> Others _____	
Secondary wiring scheme	<input type="checkbox"/> Tengen standard scheme (see Catalogue) <input type="checkbox"/> Other scheme (sheme should be provided)	
Dimensions	<input type="checkbox"/> Tengen standard scheme (see Catalogue) <input type="checkbox"/> Other scheme (sheme should be provided)	
Standard accessories	One handcart handle, one aviation socket port (58-core, with 50 pins (1.5 mm ²)), one coiled pipe (about 300mm); for 1250A and below, the contact surface of aluminum contact arm is ordinarily plated with silver as standard configuration; for 1600A and above, the copper contact arm is ordinarily plated with silver as standard configuration	
Other special requirements		Ordering unit (seal) Signature: _____ Confirmation date: _____ Tel: _____

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