ZN85-40.5 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 matures, 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

Z N 85 – 40.5 / T □ – □

- Rated short-circuit breaking current (kA)
- Rated current (A)
- Spring operating mechanism
- Rated voltage (kV)
- Design code
- Indoor
- Vacuum circuit breaker

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 ~ 2000A	
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	

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No.	Name	Unit	Value
18	Rated closing and opening operating voltage	V	220, 110
19	Contact distance, overtravel	mm	Opening distance 18±1 Overstroke 4±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 opening contact	mm	≤ 2

4 Operating Conditions

4.1 The ambient air temperature does not exceed +40℃, and the mean value measured within 24h does not exceed 35℃, and the min. ambient air temperature is -15℃;

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. The circuit breaker features with small size, high overall rigidity, consistent operating performance, and high stability.

5.2 Main conductive circuit is of the insulating cylinder type

Main conductive circuit of circuit breaker is of the sleeve type structure. The vacuum arc extinguish chamber of the primary main conductive circuit of circuit breaker is arranged in the closed insulating cylinder that is made of epoxy resin having reliable electromechanical properties through the advanced APG forming process. This insulating cylinder is used not only for installation support but also for insulation between phases and to earth. By fully considering the operating requirements of the national standard and harsh working conditions, this insulating cylinder is designed not only to prevent the influence of the external environment on the vacuum arc extinguish chamber but also to prevent dust and

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foreign matters from entering main circuit. Furthermore, there is high resistance kept for voltage effect even in the damp-heat and severe dirty environment.

5.3 Standard opening and closing function module

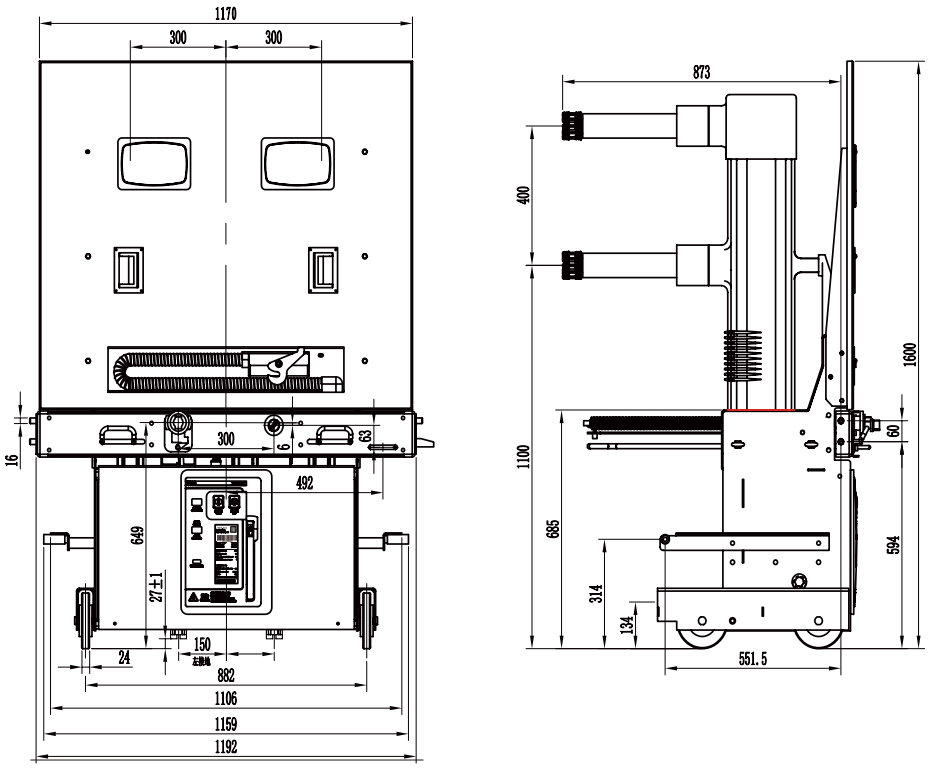
The circuit breaker is characterized by use of modular spring operating mechanism for convenient maintenance, fast replacement, and short power outage time for inspection. In addition, as the modular mechanism used as spare part has been lubricated with special grease and well-adjusted with a long storage 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 defective 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

6.1 Insulating cylinder type



Rated current (A)	630	1250	1600	2000	2500
Rated short-circuit breaking current (kA)	20/25/31.5		31.5		
Size of matching fixed contact (mm)	φ35	φ49	φ55	φ79	φ109
Width of matched cabinet (mm)	1400				

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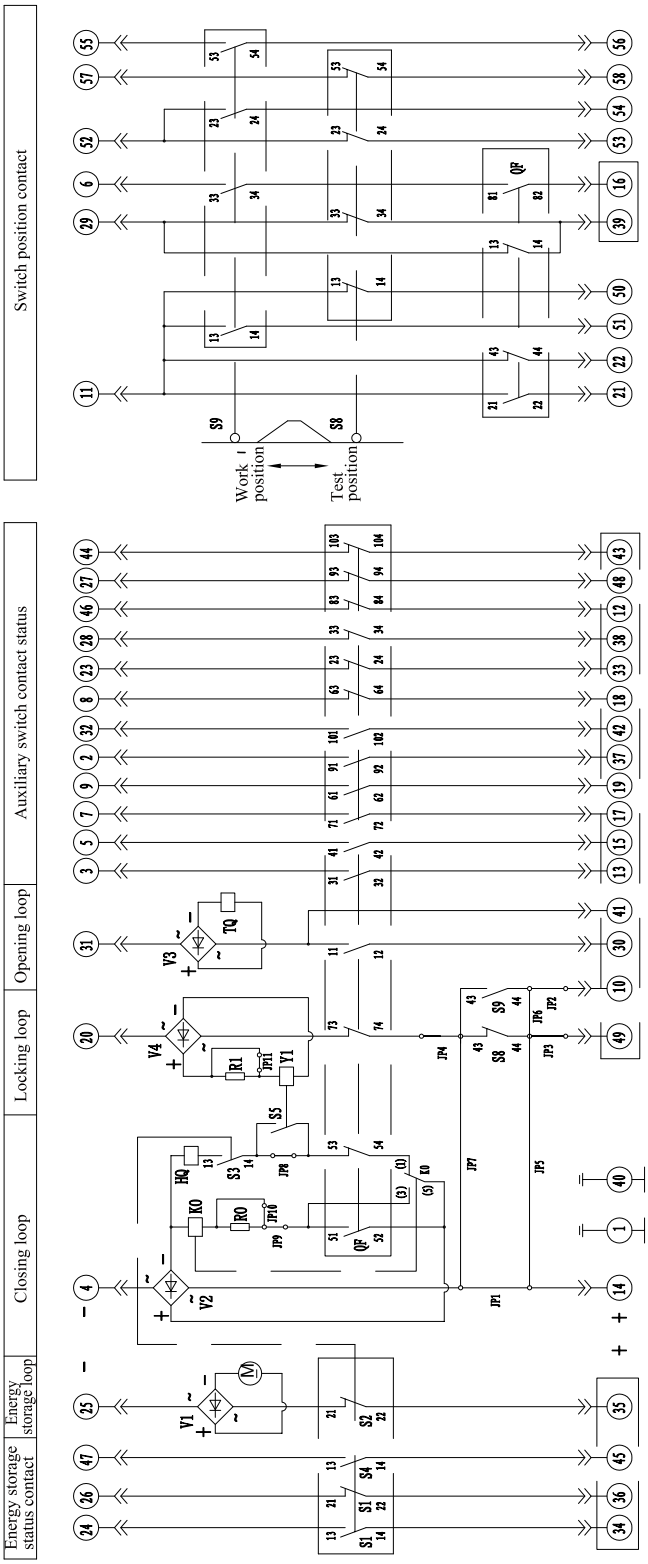
7 Electrical Schematic Diagram

Internal electrical principle of circuit breaker. The figure below shows the circuit breaker at the discharged and opening status



Option wiring layout:

Configuration \ Jumper state		JP1 (a–b)	JP2 (h–g)	JP3 (e–f)	JP4 (c–d)	JP5 (a–f)	JP6 (a–g)	JP7 (b–c)	JP8 (i–j)	JP9 (l–k)
With anti-jump	With lockout	√	√	√	√	/	/	/	/	√
	Without lockout	/	/	/	/	√	√	√	√	√
Without anti-jump	With lockout	√	√	√	√	/	/	/	/	/
	Without lockout	/	/	/	/	√	√	√	√	/

Notes: "/" indicates disconnection; "√" indicates connection

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8 Ordering Technical Confirmation Form

Technical Confirmation Form for Ordering ZN85-40.5 Indoor Medium-voltage AC Vacuum Circuit Breaker

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

Conductive part structure	□Insulating cylinder type	
Order qty. (unit)		
Rated current (A)	□630 □1250 □1600 □2000 □Others_____	
Rated short-circuit breaking current (kA)	□20 □25 □31.5	
Operating voltage (V)	OFF, ON: □AC220 □DC220 □Others_____ Stored energy: □AC220 □DC220 □Others_____	
Anti-hop relay	□No (standard configuration) □Yes	
Closing lockout	□No (standard configuration) □Yes (operating voltage_____V)	
Propelling mechanism configuration	Stroke (mm)	□ 610(standard configuration) □Others_____
	Earthing switch interlock	□Yes (standard configuration) □No
	Position aided	□Yes S8, S9 (standard configuration) □No
Earthing device	Bottom fiction grounding (standard configuration) □Left □Right	□Others_____
Aviation plug	□Standard configuration 58-core (outlet at middle) □46-core (outlet at left)	
Hose length (mm)	□Standard configuration: 1.4m outgoing line at middle; 1m outgoing line at side □Others_____	
Secondary wiring scheme	□Tengen standard scheme (see Catalogue) □Other scheme (sheme should be provided)	
Dimensions	□Tengen standard scheme (see Catalogue) □Other scheme (sheme should be provided)	
Standard accessories	Cart type: one energy-storing handle, one cart handle (length 80mm), one aviation plug female connector (58 core with 40 pieces of 1.5mm^2 pins), one coiled pipe (about 300mm length); 1250A and below standard Al contact arm contact surface is coated with common silver, and 1600A and above standard copper contact arm is coated with common silver. Fixed type: one energy-storing handle	
Other special requirements		Ordering unit (seal) Signature:_____ Confirmation date:_____ Tel:_____

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