

China YIFA Holding Group Co., Ltd.

ZN28(A)-12 indoor HV Vacuum Circuit Breaker

Indoor HV vacuum circuit breaker

- HV vacuum load switch
- HV isolating switch
- Operating mechanism
- Lightning arrestor
- Fuse



General

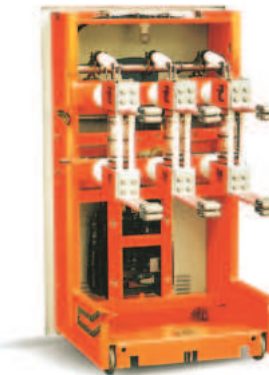
ZN28(A)-12 series indoor AC high-voltage circuit breaker is an indoor three-phase AC high voltage electric appliance of 50Hz and rated voltage 12kV, mainly mounted in the metal-clad enclosed cabinet, to protect and control the electric facilities in industrial and mining enterprise, power plant, transformer substation and so on, it also serves the location that needs the frequent operation.

This vacuum circuit breaker conforms to GB2003 High-voltage Alternating Current Circuit Breaker, JB/T20083.6-40.5 Indoor Alternating Current High-voltage Vacuum Circuit-breaker for Rated Voltages 3.6kV-40.5kV and DL/T403 Technical Specifications of Indoor High Voltage Vacuum Circuit Breaker for Rated Voltages 12-40.5kV for Order.

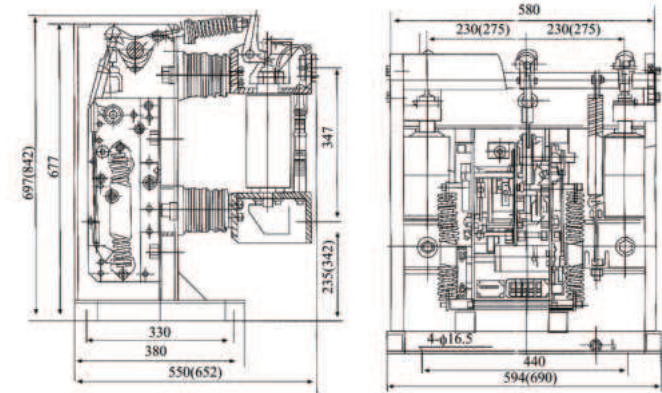


Main technical parameters

Item	unit	parameter			
Rated voltage	kV	12	12	12	12
Rated current	A	630,1000,1250	630,1000,1250	1250,1600,2000	2000,2500,3150
Rated short circuit dropout current	kA	20	25	31.5	40
Rated short circuit close current	kA	50	63	80	100
Rated peak withstand current	kA	50	63	80	100
Rated short-time withstand current	kA	20	25	31.5	40
Rated thermal stability time	s	4	4	4	4
Open circuit times of rated short circuit dropout current		50	50	50	50
Rated operating sequence	times	O-0.3s- CO-180s- CO			
Line frequency withstand voltage (effective value)	kV	42	42	42	42
Thunder impulse withstand voltage	kV	75	75	75	75
Mechanical life	times	10000	10000	10000	10000



Outline and installation dimension



VS1-12 Indoor Solid-encapsulated HV Vacuum Circuit Breaker



General

VS1-12 indoor solid-encapsulated HV vacuum circuit breaker (hereinafter referred to as circuit breaker) is an indoor three-phase AC high-voltage switchgear of 50Hz and rated voltage 7.2-12KV. This circuit breaker accords with our national standards like GB/T1984 Alternating Current High-voltage Circuit Breaker, JB3855 3.6-40.5kV Indoor Alternating Current High-voltage Vacuum Circuit Breaker as well as relevant IEC standards, it has the reliable interlocking function. Designed into fore and rear separate structure, it is used as the unit for fixed installation, in addition, it can be assembled with the chassis, as the individual handcart.

Function features

1. Employing the mature APG technique and advanced epoxy-resin solid encapsulation technology, the vacuum arc-extinguishing chamber, main conductive circuit, insulating support, etc. are combined organically to form an integrated solid-encapsulated pole, the surface of vacuum arc-extinguishing chamber is not affected with the environment, so as to really realize the maintenance free.

2.Ultra-low-resistance type vacuum interruption meets the requirements of temperature rise of large current type, and lowers the energy loss.

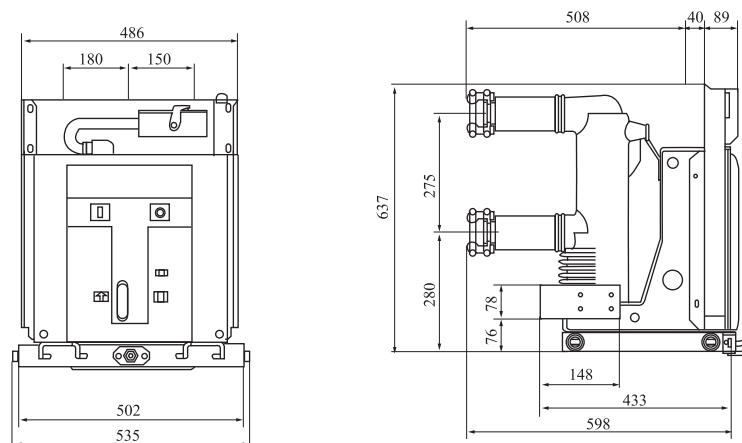
3. Owing to the modular spring operating mechanism, it presents the simple structure and stable performance.

4. Miniature design, the phase-to-phase distance is shorten by 30-60mm.

Main technical parameters

Item	unit	parameter
Rated voltage	kV	12
Rated frequency	Hz	50
Rated lighting impulse withstand voltage (peak)	kV	75
Rated (1 min) line frequency withstand voltage (effective value)	kV	42
Rated operating sequence	A	O-0.3s- CO-180s- CO
Rated current	kA	630 1250
Rated short circuit dropout current	kA	20 25 25 31.5
Rated shot circuit close current (peak)	s	60 63 63 80
Rated short circuit duration		4
Open circuit times of rated short circuit dropout current	times	30
Mechanical life	times	10000

Outline and installation dimension



VS1-12 Type Side-Mounted (Vbm7) Vacuum Circuit Breaker



General

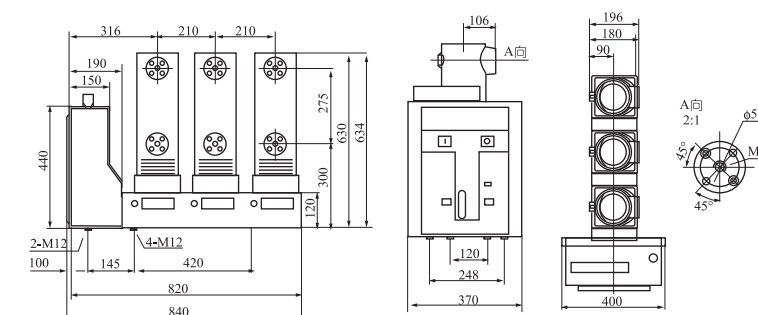
VS1-12 type side-mounted(VBM7) vacuum circuit breaker is an indoor high voltage switchgear, suitable for the three-phase power system of rated voltage 12kV and 50Hz, to protect and control the appliances, due to the special advantages, it is quite suitable for the occasion when the frequent operation at the rated current or breaking the short-circuit current is needed.

VS1-12 type side-mounted(VBM7)vacuum circuit breaker adopts the fixed type installation, mainly used for the fixed type switchgear, it can be used separately, it also can be used for the ring net power supply, box type transformer substation or kinds of non-standard power systems.

Main technical parameters

Item		unit	parameter		
Rated voltage		kV	12		
Max working voltage		kV	630	630	630
Rated current		A	1250	1250	1250
Rated short circuit breaking current		kA	20	25	31.5
Rated short circuit closing current		kA	50	63	80
Rated peak withstand current		kA	50	63	80
4S rated short circuit withstand current		kA	20	25	31.5
Rated insulation level	Power frequency withstand voltage (Before and after rated interruption)	kV	42(48)		
	Impulse withstand voltage (Before and after rated interruption)	times	75(84)		
Rated operating sequence			O-0.3s- CO-180s- CO		
Mechanical life		times	10000		
Rated short-circuit breaking current breaking times		times	50		
Rated closing voltage of operating mechanism (DC)		V	110,220		
Rated opening voltage of operating mechanism (DC)		V	110,220		
Clearance between open contacts		mm	11 1		
Over stroke(compression length of contact spring)		mm	3.5 0.5		
Three- phase opening and closing		ms	≤2		
Closing bouncing time of contacts		ms	≤2		
Average opening speed		m/s	0.9-0.12		
Average closing speed		m/s	0.4-0.8		
Opening time	At max operating voltage	s	≤0.05		
	At min operating voltage		≤0.08		
Closing time		s	0.1		
Main circuit resistance of each phase		μΩ	60	50	
Total thickness of permissible wear of moving and static contacts		mm	3		

Outline and installation dimension



VS1(ZN63) H.V Vacuum Circuit Breaker



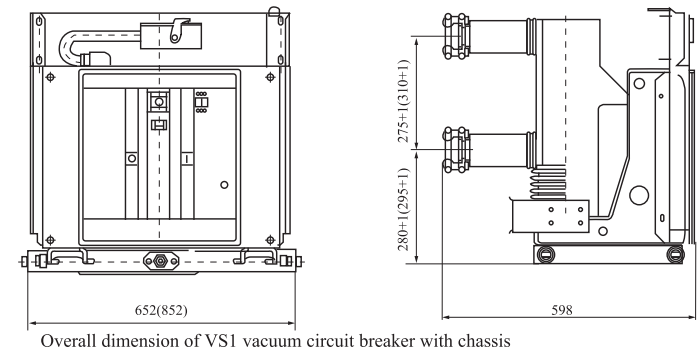
General

VS1(ZN63) series vacuum circuit breaker is an indoor three-phase AC high-voltage switchgear of 50 Hz and rated voltage 12KV, made by introducing the technology of Swiss ABB Company and according to domestic industrial development and production capacity. The entire structure of this product presents the integrated installation of switch body and operating mechanism. It adopts the composite insulation structure, with high insulation level, no pollution or explosion danger. Its operating mechanism is of spring energy-storage type, which be operated with alternating current or by manual.

Main technical parameters

Item		unit	parameter
Rated voltage		kV	12
Rated insulation level	1 min line frequency withstand voltage	kV	42
	Rated thunder impulse withstand voltage	kV	75
Rated current		A	630,1250,1600,2000
Rated short circuit breaking current		kA	20,25,31.5,40
Rated short circuit closing current		kA	50,63,80,100
Rated peak withstand current		kA	50,63,80,100
Rated short circuit withstand current (effective value)		kA	20,25,31.5,40
Rated current breaking times		times	50
Rated short-circuit duration		s	4
Rated operating sequence		times	O-0.3s- CO-180s- CO
Mechanical life		times	2000
Rated single capacitor bank breaking current		A	630
Rated back-to-back capacitor bank breaking current		A	400
Contactor torque		mm	11 1
Contact stroke		mm	3 0.5
Three-phase opening synchronization		ms	≤2
Closing bounce time		ms	≤2
Phase-to-phase distance		mm	210 1.5(275 1.5)
Contact pressure of closing contact		N	3200 100
Average break brake speed		m/s	0.9-1.2
Average close brake speed		m/s	0.55-0.8
Breaking time		ms	20-50
Closing time		ms	35-70
Accumulative Allowable Wear Thickness of Dynamic and Static Contacts		mm	3

Outline and installation dimension



VSM1-12 Indoor HV Permanent-Magnetic Vacuum Circuit Breaker



General

VSm1-12 indoor permanent magnetic vacuum circuit breaker is a new generation of circuit breaker adopting CDM series permanent-magnetic mechanism, it is an indoor three-phase AC high-voltage vacuum switchgear of 50Hz and rated voltage 12kV, suitable for the control and protection of power transmission and distribution system in the such fields as the power plant, transformer substation, industrial and mining enterprise, etc., especially, it is applicable for location that needs to break the important load and perform the frequent operation.

VSm1-12 indoor vacuum circuit breaker complies with the national standard GB1984-89 Alternating Current High-voltage Circuit Breaker, JB3855-85 Technical Specifications of Indoor Vacuum Circuit Breaker for Rated Voltages 10kV for Order as well as relevant IEC standards, with the reliable interlocking function. It has long-life vacuum arc-extinguishing chamber and maintenance-free epoxy-resin casting solid-encapsulated pole.The drive control units of both high-reliability CDM series permanent-magnetic mechanism and intelligent PMD series permanent magnetic mechanism ensure the maintenance free of mechanism.

VSm1-12 indoor AC HV vacuum circuit breaker is designed into the integrated structure, it is used as the unit for fixed installation, and it also can be assembled with the chassis, as the individual handcart.

Main technical parameters

Technical parameters of permanent-magnetic mechanism

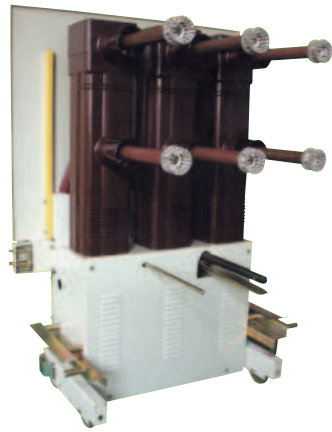
Name	Data		
Working voltage of auxiliary power supply of driver	AC	DC	220V
Closing control voltage	AC	DC	220V
Opening control voltage	AC	DC	220V
Temperature rise of mechanism coil	≤60k		

Rated technical parameter

Name	unit	parameter		
Rated voltage	kV	12kV		
Rated frequency	Hz	50Hz		
Rated current	A	630	1250	2000
Rated short time withstand current	kA	25	31.5	31.5
Rated thermal stable current (effective value)	kA	25	31.5	31.5
Rated short circuit dropout current	kA	25	31.5	31.5
Rated short circuit close current (peak)	kA	63	80	80
Rated dynamic stable current (peak)	kA	63	80	80
1 min power frequency withstand voltage of secondary circuit	kV	2		
Thermal stability time	s	4		
Rated lighting impulse withstand voltage (peak) phase-to-phase, to-ground/fracture	kV	75/85		
1 min power frequency withstand voltage(effective value), phase-to-phase, to-ground/fracture	kV	42/48		
Mechanical life		30000		
Rated operating sequence	times	O-0.3s- CO-180s- CO		
Open circuit times of rated short circuit dropout current	times	50		
Breaking times of rated current	times	30000		

ZN85-40.5 Indoor HV Vacuum Circuit breaker

ZN85-40.5 Indoor HV Vacuum Circuit breaker



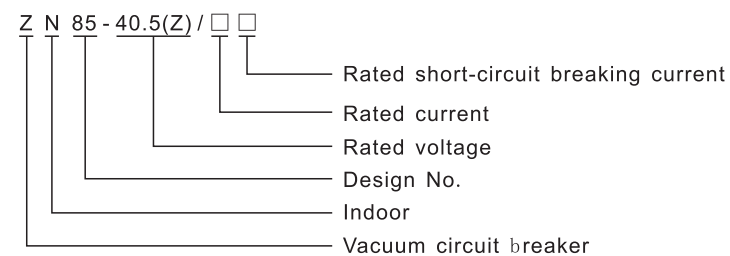
General

ZN85-40.5 indoor HV vacuum circuit breaker is an indoor three-phase AC device of 50Hz and rated voltage 450kV, with the special 3AV3 spring mechanism, the circuit breaker may be mounted in JYNI-40(Z) movable metal-enclosed switchgear or KYN61-40.5(Z) assembled metal-enclosed switchgear, it is the most ideal circuit breaker in 40.5kV device.

This series of product is featured with high technical parameters, strong breaking capacity, reliable operation, stable performance, long service life, simple maintenance, no explosion or pollution, it is used for protecting and controlling the electrical facilities of single-bus system in the industrial and mining enterprise, power plant, transformer substation, etc, it is also suitable for the location that needs switching the capacitor bank or performing the frequent operation.

Adopting the integrated and modular design, the circuit breaker is designed into superstructure and infrastructure, with the reasonable configuration, the arc extinguishing chamber is on the top, and the interlocking mechanism and operating mechanism are positioned at below. It employs 3AV3 spring operating mechanism, can run reliably without adjustment. The vacuum arc-extinguishing chamber is laid in the closed insulation barrel, so as to improve the insulation performance and shorten the entire size.

Type and its meaning



Service conditions

Ambient temp: -10℃(-25℃ in high and cold area)~+40℃

Altitude: 1000m.

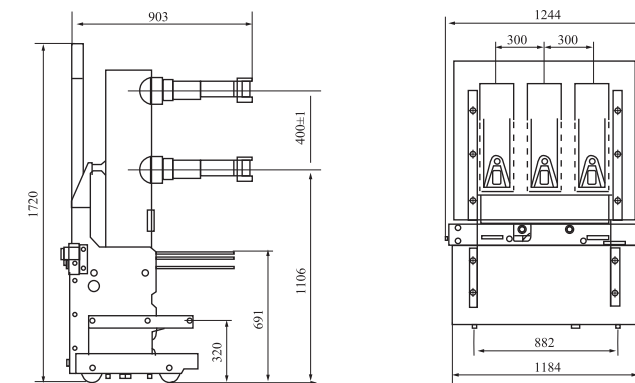
Relative humidity: daily average value is not more than 95%, and the monthly average is not more than 90% at +25℃.

The saturated vapor pressure: daily average value is not more than 2.2 10-3MPa, and the monthly average value is not more than 1.8 10-3MPa.

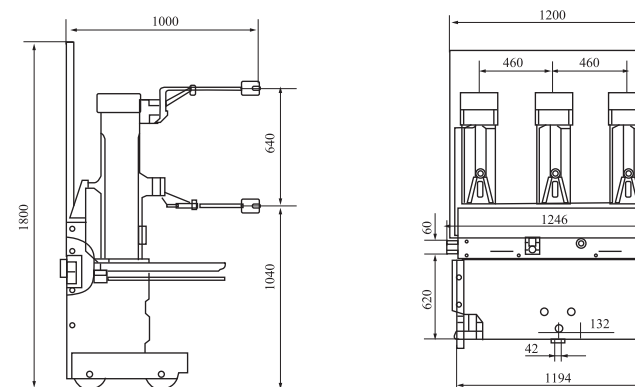
Earthquake intensity: not exceed M8.0

Not applicable for the location with fire, explosion, chemical corrosion or sharp shock.

Outline and installation dimension



Outline drawing of circuit breaker that is equipped with KYN61-40.5(Z)



Outline drawing of circuit breaker that is equipped with KYN1-40.5(Z)

ZN30-40.5C/1600-25 Indoor Handcart Type Vacuum Circuit Breaker



General

ZN-40.5 vacuum circuit breaker of ultra-long life is an indoor three-phase AC high-voltage electric equipment of rated voltage 40.5kV and 50Hz. It is suitable for controlling and protecting the power transmission and distribution system in industrial and mining enterprise and transformer substation, etc; especially, it is applicable for the industries like metallurgy, arc steelmaking that needs the frequent operation , serving as a control and protection device. This vacuum circuit breaker is of handcart type, with reasonable structure, simple maintenance and safe and reliable operation. It can be modified as required, such as PT handcart, PT with lightning arrester, handcart transformer, handcart, isolation handcart, etc.

This product conforms to the standard of GB1984-89 Alternating Current High-voltage Circuit Breaker.

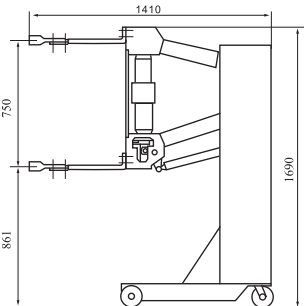
Main technical parameters

Item	unit	parameter
Rated voltage	kV	40.5
Rated lightning impulse withstand voltage	kV	185
1 min line frequency withstand voltage	kV	95
Rated frequency	Hz	50
Rated current	A	1250,1600,2000
Rated short circuit dropout current	kA	25 31.5
Rated short time withstand current	kA	25 31.5
Rated peak withstand current	kA	63 80
Rated short circuit duration	s	4
Rated short circuit dropout time	ms	=90
Rated short circuit close time	kA	80
Rated operating sequence		O-0.3s- CO-180s- CO
Close time	ms	50-85
Break time	ms	40-85
Open circuit times of rated short circuit dropout current	times	20
Mechanical life	times	12000
Rated breaking current of capacitor bank	A	630
Rated power of energy storage	W	275
Rated voltage of energy storage	V	AC/DC220.110
Energy storage time	S	15
Rated voltage of closing and opening electromagnet	V	AC/DC220.110
Rated current of over current release	A	5
Rated current of auxiliary switch	A	10

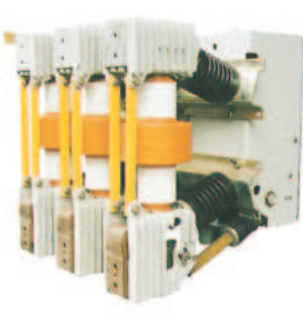
Outline and installation dimension

Technical specification: the overall width of handcart is 1180, and the central distance among wheels is 1130 (front)

Outline diagram of ZN23-40.5C/1600-25 series indoor handcart type vacuum circuit breaker



ZN12-40.5 Type Indoor AC HV Vacuum Circuit Breaker



General

ZN12-12 series vacuum circuit breaker is an indoor three-phase AC high voltage switchgear of rated voltage12KV and 50Hz, made with technology of Germany Siemens Corporation.

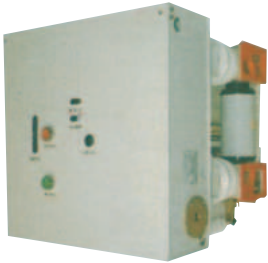
Featured with simple structure, strong breaking capability, long service life, complete operation function,simple maintenance and no explosion danger, it is used for controlling and protecting the power transmission and distribution system in power plant, transformer substation, etc, especially, it is suitable for the location that needs to break the important load and frequent operation.

The product is compliance with the standard of GB1984-2003 Alternating Current High-voltage Circuit Breaker.

Main technical parameters

Item	Unit	Type					
		I	II	III	I	II	
Rated voltage	kV	40.5	40.5	40.5	40.5	40.5	
Rated current	A	1250	1600	1600	2000	2000	
Rated short circuit dropout current	kA	31.5	31.5	31.5	25	31.5	
Peak withstand current	kA	100	100	100	25	25	
4S short-time withstand current (3S for 50KA)	kA	31.5	31.5	31.5	80	80	
Rated short circuit close current (peak)	kA	100	100	100			
Rated short circuit current breaking times	times	50			20		
Rated operating sequence		O-0.3s- CO-180s- CO					
Rated lighting impulse withstand current (full-wave)	kV	185			185		
Rated short time line frequency withstand voltage (1 min)	kV	95			95		
Close time	ms	≤75			50-85		
Break time	ms	≤60(50)			40-85		
Mechanical life	times	2000(1-1V)1000(V-X)			120000		
Rated current breaking times	times	2000(1-1V)1000(V-X)			20		
Power of Energy Storage Motor	W	275			≤275		
Rated voltage of energy storage motor	V	110 220			≤110 220		
Energy storage time	s	≤15			≤15		
Rated voltage of of closing electromagnet	V	≤110 220			≤110 220		
Rated voltage of opening electromagnet	V	≤110 220			≤110 220		
Rated voltage of energy storage shunt release	V	110 220			≤110 220		
Rated voltage of closing inter locker	V	110 220			≤110 220		
Rated voltage of no- voltage release	V	110 220			≤110 220		
Rated current of over current release	A	5			5		
Rated current of auxiliary switch	A	AC10 DC5			DC10		
Contact stroke	mm	23 3		23 3	23 3		
Over travel of contacts	mm	5 1		5 1	5 1		
Close speed	m/s	0.6-0.9			0.8-1.4		
Break speed	m/s	1.8-2.2			1.8-2.2		
Closing bouncing time of contacts	ms	≤2			≤3		
Phase-to-phase distance	mm	210 1.5(280 1.5)			350 1.15		
Three-phase contact closing and operating synchronization	ms	≤3			≤3		
Main loop resistance of each phase	μΩ	≤35			≤45		

ZN28G-12/T Type Indoor AC HV Vacuum Circuit Breaker

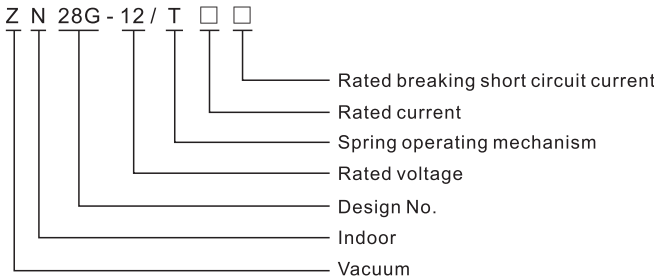


General

ZN28G-12/T indoor AC HV vacuum circuit breaker is an indoor three-phase AC device of rated voltage 12kV and 50Hz, mainly mounted in the fixed type HV switchgear, to protect and control the electrical facilities in industrial and mining enterprise, power plant, transformer substation, etc, especially, it is suitable for the location that needs the frequent operation.

The circuit breaker conforms to the standards of GB1984-2003 Alternating Current High-voltage Circuit Breaker, JB/T3855-2008 Indoor Alternating Current High-voltage Vacuum Circuit Breaker for Rated Voltages 3.6-40.5kV as well as the relevant requirements specified as the standard of IEC56.

Product type and meaning



Service conditions

1. Ambient temp:-10℃ (storage& transportation is permissible at -30℃)~ +40℃
2. Altitude: not higher than 1, 000m;
3. Daily average value of air relative humidity is not more than 95%, and the monthly average of that is not more than 90%. The daily average value of saturated vapor pressure is not more than 2.2 10-3 MPa, and the monthly average value of that is not more than 1.8 10-3 MPa;
4. Earthquake intensity: not exceed M8.0;
5. Not applicable for the location with fire, explosion, serious pollution, chemical corrosion or sharp shock, etc.

Main technical parameters

1. The technical parameters of circuit breaker are shown as table 1.
2. The mechanical property parameters of circuit breaker are shown as table 2.
- 3.ct-19 spring mechanism is applicable for the circuit breaker, its technical parameters are shown as table 3.

Technical parameters of operating mechanism

Item	Unit	Parameter
Rated voltage	kV	12
Maximum voltage	kV	12
Rated insulation level	1 min line frequency withstand voltage	kV 42
	thunder impulse withstand voltage	kV 75
Rated current	A	630,1250,1600,2000,2500,3150
Rated short circuit dropout current	kA	20,25,31.5,40
Rated operating sequence		O-0.3s- CO-180s- CO
Rated short circuit close current (peak)	kA	50,63,80,100
Rated peak withstand close current (peak)	kA	50,63,80,100
Rated short time withstand current	kA	20,25,31.5,40
Rated thermal stability time	s	4
Rated short circuit breaking times	times	30
Mechanical life	times	10000
Vacuum Degree in Vacuum Interrupters	Pa	Not higher than 1.33×10 ³
Single capacitor bank interruption capability	A	630
Back-to-back capacitor bank interruption capability	A	400

ZN28G-12/T Type Indoor AC HV Vacuum Circuit Breaker

Mechanical property parameters of circuit breaker

Item	Unit	Parameter
Contact torque	mm	11 1
Contact stroke	mm	4 1
Three-phase opening synchronization	Ms	≤2
Bouncing time of closing contact	Ms	≤2, ≤3(40kA)
Cushioning stroke of oil buffer	mm	10
Phase-to-phase distance	mm	230 1.5,250 1.5(>1250A)
Contact pressure of closing contact	N	2000-2500(20kA,25kA) 3000-3500(31.5kA) 4500-5000(40kA)
Average opening speed (before contacting the oil buffer)	m/s	1.1 0.2
Average closing speed	m/s	0.6 0.2
Resistance of conductive circuit of each phase	μΩ	≤40(630-1250A) ≤35(1600-2000A) ≤40(2500-3150A)
Allowable abrasion total thickness of active and static contactor	mm	3

Technical parameters of operating mechanism

Item	Unit	Parameter
Closing power	J	CT19-1 100 CT19-11 140 CT19-111 180
Rated output power of motor	W	-90(-70) -90(-70) -90(-70)
Rated working voltage of motor	V	AC110 and 220,DC110 and 220
Normal working voltage of motor	V	85-110% of rated working voltage
Electric energy-storage time	S	≤12
Rated working voltage of closing and opening electromagnet	V	~110~220 ~380~48 ~110~220
Rated working current of closing electromagnet	A	3.5 1.7 2.5 1.0
Rated working current of opening electromagnet	A	3.5 1.7 2.5 1.0
Normal working voltage of closing electromagnet	V	85-110% of rated working voltage
Normal working voltage of opening electromagnet	V	65-120% of rated working voltage

Product structure

The circuit breaker consists of ZN28A-12/T separate vacuum circuit breaker and special spring mechanism, using the integrated structure of mechanism and body, the main conductive circuit and operating mechanism are mounted in the front and rear, it is installed easily, little maintenance and adjustment free; due to the great simplification of driving part between the switch and mechanism, it not only improves the driving efficiency, but also the reliability.