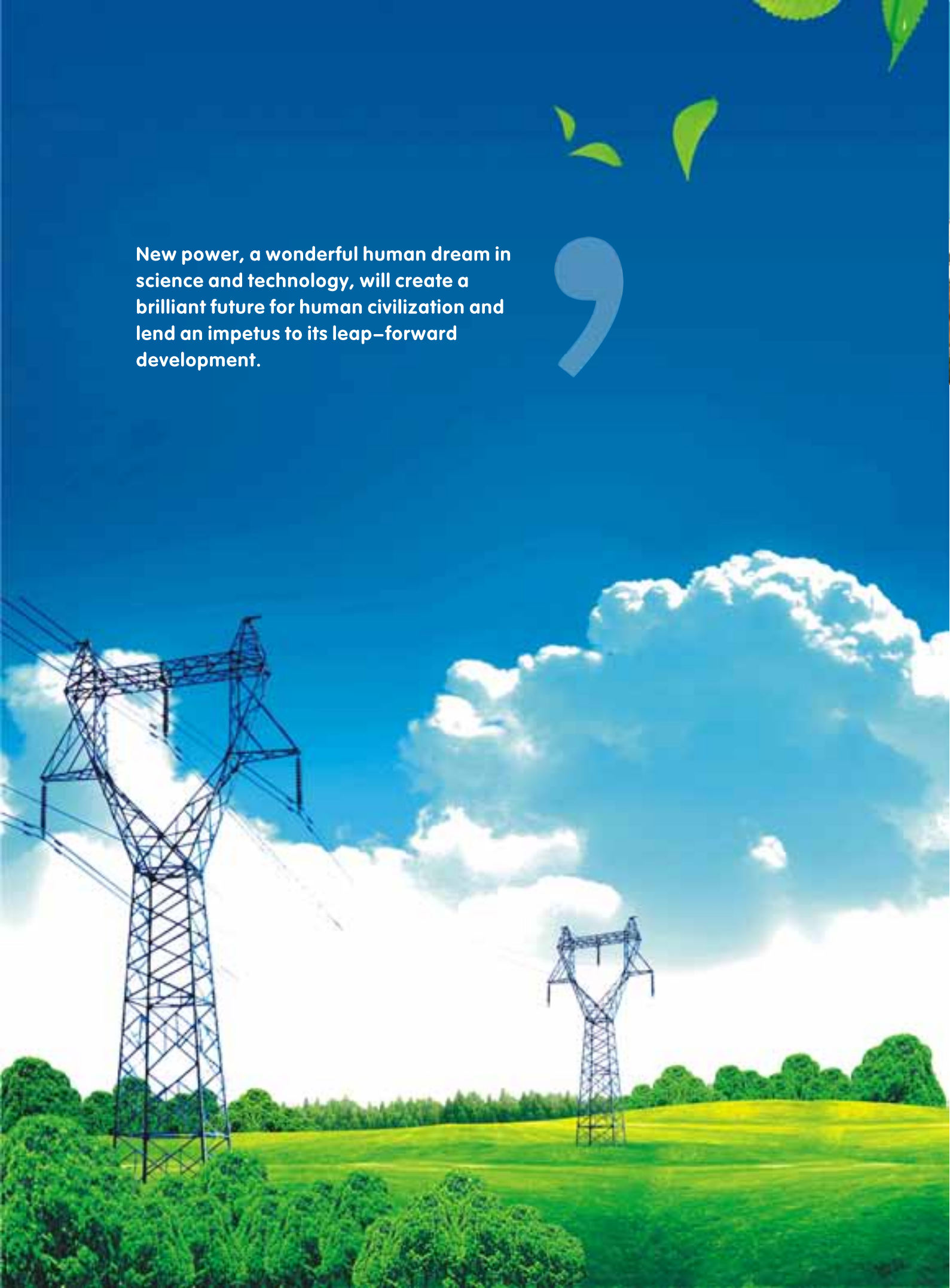
HEAG®

High Voltage Components

HUAYI ELEC. APPARATUS GROUP CO., LTD.

New power, a wonderful human dream in science and technology, will create a brilliant future for human civilization and lend an impetus to its leap-forward development.



Brief Introduction

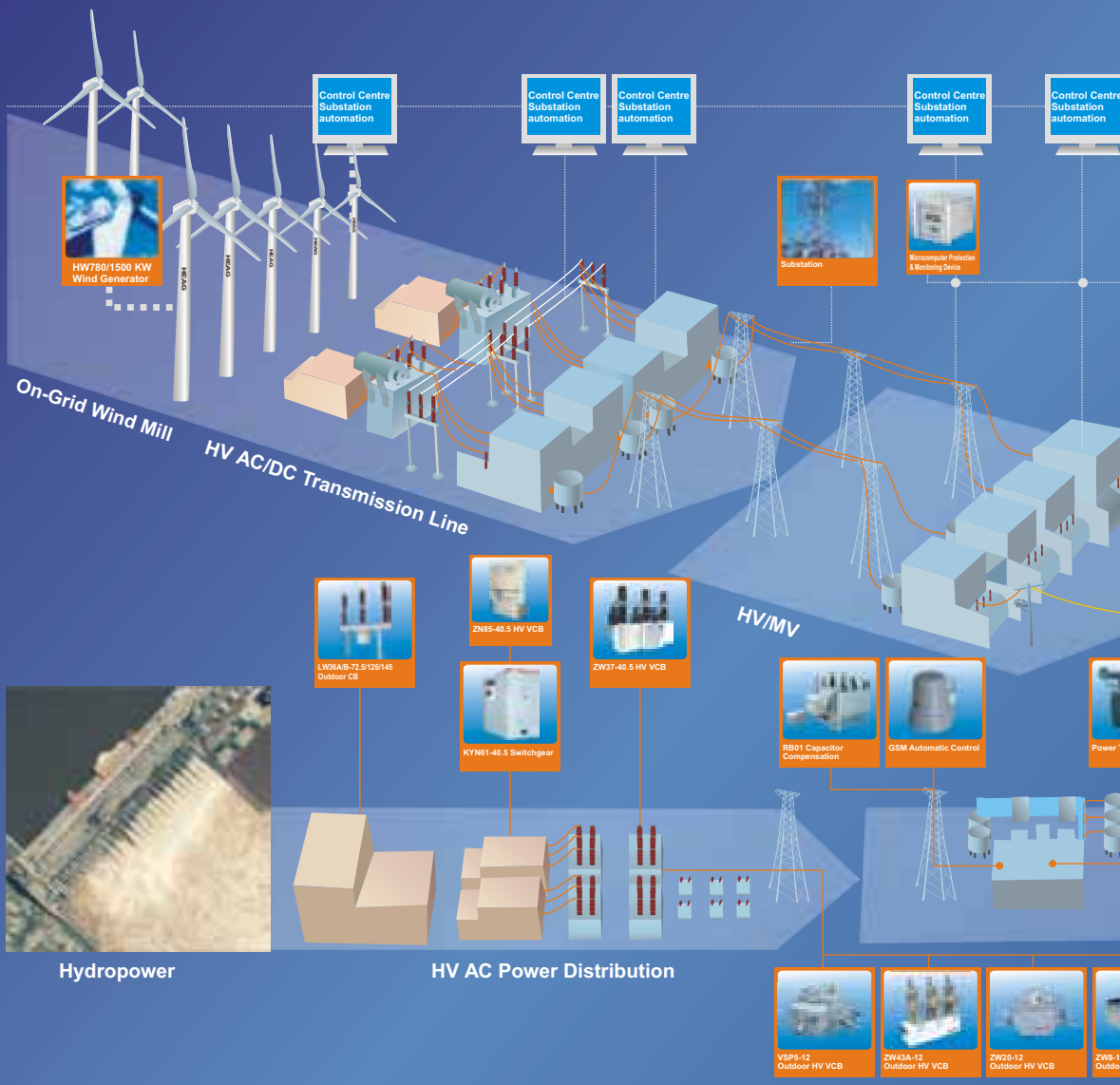
Huayi Electrical Apparatus Group Co., Ltd. (hereinafter referred to as HEAG), was founded in 1986 with total investment of RMB 40,000.00, and was promoted to a group company in 1997. HEAG now has become an inter-province, inter-industry enterprise group comprised of 7 core subsidiaries, 5 joint venture companies and over 100 member enterprises, which centers on wind power and high voltage apparatus, and diversifies into areas such as low voltage apparatus, real estate, chemical industry and tertiary industry. The company is national designated manufacturing enterprise of L.V. & H.V. switchgear and the key hi-tech enterprise listed in State Torch Project, also ranks China's Top 500 Private Enterprises, China's Top 500 Enterprises in Machinery Industry, China's Top 100 Growth Enterprises, China's Top 100 Enterprises in Electric Industry, China's Top 10 Leading Enterprises in Electric Apparatus Manufacturing, etc.. It mainly produces 252kV and below switchgears, automation distribution switches and terminal devices, high voltage switch components, static energy meters, wind power equipments and so on. Hereinto, outdoor high voltage vacuum circuit breakers are recommended as "National Key Promoting New Products" by the former Power Ministry, its market share in China is above 25% and its production and sales continuously have been No.1 in the domestic market for seven years. On Feb. 1st, 2007, one of HEAG's core subsidiaries, Huayi Electric Co., Ltd. successfully got listed on Shanghai Stock Exchange, and became the the first private enterprise listed on the Main Board in Wenzhou city.

Huayi Office Block

Huayi Plant in Shanghai

Organization

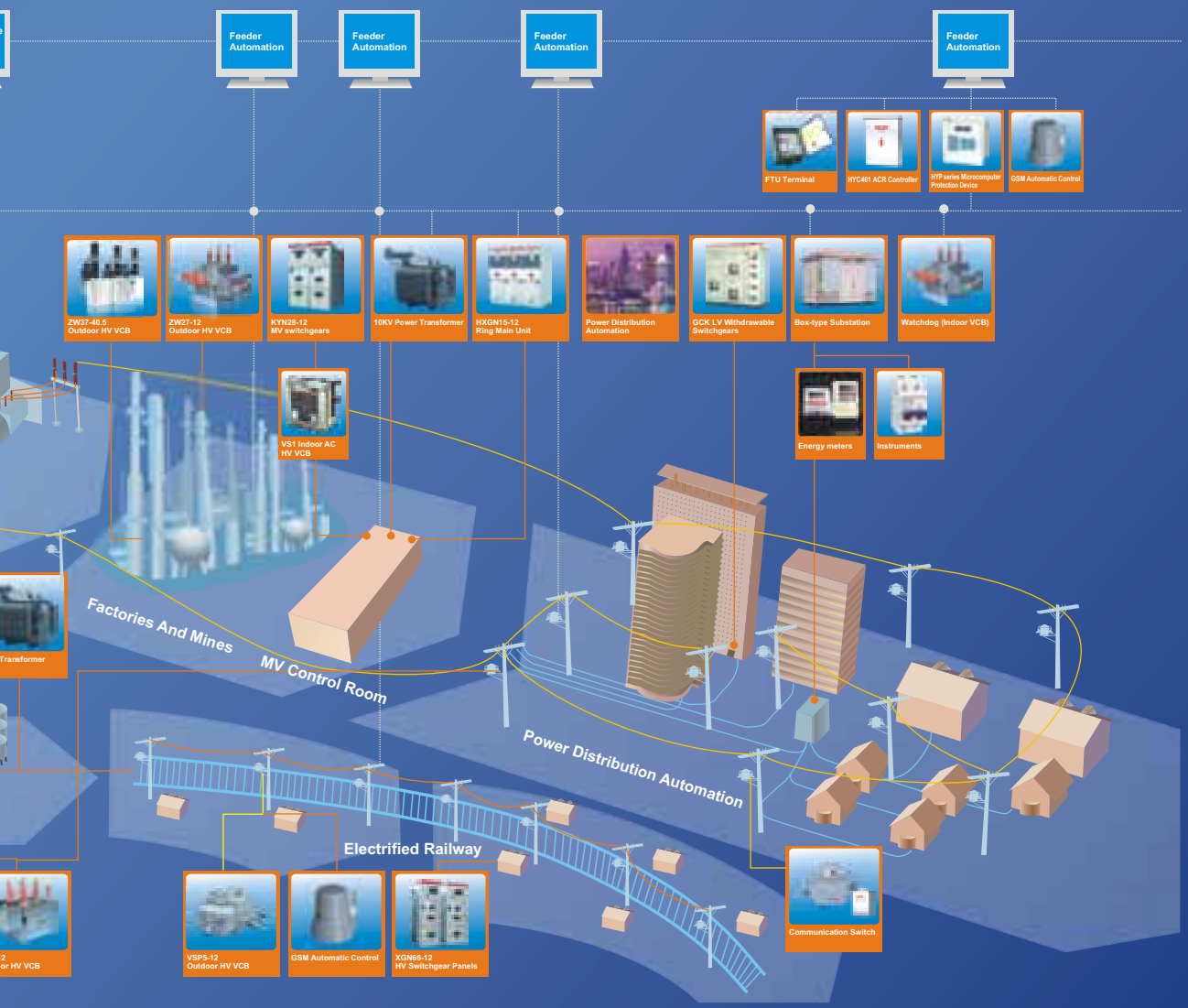
Leading Industry *Configuration*



R&D Center

Power Frequency Withstand Test Device

Workshop of HV products



Workshop of MV products

Assembly of MV products

High Voltage Components

As a representative in the field of HV switchgears in China, HEAG continues to focus on R&D and improvement of the Controlling & Distribution system, to concentrate on providing the users a complete integrated program of the Control & Distribution system from planning to service; as well as working out system solutions for power generation and distribution, power controlling and consuming.

HEAG is one of the esteemed enterprises with the most numerous in variety in HV apparatus field in domestic China by having had the systems of HV components, which are mainly used in our own indoor switchgear systems as well as outdoor power substations. Many of the HV Components have been imported by international switchgear leading manufacturers to fit with their own power distribution and control systems. HEAG company has won high reputation both in China and abroad, due to its reliable products performance and remarkable before & after sales services.

Be honest to achieve business success, and to commit to revitalizing international industries!

Cooperation Projects

A ceremony for signing the contract of technical transfer between TOSHIBA Corporation Japan and HEAG

A ceremony for signing the agreement of technical cooperation between ILJIN company Korea and HEAG

Tender contract signed by BPDP, Bangladesh and HEAG

HEAG Switchgear in Guangzhou university town

HEAG circuit breaker in Neikun railway electrification

ABB Schneider Electric TOSHIBA 東芝 ILJIN World Copartner

Qualification and Certificate

ISO9001 Certificate

ISO14001 Certificate

Gost Certificate-HEAG

Belarus Certificate for VS1

VSI-12/1250-31.5 KEMA Certificate

JN15-12/31.5 KEMA Certificate

Well-known Mark

Petrochina Membership Certificate

ZN85-40.5 Indoor AC High Voltage Vacuum Circuit Breaker

Summary

ZN85-40.5(3AV3) indoor vacuum circuit breaker is designed and produced by HEAG and Xi'an High-voltage Electric Apparatus Institute. It is three-phase and AC 50/60Hz with rated voltage of 40.5kV. This product is a kind of protecting and controlling electric apparatus, which applies to mining firms, power houses and substations, as well as occasions ask for frequent operation. It meets related stipulations of IEC 62271-100.

Ambient condition

1. Altitude: ≤1000m;
2. Ambient temperature: -25℃~+40℃;
3. Relative humidity: daily average ≤95%, monthly average ≤90%;
4. Earthquake intensity: ≤8 degree;
5. Applicable occasions should free from inflammables, explosives, corrosives and severe vibration.

Model

Z N 85 - 40.5 / 1250 - 31.5

- Rated short-circuit breaking current (kA)
- Rated current (A)
- Rated voltage(kV)
- Design serial No.
- Indoor
- Vacuum circuit breaker

Structrue feature

1. The arc-extinguish chamber is on the upper part and the mechanism is on the lower part. This structure is convenient for debug.
2. Complex insulating structure using air and organic material; Compactable dimension and small weight.
3. Domestic ZMD series Vacuum arc-extinguish chamber is applicable for the VCB. This kind of chambers extinguish arc by vertical magnetic field and featuring with low cut-off and good on-off capability with asymmetry.
4. Simple spring operation mechanism is free from maintenance within 10,000 times of operations.
5. Lead-screw propeller, easy and stable operation and good self-locking capability.

Technical specification

No.	Item	Unit	Data
1	Rated voltage	kV	40.5
2	1min. PF withstand voltage		95
3	Lightning impulse withstand voltage(peak)		185
4	Rated current	A	630,1250,1600,2000,2500
5	Rated short-circuit breaking current	kA	25,31.5
6	Rated short-circuit making current(peak)		63,80
7	4s rated short-time withstand current		25,31.5
8	Rated peak withstand current		63,80
9	Rated operation sequence		O-0.3s-CO -180s-CO
10	Breaking times of rated short circuit breaking current	Times	20
11	Mechanical life		10,000
12	Rated frequency	Hz	50/60
13	Rated breaking current of capacitor bank	A	630

Technical specification of storage motor of operating mechanism

No.	Rated voltage		Rated output power	Normal operate voltage
HDZ-22301B	AC/DC110V	AC/DC220V	≤230W	85%-110% rated voltage

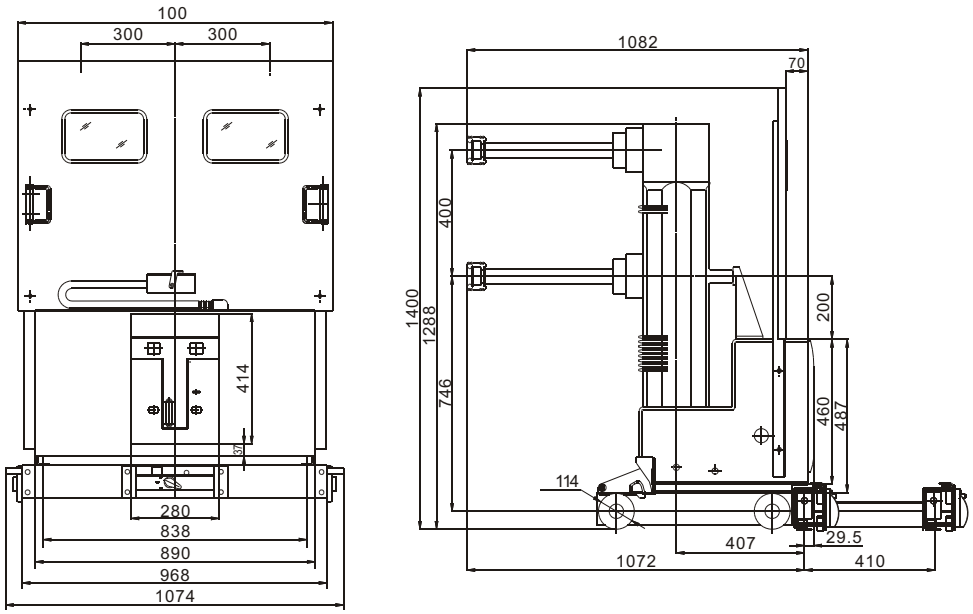
Mechanical parameters

No.	Item	Unit	Data
1	Contact clearance	mm	22±2
2	Over-travel	mm	7.5±1.5
3	Permissible abrasion of contact	mm	3
4	Average closing speed	m/s	0.65±0.15
5	Average opening speed(contact open at 12mm)	m/s	1.8±0.2
6	Contact closing trip time	ms	≤2
7	Closing simultaneity of three pole	ms	≤2
8	Opening simultaneity of three pole	ms	≤2
9	Buffer travel	mm	13±1
10	Rebound of opening contact	mm	≤2
11	Loop resistance		≤50(630A)
			≤65(1250A,1600A,2000A)

Technical specification of C/O coils

Rated operating voltage(V)	DC110	DC220
Rated operating current(A)	<115	<210
Rated power (W)	1.05	0.96
Coil resistance at 200C(Ω)	105±3	230±5
Normal operating voltage	Opening on 65%-120% of rated operating voltage, can not opening when less than 30% of rated voltage	

Outline and dimension of installation



ZN85-40.5/2000-31.5 Miniaturization vacuum circuit breaker

VHY1-40.5 Indoor High Voltage Circuit Breaker

Summary

VHY1-40.5 indoor high voltage circuit breaker is developed by HEAG, it is used in 50/60HZ 40.5kV network for the purpose of control and protection in Mining industries and substation. It is made as per IEC62271-100 and GB1984 high voltage apparatus circuit breaker.

This type of circuit breaker can be installed in the middle with drawing switchgear or fixed switchgear. It is long in life, simple in maintenance, no pollution, no explosion, and low noise. Morever, it can be used in rigorous work place where operate frequently.

Ambient condition

1. Main circuit adopts special sealing design
2. Adopted integrated block of spring operating mechanism
3. Flexible in installation
4. Handcart adopt middle with drawable type design
5. With perfect five protection when installed into switchgear
6. Supply closing lockout, inner anti-pumping,and over current protection as per requirements of user.

Technical specification

Technical parameters for circuit breaker 1

No.	Name			Unit	Data	
1	Rated voltage			kV	40.5	
2	Rated current			A	630,1250,1600, 2000, 2500, 3150	
3	Rated Insulation Level	Rated 1min P.F withstand Voltage	Between phases and phase to earth	kV	95	
			Between gaps		95	
		Rated lightning withstand voltage	Between phases and phase to earth		185	
			Between gaps		185	
4	Rated frequency			Hz	50	
5	Rated short time withstand voltage 4s			kA	25	31.5
6	Rated breaking current				25	31.5
7	Rated peak withstand current				63	80
8	Rated short time making voltage				63	80
9	Rated short circuit durance			s	4	
10	Rated operation consequence				O-0.3s-CO-180s-CO	
11	Mechanical life			Time	10,000	
12	Rated out of phase earthing fault breaking current			kA	21.7	27.4
13	Rated cable charging breaking current			A	50	
14	Electric life				E2 class	

Note: If the rated current is 3150A,switchgear shall be equipped with forced air cooling device.

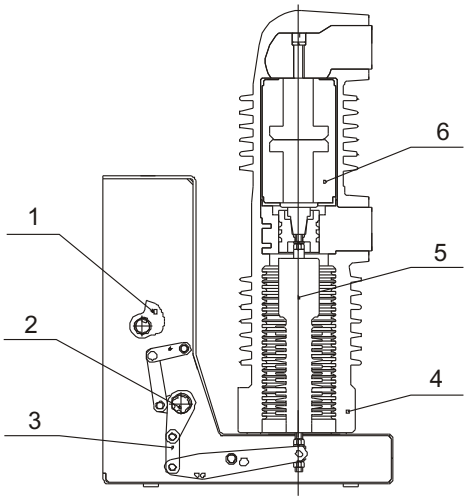
Mechanical characters of circuit breaker 2

No.	Name		Unit	Data			
1	Open distance between contacts		mm	19 ± 1			
2	Over-travel of contacts			5 ± 0.5			
3	Cental pole distance			280 ± 1.5			
4	Permissible wearable for contacts			3			
5	Average opening speed		m/s	1.7 ± 0.3			
6	Average closing speed			0.6 ± 0.2			
7	Closing spring time of contacts		ms	≤5			
8	Time spread between poles at closing/opening			≤2			
9	Resistance of main circuit	1250A	μ Ω	Fixed type	≤35	Handcart	≤45
		1600A			≤35		≤40
		2000A			≤25		≤30
		2500A、3150A			≤20		≤25
10	Opening time		ms	15~50			
11	Closing time			40~75			
12	Characters of operating mechanism			65%~120%rated votlage		Open reliably	
				≤30% rated voltage		No open	

Technical parameters of operating mechanism

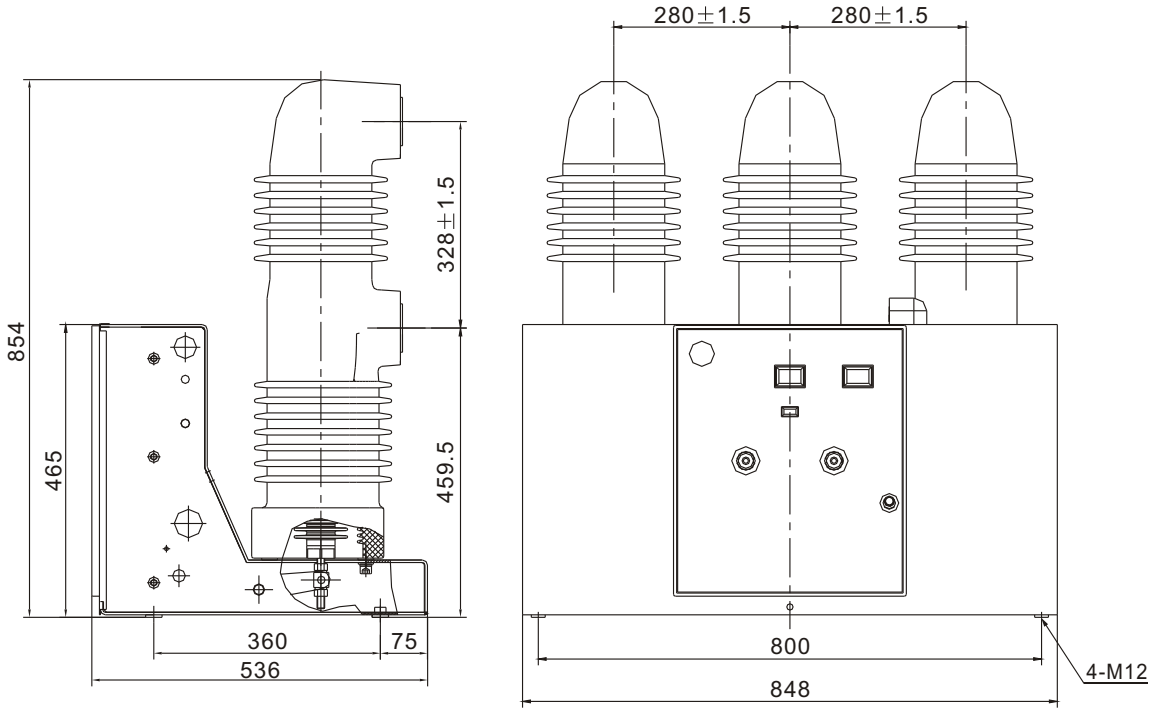
No.	Name	Unit	Data
1	Rated opening voltage/current	V/A	DC(AC)220/1.5, DC(AC)110/3
2	Rated closing voltage /current		DC(AC)220/1.5, DC(AC)110/3
3	Rated short time over current tripping current	A	5
4	Rated voltage of second wiring	V	DC(AC)220/DC(AC)110
5	Rated voltage of charging motor		DC(AC)220/DC(AC)110
6	Rated output power of charging motor	W	70
7	Charging time	s	≤12
8	Rated 1 min P.F frequency of second wiring	V	2000

Outline dimension

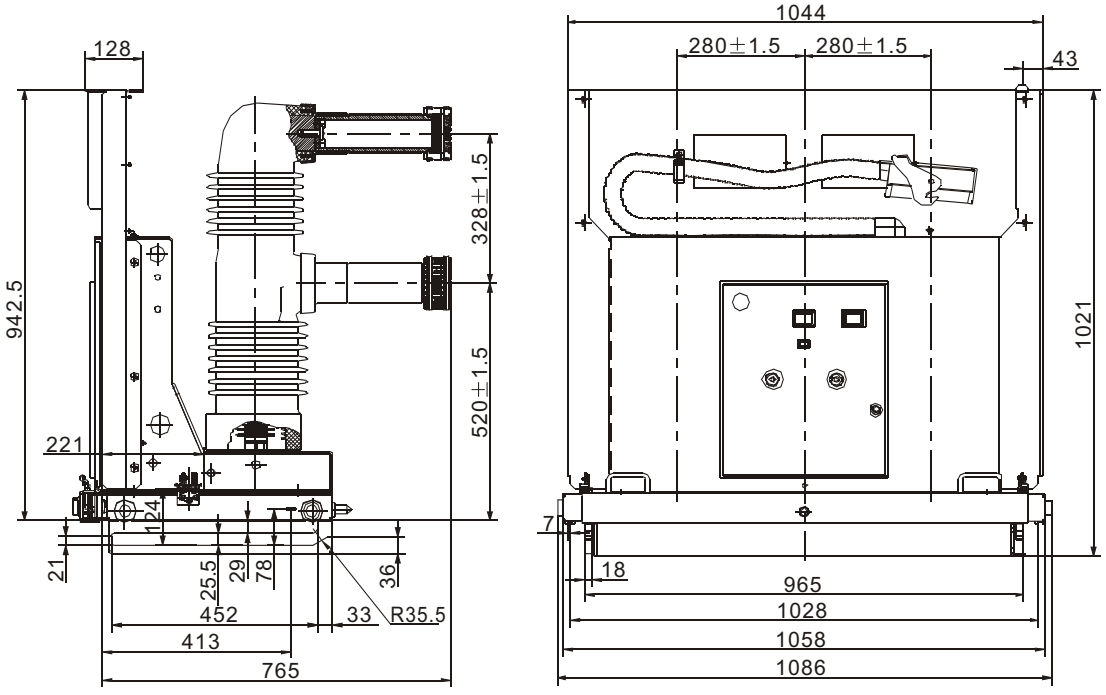


1.Closing cam 2.Principle axis 3.Transmission linkage group
4.Sealed pole 5.Insulation bar 6.Vacuum chamber

VHY1-40.5 Structure drawing



VHY1-40.5 Outline dimension drawing of fixed



VHY1-40.5 Outline dimension drawing of trolley

VHY1-12/24 Indoor AC High Voltage Vacuum Circuit Switch

Summary

VHY1-12/24 Model indoor AC HV vacuum circuit breaker is a type of holistic sealed HV switchgear with small volume and compact structure. It applies to power system of rated voltage 12/24kV, three-phase AC 50/60Hz, and used to control and protect electric apparatus and circuit with frequent operations. This product conforms to IEC62271-100 & GB1984, JB3855 and DL403.

Ambient condition

1. Altitude: ≤1000m;
2. Ambient temperature: -25℃~+40℃;
3. Relative humidity: daily average ≤95%, monthly average ≤90%;
4. Earthquake intensity: ≤8 degree;
5. Applicable occasions should free from inflammables, explosives, corrosives and severe vibration.

Model

VHY 1 - 12/24 / 630 - 31.5

- 31.5 — Rated short-circuit breaking current(kA)
- 630 — Rated current(A)
- 12/24 — Rated voltage(kV)
- 1 — Design serial No.
- VHY — Vacuum circuit breaker

Product feature

1. Holistic structure;
2. Sealed arc-extinguishing chamber;
3. High quality vacuum arc-extinguishing;
4. Sound mechanical feature;
5. Various mounting methods.

Technical specification

Technical Parameters

No.	Item			Unit	Data			
1	Rated voltage			kV	12/24			
2	Rated current			A	630 1250	1250 1600 2000 2500	1600 2000 2500 3150 4000(for VHY1-12)	
3	Rated insulation level	1min P.F withstand voltage	Between phases and phase to earth	kV	42/65			
			Between gap		48/65			
		Rated lightning withstand voltage	Between phases and phase to earth		75/125			
			Between gap		85/125/145			
4	Rated frequency				50 or 60			
5	Rated short time withstand current 4s			Hz	20	25	31.5	40
6	Rated short circuit breaking current			kA	20	25	31.5	40
7	Rated peak withstand current				50	63	80	100
8	Rated short circuit making current				50	63	80	100
9	Rated short circuit durance				4			
10	Rated operation consequency			s	O-0.3s-CO-180s-CO O-180s-CO-180s-CO(for 40kA)			
11	Mechanical life			Time	30,000			
12	Electric life				E2 class			

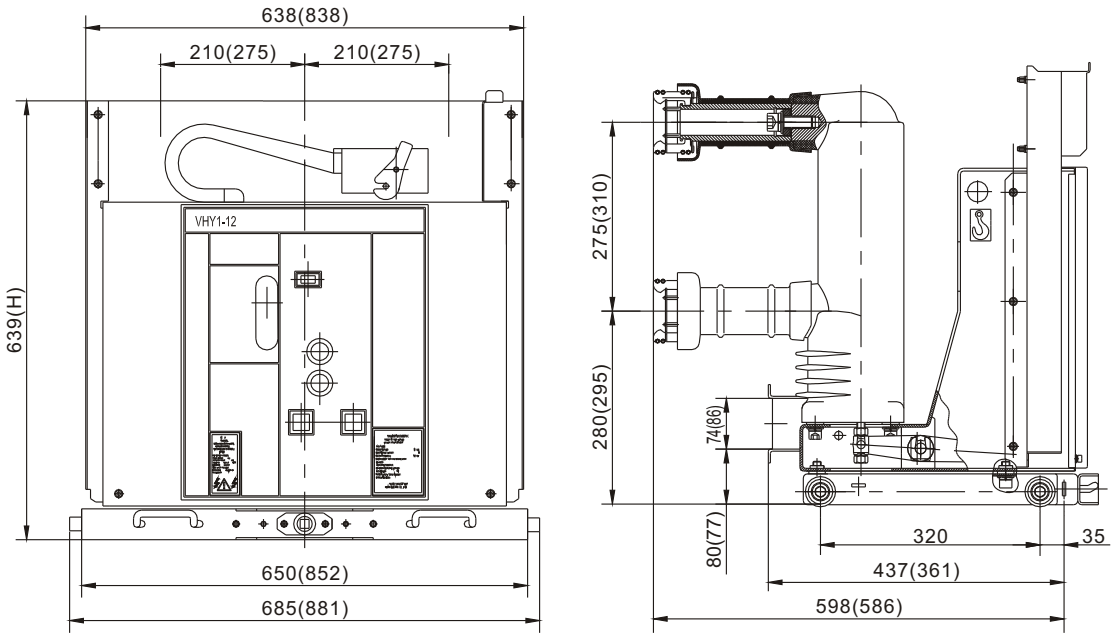
Mechanical characters of operating mechanism

NO.	Name	Unit	Data	
1	Open distance between contacts	mm	11±1 / 9±1	
2	Over-travel of contacts		3.5±0.5 / 4±1	
3	Central pole distance		210±1(upto 1600A) 275±1(more than 2000A)	
4	Permissible abrasion of contact		3	
5	Average opening speed	m/s	0.9~1.2	
6	Average closing speed		0.4~0.8	
7	Closing spring time of contacts	ms	≤2(40KA:≤3)	
8	Time spread between poles at closing/opening		≤2	
9	Opening time	ms	25~50	
10	Closing time		40~75	
11	Character of operating mechanism		65%～120% rated voltage	Open reliably
			≤30% rated voltage	No opening

Technical parameter of operating mechanism

NO.	Name	Unit	Data
1	Rated opening voltage /current	V/A	DC(AC)220/1.5, DC(AC)110/3
2	Rated closing voltage /current		DC(AC)220/1.5, DC(AC)110/3
3	Rated instantaneous tripping current	A	5
4	Rated voltage of second circuit	V	DC(AC)220/DC(AC)110
5	Rated voltage of charging motor		DC(AC)220/DC(AC)110
6	Rated output power of charging motor	W	70
7	Charging time	s	≤12
8	1min P.F withstand voltage for second circuit	V	2000

Product structure



VS1(ZN63A)-12 Indoor AC High Voltage Vacuum Circuit Breaker

Summary

VS1 (ZN63A) -12 Model indoor AC high voltage vacuum circuit breaker (short as VCB), has compactable it has compact able dimension and small volume. The VCB applies to power system of rated voltage 7.2~12kV, three -phase and AC 50/60Hz. It is applicable in occasions with frequent operations, acting to protect and control line and electric apparatus. The product conforms to IEC62271-100, GB1984-2003, JB3855 and DL1403 and passed KEMA test.

Ambient condition

1. Altitude: ≤1000m;
2. Ambient temperature: -25℃~+40℃;
3. Relative humidity: daily average ≤95%, monthly average ≤90%;
4. Earthquake intensity: ≤8 degree;
5. Applicable occasions should free from inflammables, explosives, corrosives and severe vibration.

Model

V S 1 (ZN63A) - 12 / 630 - 25

- 25 — Rated short-circuit breaking current (kA)
- 630 — Rated current (A)
- 12 — Rated voltage (kV)
- 1 — Design serial No.
- S — Indoor
- V — Vacuum circuit breaker

Product feature

1. Holistic structure.
2. High insulation level with cast resin bushing by APG technology.
3. Effective vacuum arc-extinguish.
4. Good mechanical behavior.
5. Various mounting approach.

Technical specification

No.	Item	Unit	Data						
1	Rated voltage	kV	12						
2	Rated frequency	Hz	50/60						
3	Rated current	A	630,1000,1250			1600	2000,2500,3150	4000	
4	Rated short-circuit breaking current	kA	20		31.5	31.5	40	40	50
5	Rated short-circuit making current	kA	50		80	80	100	100	125
6	Rated short-time withstand current	kA	20		31.5	31.5	40	40	50
7	Rated peak withstand current	kA	50		80	80	100	100	125
8	Rated out-of-phase earthing fault breaking current	kA	17.4	21.7	27.4	27.4	34.7	34.7	43.5
9	Rated short-circuit breaking current breaking time	Times	50				30	30	12
10	Rated operation sequence		O-0.3s-CO-180s-CO				O-180s-CO-180s-CO		
11	Rated breaking current of single capacitor bank	A	630						
12	Rated breaking current of back to back capacitor bank	A	400						

No.	Item	Unit	Data
14	1min. PF withstand voltage	kV	Phase to phase/ to earth: 42, across open contacts:48
15	Lightning impulse withstand voltage	kV	Phase to phase/ to earth: 75, across open contacts:85
16	Mechanical life	Times	20,000
17	Closing time	ms	≤75
18	Opening time	ms	≤60
19	Power storage time under rated voltage	s	≤10

Product structure

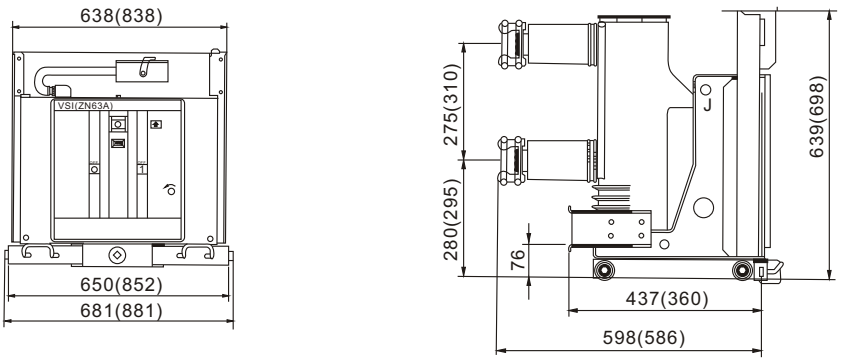


Diagram 1 Outline dimension of handcart type VS1 applies to 800mm width panel

Rated current(A)	630	1000	1250	1600	2000	2500	3150	4000
Rated short-circuit breaking current(kA)	20,25	20,25,31.5	20,25,31.5	31.5	31.5, 40	31.5, 40	40	40,50
Size of static contact (mm)	ϕ35	ϕ35	ϕ49	ϕ55	ϕ79	ϕ109	ϕ109	ϕ109

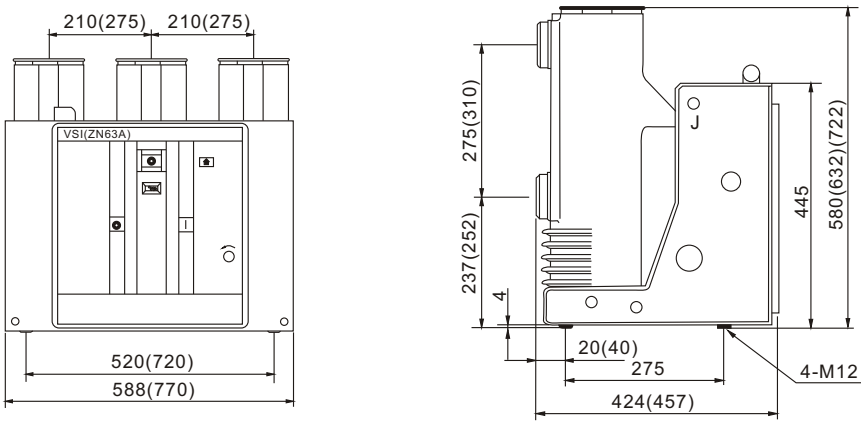


Diagram 2 Outline dimension of fixed type VS1 applied to 800mm width panel

Note: the size inside bracket is applied to1000mm width panel; rated current: 2000A~4000A.

Rated current (A)	630	1000	1250	1600	2000	2500	3150	4000
Rated short-circuit breaking current(kA)	20,25	20,25,31.5	20,25,31.5	31.5	31.5,40	31.5,40	40	40,50

ZN73D-12 Indoor AC High Voltage Vacuum Circuit Breaker

Summary

ZN73D-12 Model indoor AC high-voltage vacuum circuit breaker is a type of indoor HV switchgear of rated voltage 7.2~12kV, three-phase AC 50/60Hz. The VCB conforms to GB/T 1984 High voltage AC vacuum circuit breaker, JB3855 3.6-40.5kV indoor AC HV vacuum circuit breaker and IEC62271-100 standard. The VCB can operate frequently with good on-off capability and fast reclose capability. The VCB structure is separate into two parts that can either steadily installed or fabricated on the chassis frame as a separate handcart.

Ambient condition

1. Altitude: ≤1000m;
2. Ambient temperature: 25℃~+40℃;
3. Relative humidity: daily average ≤95%, monthly average ≤90%;
4. Earthquake intensity: ≤8 degree;
5. Applicable occasions should free from inflammables, explosives, corrosives and severe vibration.

Model

Z N 73 D - 12 / 1250 - 31.5

- 31.5 — Rated short-circuit breaking current (kA)
- 1250 — Rated current (A)
- 12 — Rated voltage(kV)
- D — Improved sequence
- 73 — Design serial No.
- N — Indoor
- Z — Vacuum circuit breaker

Product feature

1. Holistic structure
2. Sealed spark chamber
3. Effective vacuum arc-extinguish
4. Good mechanical behavior
5. Various mounting approach

Technical specification

Technical parameter of VCB

Rated voltage	12kV
Rated frequency	50/60Hz
Rated lightning impulse withstand voltage	75kV(peak)
Rated 1min. PF withstand voltage	42kV(virtue value)
Rated operation sequence	O-0.3s-CO-180s-CO

Rated current (A)	Rated breaking current (kA)		Rated short-circuit making current (peak kA)		Rated short-circuit duration(s)	Breaking time	Mechanical life
630	20	25	50	63	4	30	10,000
1250	25	31.5	63	80	4	30	10,000

Technical parameter of release and blocking electromagnet

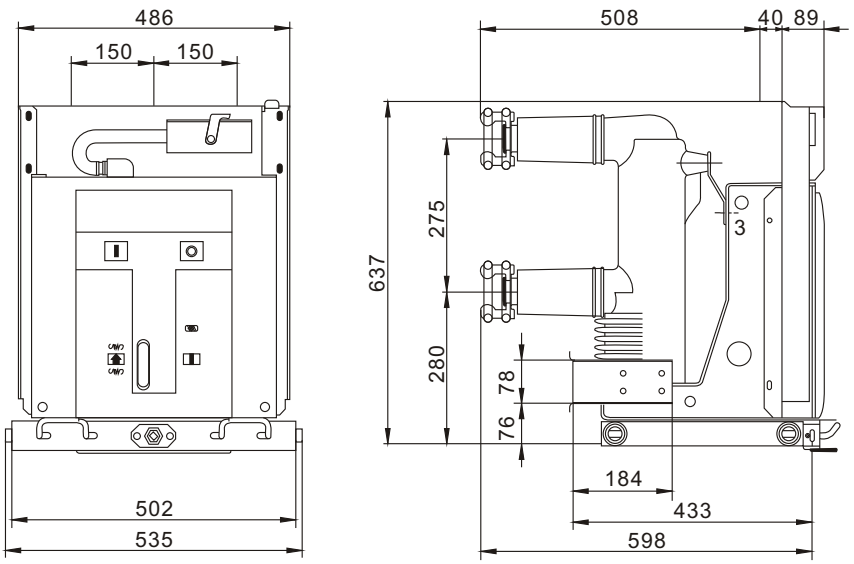
Item	Power (W)	Rated voltage(V)
Opening release	288	-220
Closing release	288	
Auxiliary switch	10A	
Over-current release	5A	

No.	Item	Unit	Data		
1	Clearance between contact	mm	11±1		
2	Over-travel of contact		3.5±0.5		
3	Interval of three pole on-off	ms	≤2		
4	Contact closing trip time	ms	≤2		
5	Pressure on closing contact	N	20kA	25kA	31.5kA
			2000±200	2400±200	3100±200
6	Average opening speed	m/s	0.9~1.2(average speed on opening at 6mm)		
7	Average closing speed		0.4~0.8		
8	Closing time	ms	≤100		
9	Opening time	ms	≤50		
10	Arc-sparking time	ms	≤15		

Technical parameter of power-storage motor

Rated voltage(V)	Power(W)	Power-storage time(s)
DC110V	50	≤10
DC220V	75	≤10

Outline dimension



Handcart travel: 200mm

ZN73D Outline dimension of handcart

VS1-12 Indoor HV Vacuum Circuit Breaker (Side Installation)

Summary

VS1-12 indoor side-mounting AC and High-voltage VCB is a type of indoor switchgear applied to electric system of rated voltage 7.2~12kV, three-phase 50/60Hz to protect and control apparatus. It is especially applicable in occasion with frequent operation; it can break short- circuit continuously. This HV VCB is of fixed mounting, mainly used in stationary switch cabinet. It can work separately or in ring network power supply, prefabricated substation as well as in non-standard power supply system.

Ambient condition

1. Altitude: ≤1000m;
2. Ambient temperature: -25℃~+40℃;
3. Relative humidity: daily average ≤95%, monthly average ≤90%;
4. Earthquake intensity: ≤8 degree;
5. Applicable occasions should free from inflammables, explosives, corrosives and severe vibration.

Model

V S 1 - 12 / 630 - 25

- 25 — Rated short-circuit breaking current (kA)
- 630 — Rated current (A)
- 12 — Rated voltage(kV)
- 1 — Design serial No.
- S — Indoor
- V — Vacuum circuit breaker

Product feature

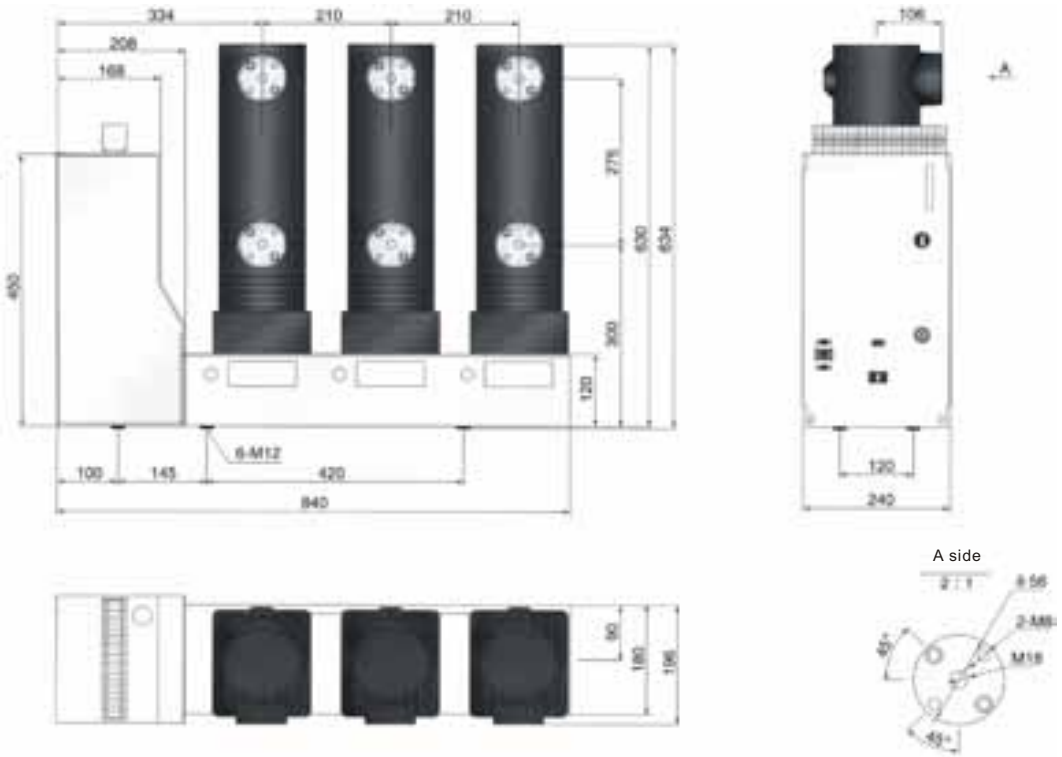
The arc-chamber can be mounted in common insulation bushing, or encapsulated within epoxy resin by APG technology. The VCB features with small volume, aesthetic appearance, reliable operation and long mechanical life.

Technical specification

No.	Item		Unit	Data		
1	Rated voltage		kV	12		
2	Rated insulation level	Rated short-time P.F. withstand voltage(1min.)		42		
3		Rated lightning impulse withstand voltage(peak)		75		
4	Rated power frequency		Hz	50/60		
5	Rated current		A	630,1250	630,1250	1250
6	Rated short-circuit breaking current		kA	20	25	31.5
7	Rated short-time withstand current			20	25	31.5
8	Rated peak withstand current			50	63	80
9	Rated short-circuit making current(peak)			50	63	80
10	4s thermal steady current			20	25	31.5
11	Rated movable steady current			50	63	80
12	Rated capacitor bank making current			12.5(frequency not higher than 1000Hz)		
13	Rated unit/capacitor bank breaking current		A	630/400		

14	Rated short-circuit duration		s	4
15	P.F. withstand voltage for secondary loop		V	2000
16	Rated operating voltage	Making winding		AC110/220, DC110/220
		Breaking winding		AC110/220, DC110/220
		Storage motor		AC110/220, DC110/220
17	Breaking time of rated voltage		ms	20~50
18	Making time of rated voltage			35~70
19	Wearing thickness of moving & fixing contacts		mm	≤3
20	Storage time		s	≤15
21	Contact opening distance		mm	11 ± 1
22	Contact travel			3~4
23	Contact closing tripping time		ms	≤2
24	Three-phase closing and opening asynchronous			≤2
25	Average opening speed		ms	0.9~1.3
26	Average closing speed			0.4~0.8
27	Contact opening rebound		mm	≤3
28	Main circuit resistance		μ Ω	≤50(630A)
				≤45(1250A)
29	Contact closing press		N	3100 ± 200(31.5kA)
30	Rated operating sequence			O-0.3s-CO-180s-CO

Outline dimension



ZN23-40.5 Indoor High Voltage Vacuum Circuit Breaker

Summary

ZN23-40.5 vacuum circuit-breaker handcart is a type of HV electric apparatus of rated voltage 40.5 kV, three-phase and AC 50/60Hz. This product applies to electricity distribution system in mining industry and substation acting as control and protection apparatus, it is applicable in occasions with frequent operation such as metallurgy and electric-arc steel-making. This product conforms to standard of IEC62271-100 & GB/T1984-2003 AC high voltage circuit breaker.

Ambient condition

1. Altitude: ≤1000m;
2. Ambient temperature: -25℃~+40℃;
3. Relative humidity: daily average ≤95%, monthly average ≤90%;
4. Earthquake intensity: ≤8 degree;
5. Applicable occasions should free from inflammables, explosives, corrosives and severe vibration.

Model

Z N 23 - 40.5 / 630 - 31.5

- 31.5 — Rated short-circuit breaking current (kA)
- 630 — Rated current (A)
- 40.5 — Rated voltage(kV)
- 23 — Design serial No.
- N — Indoor
- Z — Vacuum circuit breaker

Product feature

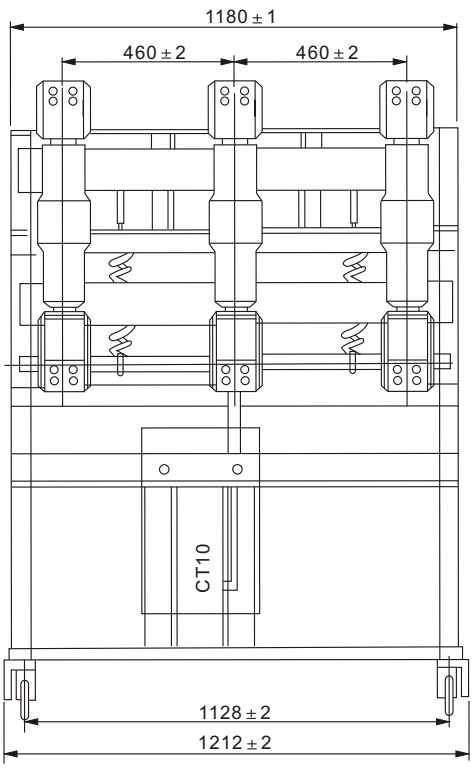
1. High insulation level, low cut-off level and strong arc-extinction capability.
2. Electric magnetic mechanism and spring operating mechanism both fit on.
3. Suitable for GBC & JYN1 type working trolley.

Technical specification

No.	Item	Unit	Data
1	Rated voltage	kV	40.5
2	Lightning impulse withstand voltage	kV	185
3	1min P.F withstand voltage	kV	95
4	Rated frequency	Hz	50/60
5	Rated current	A	630,1000,1250,1600,2000
6	Rated short circuit breaking current	kA	25,31.5
7	Rated short-time withstand current	kA	25,31.5
8	Rated peak withstand current	kA	63,80
9	Rated short-circuit duration	s	4
10	Rated short circuit breaking time	ms	90
11	Rated short-circuit making current	kA	50,80

No.	Item	Unit	Data
12	Rated operation sequence		O-0.3s-CO-180s-CO
13	Opening time	ms	50~85
14	Closing time	ms	40~85
15	Rated short-circuit breaking current breaking time	Times	20
16	Mechanical life	Times	10,000
17	Rated breaking current of capacitor	A	630
18	Rated power of storage motor	W	275
19	Rated voltage of storage motor	V	≃ 220,110
20	Power-storage time	s	≤15
21	Rated voltage of closing/opening electromagnetic	V	≃ 220,110
22	Rated voltage of no-voltage tripper	V	≃ 220,110
23	Rated current of over-current release	A	5
24	Rated current of auxiliary switch	A	10

Outline dimension



ZN23-40.5 Outline dimension

ZN12-12(40.5) Indoor AC High Voltage Vacuum Circuit Breaker

Summary

ZN12(3AF) vacuum circuit breaker is a type of indoor HV electric apparatus of rated voltage 12/40.5kV, three-phase AC 50/60Hz, produced by using the technology of Siemens.
The VCB features with simple structure, long mechanical life, strong breaking capability, multiple functions and convenient maintenance. It is safe from explosion, thus applicable in power plant and substation to control and protect electricity distribution systems. In addition, it is especially applicable at essential position and in occasions with frequent operation. Comply with IEC62271-100.

Ambient condition

1. Altitude: ≤1000m;
2. Ambient temperature: -25℃~+40℃;
3. Relative humidity: daily average ≤95%, monthly average ≤90%;
4. Earthquake intensity: ≤8 degree;
5. Applicable occasions should free from inflammables, explosives, corrosives and severe vibration.

Model

Z N 12 - 12(40.5) / 1250 - 31.5

- 31.5 — Rated short-circuit breaking current (kA)
- 1250 — Rated current (A)
- 12(40.5) — Rated voltage (kV)
- 12 — Design serial No.
- N — Indoor
- Z — Vacuum circuit breaker

Product feature

Spring operation mechanism links to switchgear, and operate both by manual and motor. The mechanism is equipped with operation counter, power charging display, on-off indicator and anti-bounce device. The propeller mechanism is fabricated on two pieces of sideboards and reliably interlocked with VCB. The mechanism and the cubicle body is grounded firmly.

Technical specification

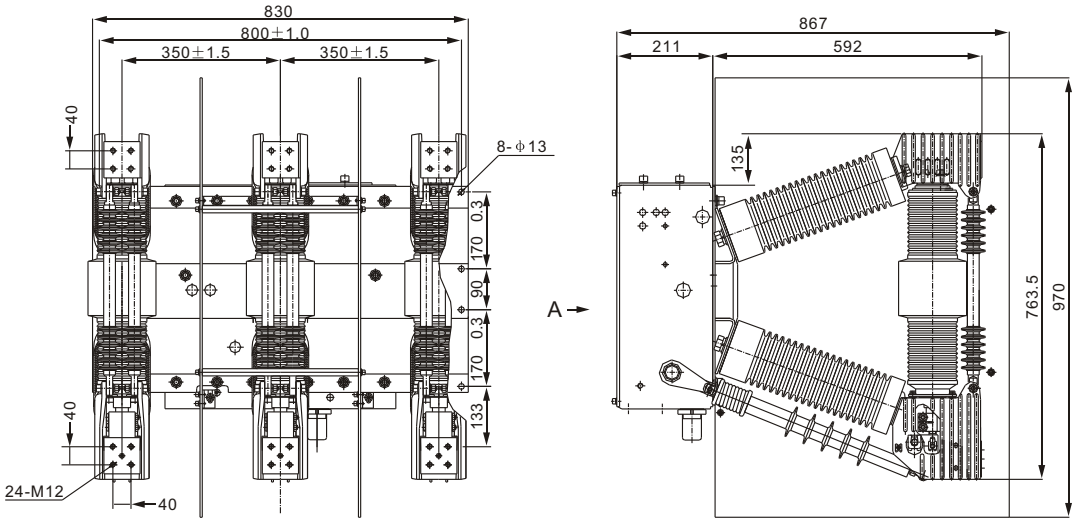
ZN12-12 Vacuum Circuit Breaker

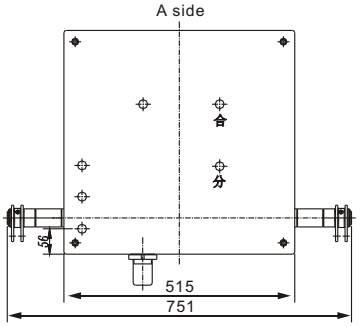
No.	Item	Unit	Data				
1	Rated voltage	kV	12				
2	Rated current	A	630,1250,1600		1250,1600,2000,2500,3150		2000,2500,3150,4000
3	Rated short-circuit breaking current	kA	20	25	31.5	40	50
4	Dynamic stable current	kA	50	63	80	100	125
5	4s thermal current	kA	20	25	31.5	40/3s	50/3s
6	Rated short-circuit making current	kA	50	63	80	100	125
7	Breaking times of short-circuit	Times	30				12
8	Operation sequence		O-0.3s-CO-180s-CO			O-180s-CO-180s-CO	
9	Breaking times of rated current	Times	10,000			6000	
10	Mechanical life	Times	10,000			6000	
11	Rated lightning impulse withstand voltage(full-wave)		75kV				
12	Rated short-time P.F withstand voltage		42kV/min				
13	Closing time		≤75ms				
14	Opening time		≤60ms				
15	Storage motor power/voltage		75W ⎓110V ⎓220V				
16	Power-storage time		<15s				
17	Rated voltage of closing-electromagnet		⎓110V ⎓220V				
18	Rated voltage of opening-electromagnet		⎓110V ⎓220V				
19	Rated voltage of lock-electromagnet		⎓110V ⎓220V				
20	Rated current of auxiliary switch		~10A -5A				

ZN12-40.5 Vacuum circuit breaker

No.	Item	Unit	Data						
1	Rated voltage	kV	40.5						
2	Rated current	A	1250	1600	2000	1250	1600	2000	2500
3	Rated short-circuit breaking current	kA	20		25	31.5			
4	Dynamic thermal stable current (peak)	kA	50		63	80			
5	3s thermal stable current	kA	20		25	31.5			
6	Rated short-circuit making current	kA	50		63	80			
7	Rated short-circuit current breaking times	Times	30			20			
8	Rated operating sequence		O-0.3s-CO-180s-CO						
9	Lightning impulse withstand current	kV	185						
10	Rated short-time power frequency withstand voltage	kV	95						
11	Closing time	ms	≤75						
12	Opening time	ms	≤60						
13	Mechanism life	Times	10,000			6000			
14	Rated current breaking time	Times	10,000			6000			
15	Rated fuse-bank breaking current	A	630						
16	Storage motor power/voltage	W	275						
17	Storage motor rated voltage	V	⎓110 ⎓220						
18	Storage time	s	≤15						
19	C/O magnet rated voltage	V	≤110≤220						
20	Over-current tripper rated current	A	5						
21	Auxiliary switch rated current	A	~10 -5						

Outline dimension





ZN65-12 Indoor AC High Voltage Vacuum Circuit Breaker

Summary

ZN65-12 indoor HV vacuum circuit breaker is an important electric element in distribution system which play functions of connect and disconnect power and fault-protection in power system. It applies to power system of rated voltage 7.2~12kV, three-phase AC 50/60Hz with purpose to protect and control electric apparatus in industry like mining, substation and power plant and occasions with frequent operations.It is made as per IEC62271-100.

Ambient condition

1. Ambient temperature: -25℃~+40℃;
2. Relative humidity: daily average ≤95%, monthly average ≤90%;
   saturated gas pressure: daily average $\leq 2.2 \times 10^{-3}$ Mpa,
   monthly average $\leq 1.8 \times 10^{-3}$ MPa;
3. Altitude: ≤1000m;
4. Earthquake intensity: ≤8 degree;
5. Occasions without fire, explosive matter, severe pollution, chemical corrosion and severe vibration.

Model

Z N 65 - 12 / 1250 31.5

- 31.5 — Rated short-circuit breaking current (kA)
- 1250 — Rated current (A)
- 12 — Rated voltage (kV)
- 65 — Design serial No.
- N — Indoor
- Z — Vacuum circuit breaker

Technical specification

1. Main technical parameter of ZN65-12 indoor VCB, please refer table 1

Technical parameter

Table 1

No.	Item		Unit	Data			
1	Rated voltage		kV	12			
2	Rated insulating level	1min. PF withstand	kV	42			
		Rated lightning impulse withstand voltage		75			
3	Rated current		A	630 1000 1250	1000 1250	1250 1600 2000 2500	1250 1600 2000 2500 3150
4	Rated short-circuit breaking current		kA	20	25	31.5	40
5	Rated short-circuit making current(peak)		kA	50	63	80	100

Table 1

No.	Item	Unit	Data			
6	Rated thermal stable time	s	4			
7	Rated thermal stable current(virtual value)	kA	20	25	31.5	40
8	Rated dynamic stable current(peak)	kA	50	63	80	100
9	Rated operation sequence		O-0.3s-CO-180s-CO			O-180s-CO-180s-CO
10	Breaking times of rated short-circuit breaking current	Times	50			30
11	Rated breaking current of single capacitor bank	A	630			
12	Rated breaking current of back to back capacitor bank	A	400			
13	Mechanical life	Times	20,000			

2. The VCB should accord to the mechanical parameters in table 2 after it is fabricated and adjusted.

Parameters on mechanical character

Table 2

No.	Item	Unit	Data
1	Distance of open contact	mm	11 ± 1
2	Contact travel		3.5 ± 0.5
3	Average opening speed(0~6mm)	m/s	1.1~1.5
4	Average closing speed		0.4~0.8
5	Contact closing trip time	ms	≤2
6	Three-pole opening asynchronism		≤2
7	Closing time		40~60
8	Opening time		35~55
9	Central distance between poles	mm	250 ± 1.5
10	Wearing thickness of moving & fixing contacts		3

3. Storage motor applies single-phase series motor, please refer to table 3 for technical data.

Techncial data for storage motor

Table 3

No.	Rated voltage (V)	Rated imput power(W)	Nomal operate voltage(V)	Energy-storage time under rated voltage(s)
HDZ-22080B	DC 220 AC 220	200	85%~110%rated voltage	≤15

4. Technical data of C/O electromagnet

Table 4

Item	Closing coil		Opening coil	
Constant operation voltage (V)	DC220 AC220	DC110 AC110	DC220 AC220	DC110 AC110
AC resistance of loop at 20℃ (Ω)	247	57.7	247	57.7
Normal operate voltage range (V)	85%~110% of rated voltage		65%~120% of rated voltage	

Outline dimension

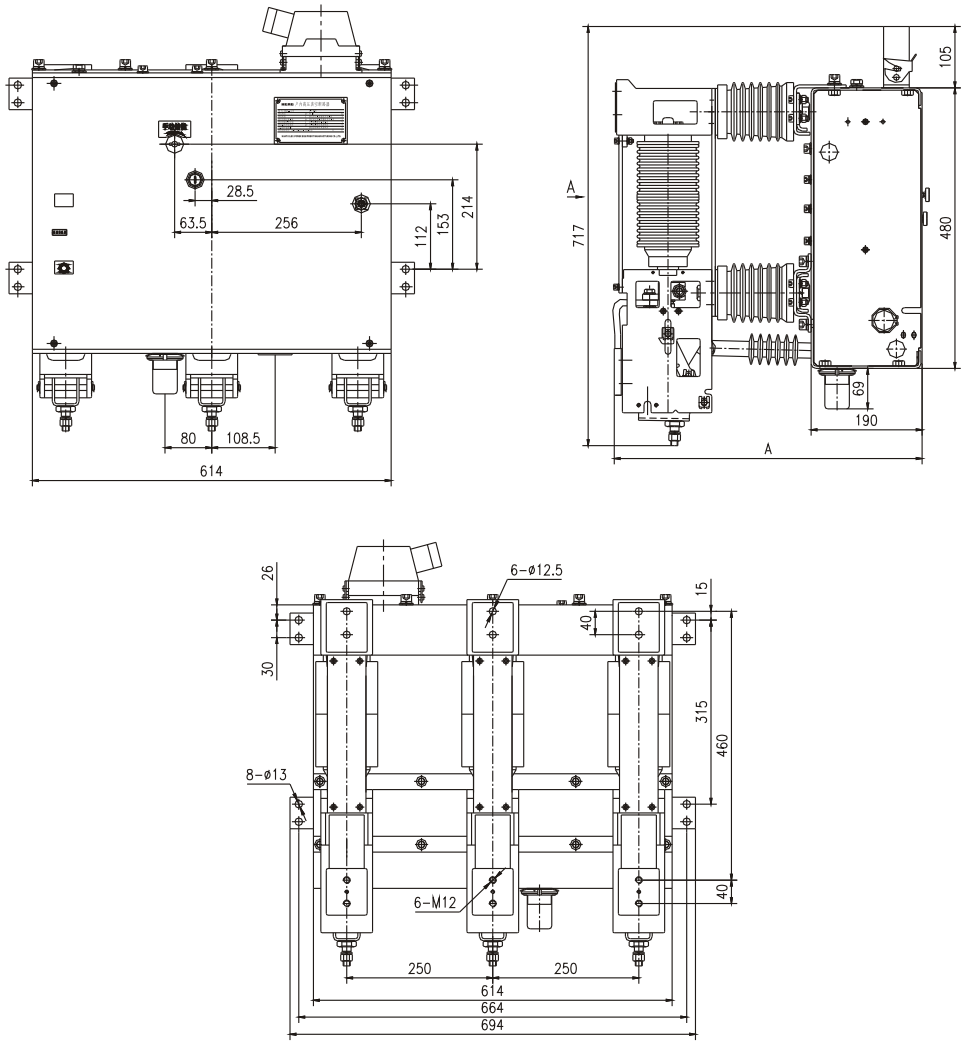


Diagram 1 ZN65-12 Indoor vacuum circuit breaker outline dimension

ZN28-12 (ZN28A-12) Indoor HV Vacuum Circuit Breaker

Summary

ZN28-12 and ZN28A-12 indoor HV vacuum circuit breaker applies to power system of rated voltage 7.2~12kV, three-phase AC 50/60Hz. It is used to control and protect electric apparatus in industry like mining, substation and so on. ZN28-12 is a unitary type (operation mechanism is installed inside the switchgear and combine with it as a whole); ZN28A-12 is a hanging-on type (the mechanism and switchgear are separately installed on cubicle or support frame, then connected with link rod and drive shaft.)

As long as the VCB operates within the required mechanical parameter, it can work with many advantages such as strong breaking capability, effective arc-extinction, long lifetime, reliable and safe operation as well as easy maintenance. The product conforms to IEC62271-100, GB/T1984, JB3855 and DL/T403 standards.

Ambient condition

1. Altitude: ≤1000m;
2. Ambient temperature: -25℃~+40℃;
3. Relative humidity: daily average ≤95%, monthly average ≤90%;
4. Earthquake intensity: ≤8 degree;
5. It should work in occasions without flammable and explosive matter, without corrosive chemical and frequent severe vibration.

Model

Z N 28 A - 12 / 630 - 20

- 20 — Rated short-circuit breaking current (kA)
- 630 — Rated current (A)
- 12 — Rated voltage (kV)
- A — Hang-on type, the mechanism is separate from switch body
- 28 — Design serial No.
- N — Indoor
- Z — Vacuum circuit breaker

Product feature

1. The vacuum arcing chamber of this VCB is of middle sealed-in longitudinal magnetic field type. The main shaft, opening spring and buffer are all installed on the framework. There are 6 pieces of insulator switch fixed with stable and moving trestles , then the vacuum arcing chamber are installed between the stable and moving trestles. The main shaft connects with moving conducting bar of vacuum arcing chamber through crutch arm of insulating bar. Two pieces of insulation bars connect two ends of stable and moving trestles to form a whole so as to improve the rigidity.
2. When the stable and moving contact open by the performance of operation mechanism, the arc in vacuum occur between contact, then extinct when the current reach at zero. Due to the special contact structure, during the arcing period, there is longitudinal magnetic field between contact so that arc lies evenly on the surface of contact and maintain a low arc voltage; in Vacuum arc-extinction chamber, the medium intensity recover at high speed, as well as small arc power and electro-corrosion ratio after arc extinction, thus to improve the breaking capability on short-circuit current and electric life.
3. The VCB applies to rigorous occasions such as high altitude and frequent operation.
4. As long as the VCB accord to the mechanical characteristics, the client may select adaptable electromagnet or spring operation mechanism according to special situation.

Technical specification

Parameter on mechanical character

No.	Item	Unit	Data
1	Distance between open contacts	mm	11 ± 1
2	Over-travel distance	mm	4 ± 1
3	Three-phase opening asynchronism	ms	≤2
4	Central distance between phases	mm	210(230, 250, 275) ± 1
5	Cushion stroke of buffer	mm	10
6	Average opening speed	m/s	0.4~0.8
7	Average closing speed	m/s	0.8~1.3
8	Wearing thickness of moving & fixing contacts	mm	≤3
9	Resistance of each circuit		630A≤50; 3150A≤30 1250A,1600A,2000A,2500A≤40
10	Closing trip	ms	≤2

Technical parameter

No.	Item	Unit	Data				
1	Rated short-circuit breaking current	kA	12.5kA	20kA	25kA	31.5kA	40kA
2	Rated voltage	kV	12				
3	Rated current	kA	630	630 1000 1250	1000 1250 1600	1250 1600 2000 2500	1600 2000 2500 3150
4	4s rated short-time withstand current	kA	12.5	20	25	31.5	40
5	Rated short-circuit making current	kA	31.5	50	63	80	100
6	Rated peak withstand current	KA	31.5	50	63	80	100
7	Rated short-circuit breaking time	Times	50	50	50	50	30
8	Mechanical life	Times	20,000				
9	Full breaking time	ms	50				
10	Rated operation sequence		O-0.3s-CO-180s-CO		O-180s-CO-180s-CO		
11	1min. PF withstand voltage(virtual value)	kV	42				
12	Lightning impulse withstand voltage(peak)	kV	75				
13	Model of operation mechanism		Follow client's requirement				

Outline dimension

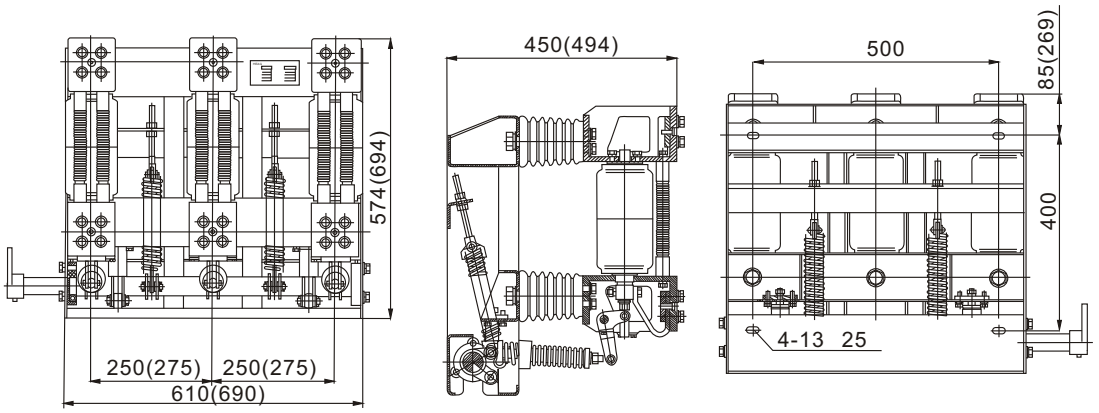
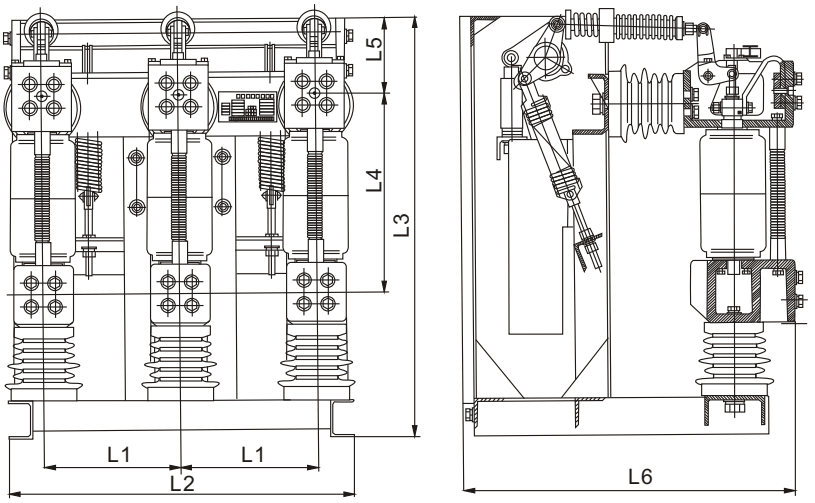


Diagram 1 ZN28A-12 Indoor HV vacuum circuit breaker



L1	L2	L3	L4	L5	L6
210	540	710	337	129	543
230	580	710	337	129	543
250	620	710	337	134	543
275	680	757	360	143	578

Diagram 2 ZN28-12 Indoor HV vacuum circuit breaker

FRHY1-12 Indoor Vacuum Load Break Switch-Fuse Combination Apparatus

Summary

FRHY1-12 indoor removable vacuum load break switch-fuse combination apparatus newly developed by HEAG, with rated voltage up to 12kV, is mainly used in power system of 50/60 Hz, AC three phase. This product is one kind of major component in ring power network for power supplying, has been widely applied in power distribution system of industrial & mining enterprises, residential communities, hospitals, schools, parks and power substations. It is best choice for the protection of stational transformer. This product is manufactured accordance with the relevant requirements of IEC62271-103 & GB3804:3.6kV~40.5kV High-voltage alternating current load break switch as well as IEC62271-105 & GB16926: High voltage alternating current load break switches-combination of fuse.

Model

F R HY 1 - 12 / T □ - □

- F: Load Break Switch
- R: Fuse
- HY: Manufacturer Code
- 1: Design Code
- 12: Rated Voltage
- T: Spring Operating Mechanism
- □: Rated current: LBS 630A; Combined apparatus: ⩽1250A
- □: LBS rated STC (20kA); Combined apparatus rated STC(50kA)

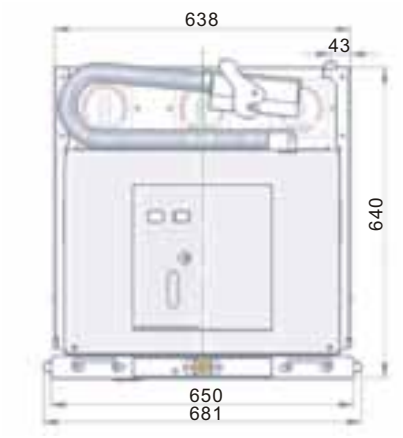
Main Technical Parameters

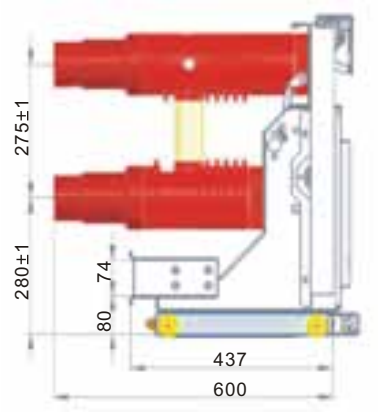
No.	Item		Unit	Data
1	Rated voltage		kV	7.2~12
2	Rated frequency		Hz	50
3	Insulation level	Rated lighting withstand voltage	kV	75
		1min power frequency withstand voltage		42
4	Load break switch	Rated current	A	630
		Rated breaking current of active power	A	630
		Rated closed breaking current	A	630
		Rated cable charging breaking current	A	10
		4s rated short time withstand current	kA	20
		Rated short time withstand current Peak	kA	50
		Rated short circuit making current	kA	50
		Rated line charging and cable charging breaking current at earthing fault	A	17.3

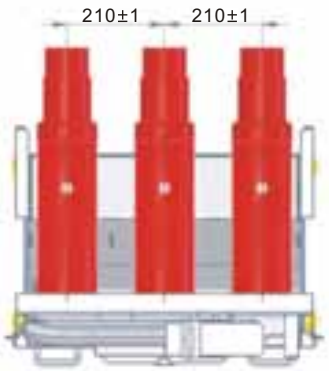
No.	Item		Unit	Data
5	LBS-Fuse combined apparatus	Mechanical life		M2
		Electric life		E2
		Rated current of fuse	A	125
		Rated transfer current	A	3150A
		Opening time of fuse hits the switch	ms	35
		Rated shot circuit breaking current	kA	31.5
		Rated short circuit making current	kA	80
		Output energy that fuse hits switch	J	2-5

No.	Item	Unit	Data	
1	Clearance across open contact	mm	8.5±1	
2	Over-travel of contacts		3±0.5	
3	Clearance between poles		210±1	
4	Permissible wearing capacity		3	
5	Averaging opening speed	m/s	1.2±0.2	
6	Average closing speed		0.6±0.2	
7	Bounce time contact closing	ms	≤3	
8	Time spread between poles at closing or opening		≤2	
9	Opening time	ms	20~50	
10	Resistance of main circuit	μ Ω	LBS ≤70	
			Combined apparatus ≤350	
11	Operating mechanism operation function		85%~110% rated voltage	Open
			65%~120% rated voltage	Open
			≤30% rated voltage	No open

Outline dimension







FZRN21-40.5/50-20 Vacuum Disconnect Load Break Switch-Fuse Combination Apparatus

Summary

FZRN21-40.5/50-20 vacuum disconnect load break switch-fuse combination apparatus is applied in 40.5kV substation, small volume, convenience for installation, especially for no power-supply area, it is easy and safe for changing the fuse.

Ambient condition

1. Altitude: ≤1000m;
2. Ambient temperature: -40℃~+40℃;
3. Relative humidity: daily average ≤95%, monthly average ≤90%;
4. Earthquake intensity: ≤8 degree;
5. Pollution degree: Ⅲ.

Structure feature

The short-circuit breaking current can up to 20kA, long mechanism life, there is an security linkage between main switch, disconnect blade and earthing blade, it can operate frequently. It according to the standard of GB16927 & IEC62271-105.

Technical specification

FZ(R)N21-40.5/50-20 load break switch-fuse

No.	Item	Unit	Combination apparatus	Load break switch
1	Rated voltage	kV	40.5	40.5
2	Rated current	A	50	1250
3	Rated power frequency	Hz	50/60	50/60
4	Rated short-circuit breaking current	kA	20	-
5	Rated short-circuit making current		-	40
6	Rated peak withstand current		-	40
7	Rated short-time withstand current		-	16
8	Rated transfer current	A	2000	-
9	Rated connect current		2000	-
10	Rated active load breaking current		-	1250
11	Rated short-circuit duration	s	-	4
12	Rated short-time(1min) P.F. withstand voltage	kV	phase to phase, to earth and normal gaps: 95	
			between gaps:115	
13	Rated lightning impulse withstand voltage(peak)		phase to phase, to earth and normal gaps:185	
			between gaps: 215	
14	Circuit resistance	μΩ	80	80

Technical parameters of FZ(R)N21-40.5/63-31.5

No.	Item	Unit	Combination apparatus	Load break switch
1	Clearance of opening contact	mm	17 ± 1	
2	Average opening speed	m/s	1.6 ± 0.2	
3	Average closing speed		0.8 ± 0.2	
4	Rated contact pressure	N	1000 ± 150	
5	Contact closing trip time	ms	≤2	
6	Central distance between poles	mm	410 ± 2	
7	Air clearance across contacts		300	
8	Manual operating moment	N • m	≤250	
9	Mechanical life	Times	10,000	

Outline dimension

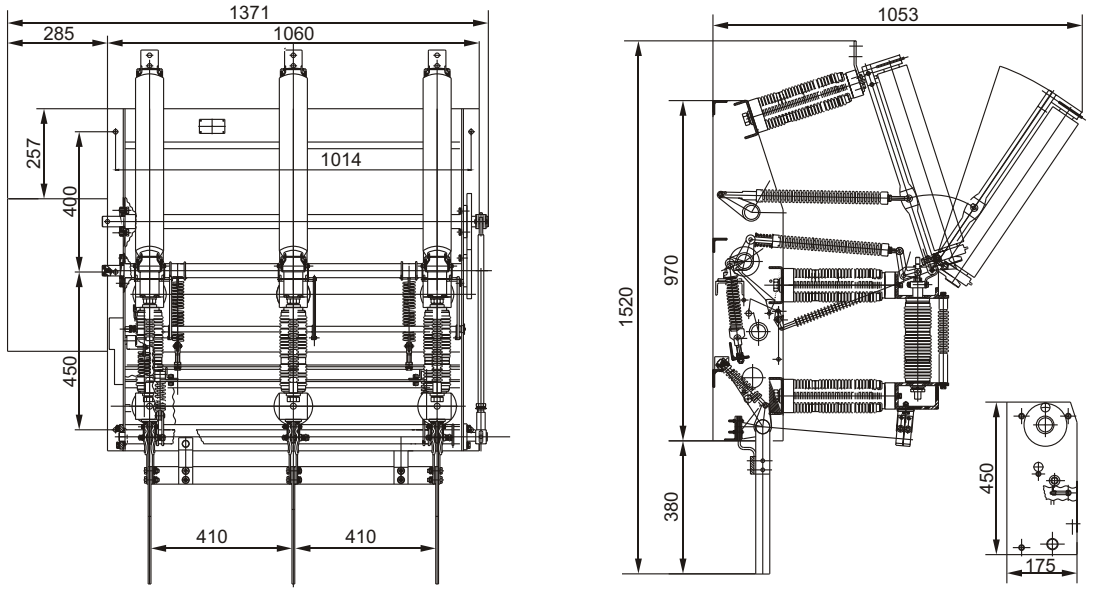
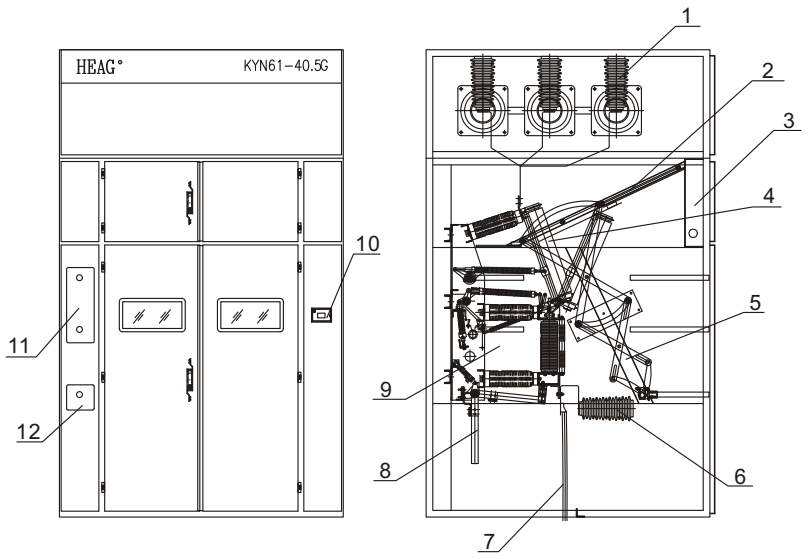


Diagram 1 FZRN21-40.5/50-20 Outline dimension



1. Insulator
2. Insulating board
3. Instrument compartment
4. Fuse
5. Drive rod
6. Post insulator with sensor
7. Cable outlet
8. Earthing switch
9. Combination apparatus
10. Power indicator
11. Operating mechanism of combination apparatus
12. Operating mechanism of insulating board

Diagram 2 FZRN21-40.5 Into cubicle switchgear (KYN61) internal structure chart

FZRN21-12D Indoor AC High Voltage Vacuum Load Break Switch-Fuse Combination Apparatus

Summary

FZRN21-12D indoor vacuum load break switch-fuse combination apparatus applies to power system of rated voltage 7.2~12kV, AC 50/60Hz. It distributes power, control and protect electric apparatus. The apparatus replace expensive VCB to service in electricity network. It can also be used in rural and urban power supply systems to break and make under rated current and short-circuit current when the circuit breaks down. It is also applicable to control and protect transformers.It is made as per IEC62271-105.

Ambient condition

1. Altitude: ≤1000m;
2. Ambient temperature: -25℃~+40℃;
3. Relative humidity: daily average ≤95%, monthly average ≤90%;
4. Earthquake intensity: ≤8 degree;
5. Applicable occasions should free from inflammables, explosives, corrosives and severe vibration.

Product feature

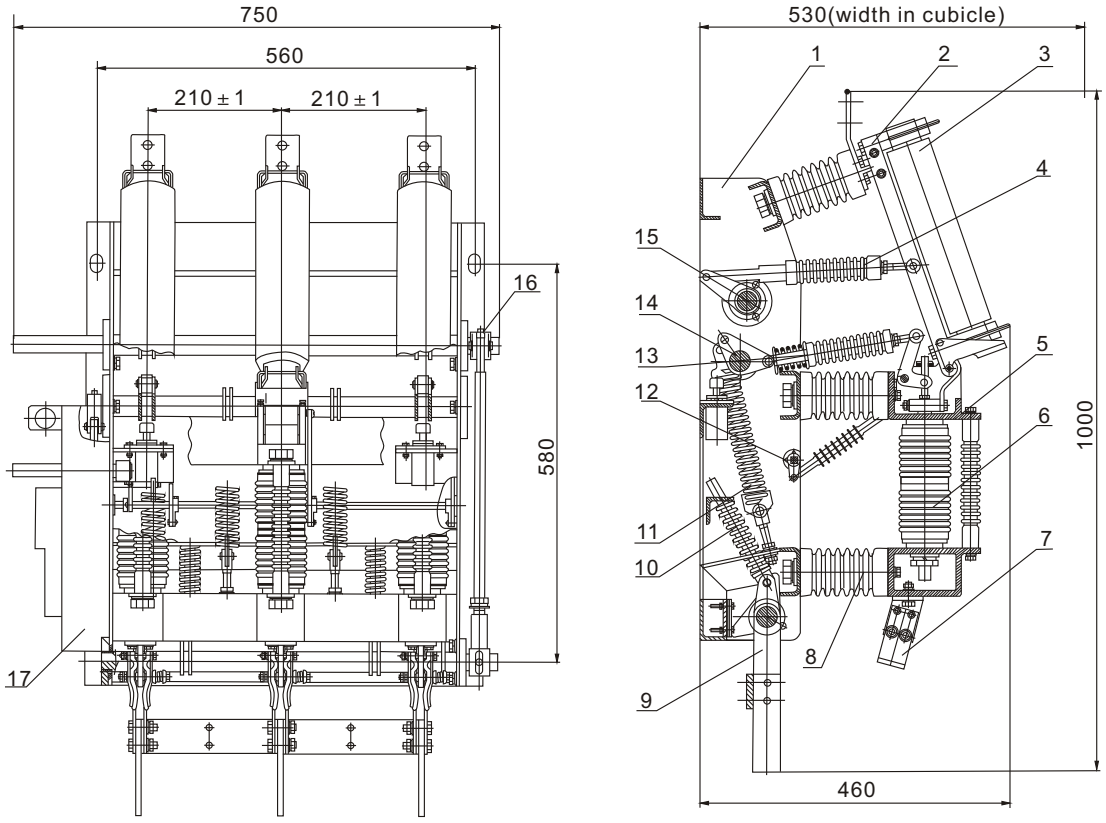
The load break switch is an interlock device of three-phase. The LBS is operated by electric motor or independent manual. The opening operation is of both independent manual and electric motor. There is reliable interlock between vacuum arc-extinguish chamber, disconnect blade and grounding blade. When the fuse breaks down, the load-breaking switch opens by the interlock mechanism. The load break switch can be mounted in switchgear and hang-on the wall to protect transformers.

Technical specification

No.	HRC Fuse	Unit	Data
1	Rated voltage	kV	12
2	Rated frequency	Hz	50/60
3	Rated maximum current of fuse	A	125
4	Transfer current	A	1550
5	Opening duration of switch activated by fuse	ms	40±5
6	Rated short-circuit breaking current	kA	31.5
7	Rated short-circuit making current (peak)	kA	80
8	1min. PF withstand voltage (phase to phase/to earth, across open contacts)	kV	42/49
9	Lightning impulse withstand voltage (phase to phase/to earth, across open contacts)	kV	75/85
10	Fuse impinger model		Middle

No.	LBS	Unit	Data
1	Rated voltage	kV	12
2	Rated frequency	Hz	50/60
3	Rated current	A	630
4	Rated active load breaking current	A	630
5	Rated closed-loop breaking current	A	630
6	5% of active load breaking current	A	31.5
7	Rated breaking current of charging cable	A	10
8	Rated breaking current of no-load transformer	A	No-load current of 1250kVA transformer
9	1min. PF withstand voltage(phase to phase/to earth, across open contacts)	kV	42/49
10	Lightning impulse withstand voltage (phase to phase/to earth, across open contacts)	kV	75/85
11	4s rated short-time withstand current	kA	31.5
12	Rated peak withstand current	kA	80
13	Rated short-circuit making current	kA	80
14	Mechanical life	Times	10,000
15	Permissible corrosion thickness of contact	mm	2
16	C/O operating moment	N・m	≤200

Outline dimension



1.Framework 2.Disconnect blade 3.Fuse 4.Insulating bar 5.Upper bracket
6.Vacuum interrupter 7.Fixed contact 8.Insulator 9.Earthing blade
10.Earthing spring 11.Opening spring 12.Trip driving device 13.Insulating bar
14.Main shaft 15.Auxiliary axis 16.Adjusting bar 17.Spring operating mechanism

FZ(R)N25-12D Indoor AC High Voltage Vacuum Load Break Switch

Summary

This product applies vacuum arc-extinguishing chamber. It features with reliable operation, long electric life and easy maintenance, breaking and making power supply frequently. The operation mechanism is inside switch gear combining disconnector, load break switch and earthing switch into one. It has compactable dimension and small weight.

The disconnect gap lies in a serial with the vacuum arc-extinguishing chamber. The large dynamic stable current and thermal stable current, the interlinked procedures assure the operation coherently.

Busbar and load break switch are separated fully by cone fixed contact, insulating cover and valve. Vacuum load break switch, earthing switch, valve and cubicle door are interlocked according to "5 protections" to prevent from miss-operation. The spring storage operation mechanism can both operate by independent manual and motor to realize remote control. The CO operating power can be AC or DC source.

Manual operation is generally on the right of switch, but can be changed to the left or obverse according to user's requirement. It is made as per IEC62271-105.

Ambient condition

1. Altitude: ⩽1000m;
2. Ambient temperature: -25℃~+40℃;
3. Relative humidity: daily average ⩽95%, monthly average ⩽90%;
4. Earthquake intensity: ⩽8 degree;
5. Applicable occasions should free from inflammables, explosives,corrosives and severe vibration.

Technical specification

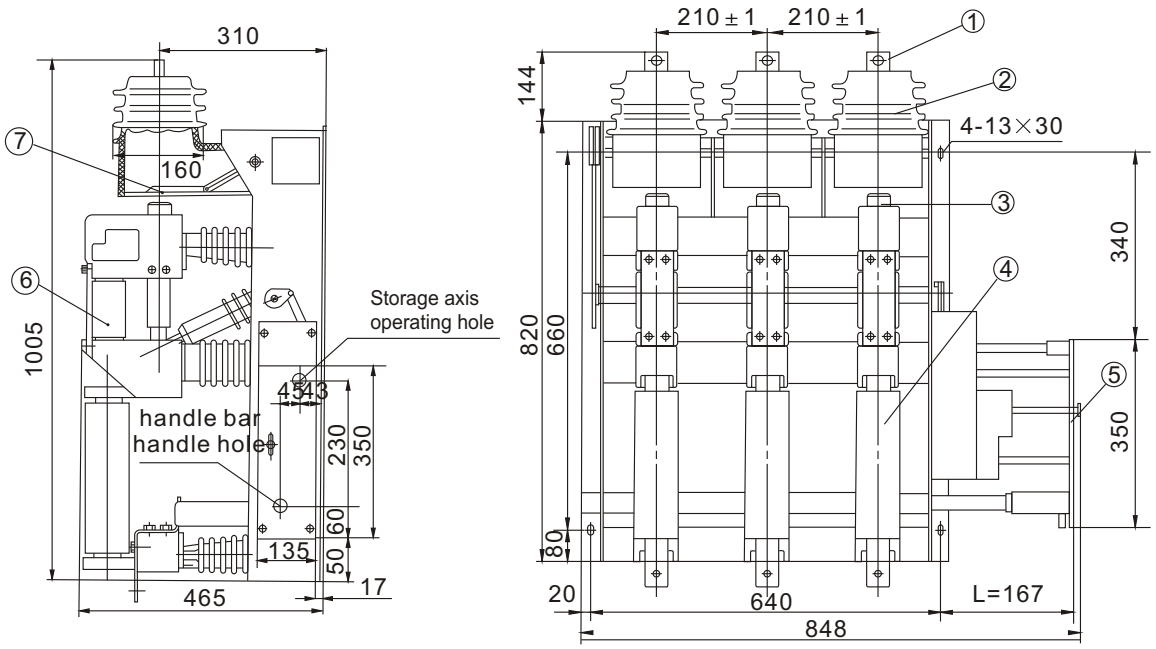
FZN25-12D Vacuum load break switch and FZRN25-12D Combination

No.	Item		Unit	FZN25-12D/T630-20	FZRN25-12D/T200-31.5
1	Rated voltage		kV	12	
2	Rated current		A	630	⩽200
3	Rated frequency		Hz	50/60	
4	Rated insulating level	1min. PF withstand voltage	kV	arcing chamber gaps:30, phase to earth, phase to phase:42, across open contacts:48	
5		lightning impulse withstand voltage(peak)	kV	phase to phase:75, across open contacts:85	
6	Rated short-time withstand current(thermal stable current)		kA	20	-
7	Rated short-circuit duration		s	4	-
8	Rated peak withstand current(dynamic stable current)		kA	50	-
9	Rated active load breaking current		A	630	-
10	Rated breaking current of closed-loop		A	630	-
11	Rated breaking current of charging cable		A	10	-
12	Rated breaking no-load transformer capacity		kVA	1600	
13	Rated short-circuit breaking current		kA	-	31.5
14	Rated transfer current		A	-	2000
15	Fuse model			-	SDLAJ-12 / SFLAJ-12
16	Output power of impinger		J	-	2-5
17	Rated short-circuit making current		kA	50	-
18	Rated short-time withstand current of earthing switch(thermal stable current)		kA	20	
19	Rated short-circuit duration of earthing switch		s	2	
20	Rated voltage of auxiliary loop		V	≃ 220, 110	
21	Mechanical life		Times	10,000	

Mechanical specification of FZN25-12D and FZRN25-12D

No.	Item	Unit	FZN25-12D/T630-20	FZRN25-12D/T200-31.5
1	Clearance between electrified parts/ to earth	mm	⩾125	
2	The thickness of conducting tube inject into fixed contacting base	mm	⩾18	
3	Clearance between fixed and moving contact	mm	6^{+1}_{0}	
4	Spring decrement under contact pressrue	mm	2^{+1}_{0}	
5	Average closing speed of arc-extinguishing chamber	m/s	0.9 ± 0.2	
6	Average opening speed of arc-extinguishing chamber	m/s	0.6 ± 0.2	
7	Opening spring time	ms	⩽2	
8	Three poles C/O asynchronous	ms	⩽3	
9	Main circuit resistance		⩽150	⩽300
10	Maximum moment of manual operation	N•m	⩽160	
11	Opening time actuated by fuse	ms	-	30-40
12	Opening time actuated by release	ms	40-45	

Outline diagram



1.Fixed contact 2.Insulating cover 3.Conducting tube
4.Fuse 5.Plate 6.Vacuum arc-extinguishing chamber
7.Valve the normal length of left handle and right handle are 167, optional cubicle depth 900, width 650, height 2000 (optional selection L=192, 207, 217)

FK(R)N12-12D Load Break Switch-Fuse Combination Apparatus

Summary

FKN12-12D series air-blast load break switch and FKRN12-12D series air-blast load break switch-fuse combination apparatus are new series switchgear applies to three- phase electric distribution system of rated 12kV, acting as protecting and control apparatus for transformers, cable and overhead wiring. These series are especially applicable in rural, urban terminal substation and prefabricated substations, as well as ring network power supply.

FKN12-12D can break and make load current and over-current.

FKRN12-12D can break and make over-current, load current and short-circuit current (limited current fuse).

This product is featured with impact structure, aesthetic appearance, reliable interlock and high insulating level. In the spring storage operation mechanism, ON/OFF speed is free from the influence of the manpower. For the arc-extinguish, electric arc- extinguish inside the insulating cover, the free gas occurs at sparking do not cause descend of insulating level between phases and phase to earth. The insulation cover clapboard separates electrified part thus boost protection grade of ring main unit. The copper-tungsten contact and main contact brings along reliable conductivity and long life. This product achieves sound fame due to easy maintenance and operation as well as reliable performance. It is in compliance with per IEC62271-105.

Ambient condition

1. Altitude: ≤1000m;
2. Ambient temperature: -25℃~+40℃;
3. Relative humidity: daily average ≤95%, monthly average ≤90%;
4. Earthquake intensity: ≤8 degree;
5. Pollution degree: Ⅱ;
6. Applicable occasions should free from inflammables, explosives, corrosives and severe vibration.

Model

F K R N 12 - 12 D / T 100 - 31.5

- Rated short circuit breaking current
- Rated current
- Operation mechanism (spring)
- Earthing switch
- Rated voltage
- Design serial No.
- Indoor
- HRC fuse
- Extinguish material(air)
- Load break switch

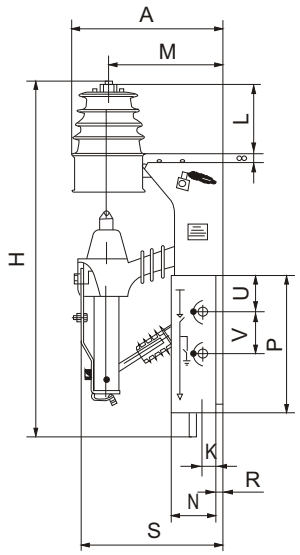
Technical specification

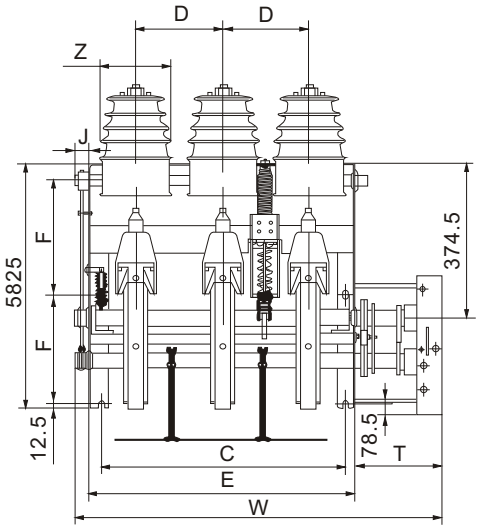
No.	Item	Unit	FKN12-12D	FKRN12-12D(HRC fuse)
1	Rated voltage	kV	12	12
2	Rated power frequency	Hz	50/60	50/60
3	Rated current	A	630	125
4	1min. PF withstand voltage(phase to earth, phase to phase)	kV	42	42
5	1min. PF withstand voltage(across open contacts)	kV	48	48
6	Lightning impulse withstand voltage(phase to earth, phase to phase)	kV	75	75
7	Lightning impulse withstand voltage(across open contacts)	kV	85	85
8	Rated short-time withstand current (thermal steadily)-LBS	kA	20	
9	Rated short-time withstand current(thermal steadily)-earthing switch	kA	20	
10	Rated short-circuit duration(thermal steadily time)-LBS	s	4	
11	Rated short-circuit duration(thermal steadily time)-earthing switch	s	2	
12	Rated short-circuit making current(peak)	kA	50	
13	Rated breaking current active load breaking current	A	630	
14	Rated breaking current loop breaking current	A	630	
15	5% of rated active load breaking current	A	31.5	
16	Rated breaking current cable charging current	A	10	
17	Rated breaking current no-load transformer capacity	kVA	1250	
18	Rated short-circuit breaking current(fuse)	kA		31.5
19	Rated transfer current	A		1200
20	Mechanical life	Times	2000	2000

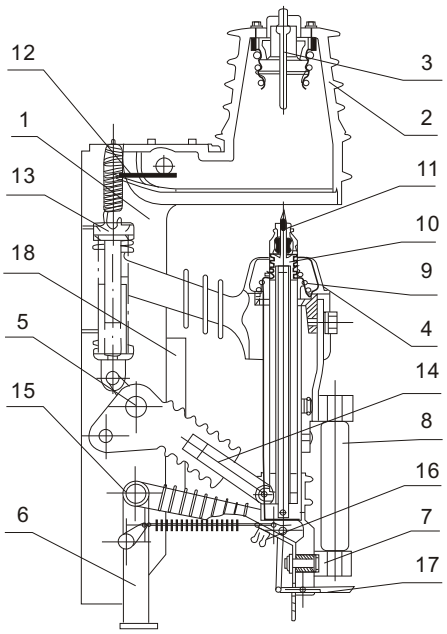
Mechanical performance

No.	Item	Unit	Data
1	Distance of open contacts	mm	⩾175
2	Central distance of poles	mm	210±2
3	Air clearance of poles	mm	⩾125
4	Travel	mm	210±4
5	Over-travel	mm	⩾40
6	Three pole making asynchronous	ms	⩽10
7	Three pole breaking asynchronous	ms	⩽5
8	Release tripper breaking time	ms	40~65
9	Main circuit resistance	μ Ω	⩽130

Outline dimension







1.Frame
2.Bell housing
3.Upper contact
4.Upper support
5.Main axle
6.Earthing blade
7.Fuse card
8.Fuse
9.Lower contact
10.Piston
11.Nozzle and conducting air pipe
12.Valve (safety board)
13.Storage mechanism
14.Pulling pole
15.Supporting arm
16.Earthing clip
17.Trip plate
18.Operating interlocking component

Size(mm) / Model	A	H	C	D	E	F	K	J	L	M	N	P	R	S	T	U	V	W	Z	Weight
FKN12-12D	390	880	600	210	648	270	67	50	155	287	171	368	11	337	170	94	105	868	180	70kg

FN7-12/24 DR AC High Voltage Load Break Switch

Summary

FN7-12/24 DR model AC and HV indoor load break switch applies to three -phase power supply system of rated voltage 12/24kV and AC 50/60Hz. It used to switch on and off load-breaking current and short-circuit current. It is made as per IEC62271-105.

Ambient condition

1. Altitude: ≤1000m;
2. Ambient temperature: -25℃~+40℃;
3. Relative humidity: daily average ≤95%, monthly average ≤90%;
4. Earthquake intensity: ≤8 degree;
5. Applicable occasions should free from inflammables, explosives, corrosives and severe vibration.

Technical specification

Main specification：

Sheet 1

Type	Model	DS	DX	L	R	RA	F
		Earthing switch at input terminal	Earthing switch at output terminal	Interlock device	Fuse	Impact release	Power closing device
No release	FN7-12/24	-	-	-	-	-	-
	FN7-12/24DSL	△	-	△	-	-	-
	FN7-12/24DXL	-	△	△	-	-	-
	FN7-12/24R	-	-	-	△	-	-
	FN7-12/24DSLR	△	-	△	△	-	-
	FN7-12/24DXLR	-	△	△	△	-	-
With Impact release	FN7-12/24RAF	-	-	-	-	△	△
	FN7-12/24DSLRAF	△	-	△	-	△	△
	FN712/24DXLRAF	-	△	△	-	e	e

Note :(-)without(△)with

Rated data:

Sheet 2

Rated voltage (kV)	Max voltage (kV)	Rated current (A)	1min P.F withstand voltage (kV)	4s thermal stable current (virtual)(kA)	Dynamic stable current (peak)(kA)	Short circuit making current (kA)	Rated breaking current (A)	Rated transfer current (A)
12	12	400	42/48	12.5	31.5	31.5	400	1000
		630	42/48	20	50	50	630	1000
20	24	400	50/60	16	40	40	400	1000
		630	50/60	20	50	50	630	1000

Outline dimension

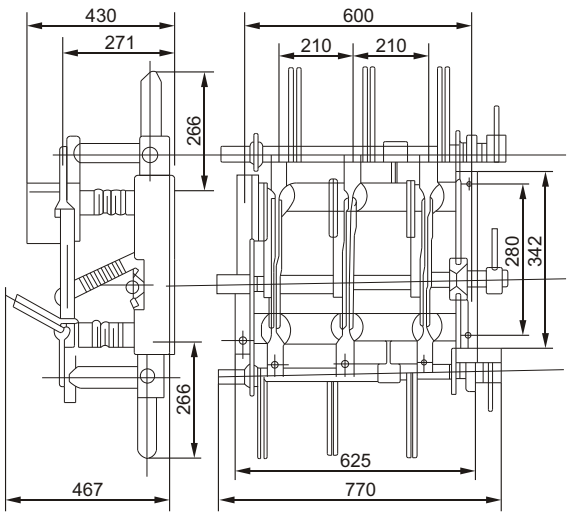


Diagram 1 "Line protection" load break switch without release

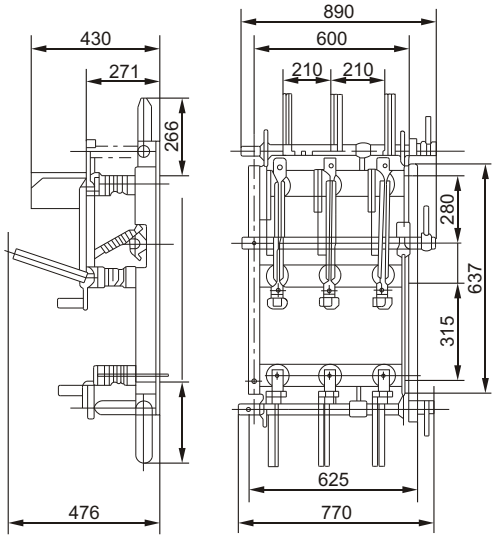
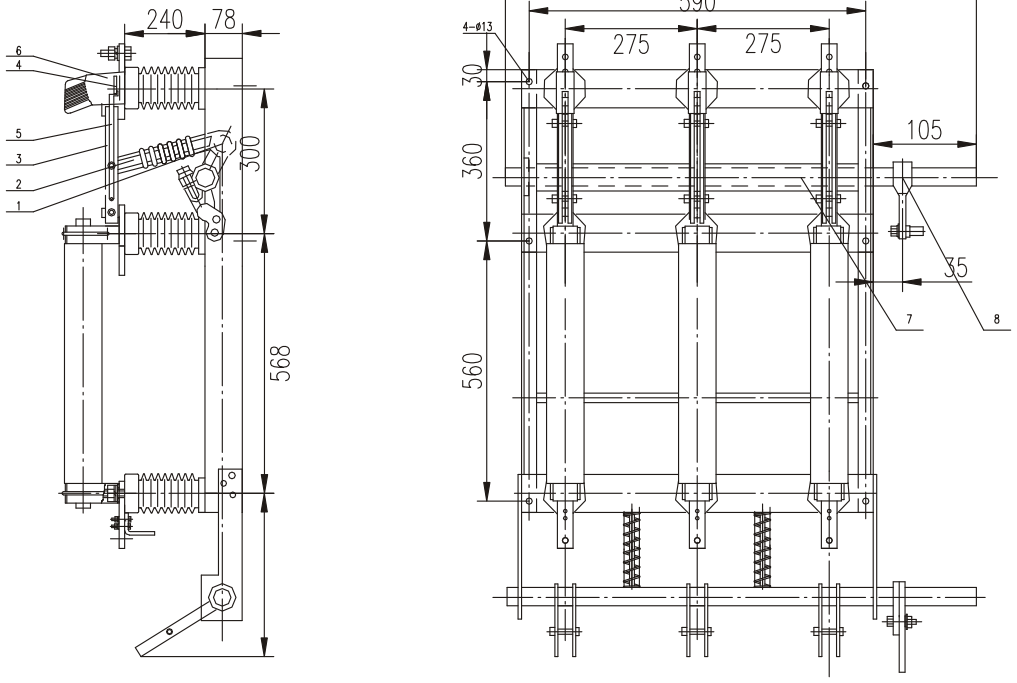


Diagram 2 "Transformer protection" load break switch without release



1.Main axis 2.Insulating rod 3.Blade 4.Contact 5.Arc contact
6.Arc extinguish chamber 7.Spring stored energy mechanism
8.On/Off operating arm

Diagram 3 Outline drawing of FN7-24D(With fuse and earthing blade)

FN5-12R(L)Indoor AC HV Load Break Switch-Fuse Combination Apparatus

Summary

FN5-12R(L) Model indoor AC HV load break switch-fuse combination apparatus is developed and designed based on international technology and national power supply requirement, it passes all type tests and trial-operation inspections. The apparatus conforms to IEC62271-105: AC load break switch and fuse combination apparatus. (1990 edition) and GB3804: 3-63kV AC HV load break switch. Compare to international product, it keeps up with technical level with small volume and light weight. It is applicable in ring main unit and prefabricated substations as well as 12kV line and power distribution system.
The product realizes three working positions: power making, power breaking and earth. It applies to power system of rated voltage 6~12kV, 50/60Hz breaking load current, overload current and short-circuit current.

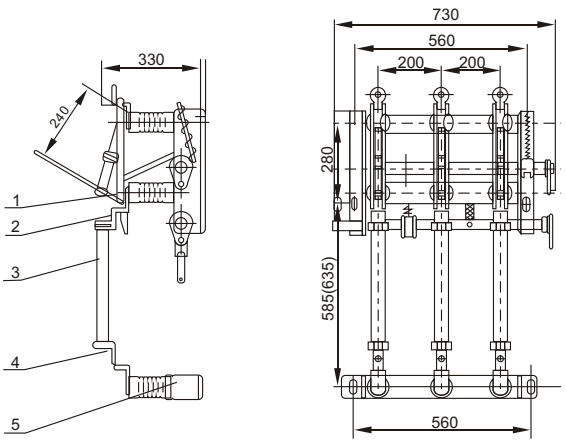
Ambient condition

1. Altitude: ≤1000m;
2. Ambient temperature: -25℃~+40℃;
3. Relative humidity: daily average ≤95%, monthly average ≤90%;
4. Earthquake intensity: ≤8 degree;
5. Applicable occasions should free from inflammables, explosives, corrosives and severe vibration.

Technical specification

No.	Item	Unit	Data	
1	Rated voltage	kV	12	
2	Rated frequency	Hz	50/60	
3	Rated current	A	400	630
4	Rated short-time withstand current(thermal)	kA/s	12.5/4	20/2
5	Rated peak withstand current	kA	31.5	50
6	Rated closed-loop breaking current	A	400	630
7	Rated active load break current		400	630
8	5% of rated active load break current		20	31.5
9	Rated cable-charging breaking current		10	
10	Rated no-load transformer breaking current		1250kVA no load current of transformer	
11	Rated short-circuit making current	kA	31.5	50
12	Breaking times of load current	Times	100%/20, 60%/35, 30%/75, 5%/80	
13	1 min. power frequency withstand voltage (phase tophase, to earth/ across open contacts)	kV	42/48	
14	Lightning impulse withstand voltage (phase to phase, to earth/ across open contacts)		75/85	
15	C/O operating moment	Nm(N)	90(180)	100(200)

Outline dimension for installation



1.FN5-12R load break switch
2.Fuse connection board
3.Fuse tube
4.Fuse connection board
5.Fuse bracket

FLRN36-12D/125 Indoor AC High Voltage Load Break Switch-Fuse Combination Apparatus

Summary

FLRN36 indoor AC high-voltage load break switch-fuse combination (combination in short)is a comprehensive and new combination apparatus produced on the bases of the mature experience in domestic and abroad. It is a complement apparatus of HXGN15-12 AC metal-enclosed ring main unit and it meet requirement of users in different power system. It has the advantages such as simple structure, easy maintenance, strong arc-extinction capability, high gap insulating level and high reliability. It accords with IEC62271-105, GB16926 & GB/T 11022 standards.

Ambient condition

1. Altitude: ≤1000m;
2. Ambient temperature: -25℃~+40℃;
3. Relative humidity: daily average ≤95%, monthly average ≤90%;
4. Earthquake intensity: ≤8 degree;
5. Occasions without flammable and explosive matter, without corrosive chemical and frequent severe vibration.

Model

F L R N 36-12 D / 125 - 50

- 50 — Rated short-circuit making current(kA)
- 125 — Rated current(A)
- D — Earthing switch
- 12 — Rated voltage(kV)
- 36 — Design serial No.
- N — Indoor
- R — Fuse
- L — Arc medium (SF6)
- F — Load break switch

Product feature

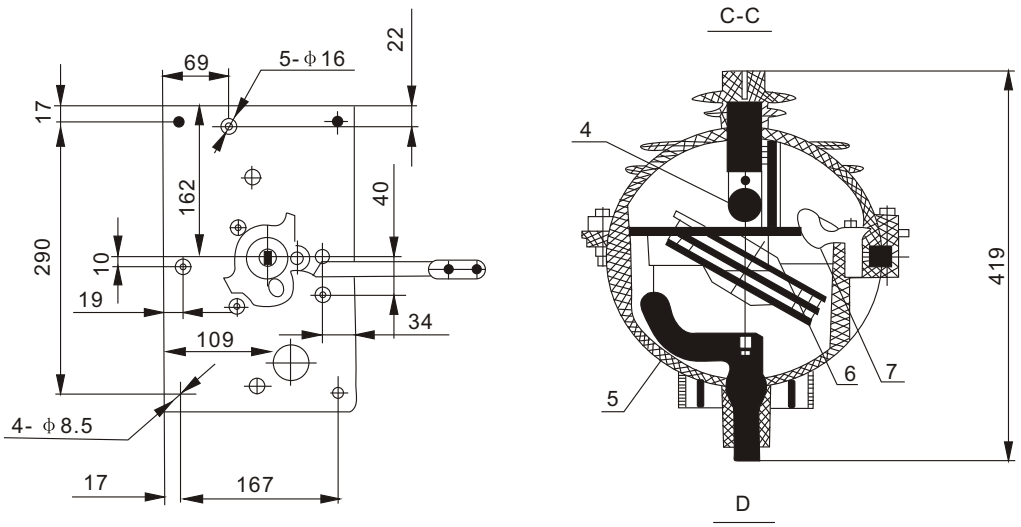
FLRN36-12D indoor AC high-voltage load break switch is equipped with double breaks, three working positions (ON, OFF, Earthing) and rotary moving contact. It uses SF6 for arcing and insulating medium. Moving contact, fixed contact and grounded contact are installed in epoxy resin enclosure by compressing casting. The operation mechanism is reliable and simple which can be operated by manual and motor. The reliable mechanical interlock device together with the switch body makes 5-protection functions.

Technical specification

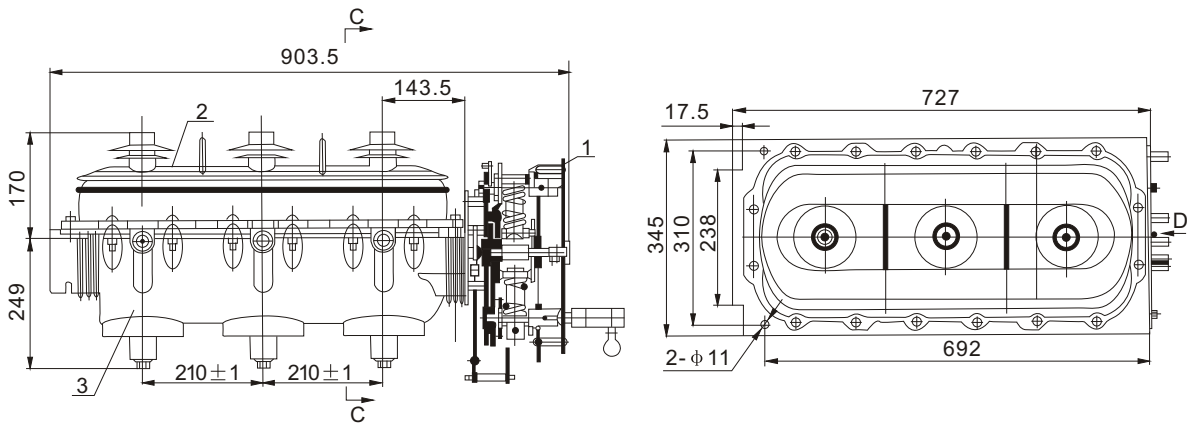
No.	Item	Unit	Load break switch	Combination
1	Ratd voltage	kV	12	12
2	Rated current	A	630	125
3	Rated frequency	Hz	50/60	50/60
4	Rated short-circuit making current(peak)	kA	50	/
5	Rated short-time withstand current	kA	20	/
6	Rated peak withstand current	kA	50	/
7	Rated short-circuit duration	s	4	/
8	Rated active load breaking current	A	630	/
9	Rated closed-loop breaking current	A	630	/
10	Rated cable charging current	A	10	/

No.	Item			Unit	Load break switch	Combination
11	5% of rated active load breaking current			A	31.5	/
12	Rated short-circuit breaking current			kA	/	50
13	Rated transfer current			A	/	1550
14	Rated insulating level	1min. PF withstand voltage	phase-phase,to earth	kV	42	42
			across open contacts	kV	49	49
		Lightning impulse withstand voltage	phase-phase,to earth	kV	75	75
			across open contacts	kV	85	85
15	Circuit resistance of each pole			μ Ω	≤70(exclude fuse resistance)	
16	Mechanical life of load break switch			Times	2000	2000
17	Rated short-time withstand current of earthing switch			kA	20	20
18	Rated peak withstand current of earthing switch			kA	50	50
19	Rated short-circuit duration of earthing switch			s	4	4
20	Rated short-circuit making current of earthing switch			kA	50	50
21	Mechanical life of earthing switch			Times	2000	2000

Outline diemension



1.Spring operating mechanism 2.Cover 3.Case 4.Main contact
5.Epoxy resin enclosure 6.Turning shaft 7.Earthing contact



GN27-40.5 Indoor AC High Voltage Disconnect Switch

Summary

GN27-40.5 disconnect switch is an indoor electric apparatus used in rated voltage 40.5kV, three-phase AC 50/60Hz system. It is made as per IEC62271-102.

Ambient condition

1. Altitude: ≤1000m;
2. Ambient temperature: -25℃~+40℃;
3. Relative humidity: daily average ≤95%, monthly average ≤90%;
4. Earthquake intensity: ≤8 degree;
5. Applicable occasions should free from inflammables, explosives, corrosives and severe vibration.

Model

G N 27 - 40.5 / 630

- 630 — Rated current(A)
- 40.5 — Rated voltage(kV)
- 27 — Design serial No.
- N — Indoor
- G — Disconnect switch

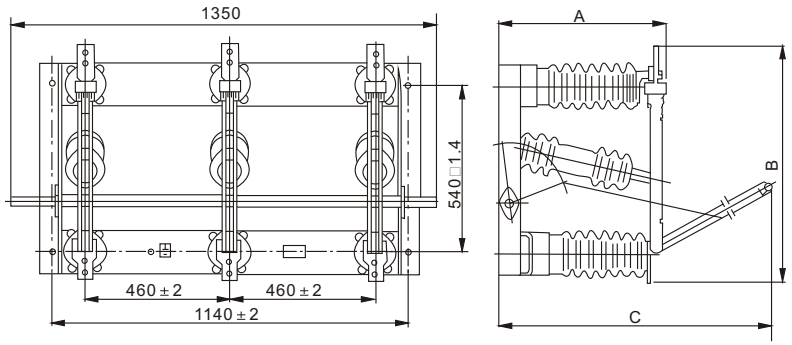
Product feature

1. Scientific design and innovative structure.
2. Multi contacts, rotary contacting, auto-cleaning capacity and effective cooling.
3. Contacting points distribute on two planes, small operating moment and good pressure withstand capability, as well as easy of adjustment.
4. Applicable when creepage distance, insulating capacity and withstand voltage are all on the highest level.
5. Axletree is fabricated on the rotary axle so as to prolong lifetime of apparatus and to simplify operation.

Technical specification

Model	Rated voltage (kV)	Rated current (A)	Rated short-time withstand current (4s)	Rated peak withstand current (kA)	Lightning impulse withstand voltage		1min. PF withstand voltage	
					Phase to phase phase to earth	Across open contacts	Phase to phase phase to earth	Across open contacts
					(kV)		(kV)	
GN27-40.5/630-20	40.5	630	20/4s	50	185	215	95	115
GN27-40.5/1250-31.5	40.5	1250	31.5/4s	80	185	215	95	115

Outline dimension



Product model	A	B	C
GN27-40.5/630-20	543	781	940
GN27-40.5/1250-31.5	544	788	950

Diagram 1 GN27-40.5/$^{630\text{-}20}_{1250\text{-}31.5}$ Indoor high voltage disconnect switch

GN19-12(C)Indoor AC High Voltage Disconnect Switch

Summary

GN19-12(C) indoor HV disconnect switch applies to power system of rated voltage below 12kV,AC 50/60Hz. It is equipped with CS6-1 manual-operating mechanism and is used to break and make circuit under no-load. There are additional pollution type, high-altitude type and power indicating type. It is made as per IEC62271-102.

Ambient condition

1. Altitude: ≤1000m;
2. Ambient temperature: -25℃~+40℃;
3. Relative humidity: daily average ≤95%, monthly average ≤90%;
4. Earthquake intensity: ≤8 degree;
5. Applicable occasions should free from inflammables, explosives, corrosives and severe vibration.

Model

G N 19 - 12 (C)

- (C) — Wall type
- 12 — Rated voltage
- 19 — Design serial No.
- N — Indoor
- G — Disconnect switch

Product feature

1. Scientific design and simple structure.
2. Large clearance between gaps.
3. Small operating power and steady performance.

Technical specification

Model	Rated voltage (kV)	Rated current (A)	Rated short-time withstand current(kA/4s)	Rated peak withstand current(kA)
GN19-12/400-12.5	12	400	12.5	31.5
GN19-12/630-20	12	630	20	50
GN19-12/1000-31.5	12	1000	31.5	80
GN19-12/1250-31.5	12	1250	31.5	80
GN19-12C/400-12.5	12	400	12.5	31.5
GN19-12C/630-20	12	630	20	50
GN19-12C/1000-31.5	12	1000	31.5	80
GN19-1C2/1250-31.5	12	1250	31.5	80

Outline dimension

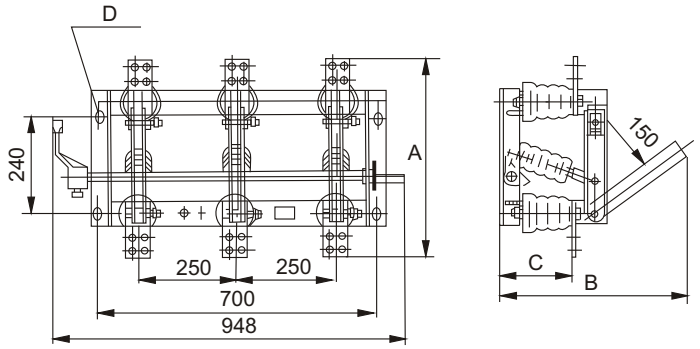


Diagram 1 GN19-12

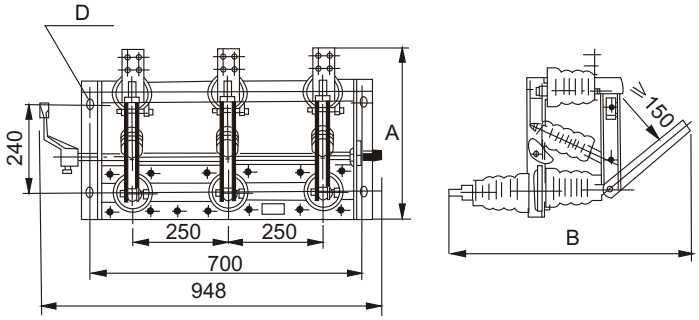
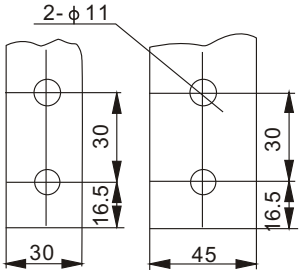
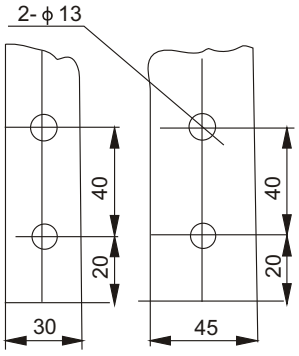


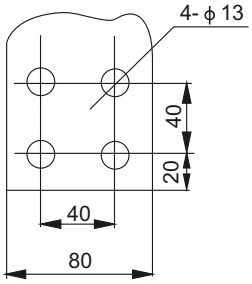
Diagram 2 GN19-12C



GN19-12(C)/400



GN19-12(C)/630



GN19-12(C)/1000 1250

Model	A	B	C	D
GN19-12/400	450	446	185	4-14×24
GN19-12/630	470	446	185	
GN19-12/1000/1250	510	500	196	4-18×28
GN19-12C/400	420	690	185	4-14×24
GN19-12C/630	430	690	185	
GN19-12C/1000/1250	470	745	196	4-18×28

GN22-12(C) Indoor AC High Voltage Disconnect Switch

Summary

GN22-12(C) disconnect switch is an indoor electric apparatus of rated voltage 12kV three-phase AC 50/60Hz. it is used to break, make and transfer lines when the HV apparatus is under situations with voltage and no-load. It is manufactured according to IEC62271-102.

Ambient condition

1. Altitude: ≤1000m;
2. Ambient temperature: -30℃~+40℃;
3. Relative humidity: daily average ≤95%, monthly average ≤90%;
4. Earthquake intensity: ≤8 degree;
5. Applicable occasions should free from inflammables, explosives, corrosives and severe vibration.

Model

G N 22 - 12 (C)

- (C) — Wall type
- 12 — Rated voltage
- 22 — Design serial No.
- N — Indoor
- G — Disconnect switch

Product feature

1. Scientific and reliable design.
2. Large current capacity.
3. Easy maintenance and operation.

Technical specification

Item		Unit	Data	
Rated voltage		kV	12	
Rated frequency		Hz	50/60	
Rated current		A	1600-2000	2500-3150
Rated short-time withstand current		kA	40	50
Rated peak withstand current		kA	100	125
Rated short-circuit duration		s	4	
Rated insulating level	1min. PF withstand voltage	kV	phase to phase/ to earth: 42, across open contacts: 49	
	Lightning impulse withstand voltage(peak)	kV	phase to phase/ to earth: 75, across open contacts: 85	

Outline dimension

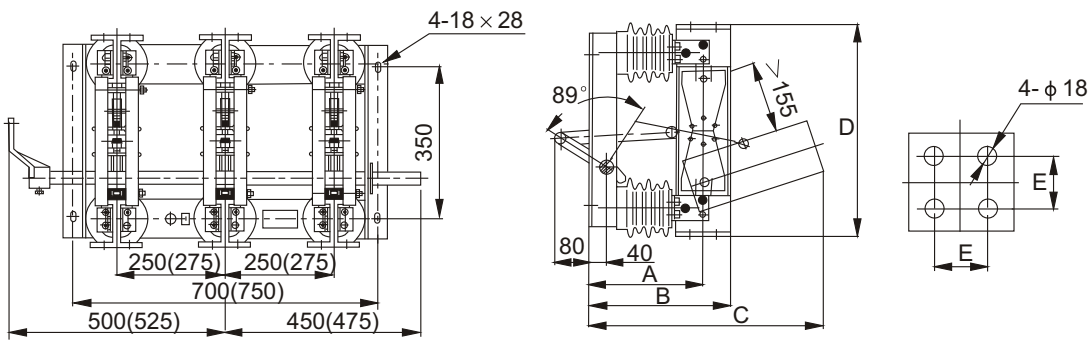


Diagram 1 GN22-12

Model	A	B	C	D	E
GN22-12/1600-2000	255	305	527	490	50
GN22-12/2500-3150	262	325	538	494	60

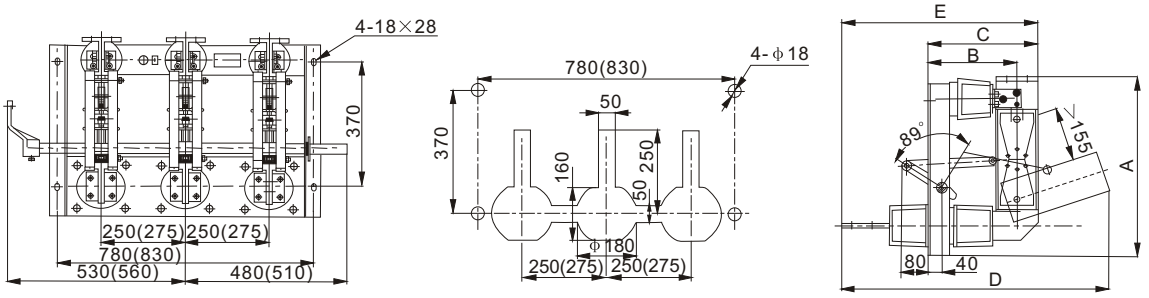
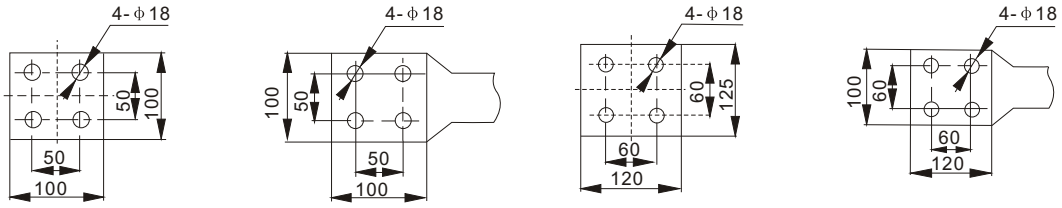


Diagram 2 GN22-12C



GN22-12C/1600~2000 Connection terminal

GN22-12C/2500~3150 Connection terminal

Model	A	B	C	D	E
GN22-12C/1600~2000	537	255	305	807	580
GN22-12C/2500~3150	539	267.5	330	880	630

GN24-12D Indoor AC High Voltage Disconnect Switch (earthing)

Summary

GN24-12(D) disconnect switch is an indoor electric apparatus of rated voltage 12kV, three-phase AC 50/60Hz which is used to make, break and transfer between lines under situations with voltage and no-load. The innovative structure which the disconnector is also fabricated with an earthing switch. The switch also can be mounted through the wall. It is made as per IEC62271-102.

Ambient condition

1. Altitude: ≤1000m;
2. Ambient temperature: -25℃~+40℃;
3. Relative humidity: daily average ≤95%, monthly average ≤90%;
4. Earthquake intensity: ≤8 degree;
5. Applicable occasions should free from inflammables, explosives, corrosives and severe vibration.

Model

G N 24 - 12 D

- D — Single earthing blade
- 12 — Rated voltage
- 24 — Design serial No.
- N — Indoor
- G — Disconnect switch

Procut feature

1. Reasonable and scientific design, innovative structure.
2. Contacting points distribute on two planes, small operation moment, strong pressure release capability, easy adjustment.
3. Improved driving and conducting parts.

Outline dimension

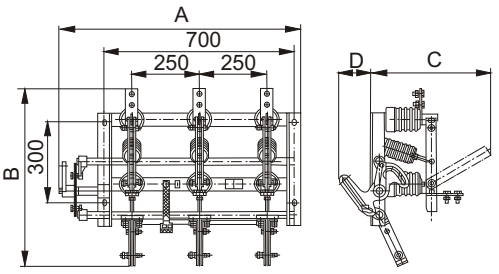


Diagram1 GN24-12D Ⅰ

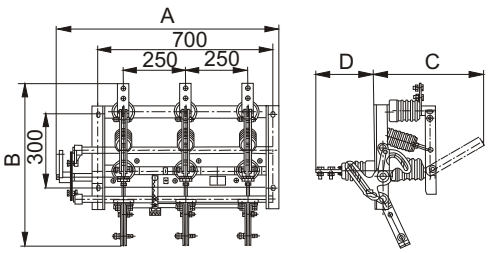


Diagram 2 GN24-12DC Ⅰ

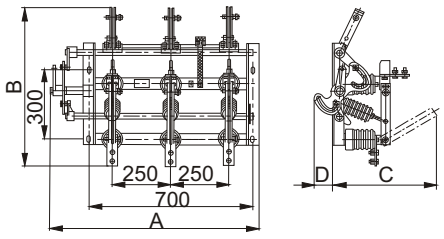


Diagram 3GN24-12D Ⅱ

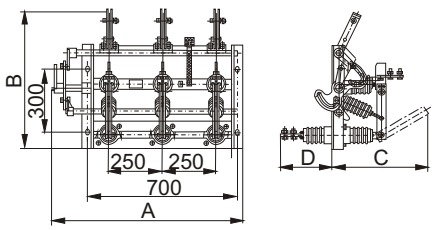


Diagram 4 GN24-12DC Ⅱ

GN30-12(D)Rotary Indoor AC HV Disconnect Switch

Summary

GN30-12(D) disconnect switch is an indoor electric apparatus of rated voltage 12kV, three-phase AC50/60Hz. It is used to make break and transfer current for HV electric apparatus under situations with voltage and no-load.The switch applies rotary moving contact which is mounted on the switchgear easily. It adopts wall through installation as well.It is made as per IEC62271-102

Ambient condition

1. Altitude: ≤1000m;
2. Ambient temperature: -25℃~+40℃;
3. Relative humidity: daily average ≤95%, monthly average ≤90%;
4. Earthquake intensity: ≤8 degree;
5. Applicable occasions should free from inflammables, explosives, corrosives and severe vibration.

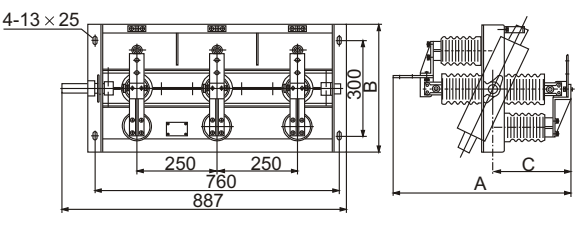
Product feature

1. Scientific design and innovative structure.
2. Contacting points distribute on two planes, small operating moment, and release pressure to small and easy adjustment.
3. Improved driving and conducting part.
4. Column moving contact that can decrease operating strength and ensure reliability of circuit conduction.

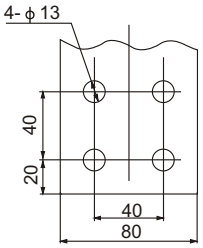
Technical specification

Data / Model and specification		GN30-12/400-12.5	GN30-12/630-20	GN30-12/1000-31.5	GN30-12/1250-31.5	GN30-12/(1600-3150)-40
Item		GN30-12D/400-12.5	GN30-12D/630-20	GN30-12D/1000-31.5	GN30-12D/1250-31.5	GN30-12D/(1600-3150)-40
Rated voltage(kV)		12				
Rated current(A)		400	630	1000	1250	1600~3150
Rated short-time withstand current(kA)		12.5	20	31.5		40
Rated short-circuit duration(s)		4				
Rated peak withstand curren(kA)		31.5	50	80		100
Rated insulating level	1min. PF withstand voltage(kV)	phase to phase/ to earth: 42, across open contacts: 49				
	Lightning impulse withstand voltage(kV)	phase to phase/ to earth: 75, across open contacts: 85				

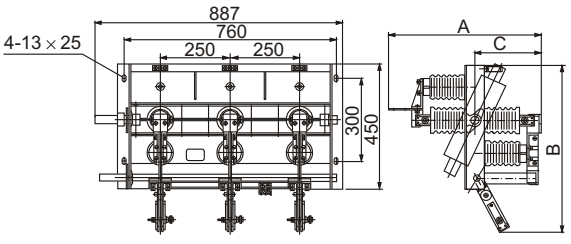
Outline dimension



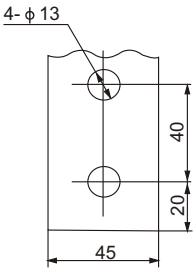
GN30-12/$\frac{630}{1000}$ Indoor HV disconnect switch



1000A Connection terminal



GN30-12D/$\frac{630}{1000}$ Indoor HV disconnect switch



630A Connection terminal

JN15-12/24(40.5) Indoor AC High Voltage Earthing Switch

Summary

JN15-12 indoor HV earthing switch absorbs advanced new technics from domestic and abroad. It conforms to GB1985 AC HV disconnect switch and earth switch, relative standards IEC62271-102 and passes KEMA test. The apparatus applies to power system of rating below12/24/40.5kV, and AC 50/60Hz. It is suitable for various types HV switchgear for earthing protection. The holistic earthing switch consists of basis, supporting insulator, main axis, main blade, fast spring, fixed and moving contact. Additional electronic display is also available according to the user's requirement.

Ambient condition

1. Altitude: ≤1000m;
2. Ambient temperature: -25℃~+40℃;
3. Relative humidity: daily average ≤95%, monthly average ≤90%;
4. Earthquake intensity: ≤8 degree.

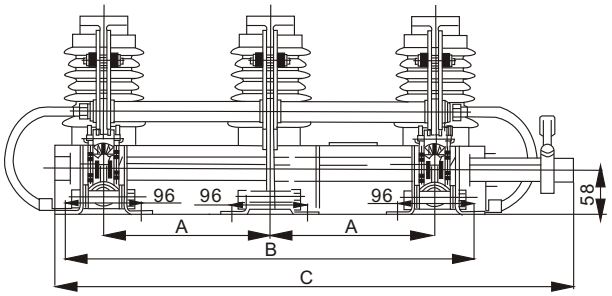
Product feature

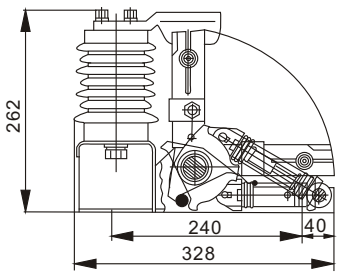
1. Advanced design and steady performance.
2. Simple structures, simple mounting and adjustment.
3. Quick breaking and making capability.
4. Handsome appearance and delicate manufacture technics.
5. Usable and scientific, available operation on both two sides(right and left).

Technical specification

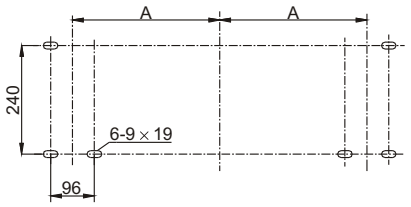
Item		Unit	Data		
Rated voltage		kV	12	24	40.5
Rated short-time withstand current		kA	31.5, 40, 50	31.5, 40, 50	31.5
Rated short-circuit duration		s	4	4	4
Rated short-circuit making current		kA	80, 100, 125	80, 100, 125	80
Rated peak withstand current		kA	80, 100, 125	80, 100, 125	80
Central distance between poles		mm	150, 165, 210, 230, 250, 275	210, 230, 250, 275	350，385，460
Rated insulting level	1min. PF withstand voltage	kV	42/49	50/60	95
	Lightning impulse withstand voltage		75/85	125/145	185

Outline dimension



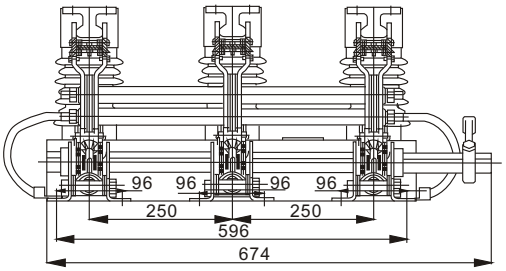


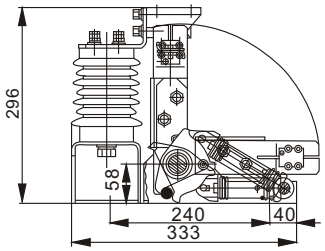
Model	A	B	C
JN15-12/31.5-150	150	396	535
JN15-12/31.5-165	165	426	565
JN15-12/31.5-210	210	516	655
JN15-12/31.5-230	230	556	710
JN15-12/31.5-250	250	596	760
JN15-12/31.5-275	275	646	810



Mounting hole

JN15-12/31.5 Earthing switch

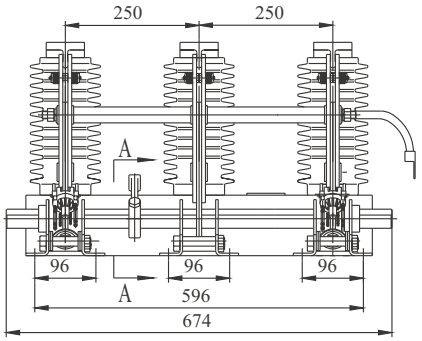


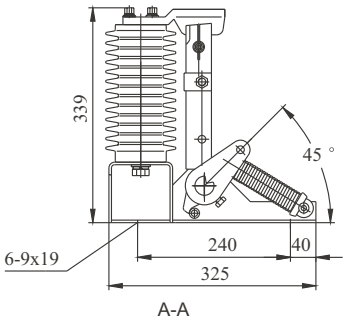


A-A

Model	A	B	C
JN15-12/40-210	210	516	655
JN15-12/40-230	230	556	710
JN15-12/40-250	250	596	760
JN15-12/40-275	275	646	810

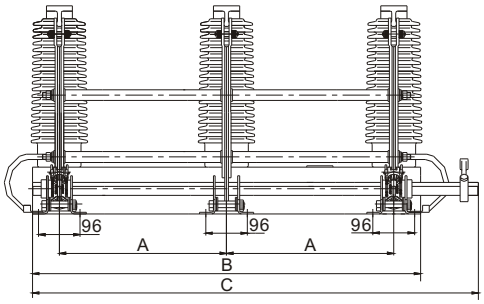
JN15-12/40 Earthing switch

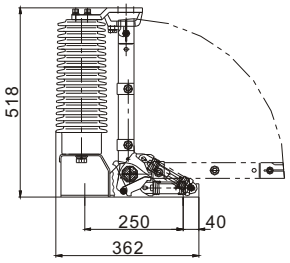




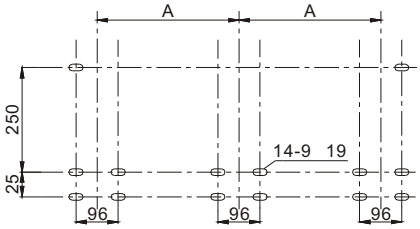
A-A

JN15-24/40 Earthing switch





Model	A	B	C
JN15-40.5/31.5-300	300	724	855
JN15-40.5/31.5-350	350	824	955
JN15-40.5/31.5-385	385	894	1025
JN15-40.5/31.5-460	460	1044	1175



Mounting hole

JN15-40.5/31.5 Earthing switch

JN15A-12 Indoor AC High Voltage Earthing Switch

Summary

JN15A-12 (EK6) indoor HV earthing switch is produced by introducing advanced technical from abroad, it is used for earthing protection in power system of rated voltage 12kV, AC 50/60Hz, it also qualified to make and break short circuit. The earthing switch has separate moving blade and fixed contact as to equip in different domestic metal-enclosed switchgear. This product conforms to IEC62271-102 and GB1985 standard.

Ambient condition

1. Altitude: ≤1000m;
2. Ambient temperature: -25℃~+40℃;
3. Relative humidity: daily average ≤95%, monthly average ≤90%;
4. Earthquake intensity: ≤8 degree.

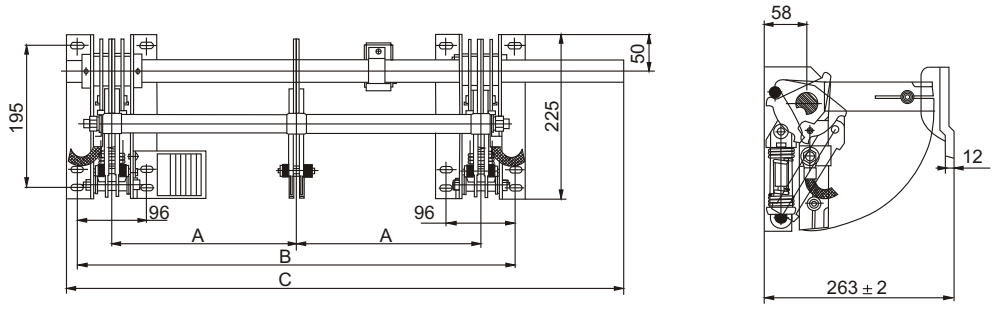
Product feature

1. Advanced design and steady performance.
2. Simple structures, installation and adjustment.
3. Fast breaking and making capability.
4. Handsome appearance and delicate manufacture craft.
5. Usable and scientific apparatus, be operated on both sides(right and left).

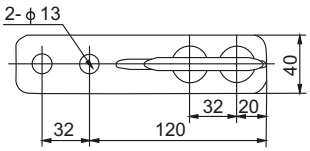
Technical specification

Item	Unit	Data
Rated voltage	kV	12
Rated short-time withstand current	kA	31.5,40
Rated short-circuit duration	s	4
Rated short-circuit making current	kA	80,100
Rated peak withstand current	kA	80,100
Central distance between poles	mm	150,165,210,230,250,275

Outline dimension

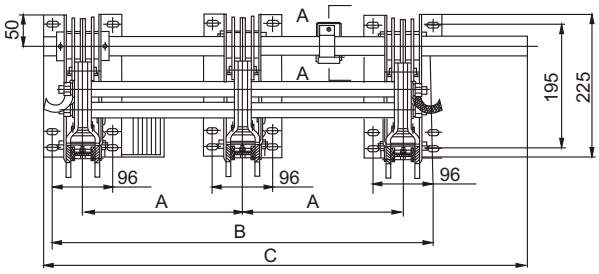


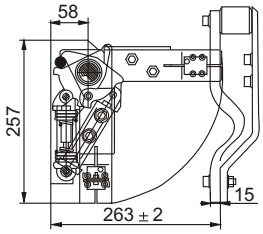
Model	A	B	C
JN15A-12/31.5-150	150	396	535
JN15A-12/31.5-165	165	426	565
JN15A-12/31.5-210	210	516	655
JN15A-12/31.5-230	230	556	710



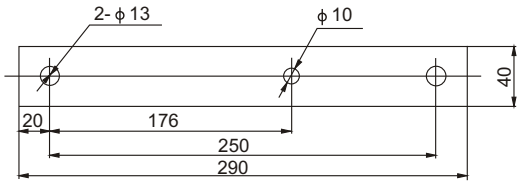
Fixed contact

JN15A-12/31.5 Earthing switch outline dimension





Model	A	B	C
JN15A-12/40-210	210	516	655
JN15A-12/40-230	230	556	710
JN15A-12/40-250	250	596	760
JN15A-12/40-275	275	646	810



Fixed contact

JN15A-12/40 Earthing switch outline dimension

VS1 Spring Operating Mechanism

Summary

VS1 Spring operating mechanism applies to indoor three-phase AC 50Hz and rated voltage 12kV. This product conforms to standards of IEC62271 & GB/T1984 AC High-voltage circuit breaker, JB3855: 3.6~40.5kV indoor AC High-voltage vacuum circuit breaker, DL403: 10~35kV Indoor HV vacuum circuit-breaker technical instruction. VS1 limited-purpose spring operating mechanism can be mounting inside handcart and fixed switchgear. It can service for a long time, featuring with easy maintenance without noise, pollution and explosive danger. It applies to occasions with frequent operation and other rigorous conditions.

Ambient condition

1. Altitude: ≤1000m;
2. Ambient temperature: -25℃ to +40℃;
3. Relative humidity: daily average ≤95%, monthly average≤90%;
4. Earthquake intensity: ≤8 degree.

Model

VS 1 12 / 630, 1250, 1600, 3150, 4000

- Rated current
- Rated voltage
- Design serial No.
- Indoor vacuum circuit breaker

Product feature

VS1 modle vacuum circuit-breaker is a type of indoor switch component of rated voltage 12kV, AC 50/60Hz. it conforms to standards in GB1984, DL403 and IEC62271. The CAD and dynamic simulation analysis programs keep the VCB operation in good state. The molybdenum disulphide oilless bearing decreases the VCB from too much maintenance. The product needs no cooling equipment even under rated current 3150A. The product is capable to control and protect electricity distribution system with normal performance, fault performance and short-circuit performance, also to break and make short-circuit frequently. Both midship mounting and fixed mounting are available.

Technical specification

1.Closing/opening electromagnetic technical parameter

	Closing coil	Opening coil	Over-current trip coil	
Rated operate voltage(V)	DC220, AC220	DC220, AC220	Rated current(A)	3
	DC110, AC110	DC110, AC110		
Coil power(w)	302	302		5
Normal working voltage range	85%~110% of rated voltage	65%~120% of rated voltage		

2. Technical specification of storage motor

Model	Rated voltage	Rated input power (W)	Normal working voltage range	Storage time under rated voltage(s)
ZYJ55-1	AC,DC110; AC,DC220	75	85%~110% rated voltage	12

3. Scheme of secondary control circuit

Control voltage	Interlock device	Jump resistance	Over-current trip		No-voltage and lack of voltage
○AC220	Yes	Yes	Yes	Triple over-current	Yes
○DC220	Yes	Yes	Yes	Secondary over-current	Yes
○AC110	No	No	No		Yes
○DC110	No	No	No		Yes

CT28 Spring Operating Mechanism

Summary

CT28 spring operating mechanism comply with IEC62271 & GB/T984-A C. HV circuit-breaker, and relevant clauses in GB/T11022.The mechanism store power by dependent manual or motor; switch on and off power by button and electromagnetic power. It is also available with slow operation.

Ambient condition

1. Altitude: ⩽4000m;
2. Ambient temperature: -35℃~+40℃;
3. Relative humidity: monthly average ⩽90%;
4. Earthquake intensity: ⩽8 degree;
5. Ice thickness: ⩽20mm;
6. Air pressure: ⩽700Pa (equivalent with wind speed at 34m/s).

Model

C T 28

- 28 — Design serial No.
- T — Spring
- C — Operating mechanism

Product feature

CT28 spring operating mechanism absorbs advanced technology of TOSHIBA of Japan. It applies to 12kV/20kA, 31.5kA, 40kA, ZN28 series, ZN63 series, ZN73 series, VK series and ZW37-40.5 vacuum circuit-breaker as well as those with equivalent closing power.

Technical specification

Item	Unit	CT28		
		CT28-Ⅰ	CT28-Ⅱ	CT28-Ⅲ
Rated voltage of CO electromagnet	V	AC/DC110 AC/DC220		
Rated voltage of storage motor	V	AC/DC110 AC/DC220		
Rated voltage of opening electromagnets	V	AC/DC110 AC/DC220		
Rated power of motor	W	70		
Mechanism life	Time	20,000		
Rated short-circuit breaking current	kA	20, 25, 31.5, 40		
Outline dimension	mm	136×176×356		

Specification of mechanism and main components

Model	Weight	Dimension (mm)	Motor power (W)	Closing spring	Breaking current of VCB (kA)	Remark
CT28-Ⅰ	23kg	375×350×180	70	φ6	20,25,31.5	Applicable for ZN85 series and 35kV outdoor switch
CT28-Ⅱ	24kg	375×567×180	70	φ6+φ3	40	
CT28-Ⅲ	30kg	375×350×180	70	φ6	20,25,31.5	ZN73 midship system
CT28-Ⅳ	32kg	375×747×180	70	φ6+φ3	40	

Rated data of C/O electromagnet

Rated voltage of C/O electromagnet	DC		AC	
	110V	220V	110V	220V
C/O current	2.3A	1.5A	2.3V	1.5A
C/O resistance	47±5	146±15	47±5	146±15
Rated voltage	65%-110% of rated voltage			

CT23 Spring Operating Mechanism

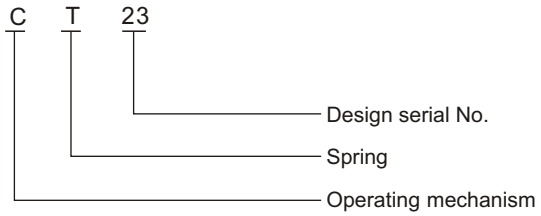
Summary

CT23 spring operating mechanism applies to vacuum circuit-breaker that rating below 12kV/25kA, ZW8 model and ZW1 vacuum circuit-breakers and those of equivalent closing power. It conforms to relevant standards in IEC62271 & GB/T1984: AC High-voltage vacuum circuit breaker. and IEC standards. The mechanism store energy by electric motor and manual, and operate by motor and manual.

Ambient condition

1. Altitude: ≤1000m;
2. Ambient temperature: -25℃~+40℃;
3. Relative humidity: daily average≤95%, monthly average≤90%;
4. Earthquake intensity: ≤8 degree;
5. Applicable occasions should free from inflammables, explosives, corrosives and severe vibration.

Model



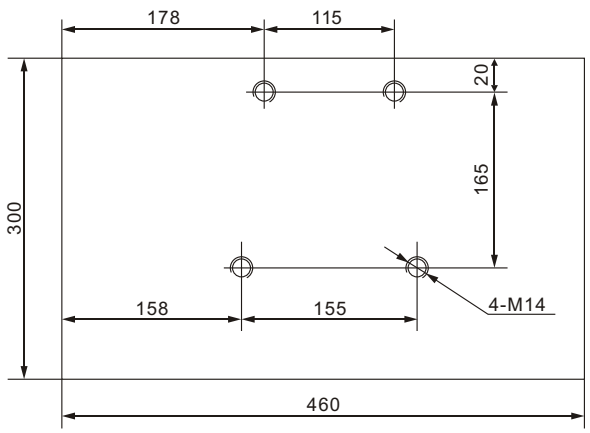
Technical specification

1. Technical specification of storage motor

Item	Closing coil	Opening coil	Overcurrent trip coil	Storage motor
Rated voltage	AC,DC 220	AC 220		AC,DC220
Rated operating current (A)	AC 2.9 DC 2.8	AC 2.4 DC 0.9	5A or 2.5A	70W
Normal operate voltage and current range	AC, DC 65%~120% of rated voltage	65%~120% of rated voltage (do not trip when voltage is less than 30%)	Opening when higher than 100% of rated current ,do not trip when less than 90% of rated current.	±10% of rated voltage

2. Mechanism output turning at 55°~60°

The mounting position:



CT20 Spring Operating Mechanism

Summary

CT20 spring operating mechanism applies to apparatus that rating below 12kV/25kA and ZW20A model outdoor vacuum circuit breaker, as well as those VCB with equivalent closing power. The mechanism is of small volume, compact structure and small input power. The mechanism store energy by motor and manual, and operate by motor and manual.

Ambient condition

1. Ambient temperature: -45℃~40℃;
2. Wind speed: ≤35m/s;
3. Altitude: ≤2000m, earthquake intensity ≤8 degree;
4. Ambient humidity: monthly average ≤90%, daily average ≤95%;
5. Mounted on occasions without explosives, inflammables, corrosives and severe vibration;
6. Air pollution degree: Ⅲ.

Model

C T 20

- 20 — Design serial No.
- T — Spring
- C — Operating mechanism

Technical specification

1. Technical specification of storage motor

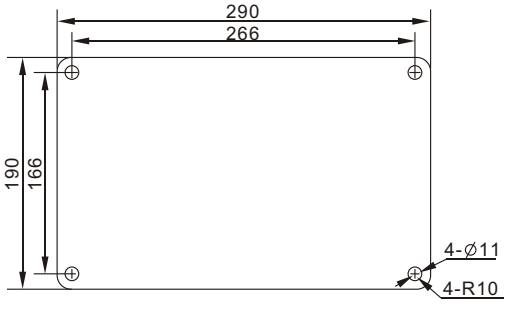
Model	Rated voltage			Rated output power	Normal operate voltage
53ZY-CJ02-DN-S	DC220	DC110	24V	30W	85%~110%

2. Technical specification of CO electromagnet and over current tripping coil

Rated operate voltage (V)	DC220	DC110	DC48	DC24V
Rated operating current (A)	3.9	4.4	10	12
Coil resistance (Ω)	56	33	4.8	2
Rated power (W)	860	484	480	288
Normal operating current range(V)	Open at 65%~110% rated operate voltage; do not open when less than 30% of rated operate voltage			
	Close at 65%~110% rated operate voltage			
Over-current trip coil	5A	Open when large than 100% rated current, do not open at 90% rated current		

3. Manual storage is operated by handle, the moment is less than 100N
4. Mechanical life 10000 (times), mechanism output angle 38~45 (degree), outline dimension 420×300×225mm.

Outline dimension



CT19(B) Spring Operating Mechanism

Summary

CT19(B) spring operating mechanism applies to ZN28 series VCB and those of equivalent closing power. CT19A is a equipment of XGN2-12Z model and GG1A HV switchgear. CT19B is based on CT19A, improved with smaller volume and good service reliability. CT19B model is also applicable for oilless improving on old model switchgear. This mechanism conforms to IEC62271-100 & GB/T1984 AC High voltage circuit breaker relevant technical condition and requirement. Energy storage is operated both by dependent manual and motor. Operation can be both button by manpower and electromagnet.

Ambient condition

1. Ambient temperature: -25℃ ~+40℃;
2. Altitude: ≤3000M;
3. Relative humidity: daily average ≤95%, monthly average ≤90%, vapor data ≤2.2×10MPa, monthly average≤2.2×10Mpa.
4. Applicable occasions free from corrosive gas and severe vibration.
5. Power supply: DC110V and 220V, AC 110V and 220V.

Model

C T 19B

- 19B — Design serial No.
- T — Spring
- C — Operating mechanism

Technical specification

Item	Unit	CT19 Model spring operating mechanism series					
		CT19I	CT19II	CT19III	CT19BI	CT19BII	CT19BIII
Rated voltage of storage motor	V	AC,DC: 110 and 220					
Rated voltage of closing electromagnet	V	AC,DC: 110 and 220					
Rated voltage of opening electromagnet	V	AC,DC: 110 and 220					
Closing power	J	120	180	230	120	180	230
Rated input power of motor	W	70					
Rated breaking current	kA	20	31.5	40	20	31.5	40
Output angle of mechanism	Degree	50~55					
Mechanical life	Times	10,000					
Outline dimension	mm	160×360×420, 178×320×550, 178×360×440					

Composite model of release

	Name, code and quantity of release	
Release composite apparatus	Over-current tripping electromagnet NO.1	Closing electromagnet NO.4
100	1	0
110	2	0
111	3	0
104	1	1
114	2	1
400	0	1
1114	3	1

Release quantity

QJZ-800/1140 (660)-4

Summary

QJZ-800/1140(660)-4 mining explosion-proof with intrinsic safeness four circuits vacuum electromagnetic starter (combination apparatus) is applied to mine with toxic gas and dust. The apparatus works at rated voltage 1140V or 660V, it is used to control and protect single set or multi-set (less than four set), 3-phase squirrel-cage type asynchronous motor's start, operating, stop.

Technical specification

1. Rated voltage level: 1140/660V; Rated frequency 50Hz.
2. Total rated current: 800A, single set's working current can reach 400A.
3. Arrangement of current's adjustment: 30 to 400A.
4. Leakage locking protection: with DC method detecting device, 1140V at 40kΩ, 660V at 22 kΩ.
5. Pilot control (intrinsic safeness control).
6. Over load protection: inverse time.
7. Short circuit protection: vibration amplitude identification type, instantaneous response.
8. Phase failure protection: Negative sequence detection, definite-time.
9. Control model: four circuits operate individually, programmer control two speed and two circuits control.

Type and the meaning

Q J Z - 800 / 1140(660) - 4

- 4 — Combined 4 control circuits
- 1140(660) — Rated voltage(main parameter)
- 800 — Rated current(main parameter)
- Z — Vacuum combined
- J — Explosion proof and intrinsic safeness
- Q — Type code

Comprehensive protection technical data

Table 1 Overload, short-circuit, and phase failure protection

No.	Protection items	Work Condition		Start time	Start status	Reset
		Work current/current setting				
1	Over load protection	1.05		2h no action	Start from cold state	Manual
2		1.20		5min < t < 20min	Start from hot state	
3		1.50		1min < t < 3min	Start from hot state	
4		6		5s < t ≤ 16s	Start from cold state	
5	3-phase short circuit protection	7, 8, 9		(200-400)ms	Start from cold state	
	Phase failure protection	2 phase at random	3rd phase			
6		1.0	0.9	no action	Start from cold state	
7		1.15	0	< 20min	Start from hot state	

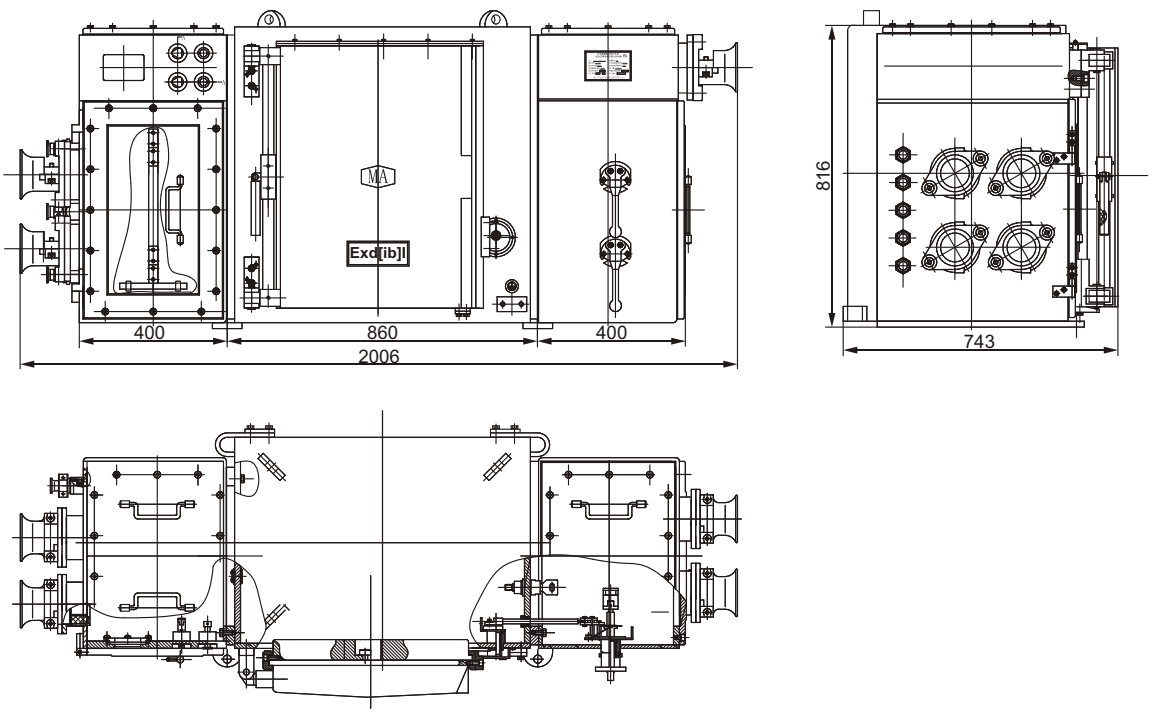
Table 2 Under voltage, over voltage and leakage protection features.

No.	Protection items	Work Condition	Action Parameters	Start time
1	Under voltage protection	Uw	Uw < 75%Un	–
2	Over voltage protection	Uw	Uw > 110%Un	
3	Leakage and blocking	Load line insulation resistance to earth	R≤22kΩ+20%(660V) R≤40kΩ+20%(1140V)	
4	Leakage unlock	Load line insulation resistance to earth	No less than 1.5 times of the leakage locking value	

Product feature

1. Combined switch's protection and control system adopts Siemens S7-200 (PLC), to control and monitor the system , with protection functions: leakage locking, overload, short-circuit, phase failure ,under voltage, over voltage. It is intelligent, stable and reliable.
2. Siemens touching LCD display, displays and records switch working states, technical data, fault. Friendly machine interface improves efficiency of fault debugging greatly.
3. All analogue signal is processed into digital signal, anti-interference, simple connection and enormous information, precise control etc.
4. Perfect self-checking, self-diagnose, and fault analogue test so that it is easy to exam whether the protection and control system works well or not.
5. The protection system is able to fulfill current, leakage locking, over load, short circuit, phase failure, over voltage, under voltage etc.

Outline dimension



QJZ-800/1140(600)-4 Outline dimension

QJZ-1200/1140(660)-6

Summary

QJZ-1200/1140(660)-6 Mining explosion-proof electromagnetic starter (combination apparatus) is applied to mine with toxic gas and dust. The apparatus works at rated voltage 1140V or 660V, it is used to control and protect single set or multi-set (less than six set), 3-phase squirrel-cage type asynchronous motor's start, operating, and stop.

Technical specification

1. Rated voltage level: 1140/660V; Rated frequency 50HZ.
2. Total rated current: 1200A , single set's working current can reach 400A.
3. Arrangement of current's adjustment: 30 to 400A.
4. Leakage locking protection: with DC method detecting device, 1140V at 40kΩ, 660V at 22 kΩ.
5. Pilot control (intrinsic safeness control).
6. Over load protection: inverse time.
7. Short circuit protection: vibration amplitude identification type, instantaneous response.
8. Phase failure protection: Negative sequence detection, definite-time.
9. Control model: six circuits operate individually, programmer control, two speed and two circuits control.

Type and the meaning

Q J Z - 1200 / 1140(660) - 6

- 6 — Combined 4 control circuits
- 1140(660) — Rated voltage(main parameter)
- 1200 — Rated current(main parameter)
- Z — Vacuum combined
- J — Explosion proof and intrinsic safeness
- Q — Type code

Comprehensive protection technical data

Table 1 Overload, short-circuit, and phase failure protection

No.	Protection items	Work Condition		Start time	Start status	Reset
		Work current/current setting				
1	Over load protection	1.05		2h no action	Start from cold state	Manual
2		1.20		5min < t < 20min	Start from hot state	
3		1.50		1min < t < 3min	Start from hot state	
4		6		5s < t ≤ 16s	Start from cold state	
5	3-phase short circuit protection	7, 8, 9		(200-400)ms	Start from cold state	
	Phase failure protection	2 phase at random	3rd phase			
6		1.0	0.9	no action	Start from cold state	
7		1.15	0	< 20min	Start from hot state	

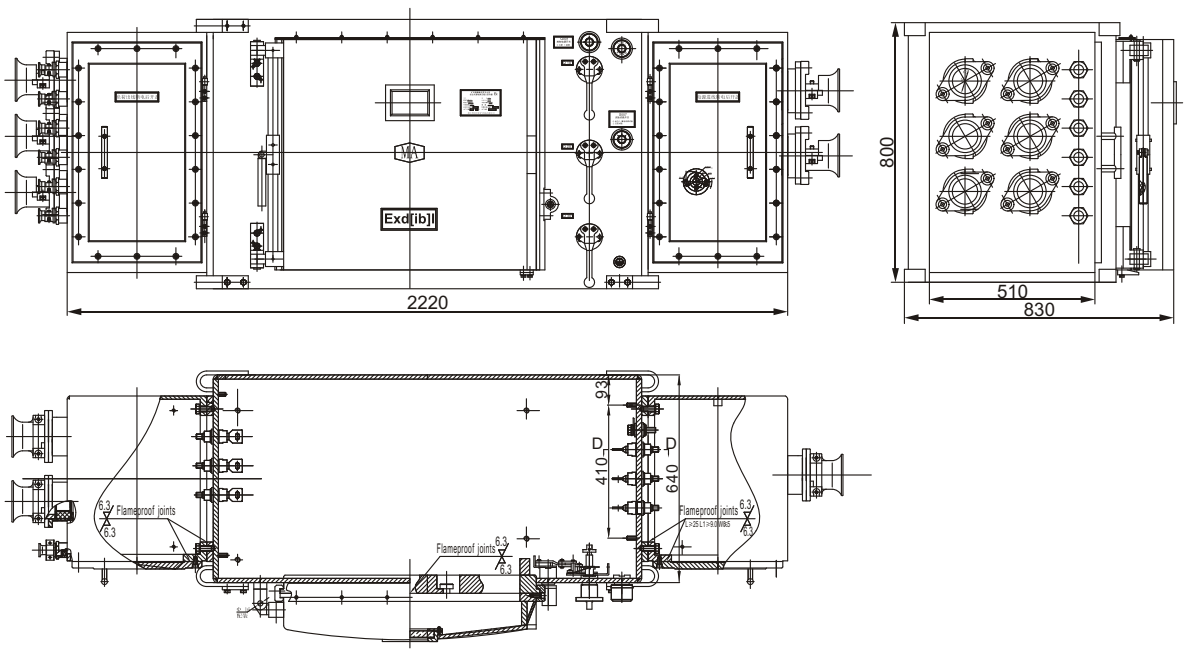
Table 2 Under voltage, over voltage and leakage protection features.

No.	Protection items	Work Condition	Action Parameters	Start time
1	Under voltage protection	Uw	Uw < 75%Un	–
2	Over voltage protection	Uw	Uw > 110%Un	
3	Leakage and blocking	Load line insulation resistance to earth	R≤22kΩ+20%(660V) R≤40kΩ+20%(1140V)	
4	Leakage unlock	Load line insulation resistance to earth	No less than 1.5 times of the leakage locking value	

Product feature

1. Combined switch's protection and control system adopts Siemens S7-200 (PLC), to control and monitor the system , with protection functions: leakage locking, overload, short-circuit, phase failure ,under voltage, over voltage. It is intelligent, stable and reliable.
2. Siemens touching LCD display, displays and records switch working states, technical data, fault. Friendly machine interface improves efficiency of fault debugging greatly.
3. All analogue signal is processed into digital signal, anti-interference, simple connection and enormous information, precise control etc.
4. Perfect self-checking, self-diagnose, and fault analogue test so that it is easy to exam whether the protection and control system works well or not.
5. The protection system is able to fulfill current, leakage locking, over load, short circuit, phase failure, over voltage, under voltage etc.

Outline dimension



QJZ-1200/1140(660)-6 Outline dimension

QBZ2-2,4,6x125/1140(660)

Summary

QBZ2-2,4,6x125/1140(660) mining explosion proof partial ventilator combination vacuum electromagnet starter(hereafter it is short for Starter) applies to mine that full of dangerous gas(methane) and coal dusty. The rated voltage is 1140V or 660V, it can be used to control and protect several counter rotating partial ventilators' combinational operation, so that it can ensure the working face's continual ventilation, and reduce none plan stop ventilation events.

Technical specification

1. Altitude above seal level: less than 2000m.
2. Running temperature -50℃~+40℃.
3. Relative humility should be less than 95%(+25℃).
4. Without any apparent spoiled insulation gas and steam.
5. No dropping, no strong vibrations and no severe impact.
6. The installation angle between the vertical plane and the machine should be less than 15° .

Main specification

1. Basic specification

1.1 Rated voltage: 1140 or 660V

1.2 Rated frequency: 50HZ

1.3 Rated working current: total two group current is 250A, total four group current is 600A and total six group current is 750A. Single disconnect switch selector is 400A. Single contactor is 125A

1.4 Max. open voltage is 10V

1.5 Max. short-circuit current 10mA

1.6 Long time working

1.7 Permissible change scope: 75%-110%, of rated voltage

1.8 Single machine contactor's breaking current 2.5kA

1.9 Mechanical life: contactor more than 300,0000 times, disconnect switch selector more than 30,000 times

1.10 Electrical life: no less than 60,000 times

1.11 Max diameter of introduced cables

Power incoming cable Φ80mm, power outgoing cable Φ35mm, control cable Φ23mm.

1.12 Outline 2100mm × 730mm × 800mm; outline 2100mm × 730mm × 800mm

1.13 Total weight 1250kg;

2. Specification of compensative protection device

Reference to table 1 and table 2

Rated scope of current adjustment is 10A~125A

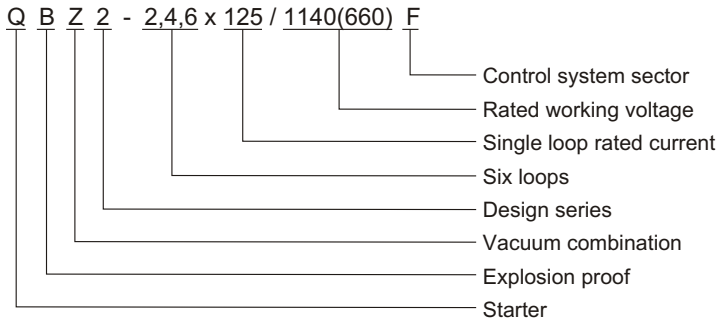
Table 1 Overload, short-circuit, and phase failure protection

No.	Protection items	Work Condition		Start time	Start status	Reset
		Work current/current setting				
1	Over load protection	1.05		2h no action	Start from cold state	Manual
2		1.20		5min < t < 20min	Start from hot state	
3		1.50		1min < t < 3min	Start from hot state	
4		6		5s < t ≤ 16s	Start from cold state	
5	3-phase short circuit protection	7, 8, 9		(200-400)ms	Start from cold state	
	Phase failure protection	2 phase at random	3rd phase			
6		1.0	0.9	no action	Start from cold state	
7		1.15	0	< 20min	Start from hot state	

Table 2 Under voltage, over voltage and leakage protection features.

No.	Protection items	Work Condition	Action Parameters	Start time
1	Under voltage protection	Uw	Uw < 75%Un	–
2	Over voltage protection	Uw	Uw > 110%Un	
3	Leakage and blocking	Load line insulation resistance to earth	R≤22kΩ+20%(660V) R≤40kΩ+20%(1140V)	
4	Leakage unlock	Load line insulation resistance to earth	No less than 1.5 times of the leakage locking value	

Type and the meaning



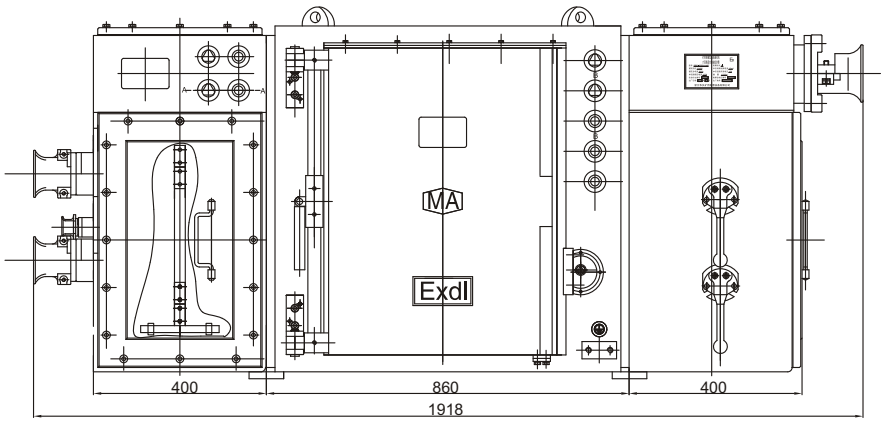
Control

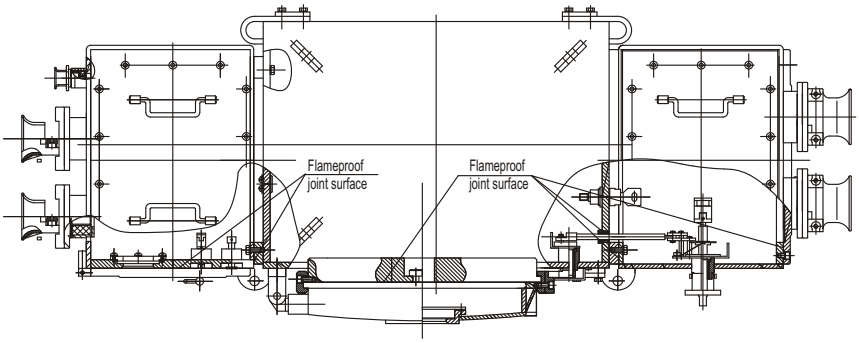
It can be classified into four type according to the central control system

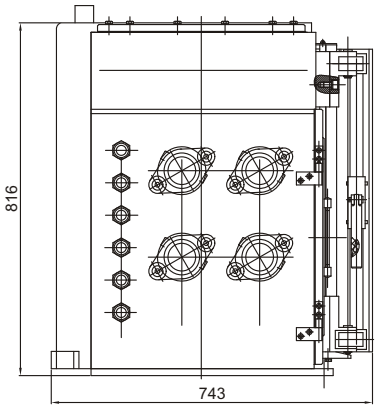
1. Multi-circuit automatic control operation
2. Multi-circuit manual control operation
3. Single circuit independent control operation
4. Multi-circuit program no-load testing control operation

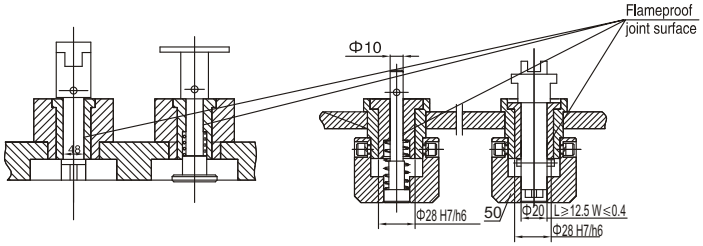
Function

1. Monitor starter pilot circuit is intrinsical safeness, and it can prevent operation control circuit from becoming short circuit or causing events.
2. Starter protection device and control system adopt Siemens S7-200 industrial control computer (PLC) to monitor, and protect leakage locking, overload, short-circuit, phases failure under voltage, over voltage as well. In a word, it shares with its high intelligence stable function, reliable actions.
3. Adopt Siemens touching liquid display to display and record switchgear's status, its parameters and faults, the friendly interface can enhance workers' efficiency greatly.
4. All of analog signals can be turned into digital signals, and these digital signals can withstand high inference, besides it has other strong points such as: easy to link, large information can be processed at a time and reliable accurate operation etc.
5. You can operate two starters at the same time, one is at work, the other is backup. backup one can continue to work and display alarming, whatever some faults of working face or the loss of power occurs.
6. It owns self-check, self-diagnose and fault simulation functions, so it is very convenient for workers to check and protect the control system.









A-A 1:1 B-B 1:1

Cavity	Voltage	Electrical Clearance	Creepage distance
Main chamber (Main box)	1140V	14.0mm	18.0mm
	220V	3.0mm	3.6mm
	≤60V	0.8mm	1.8mm
Wiring chamber (Deputy box)	1140V	18.0mm	28.0mm
	220V	6.0mm	8.0mm
	≤60V	5.0mm	6.0mm

QBZ2-2,4,6x125/1140(660) Outline dimension

KBZ-200,400,500,630/1140 Mining Explosion-Proof Vacuum Feed Switch

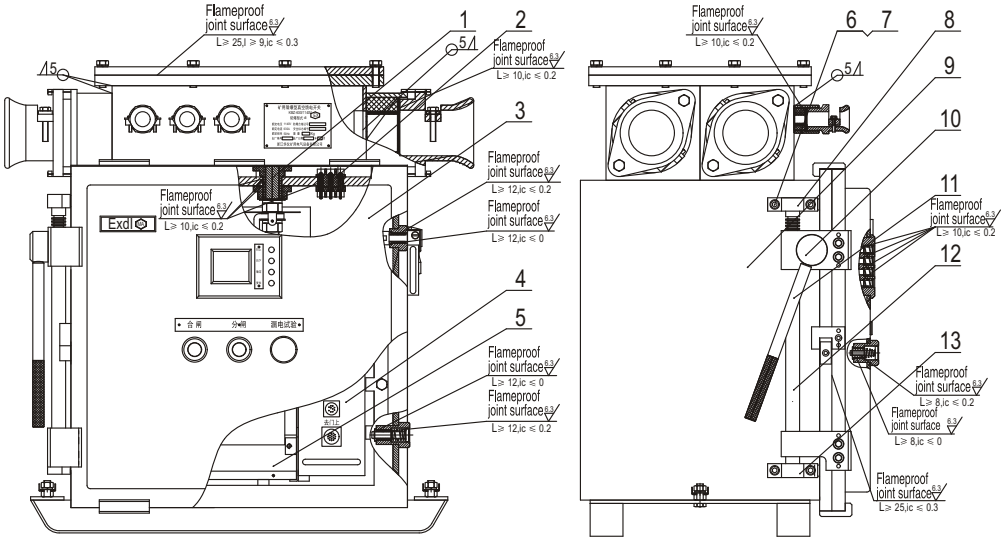
Application

Feed switch is applied to mine with AC 50HZ, rated voltage of 1140V or 660V, rated current of 500A, 630A of the neutral point is not directly grounded in the three-phase power network, can be used as a feed Switch for mobile substation (open the rear cover with the mobile substation butt joint), or as a power distribution master switch, branch switch, as a controller to open, close and protect high-capacity motor etc.

Feed switch with overload, short circuit, under voltage, over voltage, three phase imbalance (including off-phase leakage protection, leakage lockout, lockout of ventilation or electricity failure, gas protection, and through the machine's RS-485 air interface with the host computer Internet communications network to achieve "four remote" (remote control, remote adjustment, remote measure, remote signaling) functions.

Technical Data

Type	KBZ-200/1140 Integrated		KBZ-400/1140 Integrated		KBZ-500/1140 Integrated		KBZ-630 Integrated	
Rated current (A)	200		400		500		630	
Rated voltage (V)	1140	660	1140	660	1140	660	1140	660
Limited breaking capacity (kA)	7.5	9	7.5	9	12.5	15	12.5	15
Electric life (times)	3000		3000		3000		3000	
Mechanical life (times)	15,000		15,000		15,000		15,000	
Weight (kg)	290		290		300		300	



1. Big wiring terminal 2. Seven core terminal 3. Door cover 4. Main body 5. Circuit breaker
6. Standard missile pad 7. Bolt 8. The door of top block 9. Box 10. Door body circling
11. Door grip cover 12. Gate shaft 13. Shaft support blocks under the door

KBZ-200,400,500,630/1140 Mining explosion proof vacuum feed switch outline dimension

Characters of electromagnetic starter that based on PLC control

Innovation of the products

1. We are the first to successfully apple PLC to explosion-proof and intrinsically safe vacuum circuit breaker in mining electric control field nation-widely. With advanced action specification, the combination succeeded in offering centralized control of modern fully-mechanized face, developing a monitoring system with PLC as its core and intensifying the protection for the motors. The pilot circuit designed not only meets the intrinsical safety requirements, but also protects motors from faults. The multi-functional control modes designed are either manual or programmable. Beside its speed control function, the switch features a user-friendly interface.
2. The successful development of the switch has improved the import-dependent situation of our country in modern fully-mechanized face. Its sound function of protection and advanced action specification guarantee the safety and reliability of operating motors, while the user-friendly interface helps to promote the efficiency of identifying and eliminating faults. Convenient shifting of control modes widens the range of application. In particular, the control function of two-speed and two-loop motors overcomes the shortcomings of face scraper conveyor when applying , filling the domestic gap in this field.
3. Operation test proves: It is stable, reliable and durable. Its exceeding protection function guarantees the safeness, reliability and continuity of operating low-voltage motors underground.

Advantages of applying PLC as the core part of the control systems

1. High Reliability

The average non-fault working time of PLC is between 4,000 and 5,000 hours. Mini PLC such as Siemens, ABB, Panasonic are able to manage operating more than 100,000 hours without faults. In addition, its self-diagnosis function makes it easy to detect faults and carry out maintenance.

2. Flexible Combination of Modules

Programmable controllers have a series of products fulfiling different tasks by applying modularized structure. Their input and output terminals, that is I/O, is within the range of 8 to 8,192 points. There are multifunctional modules meant for various types of machine which can be organized flexibly to form various structure.

3. Powerful Functions

PLC applies microelectronics and microcomputer technologies. Simple PLC has sequential control functions such as logic, time-setting, counting and so on. Basic PLC has additional I/O simulation, basic arithmetic operations and network communication functions on that basis. Complex PLC bears improved calculation function, multi-phase terminal mechanism, intelligent I/O, PID regulation, process monitor, network communication, multi-site control and high-speed data processing ability.

4. Adaptation to Industrial Environment

PLC is able to operate in bad conditions such as high temperature, vibration, impulse, dust and strong electromagnetic interference, making it competitive in the market.

5. Easy installation and Maintenance

Unlike computer systems, PLC installation requires no special machine room and shield. The system is able to operate as long as the proper linkage of all parts is assured. There are indicators in every module, making it easy to decide its working condition and discover the faults. Since modules are replaceable, users are able to elimination fault after discovering it as soon as possible. As a result, suspension caused by faults is shortened to the greatest extent and the production is resumed. Because of this feature, it is especially recommended for large-scale manufacturing. With heat sink, some PLC covering of simple structure is made of alloy which enables PLC to operate under unfavorable conditions. Those coverings do not deform so easily like plastic in high temperature. Besides, they are radio-frequency-electromagnetic-interference-proof and fire-proof.

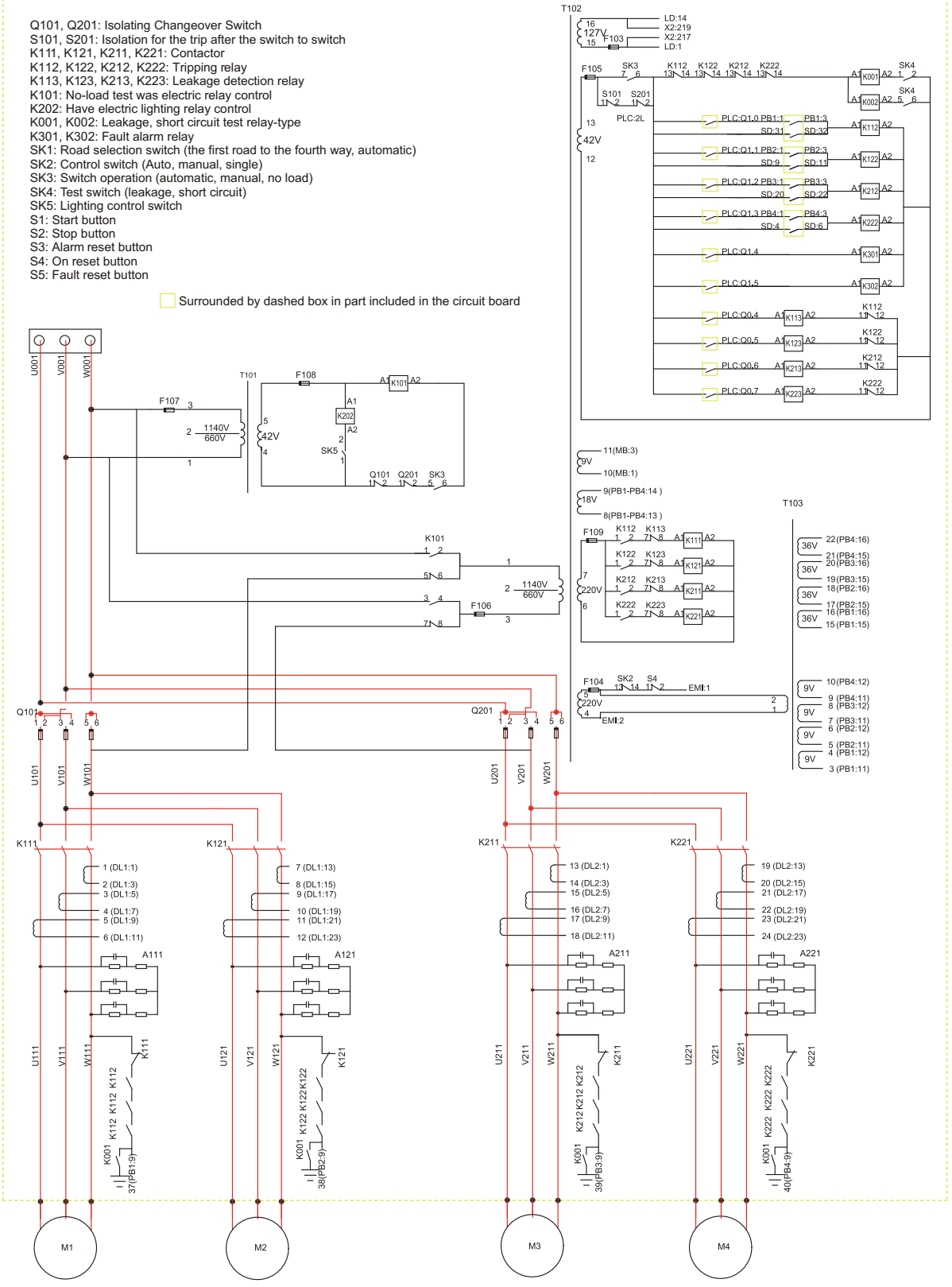
6. High Processing Speed

With the application of microprocessor, the operating speed of PLC has been dramatically improved which makes it more suitable for high-speed and complex control tasks. The gap between PLC and computer is getting narrower and narrower.

PLC Schematic

Q101, Q201: Isolating Changeover Switch
S101, S201: Isolation for the trip after the switch to switch
K111, K121, K211, K221: Contactor
K112, K122, K212, K222: Tripping relay
K113, K123, K213, K223: Leakage detection relay
K101: No-load test was electric relay control
K202: Have electric lighting relay control
K001, K002: Leakage, short circuit test relay-type
K301, K302: Fault alarm relay
SK1: Road selection switch (the first road to the fourth way, automatic)
SK2: Control switch (Auto, manual, single)
SK3: Switch operation (automatic, manual, no load)
SK4: Test switch (leakage, short circuit)
SK5: Lighting control switch
S1: Start button
S2: Stop button
S3: Alarm reset button
S4: On reset button
S5: Fault reset button

Surrounded by dashed box in part included in the circuit board



HV Contact Finger and Contact Arm

Summary

HV series contact finger and contact arm are new products based on advanced domestic and international technology. The product possesses original structure, sound performance, and easy maintenance. These series of product can be mutually exchanged for use. The contact finger is of petal shape and the arm is of column structure. This design conforms to skin effect and makes effective contact. The elementary material adopts pure copper with high conductivity, the surface coating with silver. The product own advantages like reliable contact, high conductivity and good corrosion-proof capability. The pressure spring is made of stainless steel that can decrease bow wave heat. This product is an ideal updating contacting part and is popular in HV switchgear.

Technical specification

Item	Model	Rated current (A)	Rated short-time withstand current (kA)/4s
Contact finger	CF-630	630	20, 25
	CF-1250	1250	25, 31.5
	CF-2000	2000	31.5, 40
	CF-2500	2500	31.5, 40
	CF-3150	3150	40
Contact arm	L-158/188	630	20, 25
	L-158/185	630	20, 25
	L-158/200	1250	25, 31.5
	L-158/295	1600	25, 31.5
	L-182/261	2000	31.5, 40
	L-283	2500	31.5, 40
	L-236/255	3150	40

* For detailed drawings and dimensions of all types of contact finger, contact arm, as well as contacts, please consult with us.

Bevel gear mechanism

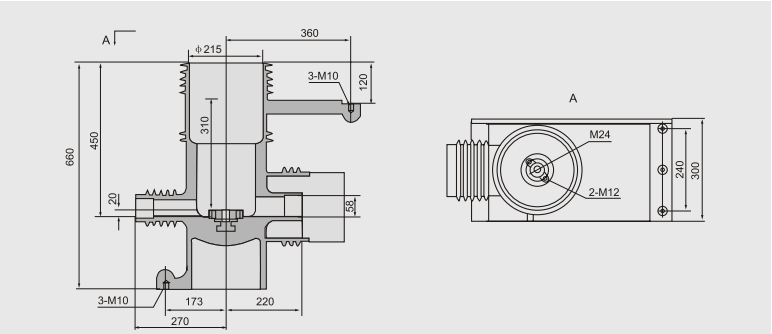
Summary

Bevel gear mechanism is a driving device between operating mechanism and switchgear, it is used to operate switch with V axis, such as load break switch, disconnector and earthing switch. Introducing an international advanced technology with innovative design and excellent performance develops this product. The driving ratio is 2:1 which makes operating moment half of the normal. It is also applicable in various switchgear with numerous composite models as well as mounting methods and operating directions depending on detail requirement.

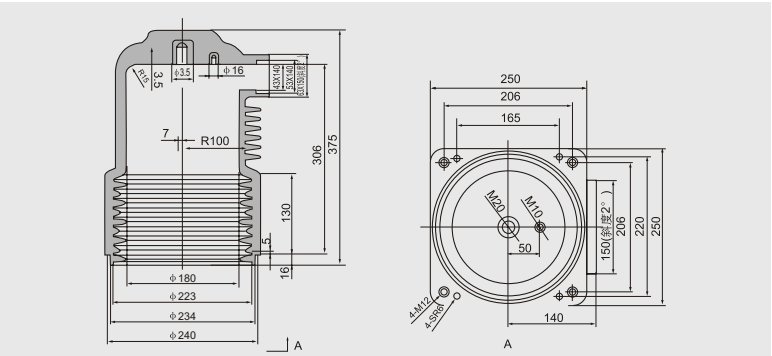
Technical specification

Item	Model	Mounting angle
Bevel gear mechanism	BR-101	35.50°
	BR-102	35.50°
	BR-103	25.0°
	BR-104	35.50°

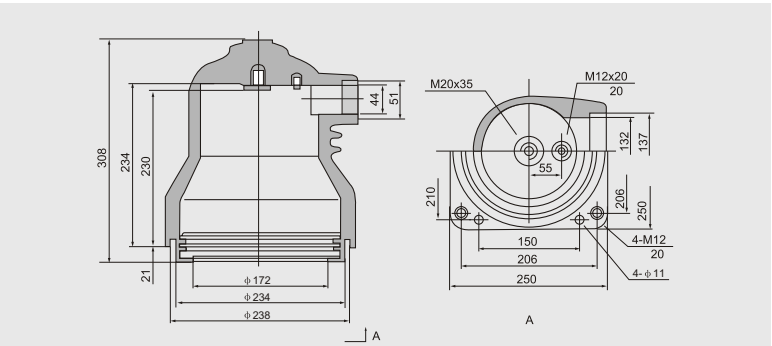
CH3-40.5Q Contact box Rated Voltage 40.5KV Three way enter



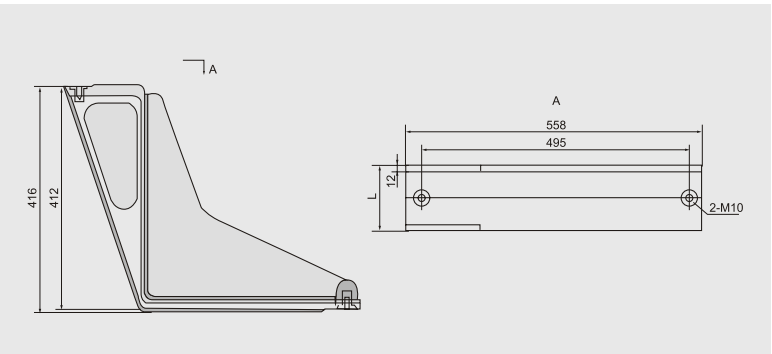
CH12-24Q Contact box Rated voltage 24KV Rated Current: 2000A -3150A



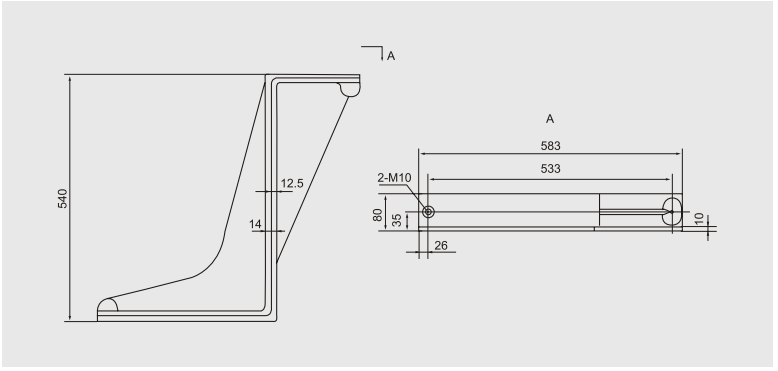
CH3-10Q/250 Contact Box 626 Rated Current 2500A-4000A



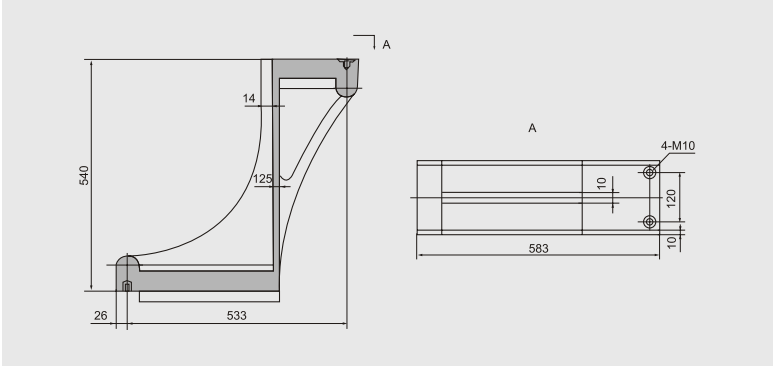
WB-40.5/ABB 40.5 KV Bending Plate



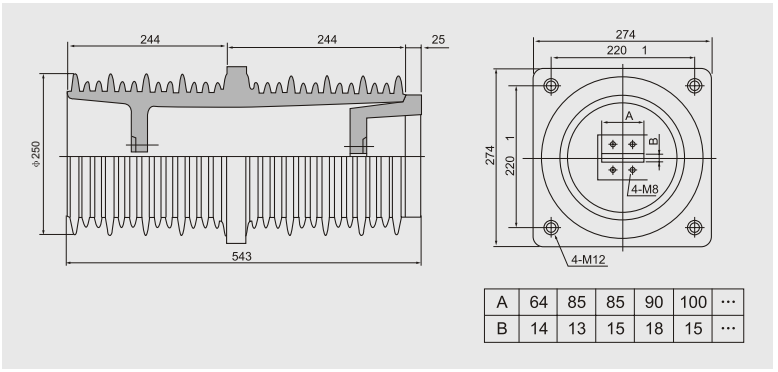
WB-40.5/1.2m Bending Plate



WB-40.5Q/1.4m Bending Plate

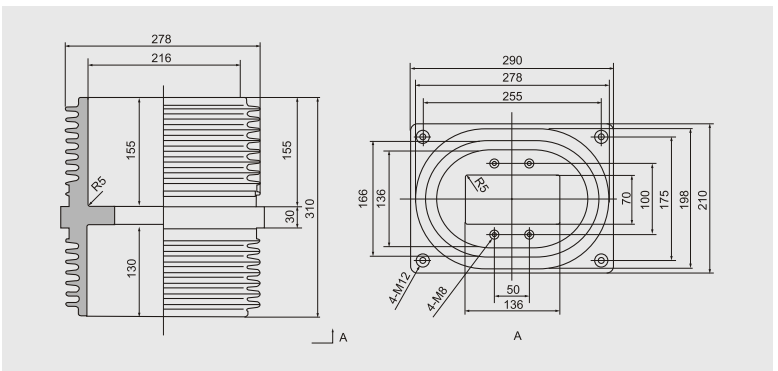


Through-Wall Busing TG-35/ Φ250x350 Rated Voltage 40.5KV

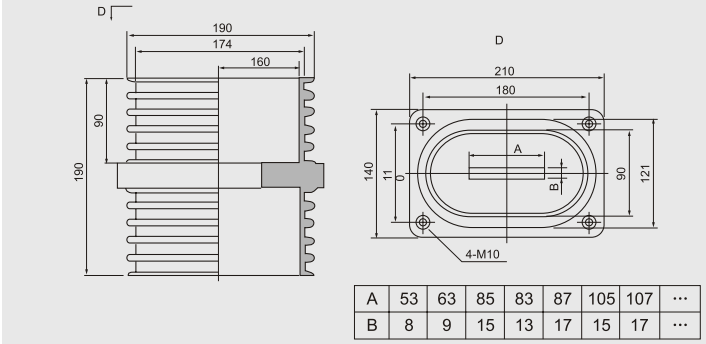


A	64	85	85	90	100	···
B	14	13	15	18	15	···

Through-Wall Bushing TG12-24Q /210x290 Rated Voltage 24KV

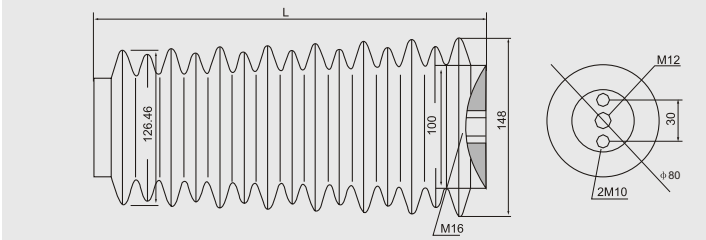


Through-Wall Bushing TG3-10Q /140x210 Rated Voltage 12KV



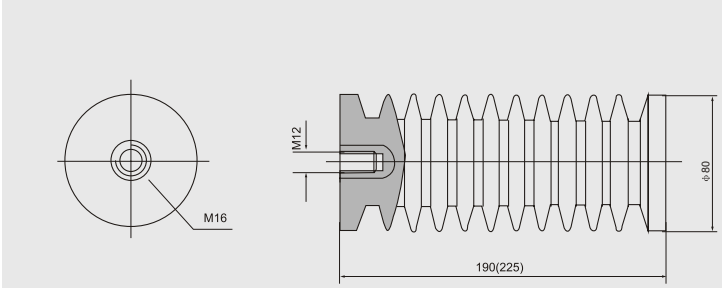
A	53	63	85	83	87	105	107	···
B	8	9	15	13	17	15	17	···

Insulator ZJ-40.5Q Φ148x320 Rated Voltage 40.5KV

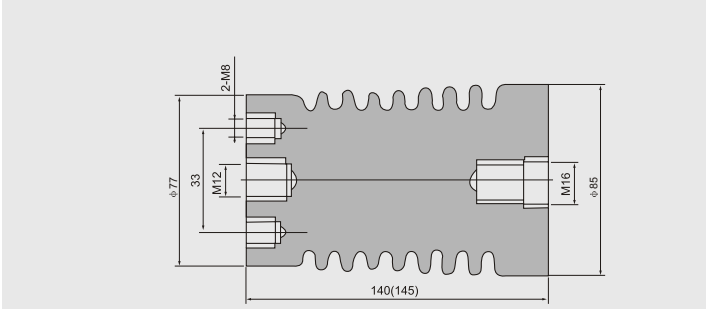


L	320	380

Insulator ZJ12-24 Φ80x190(225) Rated Voltage 24KV



Insulator ZJ-10Q/ Q85x140 (145) Rated Voltage 12KV



* Listed only some typical items, for all detailed different kind of bushings, contact boxes, insulators, as well as other components used in indoor switchgear, please consult with us.

HEAG®

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