

C

# VACUUM CIRCUIT BREAKER



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ISO9001 ISO14001 OHSAS18001

## ZN28-12C SERIES INDOOR AC MEDIUM-VOLTAGE VACUUM CIRCUIT BREAKER JYN2 AND KYN1 TYPE HANDCART VACUUM CIRCUIT BREAKER



### GENERALS

ZN28-12C Vacuum Circuit Breaker is derived from ZN28 series, three-phase 50Hz indoor medium voltage apparatus. It has JYN2 and KYN1 type handcart Vacuum Circuit Breaker and mainly equipped in distribution system and applied to control and protect furnace transformer, HV motor, capacitor bank, power plant and substation for frequent operation.

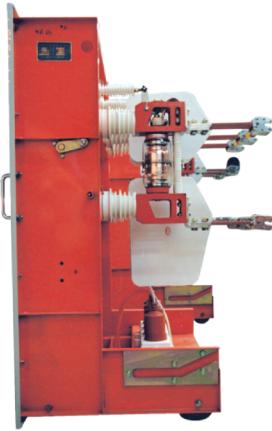
### OPERATING ENVIRONMENT CONDITION

1. Ambient temperature: -15°C ~+40°C
2. (storage and transport permissible at -30°C )
3. Altitude: Less than 2000m
4. Relative humidity: Daily average value is not more than 95%; monthly average value is not more than 90%;
5. Saturated steam pressure: Daily average value is not more than 2.2kPa; monthly average value is not more than 1.8kPa.
6. Earthquake intensity: No more than degree 8
7. No operation at places such as fire danger, explosion, severe pollution, chemical corrosion and frequent violent vibration.

### TECHNICAL PARAMETERS

No.	Name	Unit	630 1250	20	1250-25	1250- 31.5	1600 2000	31.5 2500	2000- 2500	3150-40
1	Rated voltage	kV							12	
2	Rated current	A		630	1250		1250 1600	2000 2500	2000 3150	
3	Rated insulation level	power frequency withstand voltage for 1 min Lightning withstand voltage	kV			42				
4	Rated short open circuit current	kA	20		25		31.5		40	
5	Rated operation sequence				0-0.3s-C0-180s-C0					
6	Rated short closed circuit current	kA	50		63		80		100	
7	Rated peak withstand current	kA	50		63		80		100	
8	Rated short-time withstand current	kA	20		25		31.5		40	
9	Rated short-time withstand time	s				4				
10	On/Off times of Rated short current	times		30			30(20)			
11	Rated open time	ms				≤100				
12	Mechanical life	times				10000				

## ZN28-12C SERIES INDOOR AC MEDIUM-VOLTAGE VACUUM CIRCUIT BREAKER JYN2 AND KYN1 TYPE HANDCART VACUUM CIRCUIT BREAKER



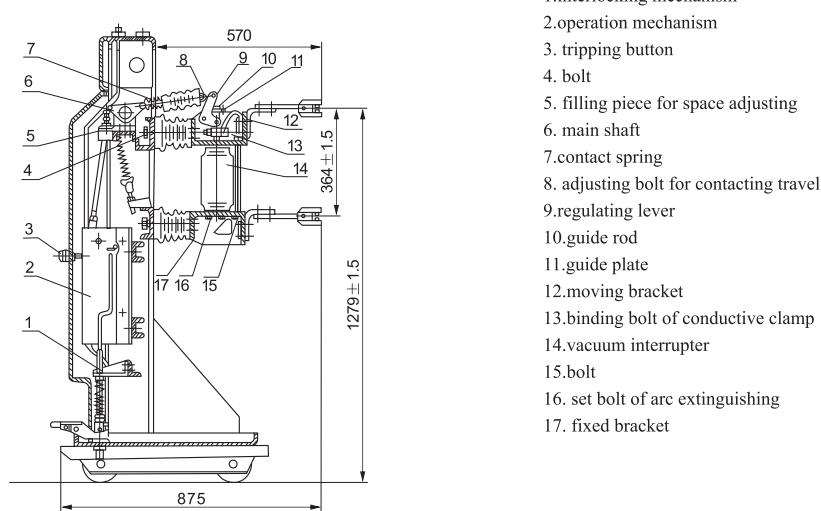
No.	Name	Unit	Data	
			20KA	31.5KA,40KA
1	Contact opening size	mm	$11 \pm 1$	
2	Contact extra size		$4 \pm 1$	
3	Permissible wear thickness of moving and static contact		3	
4	Average speed of switch on	m/s	$0.60 \pm 0.2$	
5	Average speed of switch off		$1.1 \pm 0.2$	
6	Switch on time		$\leq 100$	
7	Switch off time	ms	$\leq 0.6$	
8	Bounce time of contact on		$\leq 2$	
9	Three phase switch off synchronicity of the time difference		$\leq 2$	
10		$\mu \Omega$	$\leq 50$	$\leq 40$

### STRUCTURAL FEATURE

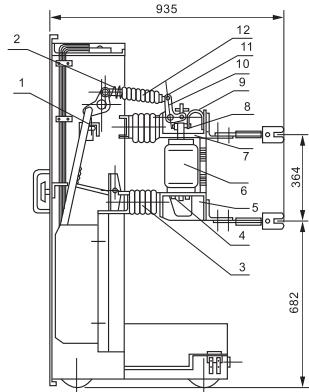
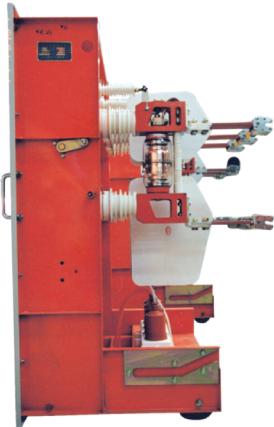
The product overall framework is handcart assembling style, each arc extinguishing chamber is fixed on mount of outgoing line by two pieces of insulators, driving contact rod by regulating lever, adopting flexible joint to conduct open-close switch current. The structure is stable and wallop is light when switching on. Their operation mechanism is CD17 electromagnetic mechanism and CT19 spring mechanism optionally.

### OUTLINE AND MOUNTING DIMENSIONS

JYN2 handcart Vacuum Circuit Breaker



## ZN28-12C SERIES INDOOR AC MEDIUM-VOLTAGE VACUUM CIRCUIT BREAKER JYN2 AND KYN1 TYPE HANDCART VACUUM CIRCUIT BREAKER



1. filling piece for space adjusting
2. contact pressure spring
3. insulator
4. bolt of Vacuum interrupter
5. down-bracket
6. vacuum interrupter
7. up-bracket
8. bolt of conductive clamp
9. flexible joint
10. regulating lever
11. adjusting bolt for contacting travel
12. draw rod

### ORDERING INFORMATION

- |                              |                              |
|------------------------------|------------------------------|
| 1. type and parameter        | 4. operation mechanism       |
| 2. switchgear type and width | 5. with /or without arrester |
| 3. rated operating voltage   | 6. special requirement       |

## ZN73-12(VS1) INDOOR VACUUM CIRCUIT BREAKER

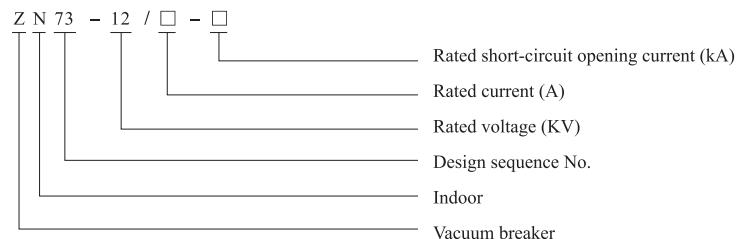
### GENERALS

ZN73-12(VS1) Indoor AC high-voltage vacuum breaker is applicable to making and breaking load of various character and also for frequent operation in power systems of 3-phase, AC 50HZ and with rated voltage of 12 KV. It can be used for protecting and controlling of electrical equipment in industrial plants, mines, power generation plants and substations.

Vacuum breaker complies with national standard GB1984 and JB3855.



### MODEL MEANING



# **ZN73-12(VS1) INDOOR VACUUM CIRCUIT BREAKER**



## **AMBIENT CONDITIONS FOR OPERATION**

1. Ambient temperature: max +40°C; min -10°C.
2. Altitude: not exceeding 2000m.
3. Relative humidity: daily average relative humidity: ≤95%. Monthly average relative humidity: ≤90%. Daily average saturated steam pressure: ≤ $2.2 \times 10^{-3}$  Mpa. Average monthly saturated steam pressure: ≤ $1.8 \times 10^{-3}$  Mpa. During the period of high degree of humidity, it may cause condensation when the temperature plumbs down.
4. Earthquake intensity: not exceeding 8.
5. There shall be no danger of inflammability and explosion, no chemical corrosion and intensive vibration at the operation place.
6. The location using this product is a place not always oscillates acutely.

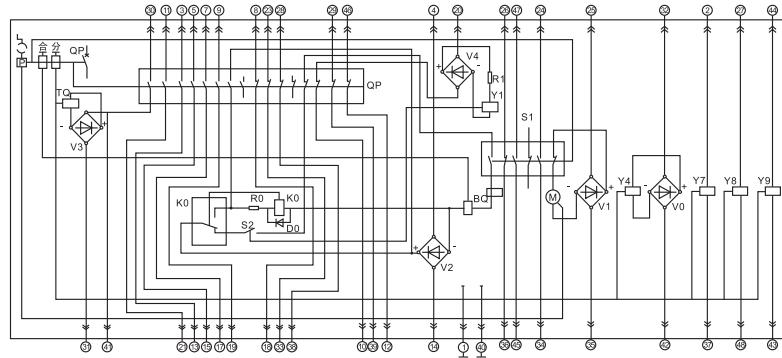
## **MAIN TECHNICAL PARAMETERS**

Table 1

Rated voltage kV	12						
Rated frequency Hz	50						
Rated insulation level	Power frequency withstand voltage for 1 min				42/48 (virtual value)		
	Lightning impulse withstand voltage		75/85(peak value)				
Rated operation sequence resistance of Major loop	Off-t-on/off-t'-on/off*				≤50		
Mechanical service life times	10000						
Type	Rated current A	Rated short-circuit opening current kA	Rated short-circuit closing current (peak value) kA	Sustained time at rated short-circuit current (s)	On/off times at rated short-circuit current		
ZN73-12/630-20	630	20/25	50/63	4	100		
ZN73-12/1250-20	1250						
ZN73-12/1250-31.5	1250	31.5	80	4	50		
ZN73-12/1600-31.5	1600						
ZN73-12/2000-31.5	2000	40	100	30			
ZN73-12/2500-31.5	2500						
ZN73-12/1250-40	1250	40	100	30			
ZN73-12/1600-40	1600						
ZN73-12/2000-40	2000	40	100	30			
ZN73-12/2500-40	2500						
ZN73-12/3150-40	3150	40	100	30			

NOTE: when short-circuit opening current is 20,25,31.5kA, t=0.3s, t'=180s.  
when short-circuit opening current is 40Ka, t=180s, t' =180s

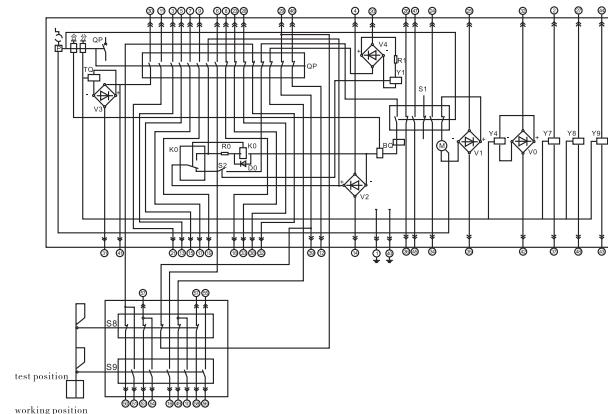
## ZN73-12(VS1) INDOOR VACUUM CIRCUIT BREAKER



K0-Trip-proof relay mechanism  
 R0, R1-Current limiting Resistor  
 Y7~Y9-Indirect over current release (optional part)  
 P-Manual operation mechanism  
 D0-Diode  
 Y4-Under voltage release(optional part)  
 V0~V4-rectifying element

Y1-Locked electromagnet (optional part)  
 TQ-Switch off release  
 S2-Auxiliary switch of locked electromagnet(optional part)  
 QF-Auxiliary switch of circuit breaker's main contact  
 HQ-Switch on release  
 M-Energy stored motor  
 S1-Sensitive switch

Drawing1: Fixed type schematic diagram



Drawing2: Withdrawable type schematic diagram

KO-Trip-proof relay mechanism  
 D0-Diode  
 R0, R1-Current limiting Resistor  
 Y4-Under voltage release(optional part)  
 Y7~Y9-Indirect over current release (optional part)  
 V0~V4-rectifying element  
 P-Manual operation mechanism  
 Y1-Locked electromagnet (optional part)  
 HQ-Switch on release  
 TQ-Switch off release  
 M-Energy stored motor  
 S9-Auxiliary switch which used in working position  
 S8-Auxiliary switch which used in test position  
 S2-Auxiliary switch of locked electromagnet(optional part)  
 S1-Sensitive switch  
 QF-Auxiliary switch of circuit breaker's main contact

Table 2 Mechanism character of the circuit breaker

Name	Unit	Data			
Contact opening size	mm	$11 \pm 1$			
Contact extra size		$3.5 \pm 0.5$			
Three phase switch off synchronicity of the time difference		$\leq 2$			
Bounce time of contact on	ms	$\leq 2$			
Switch off time		$\leq 50$			
Switch on time		$\leq 100$			
Average speed of switch off	m/s	$0.9\sim 1.3$			
Average speed of switch on		$0.4\sim 0.8$			
Pressure of contact surface of switch on contact	N	20kA	25kA	31.5kA	40kA
		$2000 \pm 200$	$2400 \pm 200$	$3100 \pm 200$	$4750 \pm 250$
Permissible wear thickness of moving and static contact	mm	3			

Table 2

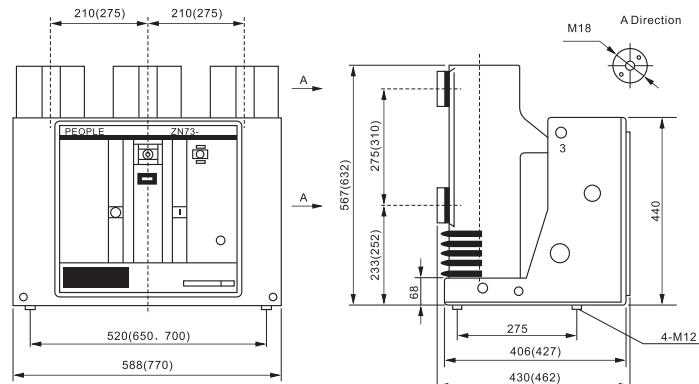
## ZN73-12(VS1) INDOOR VACUUM CIRCUIT BREAKER

Table 3 Technical parameter of operation machine

Operation power		AC/DC	
Rated voltage		220V/110V	
Rated frequency	Switching-off release	264W	
	Switching-on release	264W	
	Energy stored generator	20kA 25kA 31.5kA 70W	40kA 100W
Voltage range in normal operation		65%~120% Rated voltage	
Switching-on release		85%~110% Rated voltage	
Energy stored generator		85%~110% Rated voltage	
Energy-stored time		$\leq 10\text{S}$	

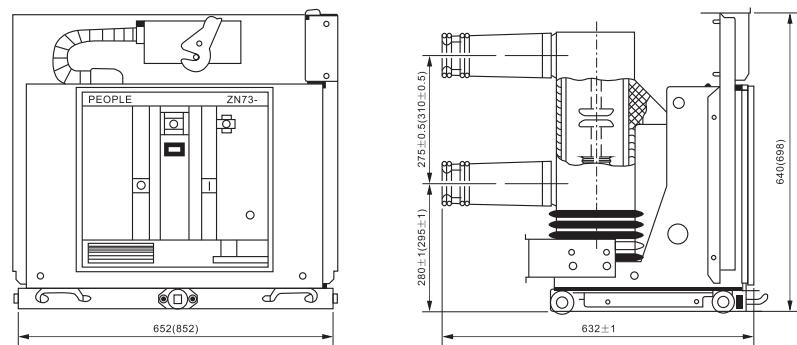


### OUTLINE AND MOUNTING DIMENSIONS



Note: The data in parenthesis is for VCB which rated current is more than 1600A

Drawing1: Outline dimension of fixed type



Note: The data in parenthesis is for VCB which rated current is more than 1600A

Drawing2: Outline dimension of withdrawable type

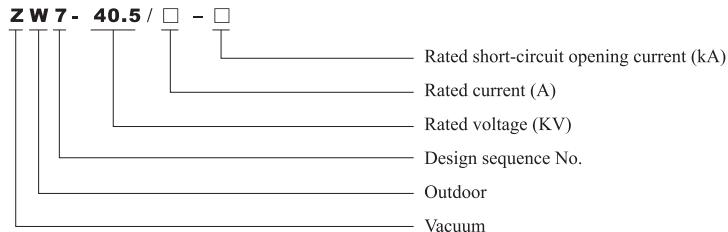
# ZW7-40.5 TYPE OUTDOOR MEDIUM-VOLTAGE VACUUM CIRCUIT BREAKER



## GENERALS

ZW7-40.5/2000-31.5 outdoor HV vacuum circuit breaker can be used in the power system with rated voltage 40.5KV, rated current up to 2000A and three-phase AC 50HZ to protect the equipment in industrial and mineral enterprises, power plants and substations. It can be used as a connecting circuit breaker in the workplaces of frequent operation. This product complies with the standards of the GB1984-89 AC HV Circuit Breaker, IEC56 HV AC Circuit Breaker and JB3385-1996 3.6-40.5KV Indoor AC HV Vacuum Circuit Breakers.

## MODEL MEANING



## AMBIENT CONDITIONS FOR OPERATION

1. Ambient temperature: max +40°C; min -40°C.
2. Altitude: not exceeding 2000m.
3. Wind pressure: less than 700Pa (equal to wind speed 34m/s)
4. Air pollution: class 3

## MAIN TECHNICAL PARAMETERS

Table 1

No.	Name			Unit	Data
1	Rated voltage 75/85(peak value)		kV		40.5
2	Rated Insulation level	Power frequency withstand voltage for 1 min	dry test	kV	95
		wet test		kV	80
	Lightning impulse withstand voltage		kV		185
3	Rated current		A		1250/1600/2000
4	Rated short open circuit current		kA		20/25/31.5
5	Rated operation sequence				0-0.3s-C0-180s-C0
6	Rated breaking current for capacitor bank		A		400
7	Rated short closed circuit current		times		20
8	Rated short time withstand current(peak value)		kA		50/63/80
9	Rated withstand current(peak value)		kA		50/63/80
10	Rated short time withstand current		kA		20/25/31.5
11	Rated short circuit persistent time		s		4
12	Rated making time		s		≤0.08
13	Mechanical life		times		10000
14	Rated operating voltage and rated voltage of auxiliary circuit		v		AC、DC 220、110



## ZW7-40.5 TYPE OUTDOOR MEDIUM-VOLTAGE VACUUM CIRCUIT BREAKER

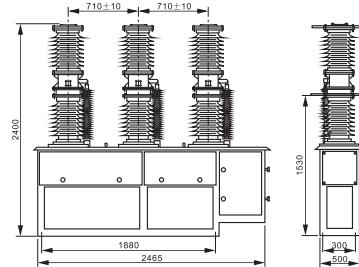
Table 2

No.	Name	Unit	Data
1	Contact opening size	mm	22±2
2	Contact extra size	mm	4±1
3	Average speed of switch off	m/s	1.5±0.2
4	Average speed of switch on	m/s	0.7±0.2
5	Bounce time of contact on	ms	≤3
6	Three phase switch off synchronicity of the time difference	ms	≤2
7	Switch on time	ms	≤150
8	Switch off time	ms	≤60
9	DC resistor of per phase circuit	μΩ	≤100

Notes: The DC resistance value of each phase circuit does not include the resistive value of current transformer.

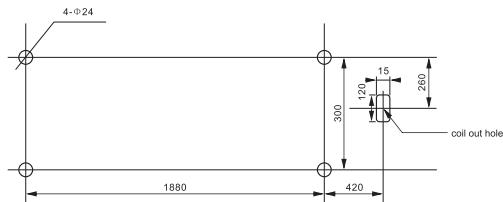
### OUTLINE AND MOUNTING DIMENSIONS

#### 1、Outline dimension

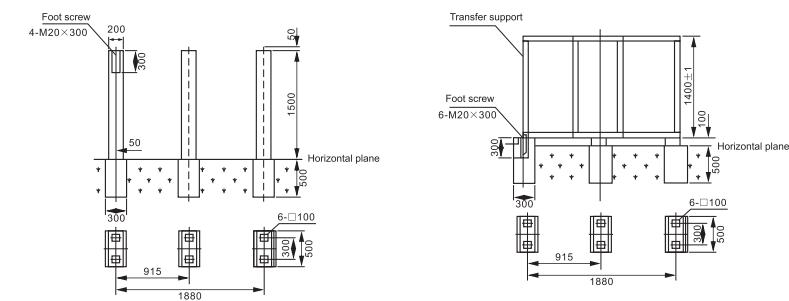


#### 2、Outline size

##### 2.1 Outline size please see drawing



##### 2.2 Installs the foundation dimensional drawing



### ORDERING INFORMATION

- 1. type and parameter
- 2. switchgear type and width
- 3. rated operating voltage
- 4. operation mechanism
- 5. with /or without arrester
- 6. special requirement

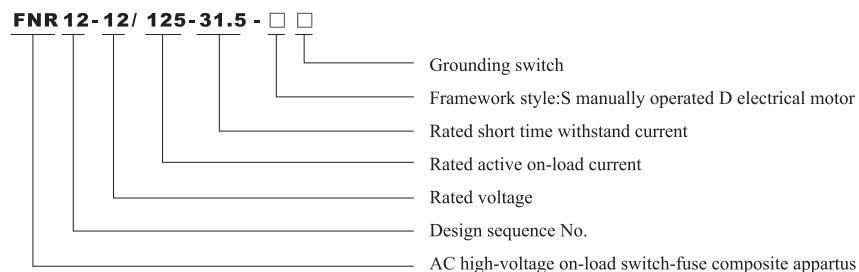
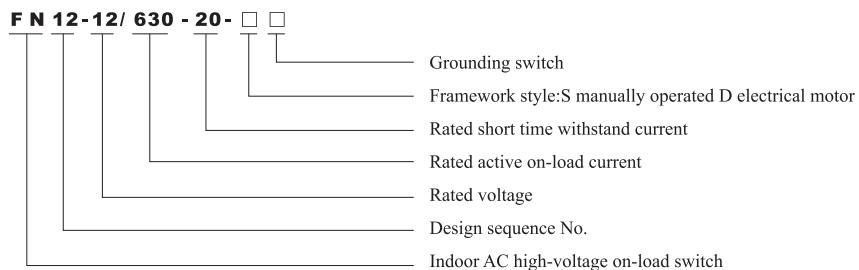
# **FN12-12 TYPE OUTDOOR MEDIUM-VOLTAGE VACUUM CIRCUIT BREAKER**



## **GENERALS**

The composite apparatus of FN12-12 and FNR12-12 is three-phase high-voltage switchgear with rated voltage 12kV, rated frequency 50Hz, applying to separate and close load current, closed-loop current, charging current of no-load transformer and cable, to close the short circuit current and assembling equipment load switch of grounding switch. It can bear short circuit current. It is mainly applied as loading control and short circuit protection in downtown distribution station of three-phase rig net or terminal power supply and industrial consumer.

## **OPERATING ENVIRONMENT CONDITION**

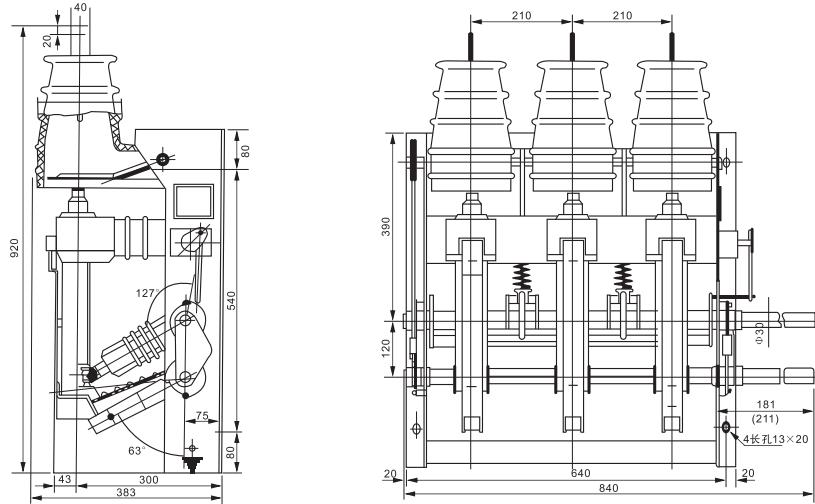


## **TECHNICAL PARAMETERS**

No.	Name	Unit	FN12-12/630	FNR12-12/125
1	Rated voltage	kV		12
2	Rated Frequency	Hz		50
3	Rated current	A	630	125
4	Lightning impulse withstand voltage	kV	To earth and between phase	75、across insulator
5	Power frequency withstand voltage for 1 min	kV	To earth and between phase	42、across insulator
6	Rated short time withstand current	kA	20(4S)	
7	Rated peak withstand current	kA	50	
8	Rated short closed circuit current	kA	50	
9	Rated short open circuit current	kA		31.5
10	Minimum breaking current	kA		Subject to characteristic curve of fuse
11	Rated transfer current	kA		1.5
12	Maximum breaking current reference value	kA		1.8
13	Capacity of breaking no-load transformer	kVA		1600
14	Rated charging current of breaking cable	A		16
15	Breaking times of rated active on-load current	次		>100
16	Gate-separation time of striker triggering load switch	S		<0.06
17	Short time withstand current of grounding switch	kA		20(2S)
18	Peak withstand current of grounding switch	kA		50
19	Operating voltage			AC/DC 220

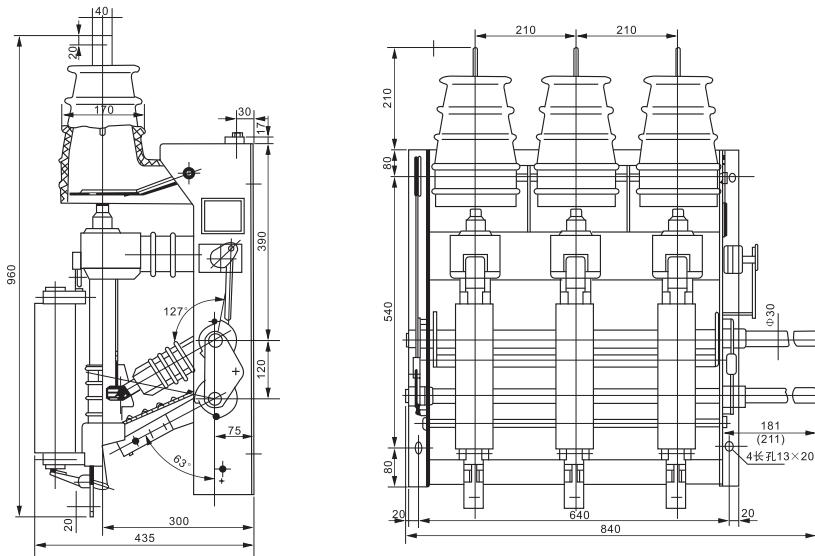
## FN12-12 TYPE OUTDOOR MEDIUM-VOLTAGE VACUUM CIRCUIT BREAKER

### OUTLINE AND MOUNTING DIMENSIONS



Notes: The user specially requires the principle axis nose with hole  $\Phi 10$ , the size should 870mm

Drawing 1: Outline diagram of FN12-12style indoor high-voltage load switch

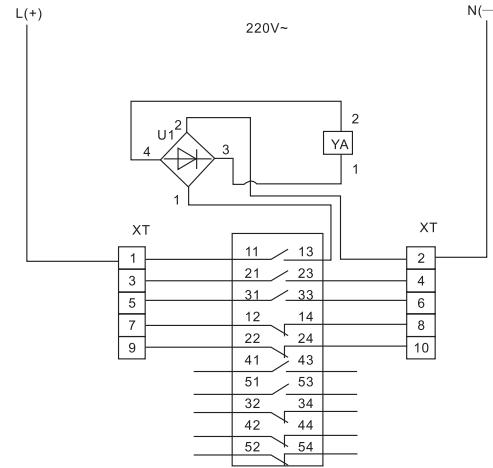


Notes: The user specially requires the principle axis nose with hole  $\Phi 10$ , the size should 870mm

Drawing 2: Structural representation, outline and installing dimension diagram of load switch-fuse composite apparatus.

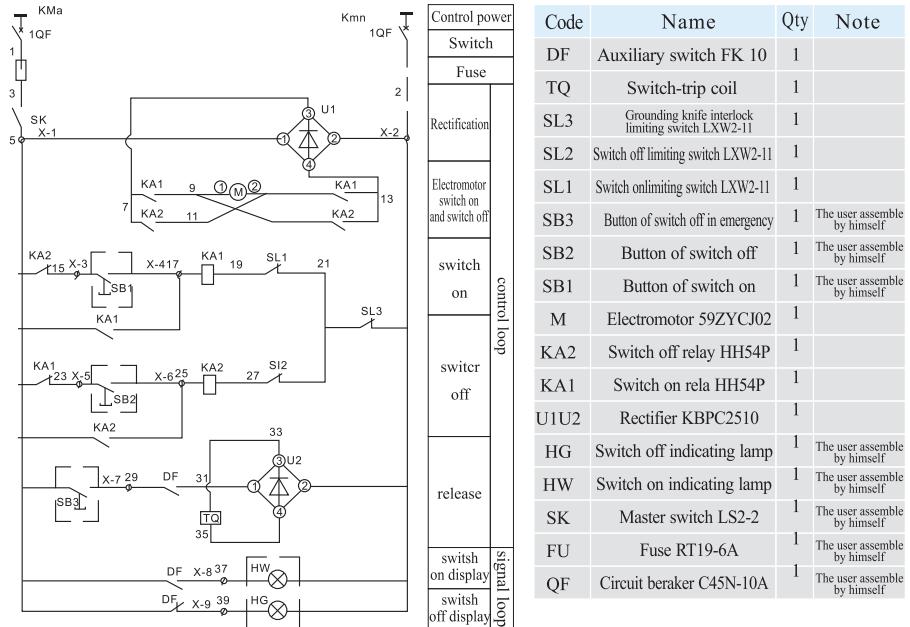
# FN12-12 TYPE OUTDOOR MEDIUM-VOLTAGE VACUUM CIRCUIT BREAKER

## SCHEMATIC DIAGRAM OF MOTOR SWITCH-OFF AND MOTOR OPERATION MECHANISM



Code	Name	Qty	Note
FU	Fuse 6A	1	The user assemble by himself
YA	Switch-off electromagnet (220V~)	1	5WXJ,617,001G
U1	Bridge style full wave rectifier	1	KBPC25-10
S	Auxiliary switch	1	F10-10/W
XT	Connection terminal row	1	JH9 660V/15A

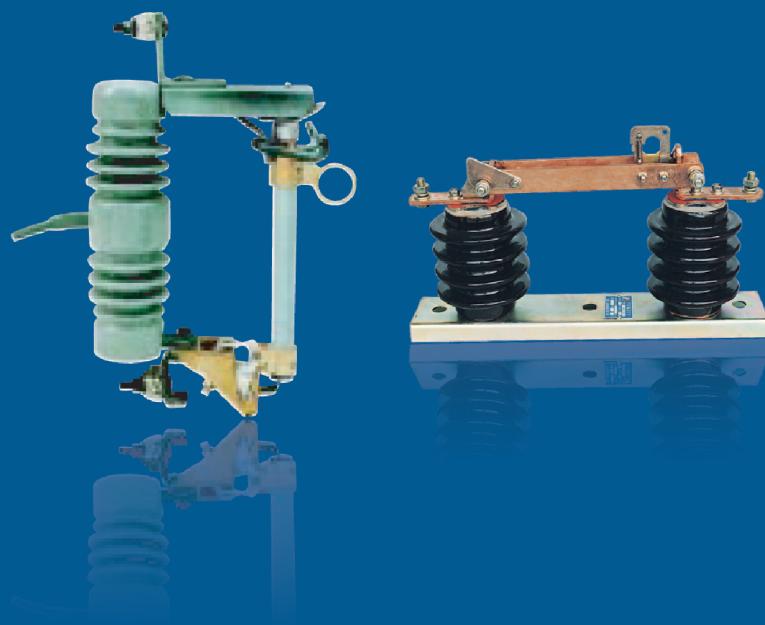
Drawing3: Schematic diagram of motor switch off



Drawing4: Schematic diagram of motor operation mechanism



## DROP-OUT FUSE



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## DROP-OUT FUSE SERIES

### 12KV-15KV



### 12KV-15KV



### 12KV-15KV



### 12KV-15KV



Type	Rated voltage (kV)	Rated current (A)	Breaking current (A)	Impulse voltage (BIL)	Power-frequency withstand voltage	Leakage distance (mm)	Weight (kG)	Dimensions (cm)
PEP-1	15	100	10000	110	40	250	7.3	38.5x34.5 x10.5
PEP-1	15	200	12000	110		250	7.3	

## DROP-OUT FUSE SERIES

### 12KV-15KV



### 12KV-15KV



### 12KV-15KV



### 12KV-15KV



Type	Rated voltage (kV)	Rated current (A)	Breaking current (A)	Impulse voltage (BIL)	Power-frequency withstand voltage	Leakage distance (mm)	Weight (kG)	Dimensions (cm)
PEP-5	15	100	10000	110	40	350	3.5	42 x 35 x 11
PEP-5	15	200	12000	110	40	350	3.5	

## DROP-OUT FUSE SERIES

### 12KV-15KV



### 10KV-15KV



### 10KV-15KV



### 12KV-15KV



Type	Rated voltage (kV)	Rated current (A)	Breaking current (A)	Impulse voltage (BIL)	Power-frequency withstand voltage	Leakage distance (mm)	Weight (kG)	Dimensions (cm)
PEP-9	15	100	10000	110	40	300	7.5	39x34.5 x10.5
PEP-9	15	200	12000	110		300	7.5	

## DROP-OUT FUSE SERIES

### 15KV-27KV



### 15KV-27KV



### 15KV-27KV



### 15KV-27KV



Type	Rated voltage (kV)	Rated current (A)	Breaking current (A)	Impulse voltage (BIL)	Power-frequency withstand voltage	Leakage distance (mm)	Weight (kG)	Dimensions (cm)
PEP-13	15	100	10000	125	45	350	8.8	51.5x34 x12
PEP-13	15	200	12000	125	45	350	8.8	

Type	Rated voltage (kV)	Rated current (A)	Breaking current (A)	Impulse voltage (BIL)	Power-frequency withstand voltage	Leakage distance (mm)	Weight (kG)	Dimensions (cm)
PEP-14	15	100	10000	125	45	350	8.5	45x34.5 x10
PEP-14	15	200	12000	125	45	350	8.5	

Type	Rated voltage (kV)	Rated current (A)	Breaking current (A)	Impulse voltage (BIL)	Power-frequency withstand voltage	Leakage distance (mm)	Weight (kG)	Dimensions (cm)
PEP-15	15	100	10000	125	45	350	8.5	48x35 x10.5
PEP-15	15	200	12000	125	45	350	8.5	

Type	Rated voltage (kV)	Rated current (A)	Breaking current (A)	Impulse voltage (BIL)	Power-frequency withstand voltage	Leakage distance (mm)	Weight (kG)	Dimensions (cm)
PEP-16	15	100	10000	125	45	350	12	50x36 x13
PEP-16	15	200	12000	125	45	350	12	

## DROP-OUT FUSE SERIES

### 15KV-27KV



### 24KV-27KV



### 24KV-27KV



### 24KV-27KV



Type	Rated voltage (kV)	Rated current (A)	Breaking current (A)	Impulse voltage (BIL)	Power-frequency withstand voltage	Leakage distance (mm)	Weight (kG)	Dimensions (cm)
PEP-17	15	100	10000	125	45	350	8.5	48x35 x10.5
PEP-17	15	200	12000	125		350	8.5	

## DROP-OUT FUSE SERIES

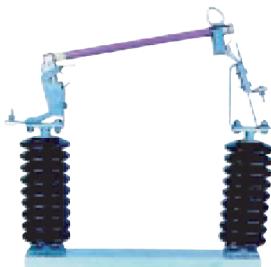
### 27KV-33KV



### 33KV-36KV



### 33-36KV



### 12KV-15KV



Type	Rated voltage (kV)	Rated current (A)	Breaking current (A)	Impulse voltage (BIL)	Power-frequency withstand voltage	Leakage distance (mm)	Weight (kG)	Dimensions (cm)
PEP-21	30	100	6000	170	70	700	15	56 x 38 x 14.5
PEP-21	30	200	8000	170	70	700	15	

Type	Rated voltage (kV)	Rated current (A)	Breaking current (A)	Impulse voltage (BIL)	Power-frequency withstand voltage	Leakage distance (mm)	Weight (kG)	Dimensions (cm)
PEP-22	33	100	10000	170	70	720	15.5	57 x 38 x 14.5
PEP-22	33	200	12000	170	70	720	15.5	

Type	Rated voltage (kV)	Rated current (A)	Breaking current (A)	Impulse voltage (BIL)	Power-frequency withstand voltage	Leakage distance (mm)	Weight (kG)	Dimensions (cm)
PEP-23	33	100	8000	170	70	820	27.5	68 x 17 x 15
PEP-23	33	200	10000	170	70	820	27.5	

Type	Rated voltage (kV)	Rated current (A)	Breaking current (A)	Impulse voltage (BIL)	Power-frequency withstand voltage	Leakage distance (mm)	Weight (kG)	Dimensions (cm)
PEP-24	15	100	10000	125	45	350	8.0	50 x 36 x 13
PEP-24	15	200	12000	125	45	350	8.0	

## DROP-OUT FUSE SERIES

### 10KV-15KV



### 10KV-15KV

Type	Rated voltage (kV)	Rated current (A)	Breaking current (A)	Impulse voltage (BIL)	Power-frequency withstand voltage	Leakage distance (mm)
PEP-G(a)	10-15	100	10000	110	40	380
PEP-G(a)	10-15	200	12000	110	40	380

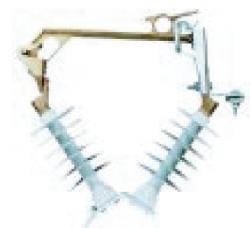
### 24KV-27KV



### 24KV-27KV

Type	Rated voltage (kV)	Rated current (A)	Breaking current (A)	Impulse voltage (BIL)	Power-frequency withstand voltage	Leakage distance (mm)
PEP-G(c)	24-27	100	6000	150	65	560
PEP-G(c)	24-27	200	8000	150	65	560

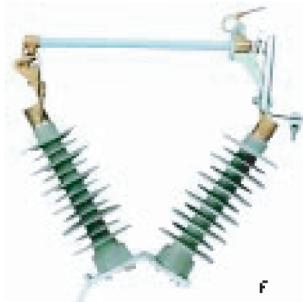
### 24KV-27KV



Type	Rated voltage (kV)	Rated current (A)	Breaking current (A)	Impulse voltage (BIL)	Power-frequency withstand voltage	Leakage distance (mm)
PEP-G(e)	24-27	100	6000	150	65	800
PEP-G(e)	24-27	200	8000	150	65	800

## DROP-OUT FUSE SERIES

### 27KV-33KV



### 27KV-33KV



### 30KV-33KV



### 36KV-38KV



### 27KV-33KV

Type	Rated voltage (kV)	Rated current (A)	Breaking current (A)	Impulse voltage (BIL)	Power-frequency withstand voltage	Leakage distance (mm)
PEP-G(f)	27-33	100	6000	170	70	1070
PEP-G(f)	27-33	200	8000	170	70	1070

### 27KV-33KV

Type	Rated voltage (kV)	Rated current (A)	Breaking current (A)	Impulse voltage (BIL)	Power-frequency withstand voltage	Leakage distance (mm)
PEP-G(g)	27-33	100	6000	170	70	620
PEP-G(g)	27-33	200	8000	170	70	620

### 30KV-33KV

Type	Rated voltage (kV)	Rated current (A)	Breaking current (A)	Impulse voltage (BIL)	Power-frequency withstand voltage	Leakage distance (mm)
PEP-G(h)	30-33	100	6000	170	70	680
PEP-G(h)	30-33	200	8000	170	70	680

### 36KV-38KV

Type	Rated voltage (kV)	Rated current (A)	Breaking current (A)	Impulse voltage (BIL)	Power-frequency withstand voltage	Leakage distance (mm)
PEP-G(i)	36-38	100	6000	180	75	820
PEP-G(i)	36-38	200	8000	180	75	820

## KB KU KS TYPE OF FUSE WIRE(FUSE LINK)

“KB” “KU” “KS” type fuses belong to “K” type fuse, it has general type, universal type and screw type, It according as IEC-282 standard. This product apply to drop-off type fuse of 11~36KV grade.



Rated current (A)	Dimension (mm)					Quantity/carton
	AB		C		F	
1 to 25	12.5 0.2	19.0 0.2	Note 1	2.0	6.5	500
30 to 40	12.5 0.2	19.0 0.2	Note 1	3.0	8.0	500
50 to 100	19.0 0.3	Not applicable	Note 1	5.0	10.0	250
140 to 200	19.0 0.3	Not applicable	Note 1	7.0	12.0	150

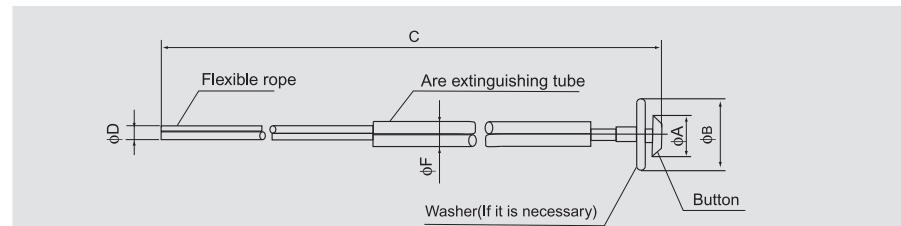
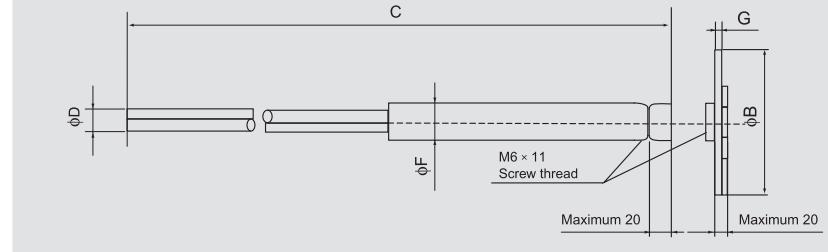
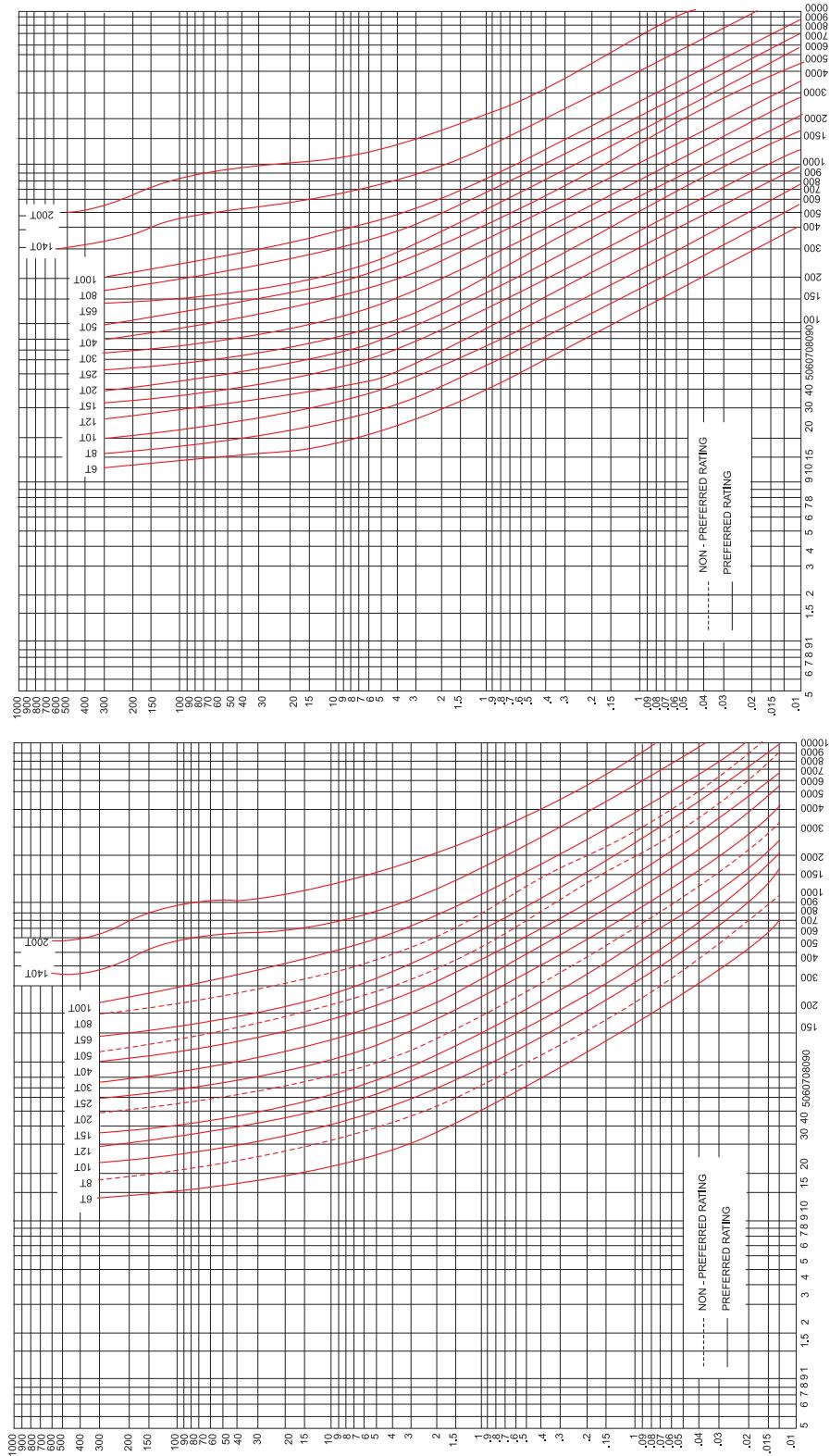


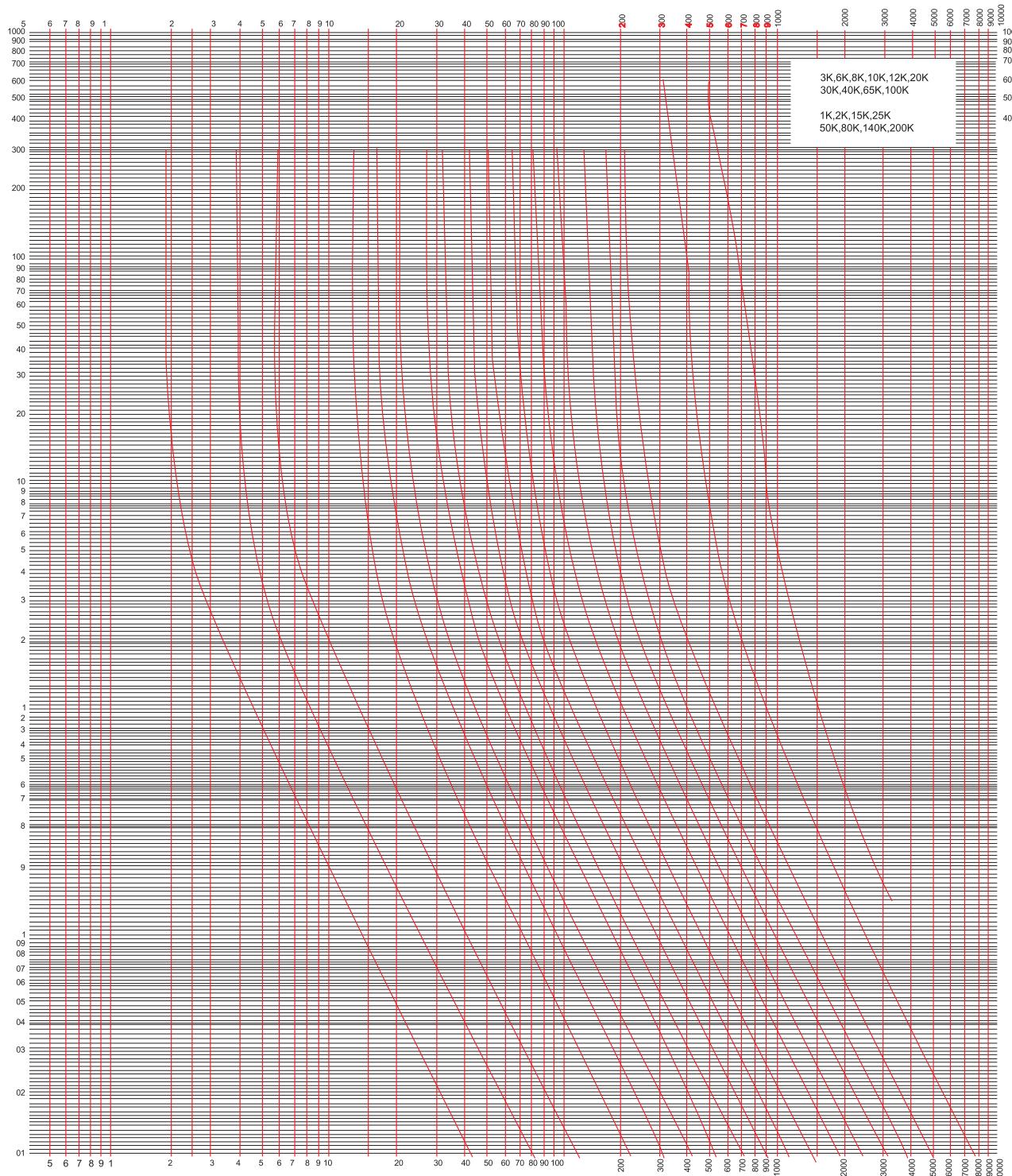
Fig.B.1a button type



## KB KU KS TYPE OF FUSE WIRE CURRENT IN AMPERS



## KB KU KS TYPE OF FUSE WIRE CURRENT IN AMPERS



## FOR FULL RANGE TRANSFORMER PROTECTION

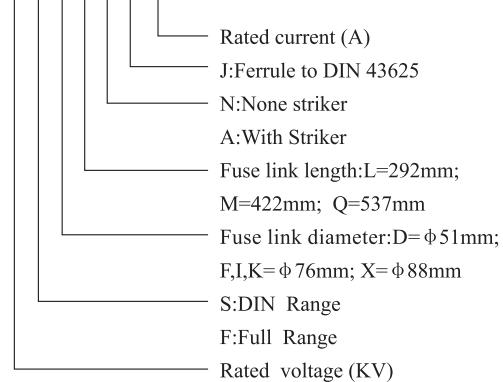


### CHARACTERISTIC BRIEF

1. Rated voltage from 7.2KV to 40.5KV
2. Wide range of rated current from 6.3A to 200A
3. Full range performance options available at 12KV and 24KV
4. Powerful pyrotechnic or spring striker
5. H.R.C.
6. Current-limiting
7. Low power dissipation, low temperature rise
8. Operation extremely quickly, high reliability
9. With primary coil of transformer in series
10. Isolating & protecting transformer
11. Conforming to standards: GB15166.2 DIN43625 BS2692-1 IEC60282-1

### MODEL ILLUSTRATION

**12S D L A J 16**

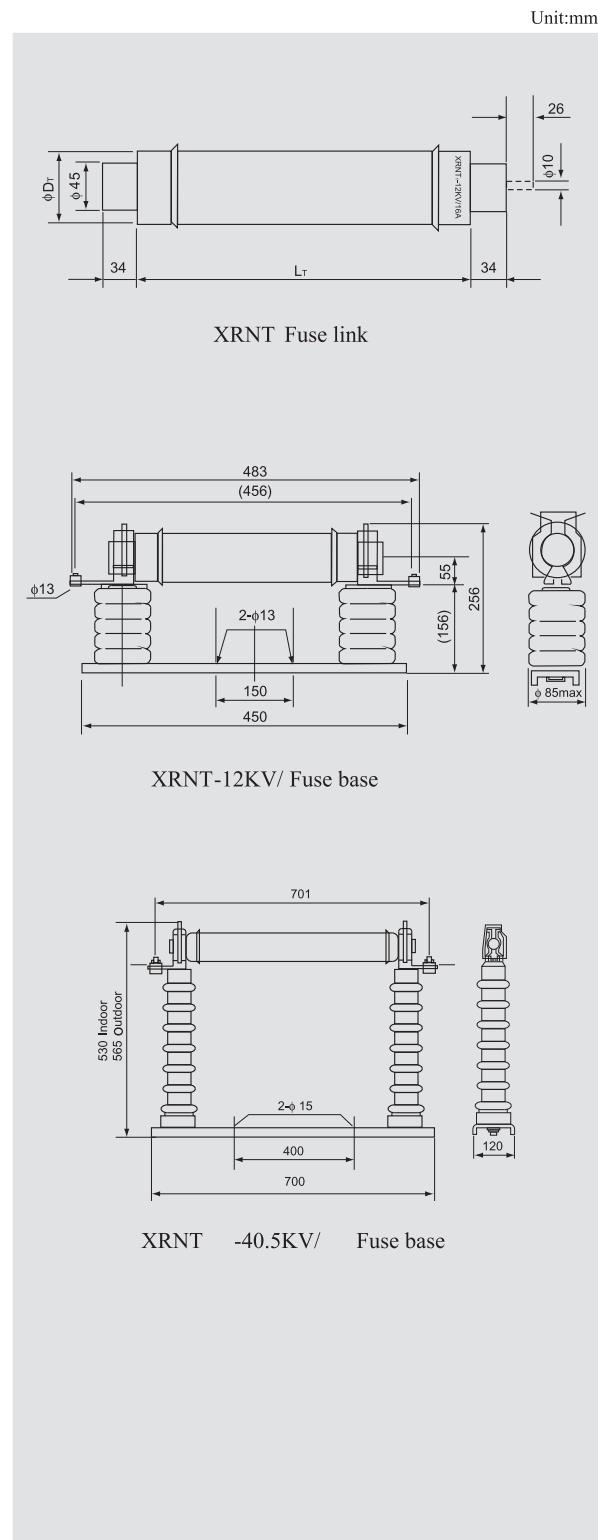


## FOR FULL RANGE TRANSFORMER PROTECTION

**XRNT SELECTION TABLE**

Model	Rated voltage U <sub>n</sub> (KV)	Rated current I <sub>n</sub> (A)	Diameter Length D <sub>T</sub> L <sub>T</sub> (mm)	Breaking capacity I <sub>b</sub> (KA)
XRNT	7.2	6.3	$\phi 51 \times 292$	63
		10		
		16		
		20		
		25		
		31.5		
		40		
		50		
		63		
		80		
	12	100	$\phi 76 \times 292$	50
		125		
		160		
		200		
	17.5	6.3	$\phi 51 \times 442$	63
		10		
		16		
		20		
		25		
		31.5		
		40		
		50		
		63		
		80		
		100		
		125		
		160		
		200		
40.5	36	6.3	$\phi 51 \times 537$	40
		10		
		16		
		20		
		25		
		31.5		
		40		
		50		
		63		
		$\phi 76 \times 537$		

**XRNT EXTERNAL&INSTALLATION DIMENSIONS**



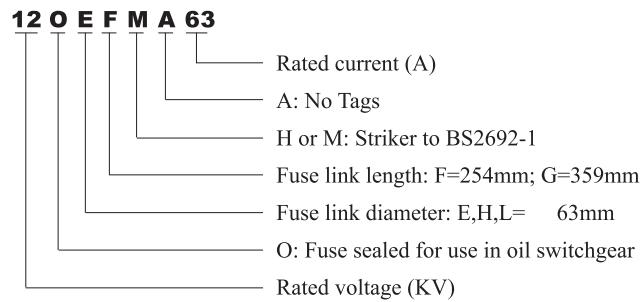
## FOR USE IN OIL SWITCHGEAR



### CHARACTERISTIC BRIEF

1. Rated voltage from 3.6KV to 12KV
2. Wide range of rated current from 6.3A to 250A
3. Powerful pyrotechnic striker
4. Unique triple seal
5. H.R.C.
6. Current-limiting
7. Low power dissipation, low temperature rise
8. Operation extremely quickly, high reliability
9. Mainly used for back-up protection in transformers of American type
10. Conforming to standards: GB15166.2 BS2692-1 / IEC60282-1

### MODEL ILLUSTRATION

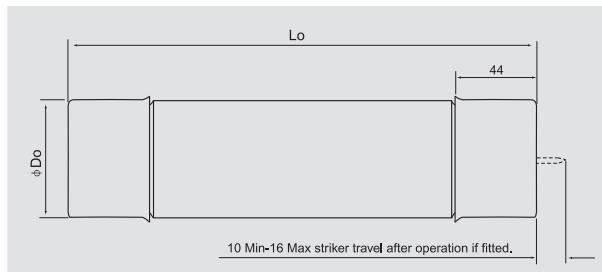


## FOR USE IN OIL SWITCHGEAR

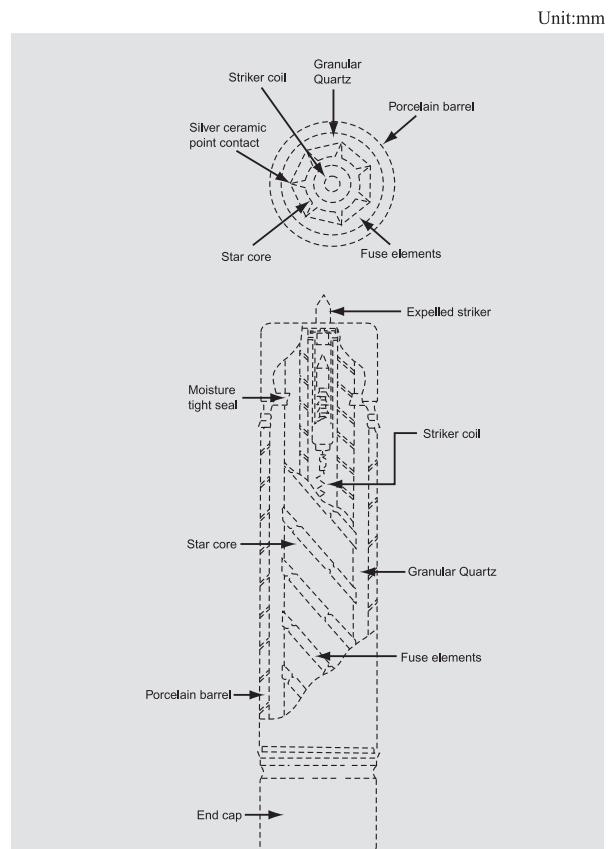
### XRNO 1 SERIES SELECTION TABLE

Model	Rated voltage Un(kV)	Rated current n(A)	Diameter Length DO LO (mm)	Breaking capacity I(KA)
XRNO1	3.6	6 .3	$\phi 63 \times 254$	50
		10		
		16		
		20		
		25		
		31.5		
		40		
		50		
		63		
		80		
	7.2	100	$\phi 63 \times 359$	45
		125		
		160		
		200		
		250		
		80		
		100		
		112		
		100		
		125		
12	12	140	$\phi 63 \times 359$	40
		160		
		6.3		
		10		
		16		
		20		
		25		
		31.5		
		40		
		50		
		63		
		71		

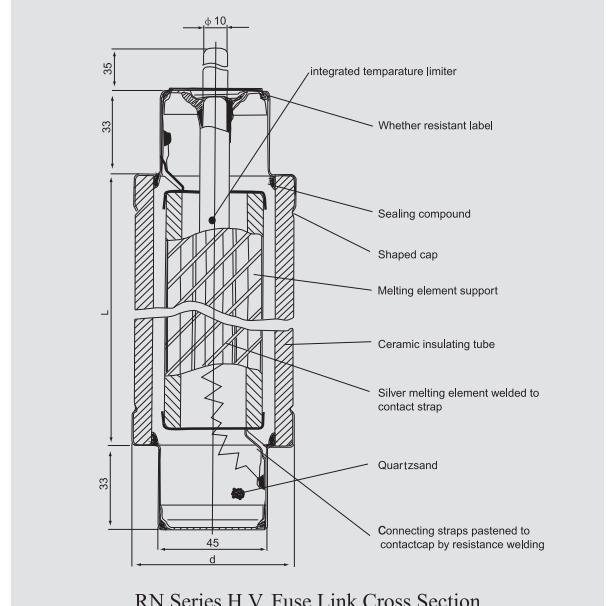
### XRNO 1 External Dimensions



### BS&DIN TYPE H.V. FUSE LINK CROSS SECTION COMPARED

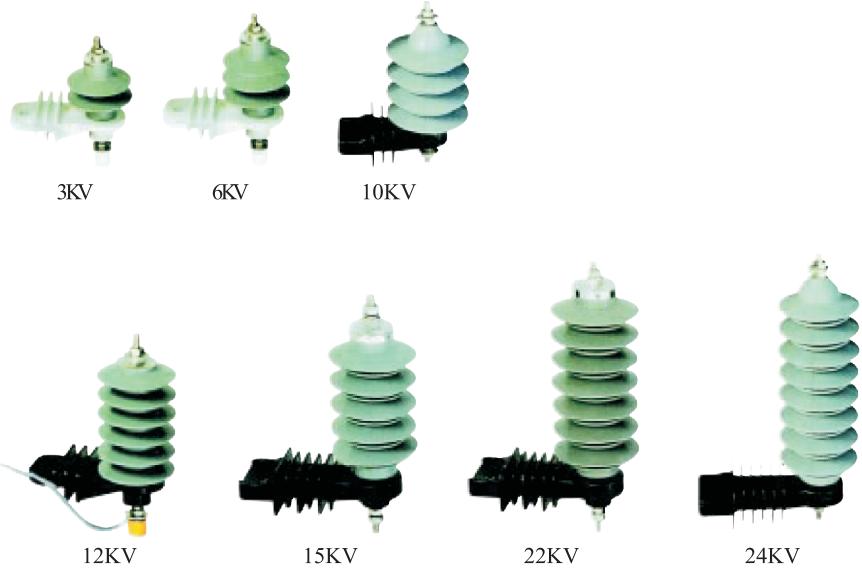


BS Type H.V. Fuse Link Cross Section



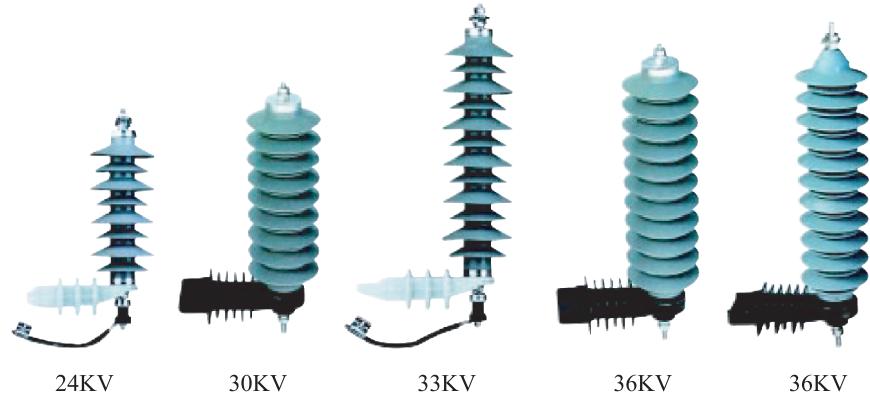
RN Series H.V. Fuse Link Cross Section

## **POLYMERIC HOUSED METAL-OXIDE SURGE ARRESTER WITHOUT GAPS NOMINAL DISCHARGE CURRENT 5KA(3-36KV)**



Type	MOA Rated voltage	MCOV	Current impulse Residual Voltage			2ms Rectangular current impulse withstand	4/10s High current impulse withstand
			1/4s Lightning current impulse	8/20s Lightning current impulse	30/60s Switching current impulse		
KV(rms)	KV(rms)	KV(crest)	KV(crest)	KV(crest)	KV(crest)	KV(crest)	KV(crest)
HY5W-3	3	2.55	11.3	9	8.9	150	65
HY5W-6	6	5.1	22.6	18	16.8	150	65
HY5W-9	9	7.65	33.7	27	23.8	150	65
HY5W-10	10	8.4	36	30	23	150	65
HY5W-11	11	9.4	40	33	30	150	65
HY5W-12	12	10.2	42.2	36	27	150	65
HY5W-15	15	12.7	51	45	38.5	150	65
HY5W-18	18	15.3	61.5	54	46.2	150	65
HY5W-21	21	17.0	71.8	63	54.2	150	65
HY5W-24	24	19.5	82	72	62	150	65
HY5W-27	27	22.0	92	81	69.8	150	65
HY5W-30	30	24.4	102	90	79	150	65
HY5W-33	33	27.5	112	99	86.7	150	65
HY5W-36	36	29.0	123	108	92.4	150	65

## POLYMERIC HOUSED METAL-OXIDE SURGE ARRESTER WITHOUT GAPS NOMINAL DISCHARGE CURRENT 10KA(3-36KV)



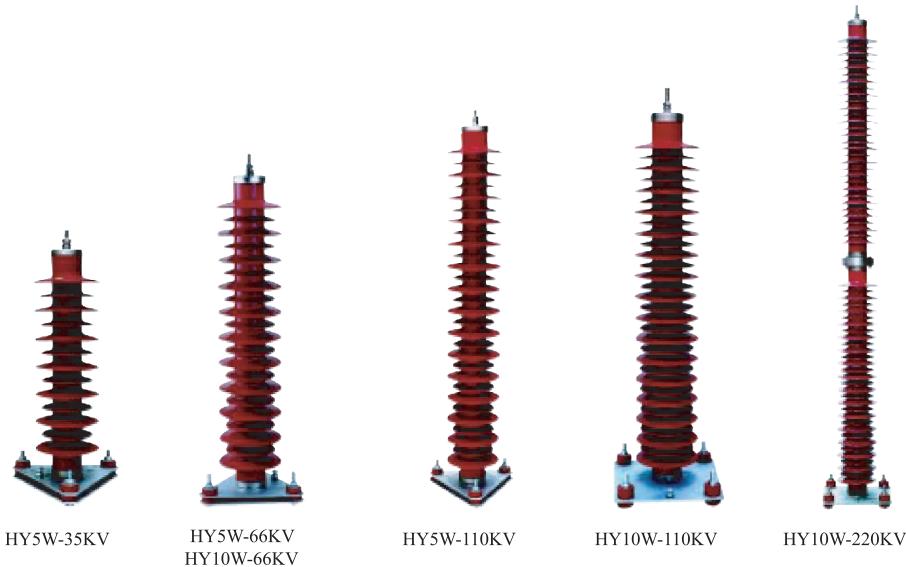
Type	MOA Rated voltage	MCOV	Current impulse Residual Voltage			2ms Rectangular current impulse withstand	4/10s High current impulse withstand
			1/4 s Lightning current impulse	8/20 s Lightning current impulse	30/60 s Switching current impulse		
	KV(rms)	KV(rms)	KV(crest)	KV(crest)	KV(crest)	KV(crest)	KV(crest)
HY10W-3	3	2.55	11.3	9	8.9	250	100
HY10W-6	6	5.1	22.6	18	16.8	250	100
HY10W-9	9	7.65	33.7	27	23.8	250	100
HY10W-10	10	8.4	36	30	23	250	100
HY10W-11	11	9.4	40	33	30	250	100
HY10W-12	12	10.2	42.2	36	27	250	100
HY10W-15	15	12.7	51	45	38.5	250	100
HY10W-18	18	15.3	61.5	54	46.2	250	100
HY10W-21	21	17.0	71.8	63	54.2	250	100
HY10W-24	24	19.5	82	72	62	250	100
HY10W-27	27	22.0	92	81	69.8	250	100
HY10W-30	30	24.4	102	90	79	250	100
HY10W-33	33	27.5	112	99	86.7	250	100
YH10W-36	36	29.0	123	108	92.4	250	100

## PORCELAIN HOUSED METAL-OXIDE SURGE ARRESTER WITHOUT GAPS (3-36KV)



Type	Rated voltage of arrester KV	Max. continuous operating voltage	D.C.(U1mA) reference voltage kV not less than	Nominal discharge current	Max residual voltage(peak)			Current impulse withstand discharge capacity	
					Steep current impulse KV	Lightning impulse current KV	Switching impulse KV	2000s A	4/10s KA
Y1.5W-0.28/1.3	0.28	0.24	0.6	1.5	1.4	1.3		75	25
Y1.5W-0.5/2.6	0.5	0.42	1.2	1.5	2.7	2.6		75	25
Y5W-3/10	3	2.55	5.5	5	11.3	10	8.9	150	65
Y5W-6/20	6	5.2	11	5	22.6	20	17.8	150	65
Y10W-3/10	3	2.55	5.2	10	11.3	10	8.9	250	100
Y10W-6/20	6	5.2	10.8	10	22.6	20	17.8	250	100
Y5W-9/30	9	7.70	16.0	5	34	30	26.8	150	65
Y5W-11/36	11	9.4	19.5	5	41.5	36	32.7	150	65
Y5W-12/39	12	10.2	21.5	5	45.3	39	35.7	150	65
Y10W-9/30	9	7.7	16.0	10	34	30	26.8	250	100
Y10W-11/36	11	9.4	19.2	10	41.5	36	32.7	250	100
Y10W-12/39	12	10.2	21.3	10	45.3	39	35.7	250	100
Y5W-15/42	15	12.75	22.0	5	47.5	42	35.8	150	65
Y5W-18/50	18	15.3	26.5	5	57.0	50	43.0	150	65
Y10W-15/42	15	2.75	22.0	10	47.5	42	35.8	250	100
Y10W-18/50	18	15.3	26.0	10	57.0	50	43.0	250	100
Y5W-21/62	21	17.1	33.4	5	70.0	62	54.2	150	65
Y5W-24/70	24	19.5	38.0	5	80.0	70	62.0	150	65
Y10W-21/62	21	17.1	33.0	10	70.0	62	54.2	250	100
Y10W-24/70	24	19.5	37.0	10	80.0	70	62.0	250	100
Y5W-36/100	36	30.4	54.5	5	115	100	86.7	150	65
Y10W-36/100	36	30.4	54.0	10	115	100	86.7	250	100

## POLYMERIC HOUSED METAL-OXIDE SURGE ARRESTER (35-220KV)



Type	Rated voltage of arrester kV	Nominal voltage of system (virtual value) kV	Continuous operating voltage (virtual value) kV	Reference voltage not less than D.C (U1mA) kV	Max residual voltage(peak)			2000 s rectangular impulse current (peak value) A	4/10 s impulse current (peak value) KA	The max. leakage current of 0.75DC refference voltage A
					Steep current impulse KV	Lightning impulse current KV	Switching current impulse KV			
HY5WZ-42/134	42	35	23	73	154	134	114			
HY5WZ-51/134	51	35	40.8	73	154	134	114			
HY5WZ-52.7/134	52.7	35	40.8	73	154	134	114			
HY5WZ-54/134	54	35	41	73	154	134	114			
HY5W-75/215	75	66	60	123	248	215	183			
HY5W-90/224	90	66	72.5	130	258	224	190			
HY10W-75/250	75	66	60	127	288	250	213			
HY10W-75/223	75	66	60	127	256	223	190			
HY10W-75/230	75	66	60	127	265	230	196			
HY10W-90/224	90	66	72.5	130	258	224	190			
HY10W-90/232	90	66	72.5	130	266	232	198			
HY10W-90/235	90	66	72.5	130	270	235	201			
HY5W-100/260	100	110	78	145	291	260	221			
HY5W-102/266	102	110	79.6	148	297	266	226			
HY5W-108/281	108	110	84	157	315	281	239			
HY10W-100/260	100	110	78	145	291	260	221			
HY10W-102/266	102	110	79.6	148	297	266	226			
HY10W-108/281	108	110	84	157	315	281	239			
HY10W-200/520	200	220	156	290	582	520	442			
HY10W-204/532	204	220	159	296	594	532	452			
HY10W-216/562	216	220	168.5	314	630	562	478			

## PORCELAIN HOUSED METAL-OXIDE SURGE ARRESTER WITH GAPS(35-110KV)



Type	Rated voltage of arrester KV	Nominal voltage of system (virtual value) KV	Continuous operating voltage (virtual value) KV	Reference voltage not less than DC (U1ma) KV	Max residual voltage(peak)			2000 s rectangular impulse current (peak value) A	4/10s impulse current (peak value) KA	The max leakage current of 0.75DC reference voltageA
					Steep impulse KV	Lightning impulse KV	Switching current impulse KV			
Y5WZ-42/134W	42	35	23	73	154	134	114			
Y5WZ-51/134W	51	35	40.8	73	154	134	114			
Y5WZ-52.7/134W	52.7	35	40.8	73	154	134	114	150	65	50
Y5WZ-54/134W	54	35	41	73	154	134	114			
Y5W-75/215	75	66	60	123	248	215	183	400	65	50
Y5W-90/224	90	66	72.5	130	258	224	190			
Y10W-75/250	75	66	60	127	288	250	213			
Y10W-75/223	75	66	60	127	256	223	190			
Y10W-75/230	75	66	60	127	265	230	196	600	100	50
Y10W-90/224	90	66	72.5	130	258	224	190			
Y10W-90/232	90	66	72.5	130	266	232	198			
Y10W-90/235	90	66	72.5	130	270	235	201			
Y5W-100/260	100	110	78	145	291	260	221			
Y5W-102/266	102	110	79.6	148	297	266	226	400	65	50
Y5W-108/281	108	110	84	157	315	281	239			
Y10W-100/260	100	110	78	145	291	260	221			
Y10W-102/266	102	110	79.6	148	297	266	226	600	100	50
Y10W-108/281	108	110	84	157	315	281	239			

## COMPOSITE INSULATOR SERIES

### PRODUCT INTRODUCTION

FPQ pin composite insulator for powerlines  
 FXBW Rod suspension composite insulators  
 FS cross-arm composite insulator  
 FZS Rod post composite insulator

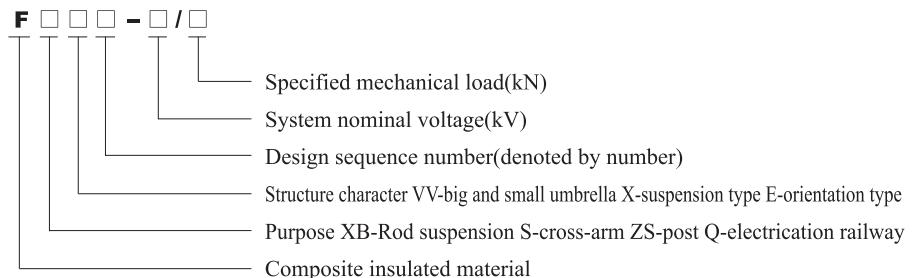
### PRODUCT STRUCTURE

The series products are composed of fiberglass epoxy resin lead out pole, silicon-rubber skirt and hardware. Adopted the whole liquid-compression technique in the silicon rubber skirt, the insulator solves the interface electrical breakdown, which is the key problem to the reliability of the composite insulator. With special colloid installation and compression joint technique in the connection of the fiberglass epoxy resin lead-out pole and the hardware, the insulator has the advantages of strong intensity, beautiful figure, small volume, and light weight. The zinc plated hardware, which can be interchanged with porcelain insulator, can protect against strust. The product has reliable colloid installation and compression joint structure, no damage to core pole and can greatly exer its mechanical intensity.

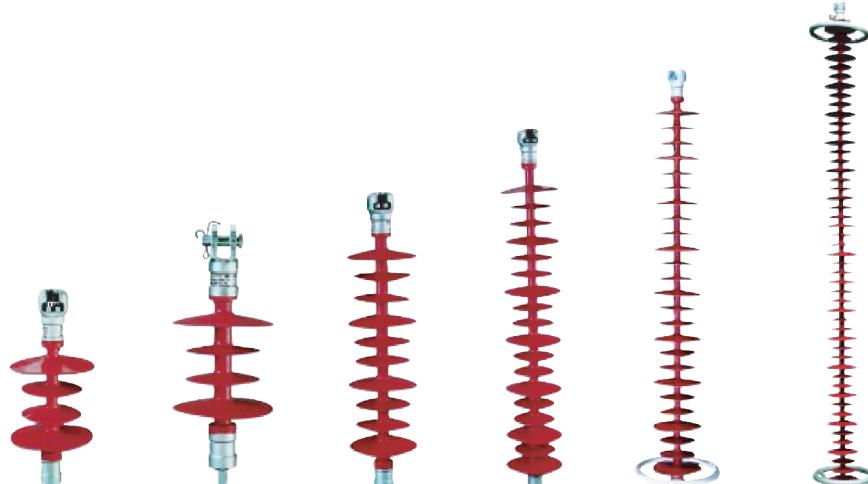
### PRODUCT PERFORMANCE

1. Excellent electrical performance, strong mechanical intensity, the extension intensity of fiberglass epoxy resinlead-out pole can be 2 times higher than general steel, and about 10 fold to porcelain material, which can effectively increase the reliability of safeoperation.
2. Good resistance to nastiness. strong aunt-defilement capacity, the flashover voltage is 1.6-2 times to the porcelain insulator with same creepage distance, not require clean, can be safely operated in heavy nastiness zone.
3. Small volume, light weight(only 1/6-1/19 of the porcelain insulator with same voltage grade), flexible structure, easy for transportation and installation.
4. The silicon rubber skirt has good hydrophobicity and the whole structure can protect against damp, not require the monitor of preventive performance insulation, not require clean and reduce daily maintenance.
5. Good seamed performance, strong resistance to electrical erosion, withstand creepage tracing of skirt material can reach TMA4.5 degree the product, have excellent resistance to erosion, resistance to low temperature and can be applicable for the zone with the temperature from -40 to+50.
6. Strong resistance to impact and shock, good resistance to brittleness and creep properties, hard to crash, bend, and wrest, can be interchanged with porcelain and glass insulator.

### TYPE EXPLANATION



## COMPOSITE INSULATOR SERIES



FXBW4-10/70    FXBW4-10/70C    FXBW4-35/70    FXBW4-66/70    FXBW4-110/70    FXBW4-220/100  
 FXBW4-10/100    FXBW4-10/100C    FXBW4-35/100    FXBW4-66/100    FXBW4-110/100    FXBW4-220/160

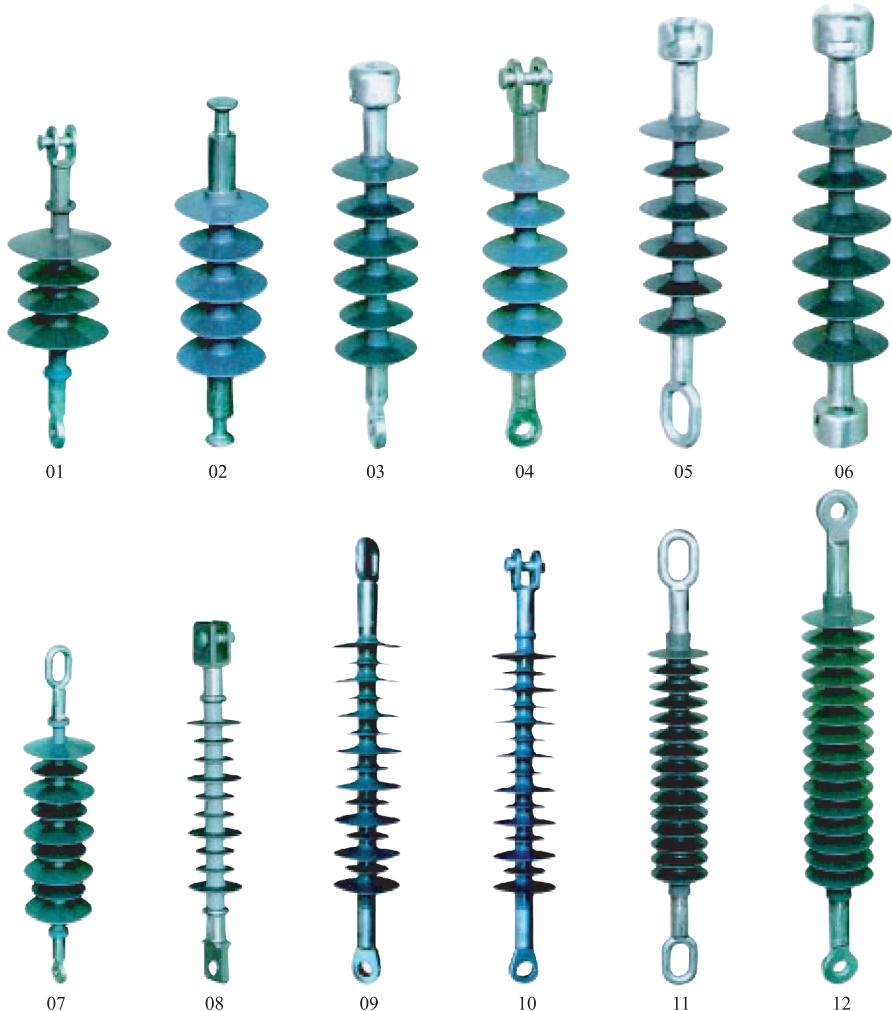
### SUMMARY

The product is suitably applies to the power lines with high mechanical tensile and long span in grimy zone. It has the features of light weight, small volume, hard to crash.

### MAIN ELECTRICAL PARAMETER

Product designation	Product type	Rated voltage kV	Specified mechanical load k N	Joint structure mark	Section length H(mm)	Min. arc ing distancee L.mm	Min. nominal creepage distance L.mm	Lightningimpulse withstand voltage (peak value) should exceed kV	Power frequency wet withstand voltage(1 minute) not less than kV	Product weight kg
Bar type hang composite insulator	FXBW4-10/70	10	70	16	380 15	200	400	165	50	2.2
	FXBW4-10/100	10	100	16	380 15	200	400	165	50	2.2
	FXBW4-10/70C	10	70	16	380 15	200	400	165	50	2.2
	FXBW4-10/100C	10	100	16	380 15	200	400	165	50	2.2
	FXBW4-35/70	35	70	16	650 15	450	1015	230	95	3.4
	FXBW4-35/100	35	100	16	650 15	450	1015	230	95	3.4
	FXBW4-66/70	66	70	16	940 15	700	1900	410	185	4.7
	FXBW4-66/100	66	100	16	940 15	700	1900	410	185	4.7
	FXBW4-110/70	110	70	16	1240 15	1000	3150	550	230	6.1
	FXBW4-110/100	110	100	16	1240 15	1000	3150	550	230	6.1
	FXBW4-220/100	220	100	16	2240 30	1900	6300	1000	395	8.8
	FXBW4-220/160	220	160	20	2240 30	1900	6300	1000	385	10.8

## COMPOSITE INSULATOR SERIES



### MAIN ELECTRICAL PARAMETER

Product type	Rated voltage kV	Specified mechanical load kN	Section length H(mm)	Arcing distance L.(mm)	Min. creepage distance Lc.mm	Diameter of shed D.(mm)	Lightning impulse withstand voltage (peak) (kV)	P.F.wet withstand voltage (virtual value) (kV)
FXBW-12/70	12	70	390	180	460	98/88	105	42
FXBW-15/70	15	70	445	225	620	98/88	105	42
FXBW-24/70	24	70	450	235	635	148/118	150	42
FXBW-28/70	28	70	560	380	1250	88	230	95
FXBW-33/70	33	70	560	380	1130	92/62	230	95
FXB-36/70	36	70	580	380	1250	88	230	95
FXBW-36/70	36	70	650	450	1320	148/118	230	95

# GW1-12 OUTDOOR HIGH VOLTAGE ISOLATING SWITCH



## GENERALS

GW1-7.2, 12/200,400,600 outdoor high voltage isolating switch is applied to outdoor circuitry of high voltage switchgear, it can make disconnection and change over circuit when with voltage but no load in the circuit .

## ENVIRONMENTAL SERVICE CONDITION

1. AC50 (60)Hz outdoor switchgear
2. Elevation: 1300m and below
3. Ambient air temperature: -40°C — +40°C
4. Place without conductive dust, corrosive gas, water vapor.
5. Place without fire and explosive danger.
6. Place without regular severe vibration

## TECHNICAL PARAMETERS

Type	Rated voltage (kV)	Rated current (A)	Stability degree of short circuit current(kA)			Weight (kg)
			Utmost through current Amplitude value	Virtual value	Thermal stable current in 10 seconds (virtual value)	
GW1-7.2/200	7.2	200	15	9	5	12
GW1-7.2/400	7.2	400	25	15	10	12
GW1-12/200	12	200	15	9	5	20
GW1-12/400	12	400	52	16	10	20
GW1-12/600	12	600	35	21	14	21

## STRUCTURAL FEATURE

1. GW1-12 outdoor high voltage isolating switch is 3 phases apparatus comprised of 3 single pole isolating switches. Each single pole isolating switch has same components such as brace of base and operational insulator's front and back fixed contact, switch blade, angle of arcing.

A: base: the base is made of armor plate, and the shaft with draw arm crosses its central section. Holes broached on the base are to fix post insulator, mount earthing bolt and fix each single pole isolating switch. The trench hole on top is set for draw arm

B: brace and operational insulator is adopted ZPA-6 type (7.2KV) and ZPA-10 type (12KV) pin insulator, its minimum bending resistance and rupturing load is 375 and 500Kg Function of middle operational insulator is as draw rod, its top and bottom fixed by collets, the top connect to switch blade and the bottom connect to draw arm

C:front and back fixed contact: blade adapter and blade tongue is made of red copper, which is fixed above the post insulator, and both sides of the top of curving sections is reliably connected to the switch blade

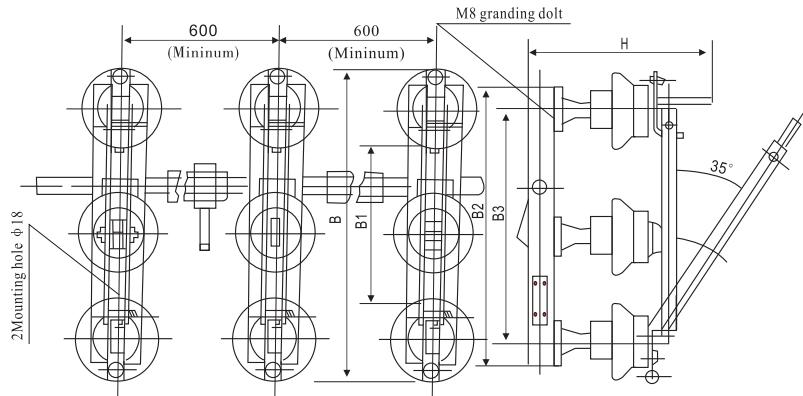
D:switch blade: 400A and 600A type and made of two pieces rectangular red copper plate, and 200A type is made of one piece of red copper plate and steel plate galvanized. The both side of switch blade set with helical springs in order to adjust connection pressure

F: angle of arcing: made by two pieces of Φ 5 stylus, the fixed mounting on blade tongue and the moving mounting on blade itself.

## GW1-12 OUTDOOR HIGH VOLTAGE ISOLATING SWITCH



### THE CONTOUR AND INSTALLING DIMENSION

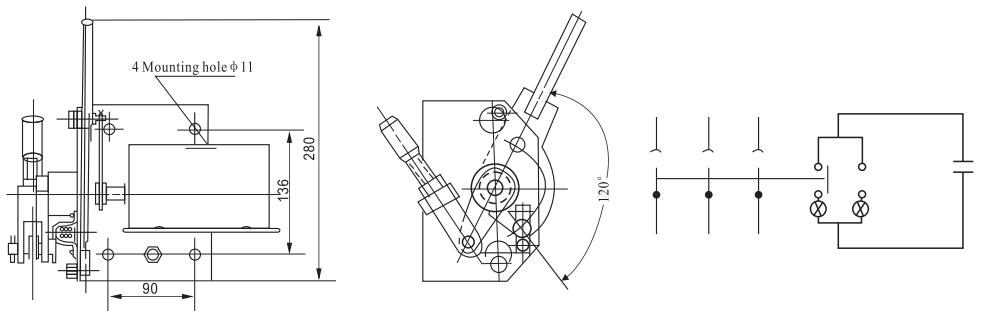


Figuration drawing of GW1-7.2、12/200,400,600 shtyle isolating switch

Type					
	H	B	B <sub>1</sub>	B <sub>2</sub>	B <sub>3</sub>
GW1-7.2/200	328	580	280	500	420
GW1-7.2/400	328	580	280	500	420
GW1-12/200	370	670	370	620	510
GW1-12/400	370	670	370	620	510
GW1-12/600	370	670	370	620	510

2. GW1-7.2, 12/200,400,600 outdoor high voltage isolating switch adopts CS8-1 manual operation mechanism. The F1 auxiliary switch fixed on splint of mechanism, and its moving arm connect to dowel of mechanism handle. The open angle of auxiliary switch is same as handle opened.

The auxiliary switch normally functioned as signal indication and also can be electrical interlocked if required.



CS8-1 Figuration drawing of CS8-1 hand power operation mechanism

Signal conneting diagram of auxiliary switch