Technology Quality Service

# CANTOR OEM/ODM ROAD.....

OEM adapt the need of rapid development of science and technology.
OEM adapt the need of development of world brand.
OEM adapt the need of development of global information management system.
OEM adapt the integrated solution provided for the customer
OEM adapt the need of building new competion advantages.

# Contents

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**OEM**

- Metal-oxide surge arrester
- Fuse cutouts
- Composite insulator

# Metal-oxide Surge Arrester

## Application

Protection of medium/high voltage AC networks against both, multiple atmospheric and switching overvoltages as well as Very Fast Transients (VFT). Suitable for the protection of transformers, transformers in arc furnace applications, cables, generators, parallel to capacitor banks, and railway vehicles. Can be used mechanically as support insulator or as suspension insulator in case of application as line arrester. For indoor and outdoor installation.

## Keystone

The metal-oxide surge arrester(MOSA) is the most advanced overvoltage protector in the word. Due to make the varistor of core component mainly adopt MOSA. Compared with the conventional silicone carbide arrester, this prescription of the product improves greatly the Voltage-Current(U-I) characteristic of the metal-oxide varistor and increased through-current capability at over-voltage so as to bring a radical-changes for the characteristic of the MOSA.
Under the circumstance of normal operating voltage, the current through the MOSA just on microampere degree. When suffered from overvoltage, the MOSA' s excellent non-linear characteristic will make the current through the MOSA increase to several thousand ampere, While the MOSA will be under the circulating state and release overvoltage energy so as to protecting the power transmission equipments against the damage caused by the overvoltage.

## Usual service condition

a) Ambient air temperature within the range of -55℃ to +50℃.
b) Altitude not exceeding 2000m.
c) Frequency of the A.C. power supply not less than 48Hz and not exceeding 62Hz.
d) Power frequency voltage applied continuously between the terminals of the arrester not exceeding its continuous operating voltage.
e) Maximum wind speed not exceeding 35m/s.
f ) Earthquake intensity not exceeding 7 degrees.

## Advantage (CANTOR MOSA)

- Low residual voltage
- Long protection distance
- High energy input capacity
- Stable U-I characteristic even after multiple strokes
- Proof against ageing
- Explosion and shatter-resistant design
- Pollution resistant and UV-stable
- Housing resistant to rough handling
- Maintenance free
- Stable against shock and vibration
- High mechanical resistance

## Technical Performance

The technical performance of metal-oxide surge arrester is accord with IEC60099-4, IEEE (ANSI) C62.11 and GB11032.



**SUPPLY**

- Metal-oxide varistor
- Semi-manufactured goods
- Accessory

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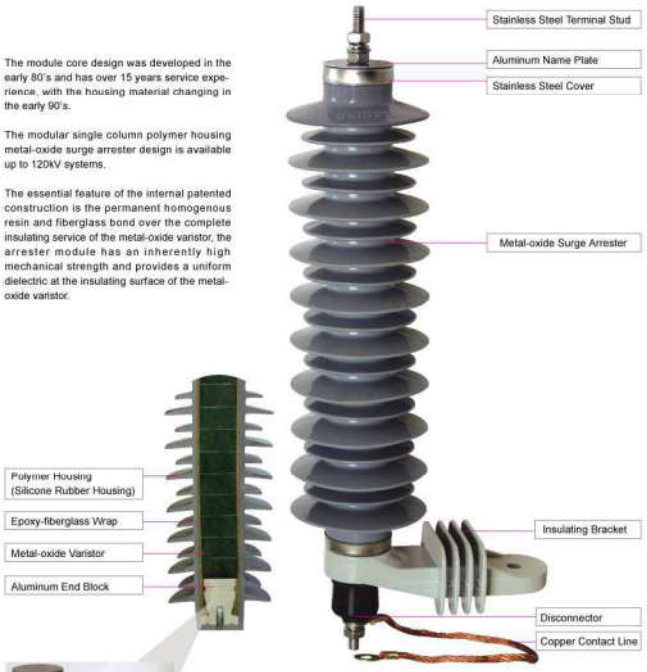
# Configuration and Anatomy Design of Polymer Housing Metal-oxide Surge Arrester

The module core design was developed in the early 80's and has over 15 years service experience, with the housing material changing in the early 90's.

The modular single column polymer housing metal-oxide surge arrester design is available up to 120kV systems.

The essential feature of the internal patented construction is the permanent homogenous resin and fiberglass bond over the complete insulating service of the metal-oxide varistor, the arrester module has an inherently high mechanical strength and provides a uniform dielectric at the insulating surface of the metal-oxide varistor.





Professional design to build up resistance of antitorque and sealing
"1" special notching design
"2" hexagonal structure
"3" sand finish treatment

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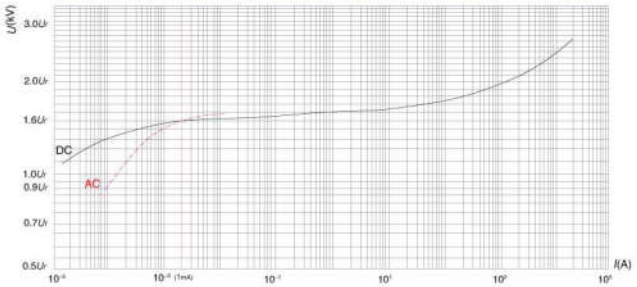
# Metal-oxide Varistor

## Application

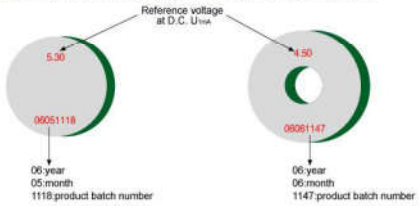
Metal-oxide varistor(MOV) are the core component of an arrester, which are sintering mainly of ZnO powder with addition of $Bi_2O_3$, $Co_2O_3$, $Cr_2O_3$, $Sb_2O_3$ and other insition.

As one of the biggest exportor of MOV, CANTOR company is a professional manufacturer of MOV of metal-oxide surge arrester. Adopting the Japanese HITACHI protective technology, we can produce 700 tons ZnO powder (more than 5 million pieses of D3524 MOV) by our full automatic production lines.CANTOR company has single passed the KEMA certificate for 27 types metal-oxide surge arrester with our own MOV.

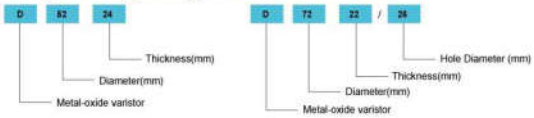
## Typical Voltage-current(U-I) Characteristic Curve of Metal-oxide Varistor




## Indication on The Surface of Metal-oxide Varistor




## Description of Type Designation of Metal-oxide Varistor



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**SUPPLY**

- Metal-oxide varistor
- Semi-manufactured goods
- Accessory

## Table 1—Main Technical Parameter of Metal-oxide Varistor

| | Manufacturer | | Wenzhou Cantor H.V. Electric Manufacturing Co., Ltd. | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Type designation | Unit | D3022 | D3024 | D3522 | D3524 | D3822 | D3824 | D4222 | D4224 | D4924 | D4922 | D5222 | D5224 | D5624 | D6024 | D7222/26 | D8522 |
| 2 | Dimension | | | | | | | | | | | | | | | | | |
| 2.1 | --Diameter | ±0.3mm | 30.0 | 30.0 | 35.0 | 35.0 | 38.0 | 38.0 | 42.0 | 42.0 | 49.0 | 49.0 | 52.0 | 52.0 | 56.0 | 60.0 | 72.0/26.0 | 85.0 |
| 2.2 | --Thickness | ±0.5mm | 22.5 | 24.5 | 22.5 | 24.5 | 22.5 | 24.5 | 22.5 | 24.5 | 24.5 | 22.5 | 22.5 | 24.5 | 24.5 | 24.5 | 22.5 | 22.5 |
| 3 | Reference voltage at U1 mA D.C. (Uref) | ±0.3kV | 4.8 | 5.3 | 4.8 | 5.3 | 4.8 | 5.3 | 4.8 | 5.3 | 5.3 | 4.8 | 4.8 | 5.3 | 5.3 | 5.3 | 4.5 | 4.5 |
| 4 | Residual voltage at | | | | | | | | | | | | | | | | | |
| 4.1 | --Lightning impule 8/20μs,5kA (Max.) | ±0.5kV | 8.6 | 9.5 | 8.4 | 9.3 | 8.3 | 9.1 | 8.2 | 9.0 | 8.8 | 8.0 | 7.9 | 8.7 | 8.6 | 8.5 | / | / |
| 4.2 | --Lightning impule 8/20μs,10kA (Max.) | ±0.5kV | / | / | / | / | 9.0 | 10.0 | 8.8 | 9.8 | 9.6 | 8.7 | 8.6 | 9.5 | 9.4 | 9.3 | 7.8 | 7.5 |
| 5 | Voltage ratio of a non--linear Varistor | | | | | | | | | | | | | | | | | |
| 5.1 | --U1mA/U1mA D.C. (Max.) | | 1.80 | 1.80 | 1.75 | 1.75 | 1.73 | 1.72 | 1.71 | 1.70 | 1.67 | 1.67 | 1.65 | 1.65 | 1.63 | 1.61 | / | / |
| 5.2 | --U1mA/U1mA D.C. (Max. ) | | / | / | / | / | 1.88 | 1.88 | 1.85 | 1.85 | 1.82 | 1.82 | 1.79 | 1.79 | 1.78 | 1.76 | 1.74 | 1.67 |
| 6 | Non--linear coefficient (10uA--1mA) (Min.) | | 24 | 24 | 22 | 22 | 21 | 21 | 20 | 20 | 19 | 19 | 18 | 18 | 17 | 16 | 15 | 13 |
| 7 | Long duration current impulse withstand | | | | | | | | | | | | | | | | | |
| 7.1 | --2ms rectangular current withstand (> 18 time) | A | 100 | 100 | 150 | 150 | 200 | 200 | 250 | 250 | 400 | 400 | 450 | 450 | 500 | 600 | 800 | 1000 |
| 8 | Operating duty | | | | | | | | | | | | | | | | | |
| 8.1 | --4/10μs high current impulse withstand (>2 times) | kA | 55 | 55 | 65 | 65 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 9 | Accelerated ageing test (115℃ 1000h) | | | | | | | | | | | | | | | | | |
| 9.1 | --Applied voltage ratio (Max.) | | 85% | 85% | 85% | 85% | 85% | 85% | 85% | 85% | 85% | 85% | 85% | 85% | 90% | 90% | 90% | 90% |
| 9.2 | --Kct | | ≤1.2 | | | | | | | | | | | | | | | |
| 10 | Package data | | | | | | | | | | | | | | | | | |
| 10.1 | Net weight of each unit | g | 92 | 100 | 119 | 130 | 140 | 153 | 174 | 190 | 263 | 241 | 266 | 290 | 345 | 405 | 432 | 730 |
| 10.2 | Each carton package quantity | pcs | 165 | 165 | 165 | 165 | 132 | 132 | 132 | 132 | 90 | 90 | 90 | 90 | 45 | 45 | 36 | 20 |
| 10.3 | Carton dimensions | cm | 30.8x15.3x23 | | | | 30.8x17.8x22 | | | | 32x21.5x22.5 | | | | 31x19x22 | | | |

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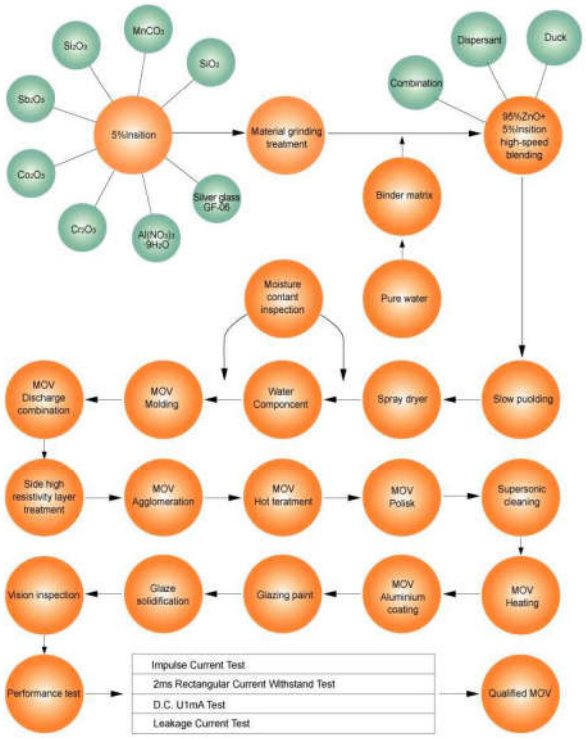
- Fuse cutouts
- Composite insulator

## Protective Technology Flow Chart of Metal-oxide Varistor




## SUPPLY

- Metal-oxide varistor
- Semi-manufactured goods
- Accessory

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Material


Spray dryer


Water Componcent


MOV Molding


Side High Resistivity Layer Treatment


Console systems


MOV Agglomeration
MOV Hot teratment


MOV polisk


MOV Aluminium coating


Glazing paint


Impulse Current Test
2ms Rectangular Current Withstand Test


D.C. U1mA Test
Leakage Current Test


Qualified MOV

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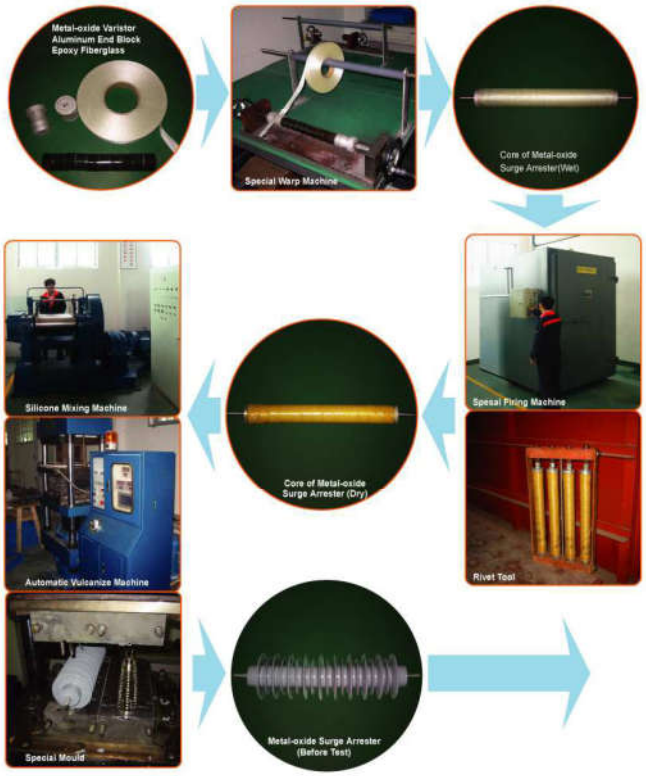
## OEM

- Metal-oxide surge arrester
- Fuse cutouts
- Composite insulator

## Protective Technology Flow Chart of Polymer Housing Metal-oxide Surge Arrester






KEMA IQNet CQC CE FSK SAVAL UL IMA

## SUPPLY

- Metal-oxide varistor
- Semi-manufactured goods
- Accessory

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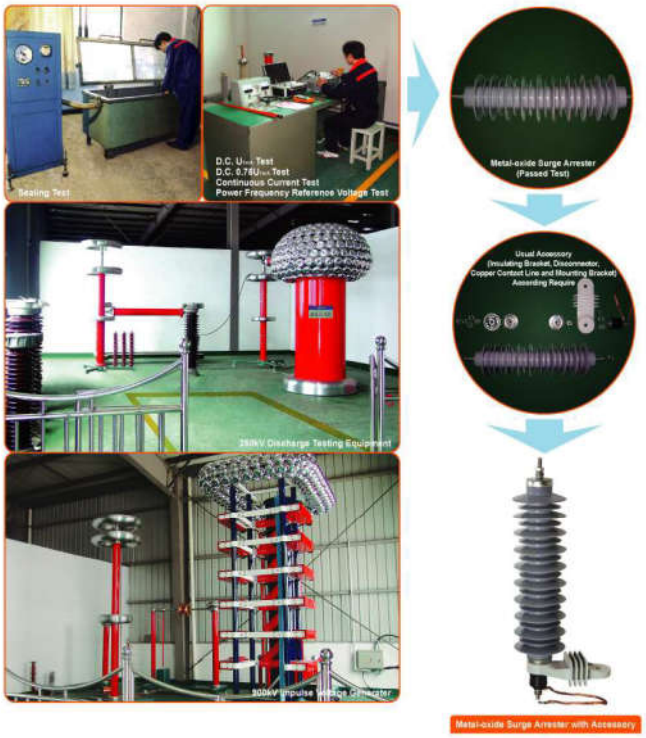

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## Metal-oxide Surge Arrester


Fig. A1


Fig. A2


Fig. A3


Fig. A4


Fig. A5


Fig. A6


Fig. A7

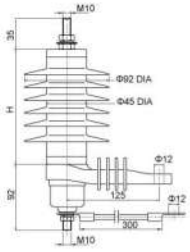

Fig. A8


Fig. A9


Fig. A10


Fig. A11


Fig. A12

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**SUPPLY**

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- Semi-manufactured goods
- Accessory



## Table 2— Main Technical Parameter of Polymer Housing Metal-oxide Surge Arrester

### (Nominal Discharge Current: 5kA, Design model: E1)

| | Manufacturer | | Wenzhou Cantor H.V. Electric Manufacturing Co., LTD. | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Rated Voltage(Ur) | kV | 3 | 6 | 9 | 10 | 11 | 12 | 15 | 18 | 21 | 24 | 27 | 30 | 33 | 36 |
| | Nominal discharge current(In) | kA | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| 1 | Type | | YHSW-3 | YHSW-6 | YHSW-9 | YHSW-10 | YHSW-11 | YHSW-12 | YHSW-15 | YHSW-18 | YHSW-21 | YHSW-24 | YHSW-27 | YHSW-30 | YHSW-33 | YHSW-36 |
| 2 | Maximum continuous operating voltage(Uc) | kV | 2.55 | 5.10 | 7.65 | 8.40 | 9.35 | 10.20 | 12.70 | 15.30 | 17.00 | 19.50 | 22.00 | 24.40 | 26.70 | 29.00 |
| 3 | Residual voltage at | | | | | | | | | | | | | | | |
| 3.1 | --Lightning impule 8/20 μ s | kV | 8.6 | 17.2 | 25.8 | 28.5 | 31.4 | 34.4 | 43.0 | 47.5 | 57.0 | 66.5 | 76.0 | 82.7 | 95.0 | 104.5 |
| 3.2 | --Steep current impulse 1/10 μ s | kV | 9.9 | 19.8 | 29.7 | 32.8 | 36.1 | 39.6 | 49.5 | 54.6 | 65.5 | 76.4 | 87.4 | 96.2 | 109.2 | 125.2 |
| 3.3 | --Switching impulse 30/60 μ s | kV | 7.3 | 14.6 | 21.9 | 24.2 | 26.7 | 29.2 | 36.5 | 40.3 | 48.4 | 56.5 | 64.6 | 71.1 | 80.7 | 88.8 |
| 4 | Long duration current impulse withstand | | | | | | | | | | | | | | | |
| 4.1 | --2ms rectangular current withstand | A | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 5 | Operating duty | | | | | | | | | | | | | | | |
| 5.1 | --4/10 μ s high current impulse withstand | kA | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 |
| 6 | Housing insulation withstand | | | | | | | | | | | | | | | |
| 6.1 | --Lightning impulse | kV | 40 | 60 | 65 | 75 | 85 | 95 | 105 | 120 | 125 | 135 | 155 | 170 | 185 | 190 |
| 6.2 | --Power frequency, (wet) | kV | 20 | 25 | 30 | 30 | 40 | 40 | 50 | 55 | 58 | 60 | 65 | 70 | 75 | 85 |
| 7 | Partial discharge | pC | < 10 | | | | | | | | | | | | | |
| 8 | Creepage distance | mm | 169 | 235 | 301 | 301 | 367 | 367 | 433 | 499 | 565 | 631 | 697 | 763 | 829 | 900 |
| 9 | Creepage distance/ rated voltage ratio | mm/kV | 56.0 | 39.0 | 33.4 | 30.1 | 33.3 | 30.5 | 28.8 | 27.7 | 26.9 | 26.3 | 25.8 | 25.4 | 25.1 | 25.0 |
| 10 | Mechanical section length( Drawing "H" ) | mm | 110 | 135 | 160 | 160 | 185 | 185 | 210 | 235 | 260 | 285 | 310 | 335 | 360 | 385 |
| 11 | Shed number | pcs | 2 | 3 | 4 | 4 | 5 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| 12 | Mechanical strength | | | | | | | | | | | | | | | |
| 12.1 | --Torsional | Nm | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 |
| 12.2 | --Cantilever | N | 147 | 147 | 147 | 147 | 147 | 147 | 147 | 147 | 147 | 147 | 147 | 147 | 147 | 147 |
| 13 | Package data | | | | | | | | | | | | | | | |
| 13.1 | --Net weight of each unit | Kg | 1.03 | 1.17 | 1.33 | 1.35 | 1.48 | 1.48 | 1.64 | 1.76 | 1.95 | 2.11 | 2.29 | 2.38 | 2.56 | 2.67 |
| 13.2 | --Dimensions (BPCS/CTN) | cm | 33x32x23 | 36x32x23 | 38x32x23 | 38x32x23 | 40x32x23 | 40x32x23 | 43x32x23 | 45x32x23 | 48x32x23 | 50x32x23 | 53x32x23 | 56x32x23 | 58x32x23 | 60x32x23 |
| 14 | Figure No. | | Fig. A1 | Fig. A2 | Fig. A3 | Fig. A3 | Fig. A4 | Fig. A4 | Fig. A5 | Fig. A6 | Fig. A7 | Fig. A8 | Fig. A9 | Fig. A10 | Fig. A11 | Fig. A12 |

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## OEM

- Metal-oxide surge arrester
- Fuse cutouts
- Composite insulator


Fig. A13


Fig. A14


Fig. A15


Fig. A16


Fig. 17


Fig. A18


Fig. A19

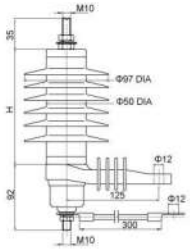

Fig. A20


Fig. A21


Fig. A22


Fig. A23


Fig. A24



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## SUPPLY

- Metal-oxide varistor
- Semi-manufactured goods
- Accessory

### Table 3— Main Technical Parameter of Polymer Housing Metal-oxide Surge Arrester

**(Nominal Discharge Current: 5kA, Design model: S1)**

| | Manufacturer | | Wenzhou Cantor H.V. Electric Manufacturing Co., LTD. | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Rated Voltage(U-r) | kV | 3 | 6 | 9 | 10 | 11 | 12 | 15 | 18 | 21 | 24 | 27 | 30 | 33 | 36 |
| | Nominal discharge current(In) | kA | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| 1 | Type | | YHSW-3 | YHSW-6 | YHSW-9 | YHSW-10 | YHSW-11 | YHSW-12 | YHSW-15 | YHSW-18 | YHSW-21 | YHSW-24 | YHSW-27 | YHSW-30 | YHSW-33 | YHSW-36 |
| 2 | Maximun continuous operating voltage(U-c) | kV | 2.55 | 5.10 | 7.65 | 8.40 | 9.35 | 10.20 | 12.70 | 15.30 | 17.00 | 19.50 | 22.00 | 24.40 | 26.70 | 29.00 |
| 3 | Residual voltage at | | | | | | | | | | | | | | | |
| 3.1 | --Lightning impule 8/20 μ s | kV | 8.4 | 16.8 | 25.2 | 27.9 | 30.7 | 33.6 | 42.0 | 46.5 | 55.8 | 65.1 | 74.4 | 83.7 | 93.0 | 102.0 |
| 3.2 | --Steep current impulse 1/10 μ s | kV | 9.6 | 19.2 | 28.8 | 32.0 | 35.3 | 38.8 | 48.0 | 53.5 | 64.1 | 74.8 | 85.5 | 96.2 | 106.9 | 117.6 |
| 3.3 | --Switching impulse 30/60 μ s | kV | 7.1 | 14.2 | 21.3 | 23.7 | 26.0 | 28.4 | 35.5 | 39.5 | 47.4 | 55.3 | 63.2 | 71.1 | 79.0 | 87.7 |
| 4 | Long duration current impulse withstand | | | | | | | | | | | | | | | |
| 4.1 | --2ms rectangular current withstand | A | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 |
| 5 | Operating duty | | | | | | | | | | | | | | | |
| 5.1 | --4/10 μ s high current impulse withstand | kA | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 |
| 6 | Housing insulation withstand | | | | | | | | | | | | | | | |
| 6.1 | --Lightning impulse | kV | 40 | 60 | 65 | 75 | 85 | 95 | 105 | 120 | 125 | 135 | 155 | 170 | 185 | 190 |
| 6.2 | --Power frequency, (wet) | kV | 20 | 25 | 30 | 30 | 40 | 40 | 50 | 55 | 58 | 60 | 65 | 70 | 75 | 85 |
| 7 | Partial discharge | pC | < 10 | | | | | | | | | | | | | |
| 8 | Creepage distance | mm | 140 | 205 | 270 | 270 | 335 | 335 | 400 | 465 | 530 | 600 | 675 | 750 | 855 | 920 |
| 9 | Creepage distance/ rated voltage ratio | mm/kV | 46.7 | 34.2 | 30.0 | 27.0 | 30.0 | 27.9 | 26.6 | 25.8 | 25.2 | 25.0 | 25.0 | 25.0 | 25.9 | 25.5 |
| 10 | Mechanical section length( Drawing "H" ) | mm | 85 | 110 | 135 | 135 | 160 | 160 | 185 | 210 | 235 | 260 | 285 | 310 | 360 | 385 |
| 11 | Shed number | pcs | 2 | 3 | 4 | 4 | 5 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 13 | 14 |
| 12 | Mechanical strength | | | | | | | | | | | | | | | |
| 12.1 | --Torsional | Nm | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 |
| 12.2 | --Cantilever | N | 147 | 147 | 147 | 147 | 147 | 147 | 147 | 147 | 147 | 147 | 147 | 147 | 147 | 147 |
| 13 | Package data | | | | | | | | | | | | | | | |
| 13.1 | --Net weight of each unit | Kg | 1.09 | 1.28 | 1.47 | 1.47 | 1.66 | 1.66 | 1.83 | 2.03 | 2.23 | 2.43 | 2.59 | 2.82 | 3.15 | 3.35 |
| 13.2 | --Dimensions (BPCS/CTN) | cm | 31x32x23 | 33x32x23 | 36x32x23 | 36x32x23 | 36x32x23 | 36x32x23 | 41x32x23 | 43x32x23 | 45x32x23 | 48x32x23 | 51x32x23 | 53x32x23 | 58x32x23 | 60x32x23 |
| 14 | Figure No. | | Fig. A13 | Fig. A14 | Fig. A15 | Fig. A15 | Fig. A16 | Fig. A16 | Fig. A17 | Fig. A18 | Fig. A19 | Fig. A20 | Fig. A21 | Fig. A22 | Fig. A23 | Fig. A24 |

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- Metal-oxide surge arrester
- Fuse cutouts
- Composite insulator


Fig. A25


Fig. A26


Fig. A27


Fig. A28


Fig. A29


Fig. A30


Fig. A31

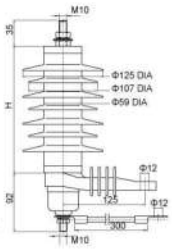

Fig. A32


Fig. A33


Fig. A34


Fig. A35


Fig. A36



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## SUPPLY

- Metal-oxide varistor
- Semi-manufactured goods
- Accessory

### Table 4— Main Technical Parameter of Polymer Housing Metal-oxide Surge Arrester

**Nominal Discharge Current: 5kA, Design model: T1**

| | Manufacturer | | Wenzhou Cantor H.V. Electric Manufacturing Co., LTD. | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Rated Voltage(Ur) | kV | 3 | 6 | 9 | 10 | 11 | 12 | 15 | 18 | 21 | 24 | 27 | 30 | 33 | 36 |
| | Nominal discharge current(In) | kA | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| 1 | Type | | YHSW-3 | YHSW-6 | YHSW-9 | YHSW-10 | YHSW-11 | YHSW-12 | YHSW-15 | YHSW-18 | YHSW-21 | YHSW-24 | YHSW-27 | YHSW-30 | YHSW-33 | YHSW-36 |
| 2 | Maximum continuous operating voltage(Uc) | kV | 2.55 | 5.10 | 7.65 | 8.40 | 9.35 | 10.20 | 12.70 | 15.30 | 17.00 | 19.50 | 22.00 | 24.40 | 26.70 | 29.00 |
| 3 | Residual voltage at: | | | | | | | | | | | | | | | |
| 3.1 | --Lightning impule 8/20 μ s | kV | 8.2 | 16.4 | 24.6 | 27.0 | 29.9 | 32.8 | 41.0 | 49.0 | 54.0 | 63.0 | 72.0 | 81.0 | 90.0 | 99.0 |
| 3.2 | --Steep current impulse 1/10 μ s | kV | 9.4 | 18.8 | 28.2 | 30.9 | 34.3 | 37.6 | 47.0 | 51.5 | 61.8 | 72.1 | 82.4 | 92.7 | 103.0 | 113.3 |
| 3.3 | --Switching impulse 30/60 μ s | kV | 7.0 | 14.0 | 21.0 | 22.8 | 25.4 | 28.0 | 35.0 | 38.0 | 45.6 | 53.2 | 60.8 | 68.4 | 76.0 | 83.6 |
| 4 | Long duration current impulse withstand | | | | | | | | | | | | | | | |
| 4.1 | --2ms rectangular current withstand | A | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 |
| 5 | Operating duty | | | | | | | | | | | | | | | |
| 5.1 | --4/10 μ s high current impulse withstand | kA | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 |
| 6 | Housing insulation withstand | | | | | | | | | | | | | | | |
| 6.1 | --Lightning impulse | kV | 40 | 60 | 65 | 75 | 85 | 95 | 105 | 120 | 125 | 135 | 155 | 170 | 185 | 190 |
| 6.2 | --Power frequency, (wet) | kV | 20 | 25 | 30 | 30 | 40 | 40 | 50 | 55 | 58 | 60 | 65 | 70 | 75 | 85 |
| 7 | Partial discharge | pC | < 10 | | | | | | | | | | | | | |
| 8 | Creepage distance | mm | 120 | 240 | 369 | 369 | 432 | 432 | 510 | 576 | 660 | 780 | 837 | 975 | 1122 | 1186 |
| 9 | Creepage distance/ rated voltage ratio | mm/kV | 40.0 | 40.0 | 41.0 | 36.9 | 39.3 | 36.0 | 34.0 | 32.0 | 33.0 | 32.5 | 31.0 | 32.5 | 34.0 | 33.0 |
| 10 | Mechanical section length( Drawing "H" ) | mm | 90 | 113 | 157 | 157 | 175 | 175 | 198 | 216 | 259 | 281 | 312 | 343 | 386 | 406 |
| 11 | Shed number | pcs | 1 | 3 | 5 | 5 | 6 | 6 | 7 | 8 | 10 | 11 | 12 | 14 | 16 | 17 |
| 12 | Mechanical strength | | | | | | | | | | | | | | | |
| 12.1 | --Torsional | Nm | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 |
| 12.2 | --Cantilever | N | 147 | 147 | 147 | 147 | 147 | 147 | 147 | 147 | 147 | 147 | 147 | 147 | 147 | 147 |
| 13 | Package data | | | | | | | | | | | | | | | |
| 13.1 | --Net weight of each unit | Kg | 1.31 | 1.83 | 2.09 | 2.09 | 2.33 | 2.33 | 2.64 | 2.90 | 3.34 | 3.73 | 3.90 | 4.34 | 4.78 | 5.01 |
| 13.2 | --Dimensions (BPCS/CTN) | cm | 31x41x29 | 33x41x29 | 37x41x29 | 37x41x29 | 39x41x29 | 39x41x29 | 41x41x29 | 43x41x29 | 46x41x29 | 50x41x29 | 53x41x29 | 56x41x29 | 60x41x29 | 62x41x29 |
| 14 | Figure No. | | Fig. A25 | Fig. A26 | Fig. A27 | Fig. A27 | Fig. A28 | Fig. A28 | Fig. A29 | Fig. A30 | Fig. A31 | Fig. A32 | Fig. A33 | Fig. A34 | Fig. A35 | Fig. A36 |

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## OEM

- Metal-oxide surge arrester
- Fuse cutouts
- Composite insulator


Fig. A37


Fig. A38


Fig. A39


Fig. A40


Fig. A41


Fig. A42


Fig. A43

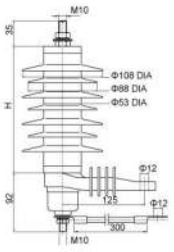

Fig. A44


Fig. A45


Fig. A46


Fig. A47


Fig. A48






## SUPPLY

- Metal-oxide varistor
- Semi-manufactured goods
- Accessory

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## Table 5— Main Technical Parameter of Polymer Housing Metal-oxide Surge Arrester

**Nominal Discharge Current: 10kA, Design model: E1**

| | Manufacturer | | Wenzhou Cantor H.V. Electric Manufacturing Co., LTD. | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Rated Voltage(Ur) | kV | 3 | 6 | 9 | 10 | 11 | 12 | 15 | 18 | 21 | 24 | 27 | 30 | 33 | 36 |
| | Nominal discharge current(In) | kA | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 1 | Type | | YH10W-3 | YH10W-6 | YH10W-9 | YH10W-10 | YH10W-11 | YH10W-12 | YH10W-15 | YH10W-18 | YH10W-21 | YH10W-24 | YH10W-27 | YH10W-30 | YH10W-33 | YH10W-36 |
| 2 | Maximun continuous operating voltage(Uc) | kV | 2.55 | 5.10 | 7.65 | 8.40 | 9.35 | 10.20 | 12.70 | 15.30 | 17.00 | 19.50 | 22.00 | 24.40 | 26.70 | 29.00 |
| 3 | Residual voltage at: | | | | | | | | | | | | | | | |
| 3.1 | –Lightning impule 8/20 μ s | kV | 9.0 | 18.0 | 27.0 | 30.0 | 33.0 | 36.0 | 45.0 | 54.0 | 60.0 | 70.0 | 80.0 | 90.0 | 99.0 | 108.0 |
| 3.2 | –Steep current impulse 1/10 μ s | kV | 10.3 | 20.6 | 30.9 | 34.5 | 37.8 | 41.2 | 51.5 | 57.5 | 69.0 | 80.5 | 92.0 | 103.5 | 113.8 | 124.2 |
| 3.3 | –Switching impulse 30/80 μ s | kV | 7.6 | 15.2 | 22.8 | 25.5 | 25.6 | 30.4 | 38.0 | 42.5 | 51.0 | 59.5 | 68.0 | 76.5 | 84.1 | 91.8 |
| 3.4 | –Switching surge (Peak current) | A | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 |
| 4 | Long duration current impulse withstand | | | | | | | | | | | | | | | |
| 4.1 | –2ms rectangular current withstand | A | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 |
| 4.2 | –Line discharge class (10kA & up) | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 5 | Operating duty | | | | | | | | | | | | | | | |
| 5.1 | –4/10 μ s high current impulse withstand | kA | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 6 | Housing insulation withstand | | | | | | | | | | | | | | | |
| 6.1 | –Lightning impulse | kV | 40 | 60 | 65 | 75 | 85 | 95 | 105 | 120 | 125 | 135 | 155 | 170 | 185 | 190 |
| 6.2 | –Power frequency, (wet) | kV | 20 | 25 | 30 | 30 | 40 | 40 | 50 | 55 | 58 | 60 | 65 | 70 | 75 | 85 |
| 7 | Partial discharge | pC | < 10 | | | | | | | | | | | | | |
| 8 | Creepage distance | mm | 154 | 273 | 380 | 380 | 448 | 448 | 567 | 686 | 737 | 856 | 975 | 1043 | 1094 | 1162 |
| 9 | Creepage distance/ rated voltage ratio | mm/kV | 51.0 | 45.0 | 42.0 | 38.0 | 40.7 | 37.7 | 37.8 | 38.0 | 35.0 | 35.8 | 36.0 | 34.7 | 33.1 | 32.3 |
| 10 | Mechanical section length( Drawing "H") | mm | 100 | 135 | 155 | 155 | 170 | 170 | 205 | 240 | 260 | 295 | 330 | 345 | 365 | 380 |
| 11 | Shed number | pcs | 3 | 5 | 6 | 6 | 7 | 7 | 9 | 11 | 12 | 14 | 16 | 17 | 18 | 19 |
| 12 | Mechanical strength | | | | | | | | | | | | | | | |
| 12.1 | –Torsional | Nm | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 |
| 12.2 | –Cantilever | N | 147 | 147 | 147 | 147 | 147 | 147 | 147 | 147 | 147 | 147 | 147 | 147 | 147 | 147 |
| 13 | Package data | | | | | | | | | | | | | | | |
| 13.1 | –Net weight of each unit | Kg | 1.19 | 1.52 | 1.69 | 1.69 | 1.86 | 1.86 | 2.19 | 2.45 | 2.59 | 2.92 | 3.23 | 3.40 | 3.57 | 3.79 |
| 13.2 | –Dimensions (6PCS/CTN) | cm | 32x32x23 | 35x32x23 | 37x32x23 | 37x32x23 | 39x32x23 | 39x32x23 | 42x32x23 | 46x32x23 | 48x32x23 | 51x32x23 | 55x32x23 | 56x32x23 | 58x32x23 | 60x32x23 |
| 14 | Figure No. | | Fig. A37 | Fig. A38 | Fig. A39 | Fig. A39 | Fig. A40 | Fig. A40 | Fig. A41 | Fig. A42 | Fig. A43 | Fig. A44 | Fig. A45 | Fig. A46 | Fig. A47 | Fig. A48 |

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## OEM

- Metal-oxide surge arrester
- Fuse cutouts
- Composite insulator


Fig. A49


Fig. A50


Fig. A51


Fig. A52


Fig. A53


Fig. A54


Fig.A55

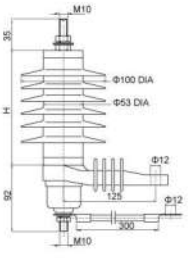

Fig. A56


Fig. A57


Fig. A58


Fig. A59


Fig. A60



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## SUPPLY

- Metal-oxide varistor
- Semi-manufactured goods
- Accessory

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## Table 6— Main Technical Parameter of Polymer Housing Metal-oxide Surge Arrester

**Nominal Discharge Current: 10kA, Design model: E2**

| | Manufacturer | | Wenzhou Cantor H.V. Electric Manufacturing Co., LTD. | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Rated Voltage(Ur) | kV | 3 | 6 | 9 | 10 | 11 | 12 | 15 | 18 | 21 | 24 | 27 | 30 | 33 | 36 |
| | Nominal discharge current(In) | kA | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 1 | Type | | YH10W-3 | YH10W-6 | YH10W-9 | YH10W-10 | YH10W-11 | YH10W-12 | YH10W-15 | YH10W-18 | YH10W-21 | YH10W-24 | YH10W-27 | YH10W-30 | YH10W-33 | YH10W-36 |
| 2 | Maximun continuous operating voltage(Uc) | kV | 2.55 | 5.10 | 7.65 | 8.40 | 9.35 | 10.20 | 12.70 | 15.30 | 17.00 | 19.50 | 22.00 | 24.40 | 26.70 | 29.00 |
| 3 | Residual voltage at | | | | | | | | | | | | | | | |
| 3.1 | –Lightning impule 8/20 μ s | kV | 9.0 | 18.0 | 27.0 | 30.0 | 33.0 | 36.0 | 45.0 | 50.0 | 60.0 | 70.0 | 80.0 | 90.0 | 99.0 | 108.0 |
| 3.2 | –Steep current impulse 1/10 μ s | kV | 10.3 | 20.6 | 30.9 | 34.5 | 37.8 | 41.2 | 51.5 | 57.5 | 69.0 | 80.5 | 92.0 | 103.5 | 113.8 | 124.2 |
| 3.3 | –Switching impulse 30/60 μ s | kV | 7.6 | 15.2 | 22.8 | 25.5 | 25.6 | 30.4 | 38.0 | 42.5 | 51.0 | 59.5 | 68.0 | 76.5 | 84.1 | 91.8 |
| 3.4 | –Switching surge (Peak current) | A | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 |
| 4 | Long duration current impulse withstand | | | | | | | | | | | | | | | |
| 4.1 | –2ms rectangular current withstand | A | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 |
| 4.2 | –Line discharge class (10kA & up) | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 5 | Operating duty | | | | | | | | | | | | | | | |
| 5.1 | –4/10 μ s high current impulse withstand | kA | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 6 | Housing insulation withstand | | | | | | | | | | | | | | | |
| 6.1 | –Lightning impulse | kV | 40 | 60 | 65 | 75 | 85 | 85 | 105 | 120 | 125 | 135 | 155 | 170 | 185 | 190 |
| 6.2 | –Power frequency, (wet) | kV | 20 | 25 | 30 | 30 | 40 | 40 | 50 | 55 | 58 | 60 | 65 | 70 | 75 | 85 |
| 7 | Partial discharge | pC | | | | | | | < 10 | | | | | | | |
| 8 | Creepage distance | mm | 164 | 230 | 295 | 296 | 362 | 362 | 428 | 494 | 560 | 626 | 692 | 758 | 825 | 900 |
| 9 | Creepage distance/ rated voltage ratio | mm/kV | 54.0 | 38.0 | 32.8 | 29.6 | 32.9 | 30.0 | 28.5 | 27.4 | 26.7 | 26.0 | 25.6 | 25.2 | 25.1 | 25.0 |
| 10 | Mechanical section length( Drawing "H" ) | mm | 110 | 135 | 160 | 160 | 185 | 185 | 210 | 235 | 260 | 285 | 310 | 335 | 360 | 385 |
| 11 | Shed number | pcs | 2 | 3 | 4 | 4 | 5 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| 12 | Mechanical strength | | | | | | | | | | | | | | | |
| 12.1 | –Torsional | Nm | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 |
| 12.2 | –Cantilever | N | 147 | 147 | 147 | 147 | 147 | 147 | 147 | 147 | 147 | 147 | 147 | 147 | 147 | 147 |
| 13 | Package data | | | | | | | | | | | | | | | |
| 13.1 | –Net weight of each unit | Kg | 1.13 | 1.32 | 1.51 | 1.51 | 1.75 | 1.75 | 2.01 | 2.24 | 2.51 | 2.69 | 2.95 | 3.17 | 3.38 | 3.56 |
| 13.2 | –Dimensions (6PCS/CTN) | cm | 33x32x23 | 35x32x23 | 38x32x23 | 38x32x23 | 40x32x23 | 40x32x23 | 43x32x23 | 45x32x23 | 48x32x23 | 50x32x23 | 53x32x23 | 55x32x23 | 58x32x23 | 60x32x23 |
| 14 | Figure No. | | Fig. A37 | Fig. A38 | Fig. A39 | Fig. A39 | Fig. A40 | Fig. A40 | Fig. A41 | Fig. A42 | Fig. A43 | Fig. A44 | Fig. A45 | Fig. A46 | Fig. A47 | Fig. A48 |

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## OEM

- Metal-oxide surge arrester
- Fuse cutouts
- Composite insulator

Fig. A61 Fig. A62 Fig. A63 Fig. A64 Fig. A65

Fig. A66 Fig. A67 Fig. A68 Fig. A69

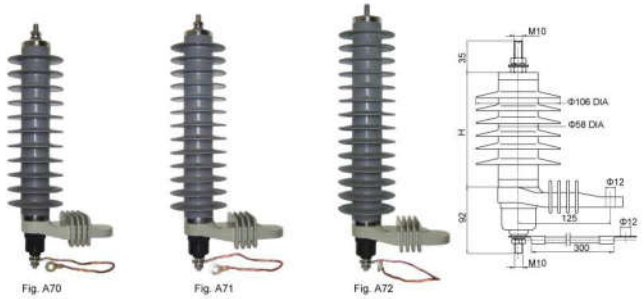


Fig. A70 Fig. A71 Fig. A72



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## SUPPLY

- Metal-oxide varistor
- Semi-manufactured goods
- Accessory

## Table 7— Main Technical Parameter of Polymer Housing Metal-Oxide Surge Arrester

**Nominal Discharge Current: 10kA, Design model: S1**

| | Manufacturer | | Wenzhou Cantor H.V. Electric Manufacturing Co., LTD. | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Rated Voltage(Ur) | kV | 3 | 6 | 9 | 10 | 11 | 12 | 15 | 18 | 21 | 24 | 27 | 30 | 33 | 36 |
| | Nominal discharge current(In) | kA | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 1 | Type | | YH10W-3 | YH10W-6 | YH10W-9 | YH10W-10 | YH10W-11 | YH10W-12 | YH10W-15 | YH10W-18 | YH10W-21 | YH10W-24 | YH10W-27 | YH10W-30 | YH10W-33 | YH10W-36 |
| 2 | Maxmun continuous operating voltage(Uc) | kV | 2.55 | 5.10 | 7.65 | 8.40 | 9.35 | 10.20 | 12.70 | 15.30 | 17.00 | 19.50 | 22.00 | 24.40 | 26.70 | 29.00 |
| 3 | Residual voltage at | | | | | | | | | | | | | | | |
| 3.1 | --Lightning impule 8/20 μ s | kV | 8.8 | 17.6 | 26.4 | 29.4 | 32.3 | 35.2 | 44.0 | 49.0 | 58.8 | 68.6 | 78.4 | 88.2 | 98.0 | 107.8 |
| 3.2 | --Steep current impulse 1/10 μ s | kV | 10.1 | 20.2 | 30.3 | 33.6 | 37.0 | 40.4 | 50.5 | 56.0 | 67.2 | 78.4 | 89.6 | 100.8 | 112.0 | 123.2 |
| 3.3 | --Switching impulse 30/60 μ s | kV | 7.4 | 14.8 | 22.2 | 24.9 | 25.6 | 29.6 | 37.0 | 41.5 | 49.8 | 58.1 | 66.4 | 74.7 | 83.0 | 91.3 |
| 3.4 | --Switching surge (Peak current) | A | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 |
| 4 | Long duration current impulse withstand | | | | | | | | | | | | | | | |
| 4.1 | --2ms rectangular current withstand | A | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 | 250 |
| 4.2 | --Line discharge class (10kA & up) | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 5 | Operating duty | | | | | | | | | | | | | | | |
| 5.1 | --4/10 μ s high current impulse withstand | kA | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 6 | Housing insulation withstand | | | | | | | | | | | | | | | |
| 6.1 | --Lightning impulse | kV | 40 | 60 | 65 | 75 | 85 | 95 | 105 | 120 | 125 | 135 | 155 | 170 | 185 | 190 |
| 6.2 | --Power frequency-(wet) | kV | 20 | 25 | 30 | 30 | 40 | 40 | 50 | 55 | 58 | 60 | 65 | 70 | 75 | 85 |
| 7 | Partial discharge | pC | < 10 | | | | | | | | | | | | | |
| 8 | Creepage distance | mm | 146 | 211 | 276 | 276 | 341 | 341 | 406 | 471 | 536 | 601 | 675 | 750 | 861 | 926 |
| 9 | Creepage distance/ rated voltage ratio | mm/kV | 48.0 | 35.0 | 30.0 | 27.6 | 31.0 | 28.4 | 27.0 | 26.0 | 25.5 | 25.0 | 25.0 | 25.0 | 26.0 | 25.7 |
| 10 | Mechanical section length( Drawing "H") | mm | 85 | 110 | 135 | 135 | 160 | 160 | 185 | 210 | 235 | 260 | 285 | 310 | 360 | 385 |
| 11 | Shed number | pcs | 2 | 3 | 4 | 4 | 5 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| 12 | Mechanical strength | | | | | | | | | | | | | | | |
| 12.1 | --Torsional | Nm | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 |
| 12.2 | --Cantilever | N | 147 | 147 | 147 | 147 | 147 | 147 | 147 | 147 | 147 | 147 | 147 | 147 | 147 | 147 |
| 13 | Package data | | | | | | | | | | | | | | | |
| 13.1 | --Net weight of each unit | Kg | 1.19 | 1.52 | 1.69 | 1.69 | 1.99 | 1.99 | 2.32 | 2.63 | 2.93 | 3.18 | 3.33 | 3.68 | 4.00 | 4.27 |
| 13.2 | --Dimensions (6PCS/CTN) | cm | 31x32x23 | 33x32x23 | 36x32x23 | 36x32x23 | 36x32x23 | 36x32x23 | 41x32x23 | 43x32x23 | 45x32x23 | 48x32x23 | 51x32x23 | 53x32x23 | 56x32x23 | 60x32x23 |
| 14 | Figure No. | | Fig. A61 | Fig. A62 | Fig. A63 | Fig. A63 | Fig. A64 | Fig. A64 | Fig. A65 | Fig. A66 | Fig. A67 | Fig. A68 | Fig. A69 | Fig. A70 | Fig. A71 | Fig. A72 |

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## OEM

- Metal-oxide surge arrester
- Fuse cutouts
- Composite insulator


Fig. A73


Fig. A74


Fig. A75


Fig. A76


Fig. A77


Fig. A78


Fig. A79

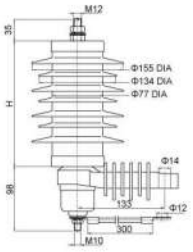

Fig. A80


Fig. A81


Fig. A82


Fig. A83


Fig. A84



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## SUPPLY

- Metal-oxide varistor
- Semi-manufactured goods
- Accessory

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## Table 8— Main Technical Parameter of Polymer Housing Metal-oxide Surge Arrester

**Nominal Discharge Current: 10kA, Design model: T1**

| | Manufacturer | | Wenzhou Cantor H.V. Electric Manufacturing Co., LTD. | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Rated Voltage(Ur) | kV | 3 | 6 | 9 | 10 | 11 | 12 | 15 | 18 | 21 | 24 | 27 | 30 | 33 | 36 |
| | Nominal discharge current(In) | kA | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 1 | Type | | YH1DW-3 | YH1DW-6 | YH1DW-9 | YH1DW-10 | YH1DW-11 | YH1DW-12 | YH1DW-15 | YH1DW-18 | YH1DW-21 | YH1DW-24 | YH1DW-27 | YH1DW-30 | YH1DW-33 | YH1DW-36 |
| 2 | Maximun continuous operating voltage(Uc) | kV | 2.55 | 5.10 | 7.65 | 8.40 | 9.35 | 10.20 | 12.70 | 15.30 | 17.00 | 19.50 | 22.00 | 24.40 | 26.70 | 29.00 |
| 3 | Residual voltage at | | | | | | | | | | | | | | | |
| 3.1 | --Lightning impule 8/20 μ s | kV | 8.6 | 17.2 | 25.8 | 28.5 | 31.4 | 34.4 | 43.0 | 47.5 | 57.0 | 66.5 | 76.0 | 85.5 | 95.0 | 104.5 |
| 3.2 | --Steep current impulse 1/10 μ s | kV | 9.8 | 19.6 | 29.4 | 32.7 | 35.9 | 39.2 | 49.0 | 54.5 | 65.4 | 76.3 | 87.2 | 98.1 | 109.0 | 120.0 |
| 3.3 | --Switching impulse 30/60 μ s | kV | 7.3 | 14.6 | 21.9 | 24.0 | 26.6 | 29.2 | 36.5 | 40.0 | 48.0 | 56.0 | 64.0 | 72.0 | 80.0 | 88.0 |
| 3.4 | --Switching surge (Peak current) | A | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 |
| 4 | Long duration current impulse withstand | | | | | | | | | | | | | | | |
| 4.1 | --2ms rectangular current withstand | A | 450 | 450 | 450 | 450 | 450 | 450 | 450 | 450 | 450 | 450 | 450 | 450 | 450 | 450 |
| 4.2 | --Line discharge class (10kA & up) | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 5 | Operating duty | | | | | | | | | | | | | | | |
| 5.1 | --4/10 μ s high current impulse withstand | kA | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 6 | Housing insulation withstand | | | | | | | | | | | | | | | |
| 6.1 | --Lightning impulse | kV | 40 | 60 | 65 | 75 | 85 | 95 | 105 | 120 | 125 | 135 | 155 | 170 | 185 | 190 |
| 6.2 | --Power frequency, (wet) | kV | 20 | 25 | 30 | 30 | 40 | 40 | 50 | 55 | 58 | 60 | 65 | 70 | 75 | 85 |
| 7 | Partial discharge | pC | | | | | | | < 10 | | | | | | | |
| 8 | Creepage distance | mm | 120 | 261 | 414 | 414 | 480 | 480 | 570 | 630 | 798 | 888 | 945 | 1095 | 1254 | 1350 |
| 9 | Creepage distance/ rated voltage ratio | mm/kV | 40.0 | 43.5 | 46.0 | 41.4 | 43.6 | 40.0 | 38.0 | 35.0 | 37.5 | 37.0 | 35.0 | 36.5 | 38.0 | 37.5 |
| 10 | Mechanical section length( Drawing "H" ) | mm | 93 | 113 | 155 | 155 | 174 | 174 | 198 | 217 | 298 | 281 | 304 | 343 | 384 | 408 |
| 11 | Shed number | pcs | 1 | 3 | 5 | 5 | 6 | 6 | 7 | 8 | 10 | 11 | 12 | 14 | 16 | 17 |
| 12 | Mechanical strength | | | | | | | | | | | | | | | |
| 12.1 | --Torsional | Nm | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 | 70 |
| 12.2 | --Cantilever | N | 294 | 294 | 294 | 294 | 294 | 294 | 294 | 294 | 294 | 294 | 294 | 294 | 294 | 294 |
| 13 | Package data | | | | | | | | | | | | | | | |
| 13.1 | --Net weight of each unit | Kg | 2.05 | 2.26 | 3.34 | 3.34 | 3.68 | 3.68 | 4.27 | 4.57 | 5.33 | 5.86 | 6.27 | 7.04 | 7.72 | 8.35 |
| 13.2 | --Dimensions (6PCS/CTN) | cm | 31x48x34 | 33x48x34 | 37x48x34 | 37x48x34 | 39x48x34 | 39x48x34 | 41x48x34 | 43x48x34 | 48x48x34 | 50x48x34 | 53x48x34 | 55x48x34 | 60x48x34 | 62x48x34 |
| 14 | Figure No. | | Fig. A73 | Fig. A74 | Fig. A75 | Fig. A75 | Fig. A76 | Fig. 7A6 | Fig. 77 | Fig. A78 | Fig. A79 | Fig. A80 | Fig. A81 | Fig. A82 | Fig. A83 | Fig. A84 |

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## OEM

- Metal-oxide surge arrester
- Fuse cutouts
- Composite insulator

### Y5W, Y5C, Y10W, Y10C Series Porcelain Housing Metal-oxide Surge Arrester

Fig. A85 Ur: 3~6kV
Creepage distance:280mm

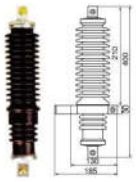

Fig. A86 Ur: 9~12kV
Creepage distance:460mm

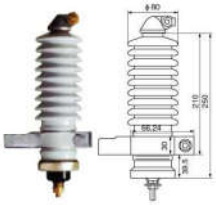

Fig. A87 Ur: 9~12kV
Creepage distance:350mm

Fig. A88 Ur: 9~12kV
Creepage distance:340mm

Fig. A89 Ur: 12~15kV
Creepage distance:490mm

Fig. A90 Ur: 15~21kV
Creepage distance:655mm

Fig. A91 Ur: 18~24kV
Creepage distance:570mm

Fig. A92 Ur: 24~27kV
Creepage distance:675mm

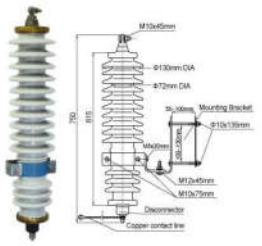

Fig. A93 Ur: 27~36kV
Creepage distance:900mm



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## SUPPLY

- Metal-oxide varistor
- Semi-manufactured goods
- Accessory

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### Table 9— Main Technical Parameter of Porcelain Housing Metal-oxide Surge Arrester with Series Gaps

**Nominal Discharge Current: 5 kA**

| | Manufacturer | | Wenzhou Cantor H.V. Electric Manufacturing Co., LTD. | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Rated Voltage | kV | 3 | 6 | 9 | 10 | 12 | 15 | 18 | 21 | 24 | 27 | 30 | 33 | 36 |
| | Nominal discharge current | kA | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| 1 | Type | | Y5C-3 | Y5C-6 | Y5C-9 | Y5C-10 | Y5C-12 | Y5C-15 | Y5C-18 | Y5C-21 | Y5C-24 | Y5C-27 | Y5C-30 | Y5C-33 | Y5C-36 |
| 2 | Continuous operating voltage | kV | 2.55 | 5.10 | 7.65 | 8.40 | 10.20 | 12.70 | 15.30 | 17.00 | 19.50 | 22.00 | 24.40 | 26.70 | 29.00 |
| 3 | Residual voltage at Lightning impulse8/20 μ s | kV | 9 | 18 | 27 | 30 | 36 | 45 | 54 | 63 | 72 | 81 | 90 | 99 | 108 |
| 4 | Power frequency discharge voltage ≥ | kV | 5.5 | 11 | 16 | 18 | 22 | 26 | 33 | 36 | 40 | 45 | 50 | 56 | 61 |
| 5 | 1.2/50 μ s Impulse discherge voltage< | kV | 9 | 18 | 27 | 30 | 36 | 45 | 54 | 63 | 72 | 81 | 90 | 99 | 108 |
| 6 | 2ms rectangular current withstand | A | 100/150 | 100/150 | 100/150 | 100/150 | 100/150 | 100/150 | 100/150 | 100/150 | 100/150 | 100/150 | 100/150 | 100/150 | 100/150 |
| 7 | 4/10 μ s high current impulse withstand | kA | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 |
| 8 | Housing insulation level | | | | | | | | | | | | | | |
| 8.1 | ~Power frequency,wet | kV | 40 | 60 | 65 | 75 | 95 | 105 | 120 | 125 | 135 | 155 | 170 | 185 | 190 |
| 8.2 | ~Lightning impulse | kV | 100 | 110 | 110 | 140 | 140 | 140 | 160 | 170 | 180 | 190 | 200 | 220 | 240 |
| 9 | Creepage distance/ rated voltage ratio | mm/kV | ≥25 | ≥25 | ≥25 | ≥25 | ≥25 | ≥25 | ≥25 | ≥25 | ≥25 | ≥25 | ≥25 | ≥25 | ≥25 |

### Table 10— Main Technical Parameter of Porcelain Housing Metal-oxide Surge Arrester with Series Gaps

**Nominal Discharge Current: 10 kA**

| | Manufacturer | | Wenzhou Cantor H.V. Electric Manufacturing Co., LTD. | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Rated Voltage | kV | 3 | 6 | 9 | 10 | 12 | 15 | 18 | 21 | 24 | 27 | 30 | 33 | 36 |
| | Nominal discharge current | kA | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 1 | Type | | Y10C-3 | Y10C-6 | Y10C-9 | Y10C-10 | Y10C-12 | Y10C-15 | Y10C-18 | Y10C-21 | Y10C-24 | Y10C-27 | Y10C-30 | Y10C-33 | Y10C-36 |
| 2 | Continuous operating voltage | kV | 2.55 | 5.10 | 7.65 | 8.40 | 10.20 | 12.70 | 15.30 | 17.00 | 19.50 | 22.00 | 24.40 | 26.70 | 29.00 |
| 3 | Residual voltage at Lightning impulse8/20 μ s | kV | 9 | 18 | 27 | 30 | 36 | 45 | 54 | 63 | 72 | 81 | 90 | 99 | 108 |
| 4 | Power frequency discharge voltage ≥ | kV | 5.5 | 11 | 16 | 18 | 22 | 26 | 33 | 36 | 40 | 45 | 50 | 56 | 61 |
| 5 | 1.2/50 μ s Impulse discherge voltage< | kV | 9 | 18 | 27 | 30 | 36 | 45 | 54 | 63 | 72 | 81 | 90 | 99 | 108 |
| 6 | 2ms rectangular current withstand | A | 200/250 | 200/250 | 200/250 | 200/250 | 200/250 | 200/250 | 200/250 | 200/250 | 200/250 | 200/250 | 200/250 | 200/250 | 200/250 |
| 7 | 4/10 μ s high current impulse withstand | kA | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 8 | Housing insulation level | | | | | | | | | | | | | | |
| 8.1 | ~Power frequency,wet | kV | 40 | 60 | 65 | 75 | 95 | 105 | 120 | 125 | 135 | 155 | 170 | 185 | 190 |
| 8.2 | ~Lightning impulse | kV | 100 | 110 | 110 | 140 | 140 | 140 | 160 | 170 | 180 | 190 | 200 | 220 | 240 |
| 9 | Creepage distance/ rated voltage ratio | mm/kV | ≥25 | ≥25 | ≥25 | ≥25 | ≥25 | ≥25 | ≥25 | ≥25 | ≥25 | ≥25 | ≥25 | ≥25 | ≥25 |

**Notes:**
Porcelain housing metal-oxide surge arrester without gaps techincal performance see about ( "Table2" or "Table3" of Nominal Discharge current 5kA, "Table5" or "Table7" of Niminal Discharge current 10kA), Without "H" .

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## OEM

- Metal-oxide surge arrester
- Fuse cutouts
- Composite insulator

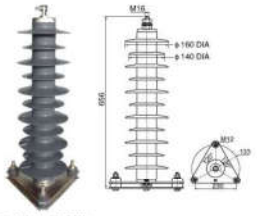


Fig. A94 Ur: 39~54kV

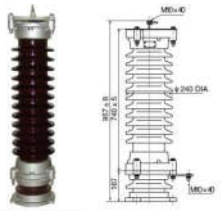


Fig. A95 Ur: 39~54kV

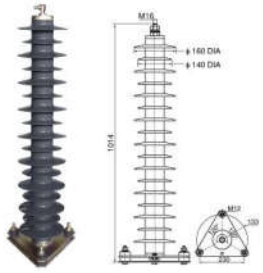


Fig. A96 Ur: 60~84kV


Fig. A97 Ur: 60~84kV


Fig. A98 Ur: 90~120kV

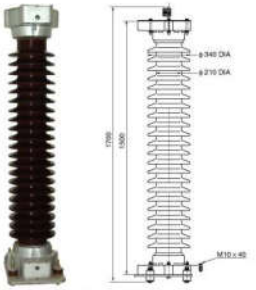


Fig. A99 Ur: 90~120kV



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## SUPPLY

- Metal-oxide varistor
- Semi-manufactured goods
- Accessory

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## Table 1 — Main Technical Parameter of Metal-oxide Surge Arrester

**Nominal Discharge Curent:10kA**

| | Manufacturer | | Wenzhou Cantor H.V. Electric Manufacturing Co., LTD. | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Rated Voltage | kV | 39 | 42 | 45 | 48 | 51 | 54 | 60 | 66 | 69 | 72 | 75 | 84 | 90 | 96 | 108 | 120 |
| | Nominal discharge current | kA | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 1 | Type | | YH10W-39 | YH10W-42 | YH10W-45 | YH10W-48 | YH10W-51 | YH10W-54 | YH10W-60 | YH10W-66 | YH10W-69 | YH10W-72 | YH10W-75 | YH10W-84 | YH10W-90 | YH10W-96 | YH10W-108 | YH10W-120 |
| 2 | Continuous operating voltage | kV | 31.5 | 33.6 | 36.5 | 39.0 | 40.8 | 42.0 | 48.0 | 52.8 | 55.2 | 57.0 | 60.0 | 67.2 | 70.0 | 76.0 | 84.0 | 98.0 |
| 3 | Residual voltage at | | | | | | | | | | | | | | | | | |
| 3.1 | –Lightning impule 8/20 μ s | kV | 103 | 111 | 119 | 127 | 135 | 143 | 159 | 175 | 183 | 191 | 199 | 218 | 222 | 237 | 266 | 295 |
| 3.2 | –Steep current impulse 1/10 μ s | kV | 117 | 126 | 128 | 139 | 151 | 160 | 178 | 196 | 205 | 214 | 223 | 244 | 249 | 265 | 298 | 330 |
| 3.3 | –Switching impulse 30/60 μ s(10kA A up) | kV | 94 | 101 | 102 | 110 | 115 | 119 | 132 | 145 | 152 | 158 | 165 | 181 | 184 | 197 | 221 | 245 |
| 3.4 | –Switching surge(class 1) | kA | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| 4 | Long duration current impulse withstand | | | | | | | | | | | | | | | | | |
| 4.1 | –Line discharge class(10kA A up) | | 1 / 2 / 3 | | | | | | | | | | | | | | | |
| 4.2 | –2ms rectangular current withstand | A | 400 / 600/ 1000 | | | | | | | | | | | | | | | |
| 5 | Operating duty | | | | | | | | | | | | | | | | | |
| 5.1 | –4/10 μ s high current impulse withstand | kA | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 6 | –Housing insulation level | | | | | | | | | | | | | | | | | |
| 6.1 | –Lightning impulse | kV | 200 | 210 | 210 | 240 | 240 | 240 | 250 | 280 | 290 | 300 | 315 | 350 | 380 | 400 | 450 | 500 |
| 6.2 | –Power frequency, wet 1 min | kV | 100 | 110 | 110 | 140 | 140 | 140 | 160 | 170 | 180 | 190 | 200 | 220 | 240 | 250 | 280 | 320 |
| 7 | Partial discharge | pC | < 10 | | | | | | | | | | | | | | | |
| 8 | Creepage distance/ rated voltage ratio | mm/kV | ≥31 | ≥31 | ≥31 | ≥31 | ≥31 | ≥31 | ≥31 | ≥31 | ≥31 | ≥31 | ≥31 | ≥31 | ≥31 | ≥31 | ≥31 | ≥31 |

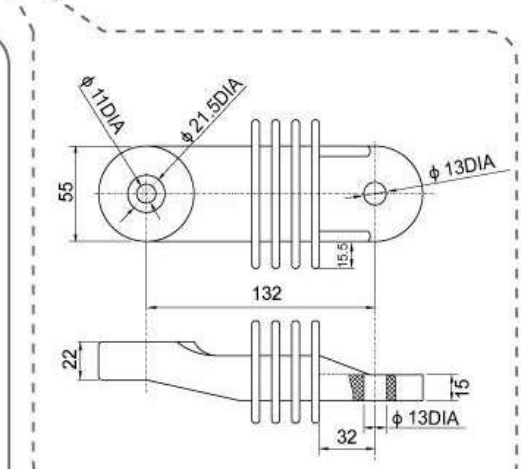
**OEM**

- Metal-oxide surge arrester
- Fuse cutouts
- Composite insulator



## Main Accessory

**Insulating Bracket**




**Disconnector**

JS-8 Counter

JCQ Monitor

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**OEM**
- Metal-oxide surge arrester
- Fuse cutouts
- Composite insulator

# Fuse Cutouts

## Application

The primary purpose of any Fuse cutouts is to provide protection to the lines of your system and the various apparatus on those lines such as transformers and capacitor banks. Fuse cutouts provide reliable protection from low-level overloads that just melt the fuse link, intermediate faults, and very high faults, through maximum interrupting capacity.

## Quality Construction

### Top Contact

The top contact is attached to the galvanized-steel hood by a stainless rivet to provide a smooth self-aligning action during closing even in severely corrosive environments. The top contact provides a socket-type cavity for latching the fuse holder and prevents any possible "over-travel. of the fuse holder. The top contact is made of a highly conductive copper strip with silver-plated embossments to resist corrosion. The contacts are held under constant pressure designed to maintain firm contact with the fuse holder contact surface until fault interruption is accomplished.

### Hinge

The hinge on the Fuse cutout employs large pivot areas for the fuse holder' s trunnion and is cast of a copper alloy chosen for its strength and corrosion resistance. The hinge contacts are highly conductive copper alloy stampings and are plated to assure low resistance current transfer from the trunnion casting. The parallel current paths are backed up by high strength cantilever springs and are riveted to the hinge castings. Fuse holder can be dropped into place and easily lifted up and out. No tricky maneuvering.

### Fuse holder

The solid cap on the single vent fuse holder is a copper alloy, silver-plated to provide efficient current transfer. An integral ring is provided in the top tube casting for opening and closing the fuse holder with conventional disconnect tools from the ground, from a bucket truck or from the pole.
The toggle type trunnion casting is a selective silver-plated bronze for efficient current transfer to the lower hinge contacts. A cam shaped projection on each side of the trunnion casting provides high pressure parallel current paths to the lower contacts. These projections, or pivot pins, are cast full round for smooth rotational operation in the hinge. The link ejector assists in arc interruption during low fault current or excessive overload conditions. A groove in the center of the link ejector allows the fuse link' s pigtail to go directly from the fuse tube to the attachment nut. A curved ejector minimizes bending stresses in the pigtail to prevent broken strands. A stainless steel torsion spring on the link ejector helps to rapidly eject the link from the bore of the fuse holder during interruption. The 200 ampere link ejector has a wider groove area and increased spring force to accommodate the larger links.

### Fuse tube

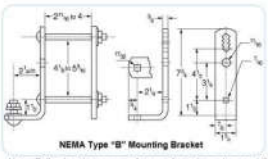
The 1⁄2-inch inside diameter of the Fuse cutouts 100ampere fuse tube increases internal pressure giving superior and reliable expulsion action. During frequently encountered intermediate fault ranges this diameter also permits higher TRV (transient recovery voltage) values to be tolerated. This small bore design eliminates any concern related to high impedance phase-to-phase faults on ungrounded wye and delta systems.
The inside liner is constructed of a synthetic arc-quenching material. The tube is made of fiberglass which permits the smaller bore and provides a higher burst strength. It is protected from the weather and environment by a special ultra-violet resistant coating.
Also, the Cantor fuse tube operates with fuse links from all major suppliers.

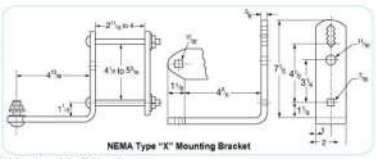
### Mounting Bracket

Fuse cutouts come packed one per carton including a NEMA Heavy Duty "B" bracket with captive 11⁄2" bolt for cross arm mounting.
Type "X" bracket, also for cross arm mounting, provides 25⁄8" additional clearance between the cross arm and the cutout.

### Higher Interrupting Capacities

By using a copper arc shortening rod inside the top of the fuse tube, higher interrupt ratings are obtainable. An arc shortening rod is attached to the cap of some fuse tube and lowers the fuse link within the fuse tube. This permit a much shorter arc, resulting in less arc energy, and higher interrupting capacities.
For 200 A tubes, it allows for full voltage rating. It is necessary to use fuse links with removable button heads when arc shortening rods are employed.


NEMA Type "B" Mounting Bracket


NEMA Type "X" Mounting Bracket

Note: Following the cross-reference of metric system and British system (1in=25.4mm)



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**SUPPLY**
- Metal parts
- Semi-manufactured goods
- Fuse link

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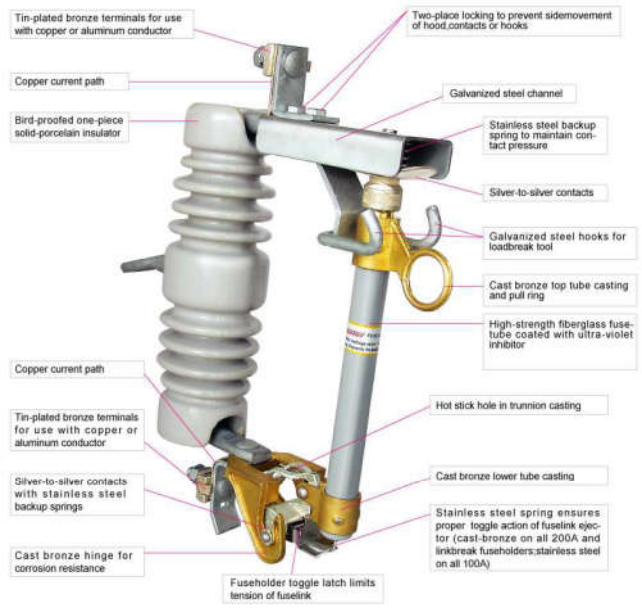
# Parts Designation of Fuse Cutouts for Type CTF-A




**Mechanical assist:**

Fuseholder is available with a torsional spring on trunnion to aid drop out operation in corrosive environments.

Large nut to fasten fuselink without breaking strands

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## OEM

- Metal-oxide surge arrester
- Fuse cutouts
- Composite insulator


Fig.C1


Fig.C2


Fig.C3


Fig.C4


Fig.C5


Fig.C6


Fig.C7



KEMA IQNet CQC CE FSK SIRIM UL IMA

## SUPPLY

- Metal parts
- Semi-manufactured goods
- Fuse link

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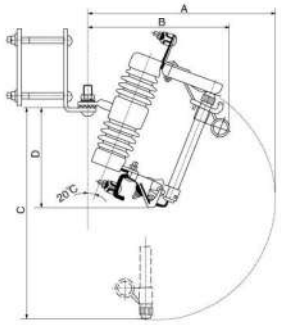
### Table C1—Main Technical Parameter of Fuse Cutouts Type CTF-A

| | Manufacturer | | Wenzhou Cantor H.V. Electric Manufacturing Co., LTD. | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Type designation | | CTF-A | | | | | | | | | | | |
| | Rated voltage (*Ur*) | kV | 10-15 | | 15-27 | | 24-27 | | 27-33 | | 33-36 | | 36-38 | |
| | Rated current (*Ir*) | kA | 100 | 200 | 100 | 200 | 100 | 200 | 100 | 200 | 100 | 200 | 100 | 200 |
| 1 | Generalfeature | Unit | | | | | | | | | | | | |
| 1.1 | -Housing material | | Porcelain | | Porcelain | | Porcelain | | Porcelain | | Porcelain | | Porcelain | |
| 2 | Ratings & characteristics | | | | | | | | | | | | | |
| 2.1 | -Rated frequency | Hz | 50/60 | | 50/60 | | 50/60 | | 50/60 | | 50/60 | | 50/60 | |
| 2.2 | -Interrupting capacity | kA | 10.0 | 12.0 | 10.0 | 12.0 | 8.0 | 10.0 | 6.3 | 8.0 | 6.3 | 8.0 | 6.3 | 8.0 |
| 3 | Housing insulation level | | | | | | | | | | | | | |
| 3.1 | -Power frequency withstand voltage (Dry) | kV | 40 | 40 | 45 | 45 | 65 | 65 | 70 | 70 | 72 | 72 | 75 | 75 |
| 3.2 | -Power frequency withstand voltage (Wet) | kV | 30 | 30 | 35 | 35 | 50 | 50 | 55 | 55 | 56 | 56 | 60 | 60 |
| 3.3 | -Lightning impulse withstand voltage ( BIL) | kV | 110 | 110 | 125 | 125 | 150 | 150 | 170 | 170 | 170 | 170 | 180 | 180 |
| 4 | Creepage distance | mm | 250 | 250 | 350 | 350 | 530 | 530 | 700 | 700 | 720 | 720 | 850 | 850 |
| 5 | Package data | | | | | | | | | | | | | |
| 5.1 | -Net weight of each unit | Kg | 7.0 | 7.1 | 8.3 | 8.4 | 10.0 | 10.1 | 15.0 | 15.1 | 15.5 | 15.6 | 17.0 | 17.1 |
| 5.2 | -Dimensions (1PC/CTN) | cm | 41×31×11 | | 49×35×12.5 | | 49×35×14 | | 56×38×14.5 | | 57×38×14.5 | | 61×38×14.5 | |
| 6 | Figure No. | | Fig.C1 | | Fig.C2 | | Fig.C3/Fig.C4 | | Fig.C5 | | Fig.C6 | | Fig.C7 | |




**CTF-A Fuse Cutouts with NEMA Type B Mounting Bracket Dimensions**

| Dimensions (mm) / Voltage(kV) | A | B | C | D |
|---|---|---|---|---|
| 10-15 | 455 | 340 | 515 | 240 |
| 15-27 | 515 | 355 | 650 | 295 |
| 24-27 | 515 | 355 | 650 | 295 |
| 27-33 | 600 | 375 | 780 | 330 |
| 33-36 | 640 | 395 | 890 | 370 |
| 36-38 | 660 | 420 | 915 | 395 |

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## OEM

- Metal-oxide surge arrester
- Fuse cutouts
- Composite insulator


Fig.C8


Fig.C9


Fig.C10


Fig.C11


Fig.C12


Fig.C13


Fig.C14



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## SUPPLY

- Metal parts
- Semi-manufactured goods
- Fuse link

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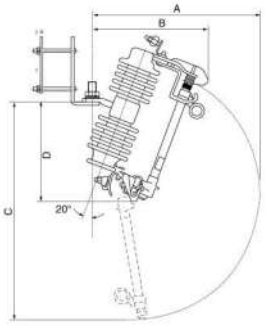
## Table C2—Main Technical Parameter of Fuse Cutouts Type CTF-B

| | Manufacturer | | Wenzhou Cantor H.V. Electric Manufacturing Co., LTD. | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Type designation | | CTF-A | | | | | | | | | | | |
| | Rated voltage (*U*) | kV | 10-15 | | 15-27 | | 24-27 | | 27-33 | | 33-36 | | 36-38 | |
| | Rated current (*I*) | kA | 100 | 200 | 100 | 200 | 100 | 200 | 100 | 200 | 100 | 200 | 100 | 200 |
| 1 | Generalfeature | Unit | | | | | | | | | | | | |
| 1.1 | -Housing material | | Porcelain | | Porcelain | | Porcelain | | Porcelain | | Porcelain | | Porcelain | |
| 2 | Ratings & characteristics | | | | | | | | | | | | | |
| 2.1 | -Rated frequency | Hz | 50/60 | | 50/60 | | 50/60 | | 50/60 | | 50/60 | | 50/60 | |
| 2.2 | -Interrupting capacity | kA | 10.0 | 12.0 | 10.0 | 12.0 | 8.0 | 10.0 | 6.3 | 8.0 | 6.3 | 8.0 | 6.3 | 8.0 |
| 3 | Housing insulation level | | | | | | | | | | | | | |
| 3.1 | -Power frequency withstand voltage (Dry) | kV | 40 | 40 | 45 | 45 | 65 | 65 | 70 | 70 | 72 | 72 | 75 | 75 |
| 3.2 | -Power frequency withstand voltage (Wet) | kV | 30 | 30 | 35 | 35 | 50 | 50 | 55 | 55 | 56 | 56 | 60 | 60 |
| 3.3 | -Lightning impulse withstand voltage ( BIL) | kV | 110 | 110 | 125 | 125 | 150 | 150 | 170 | 170 | 170 | 170 | 180 | 180 |
| 4 | Creepage distance | mm | 250 | 250 | 350 | 350 | 530 | 530 | 700 | 700 | 720 | 720 | 850 | 850 |
| 5 | Package data | | | | | | | | | | | | | |
| 5.1 | -Net weight of each unit | Kg | 7.0 | 7.1 | 8.3 | 8.4 | 10.0 | 10.1 | 15.0 | 15.1 | 15.5 | 15.6 | 17.0 | 17.1 |
| 5.2 | -Dimensions (1PC/CTN) | cm | 41×31×11 | | 49×35×12.5 | | 49×35×14 | | 56×38×14.5 | | 57×38×14.5 | | 61×38×14.5 | |
| 6 | Figure No. | | Fig.C8 | | Fig.C9 | | Fig.C10/Fig.C11 | | Fig.C12 | | Fig.C13 | | Fig.C14 | |




**CTF-B Fuse Cutouts with NEMA Type B Mounting Bracket Dimensions**

| Voltage(kV) \ Dimensions (mm) | A | B | C | D |
|---|---|---|---|---|
| 10-15 | 450 | 335 | 433 | 245 |
| 15-27 | 520 | 350 | 570 | 300 |
| 24-27 | 520 | 350 | 570 | 300 |
| 27-33 | 595 | 370 | 700 | 330 |
| 33-36 | 635 | 395 | 820 | 370 |
| 36-38 | 635 | 655 | 850 | 390 |

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## OEM

- Metal-oxide surge arrester
- Fuse cutouts
- Composite insulator

Fig.C15

Fig.C16

Fig.C17

Fig.C18

Fig.C19

Fig.C20



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## SUPPLY

- Metal parts
- Semi-manufactured goods
- Fuse link

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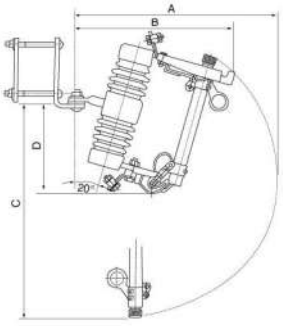
## Table C3—Main Technical Parameter of Fuse Cutouts Type CTF-C

| | Manufacturer | | Wenzhou Cantor H.V. Electric Manufacturing Co., LTD. | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Type designation | | CTF-A | | | | | | | | | | | |
| | Rated voltage (U) | kV | 10-15 | | 15-27 | | 24-27 | | 27-33 | | 33-36 | | 36-38 | |
| | Rated current (In) | kA | 100 | 200 | 100 | 200 | 100 | 200 | 100 | 200 | 100 | 200 | 100 | 200 |
| 1 | Generalfeature | Unit | | | | | | | | | | | | |
| 1.1 | -Housing material | | Porcelain | | Porcelain | | Porcelain | | Porcelain | | Porcelain | | Porcelain | |
| 2 | Ratings & characteristics | | | | | | | | | | | | | |
| 2.1 | -Rated frequency | Hz | 50/60 | | 50/60 | | 50/60 | | 50/60 | | 50/60 | | 50/60 | |
| 2.2 | -Interrupting capacity | kA | 10.0 | 12.0 | 10.0 | 12.0 | 8.0 | 10.0 | 6.3 | 8.0 | 6.3 | 8.0 | 6.3 | 8.0 |
| 3 | Housing insulation level | | | | | | | | | | | | | |
| 3.1 | -Power frequency withstand voltage (Dry) | kV | 40 | 40 | 45 | 45 | 65 | 65 | 70 | 70 | 72 | 72 | 75 | 75 |
| 3.2 | -Power frequency withstand voltage (Wet) | kV | 30 | 30 | 35 | 35 | 50 | 50 | 55 | 55 | 56 | 56 | 60 | 60 |
| 3.3 | -Lightning impulse withstand voltage ( BIL) | kV | 110 | 110 | 125 | 125 | 150 | 150 | 170 | 170 | 170 | 170 | 180 | 180 |
| 4 | Creepage distance | mm | 250 | 250 | 350 | 350 | 530 | 530 | 700 | 700 | 720 | 720 | 850 | 850 |
| 5 | Package data | | | | | | | | | | | | | |
| 5.1 | -Net weight of each unit | Kg | 7.0 | 7.1 | 8.3 | 8.4 | 10.0 | 10.1 | 15.0 | 15.1 | 15.5 | 15.6 | 17.0 | 17.1 |
| 5.2 | -Dimensions (1PC/CTN) | cm | 41×31×11 | | 49×35×12.5 | | 49×35×14 | | 56×38×14.5 | | 57×38×14.5 | | 61×38×14.5 | |
| 6 | Figure No. | | Fig.C15 | | Fig.C16 | | Fig.C17 | | Fig.C18 | | Fig.C19 | | Fig.C20 | |




**CTF-C Fuse Cutouts with NEMA Type B Mounting Bracket Dimensions**

| Dimensions (mm) / Voltage(kV) | A | B | C | D |
|---|---|---|---|---|
| 10-15 | 480 | 335 | 545 | 230 |
| 15-27 | 545 | 348 | 678 | 280 |
| 24-27 | 545 | 348 | 678 | 280 |
| 27-33 | 630 | 365 | 810 | 320 |
| 33-36 | 665 | 390 | 920 | 360 |
| 36-38 | 690 | 415 | 945 | 380 |

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## OEM

- Metal-oxide surge arrester
- Fuse cutouts
- Composite insulator

Fig.C21

Fig.C22

Fig.C23

Fig.C24

Fig.C25

Fig.C26



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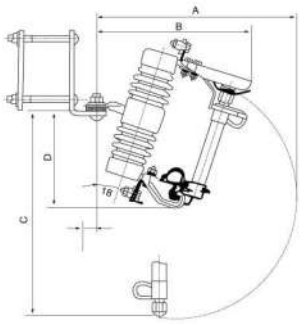
## SUPPLY

- Metal parts
- Semi-manufactured goods
- Fuse link

## Table C4—Main Technical Parameter of Fuse Cutouts Type CTF-D

| | Manufacturer | | Wenzhou Cantor H.V. Electric Manufacturing Co., LTD. | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Type designation | | CTF-A | | | | | | | | | | | |
| | Rated voltage (*U*) | kV | 10-15 | | 15-27 | | 24-27 | | 27-33 | | 33-36 | | 36-38 | |
| | Rated current (*In*) | kA | 100 | 200 | 100 | 200 | 100 | 200 | 100 | 200 | 100 | 200 | 100 | 200 |
| 1 | Generalfeature | Unit | | | | | | | | | | | | |
| 1.1 | -Housing material | | Porcelain | | Porcelain | | Porcelain | | Porcelain | | Porcelain | | Porcelain | |
| 2 | Ratings & characteristics | | | | | | | | | | | | | |
| 2.1 | -Rated frequency | Hz | 50/60 | | 50/60 | | 50/60 | | 50/60 | | 50/60 | | 50/60 | |
| 2.2 | -Interrupting capacity | kA | 10.0 | 12.0 | 10.0 | 12.0 | 8.0 | 10.0 | 6.3 | 8.0 | 6.3 | 8.0 | 6.3 | 8.0 |
| 3 | Housing insulation level | | | | | | | | | | | | | |
| 3.1 | -Power frequency withstand voltage (Dry) | kV | 40 | 40 | 45 | 45 | 65 | 65 | 70 | 70 | 72 | 72 | 75 | 75 |
| 3.2 | -Power frequency withstand voltage (Wet) | kV | 30 | 30 | 35 | 35 | 50 | 50 | 55 | 55 | 56 | 56 | 60 | 60 |
| 3.3 | -Lightning impulse withstand voltage ( BIL) | kV | 110 | 110 | 125 | 125 | 150 | 150 | 170 | 170 | 170 | 170 | 180 | 180 |
| 4 | Creepage distance | mm | 250 | 250 | 350 | 350 | 530 | 530 | 700 | 700 | 720 | 720 | 850 | 850 |
| 5 | Package data | | | | | | | | | | | | | |
| 5.1 | -Net weight of each unit | Kg | 7.0 | 7.1 | 8.3 | 8.4 | 10.0 | 10.1 | 15.0 | 15.1 | 15.5 | 15.6 | 17.0 | 17.1 |
| 5.2 | -Dimensions (1PC/CTN) | cm | 41×31×11 | | 49×35×12.5 | | 49×35×14 | | 56×38×14.5 | | 57×38×14.5 | | 61×38×14.5 | |
| 6 | Figure No. | | Fig.C21 | | Fig.C22 | | Fig.C23 | | Fig.C24 | | Fig.C25 | | Fig.C26 | |




**CTF-D Fuse Cutouts with NEMA Type B Mounting Bracket Dimensions**

| Voltage(kV) \ Dimensions (mm) | A | B | C | D |
|---|---|---|---|---|
| 10-15 | 455 | 330 | 475 | 230 |
| 15-27 | 520 | 355 | 612 | 310 |
| 24-27 | 520 | 355 | 612 | 310 |
| 27-33 | 600 | 375 | 742 | 320 |
| 33-36 | 640 | 395 | 852 | 360 |
| 36-38 | 660 | 420 | 880 | 390 |

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## OEM

- Metal-oxide surge arrester
- Fuse cutouts
- Composite insulator


Fig.C27


Fig.C28


Fig.C29


Fig.C30


Fig.C31


Fig.C32



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## SUPPLY

- Metal parts
- Semi-manufactured goods
- Fuse link

## Table C5—Main Technical Parameter of Fuse Cutouts Type CTF-A LOADBREAK

| | Manufacturer | | Wenzhou Cantor H.V. Electric Manufacturing Co., LTD. | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Type designation | | CTF-A LOADBREAK | | | | | | | | | | | |
| | Rated voltage (*U*) | kV | 10-15 | | 15-27 | | 24-27 | | 27-33 | | 33-36 | | 36-38 | |
| | Rated current (*I*) | kA | 100 | 200 | 100 | 200 | 100 | 200 | 100 | 200 | 100 | 200 | 100 | 200 |
| 1 | Generalfeature | Unit | | | | | | | | | | | | |
| 1.1 | -Housing material | | Porcelain | | Porcelain | | Porcelain | | Porcelain | | Porcelain | | Porcelain | |
| 2 | Ratings & characteristics | | | | | | | | | | | | | |
| 2.1 | -Rated frequency | Hz | 50/60 | | 50/60 | | 50/60 | | 50/60 | | 50/60 | | 50/60 | |
| 2.2 | -Interrupting capacity | kA | 10.0 | 12.0 | 10.0 | 12.0 | 8.0 | 10.0 | 6.3 | 8.0 | 6.3 | 8.0 | 6.3 | 8.0 |
| 3 | Housing insulation level | | | | | | | | | | | | | |
| 3.1 | -Power frequency withstand voltage (Dry) | kV | 40 | 40 | 45 | 45 | 65 | 65 | 70 | 70 | 72 | 72 | 75 | 75 |
| 3.2 | -Power frequency withstand voltage (Wet) | kV | 30 | 30 | 35 | 35 | 50 | 50 | 55 | 55 | 56 | 56 | 60 | 60 |
| 3.3 | -Lightning impulse withstand voltage ( BIL) | kV | 110 | 110 | 125 | 125 | 150 | 150 | 170 | 170 | 170 | 170 | 180 | 180 |
| 4 | Creepage distance | mm | 250 | 250 | 350 | 350 | 530 | 530 | 700 | 700 | 720 | 720 | 850 | 850 |
| 5 | Package data | | | | | | | | | | | | | |
| 5.1 | -Net weight of each unit | Kg | 7.0 | 7.1 | 8.3 | 8.4 | 10.0 | 10.1 | 15.0 | 15.1 | 15.5 | 15.6 | 17.0 | 17.1 |
| 5.2 | -Dimensions (1PC/CTN) | cm | 41×31×11 | | 49×35×12.5 | | 49×35×14 | | 56×38×14.5 | | 57×38×14.5 | | 61×38×14.5 | |
| 6 | Figure No. | | Fig.C27 Fig.C28 Fig.C29 | | Fig.C30 | | Fig.C31 | | | | | | Fig.C32 | |

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## OEM

- Metal-oxide surge arrester
- Fuse cutouts
- Composite insulator

### Polymer Insulator Fuse Cutouts (OEM)

10kV-15kV

24kV-27kV

27kV-36kV

27kV-33kV

30kV-33kV

36kV-38kV

10kV-15kV

10kV-15kV

24kV-27kV



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## SUPPLY

- Metal parts
- Semi-manufactured goods
- Fuse link

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15kV-27kV

27kV-33kV

24kV-27kV

27kV-33kV

27kV-33kV

27kV-33kV

27kV-33kV

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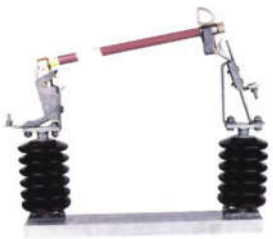
## OEM

- Metal-oxide surge arrester
- Fuse cutouts
- Composite insulator

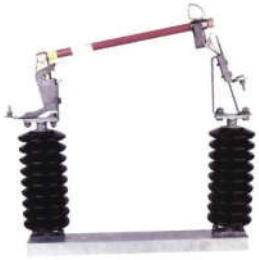
24kV-27kV

27kV-33kV

10kV-15kV



10kV-15kV



33kV-36kV



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## SUPPLY

- Metal parts
- Semi-manufactured goods
- Fuse link

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### Hookstick tools

### Hookstick, portable loadbreak tool

HookStick is first attaced to a universal pole at least six feet long, it is then positioned across the front of the Cutouts, with the HookStick anchor hung on the attachment hook on the far side of the cutout. The pull ring of the fuse tube or disconnect blade is engaged with HookStick's pull-ring hook and held fast with HookStick 's pull-ring of the fuse tube or disconnect blade is engaged with HookStick's pull-ring hook and held fast HookStick' s pull-ring latch.As the universal pole is pulled downward with a firm, steady stroke, and as HookStick is extended to its maximum length, the cutout is opened and the current is diverted through HookStick-at the same time HookStick's opening stroke, its internal trigger trips, the charged operating spring is released, the internal contact are separated, and the circuit is positively interrupted,The only sound is that of HookStick tripping.

Circuit interruption is independent of the speed at which the HookStick tool is operated.All that is required is a smooth operating stroke until the tool is extended to its maximum length.The resetting latch the tool in the open position for removal from the cutout-and until released to reset HookStick for its next operation.

### 1、Attach

Reach acrosst he front of the cutout and attach HookStick's anchor to the attactlment hook on the far side of the cutout, and then engage its pull ring with HookStick's pull-ring hook.
HookStick's pull-ring latch prevents disengagement of the cutout pull ring and HookStick's pulling hook.

### 2、Pull

Afirm, steady downward pull on HookStick-to its maximum extended length—opens the cutout in the normal manner as the current is diverded through HookStick.At a predetermined point in the opening stroke,HookStick trips,breaking the circuit positively.

### 3、Remove

HookStick is disengaged by first removing its anchor from the cutout attachment hook.Then, with the blade in the open position, HookStick is re moved from the pull ring with a simple"roll-off"motion.

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## OEM

- Metal-oxide surge arrester
- Fuse cutouts
- Composite insulator

## Fuse link

"KB.KU.KS"type fuses belong to"K"and "T"type fuse,it has general type,universal type and screw type available accrding to IEC 282 standard.The product drop-off type fuse of 11-36KV grade.

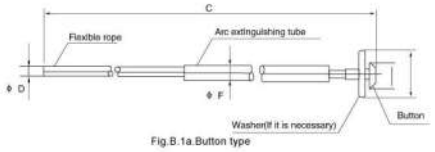
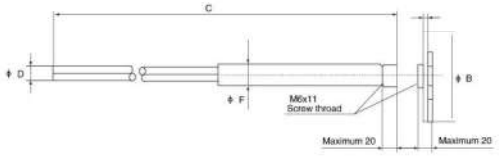



Fig.B.1a.Button type




| Rated current(A) | Simension(mm) | | | | | Quantiyt/carton |
|---|---|---|---|---|---|---|
| | A | B | C | D | F | |
| 1(to)25 | 12.5±0.2 | 19.0±0.2 | Note 1 | 2.0 | 6.5 | 500 |
| 30(to)40 | | | | 3.0 | 8.0 | |
| 50(to)100 | 19.0±0.3 | Not applicable | | 5.0 | 10.0 | 250 |
| 140(to)200 | | | | 7.0 | 12.0 | 150 |



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## SUPPLY

- Metal parts
- Semi-manufactured goods
- Fuse link

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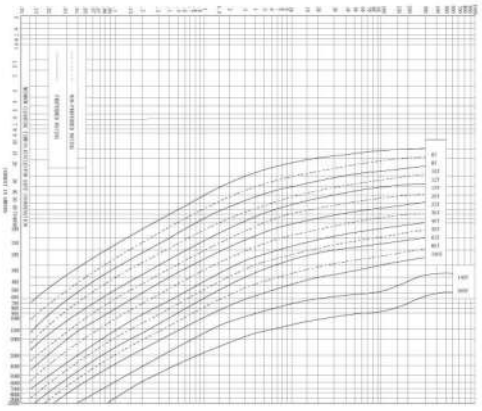
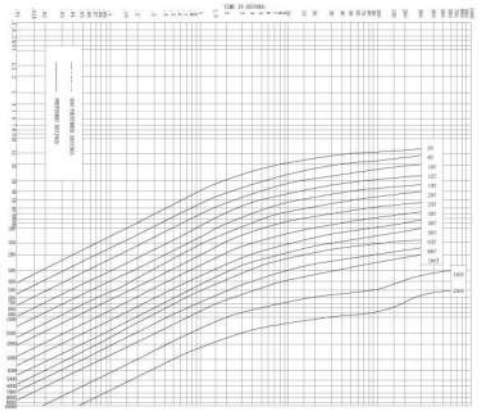
## Fuse Link Curve Diagram





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## OEM

- Metal-oxide surge arrester
- Fuse cutouts
- Composite insulator

# Voltage Transformer high-voltage current-limiting Fuse For ProTection(DIN Standard)

The product can be used in indoor system of 50Hz and Rated Voltage of 3.6kV、7.2kV、12kV、24kV and 40.5kV.Used together with other switch facilities such as loading swithes,vacuum contactors,it can protects electric transformers and other electric facilities against overloading or circuit break.It is also as necessary accessory for High-voltage switch box, circular circuit cabinet, High/Low-voltage top-loading transformer substation.

## Type designation

**Chinese type**

X R N T □ — 12

- 12 — Rated voltage:kV
- □ — Design serial number
- T — Transformer protection
- N — Indoor
- R — Fuse
- X — Current-limiting

**Foreign same type**

S □ L □ J

- J — German DIN Standard Inserting Type
- □ — Impinger:N=Nine A=Available
- L — Fuse length:L=292mm(12kV)442mm、(24kV)537mm(35kV)
- □ — Fuse diameters:D= ϕ 50mm F.K= ϕ 63mm、ϕ 76mm
- S — Transformer protection

## Main Technical Parameter

| Type | Same type | Rated voltage (kV) | Rated current of the fuse (A) | Rated current of the fuselimit (A) |
|---|---|---|---|---|
| XRNT-12 | SDLAJ | 12、24、35 | 40 | 6.3、10、16、20、25、31.5、40 |
| XRNT-24 | SFLAJ | | 100 | 50、63、71、80、100 |
| XRNT-35 | SKLAJ | | 125 | 125 |
| XRNT-35 | SKLAJ | | 200 | 160、200 |



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## SUPPLY

- Metal parts
- Semi-manufactured goods
- Fuse link

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3.6 / 7.2KV Fuse (d= ϕ 25mm)

| Type | Rated voltage (kV) | Rated current (A) | Diameter x Length (mm) | Interrupting current (kA) |
|---|---|---|---|---|
| XRNT1 | 3.6 / 7.2 | 6.3, 10, 16, 20, 25 31.5, 40, 50, 63 | ϕ 52 x 192 | 63 |
| | | 80, 100, 125 | ϕ 76 x 192 | |
| | | 160 | ϕ 88 x 192 | |
| | | *200, *250 | | 50 |
| | | 6.3, 10, 16, 20, 25 | ϕ 52 x 292 | 63 |
| | | 31.5, 40, 50, 63, 80 | | |
| | | 100, 125, 160 | ϕ 76 x 292 | |
| | | *200, *250, *315, *355 | ϕ 88 x 292 | 50 |
| | | 100, 125, 160 *200, *250 | ϕ 76 x 442 | 63 |
| | | *315, *355 | | 50 |
| | | *400, *500 | ϕ 88 x 442 | |

6 / 12kV Fuse (d= ϕ 25mm)

| Type | Rated voltage (kV) | Rated current (A) | Diameter x Length (mm) | Interrupting current (kA) |
|---|---|---|---|---|
| XRNT1 | 6 / 12 | 6.3, 10, 16 | ϕ 52 x 192 | 63 |
| | | 20, 25, 31.5, 40, 50, 63 | ϕ 76 x 192 | |
| | | 6.3, 10, 20, 31.5, 40 | ϕ 52 x 292 | |
| | | 50, 63, 80,100, 125 | ϕ 76 x 292 | |
| | | *160, *200 | ϕ 88 x 292 | 50 |
| | | 6.3, 10, 16 | ϕ 52 x 442 | 63 |
| | | 20, 25, 31.5, 40, 50, 63 | | |
| | | 80,100, 125, 160 | ϕ 76 x 442 | |
| | | *200, *250 | ϕ 88 x 442 | 50 |
| | | 00, 125, 160, *200 | ϕ 76 x 537 | 63 |
| | | *250, *315 | ϕ 88 x 537 | 50 |

17.5/24kV Fuse (d= ϕ 25mm)

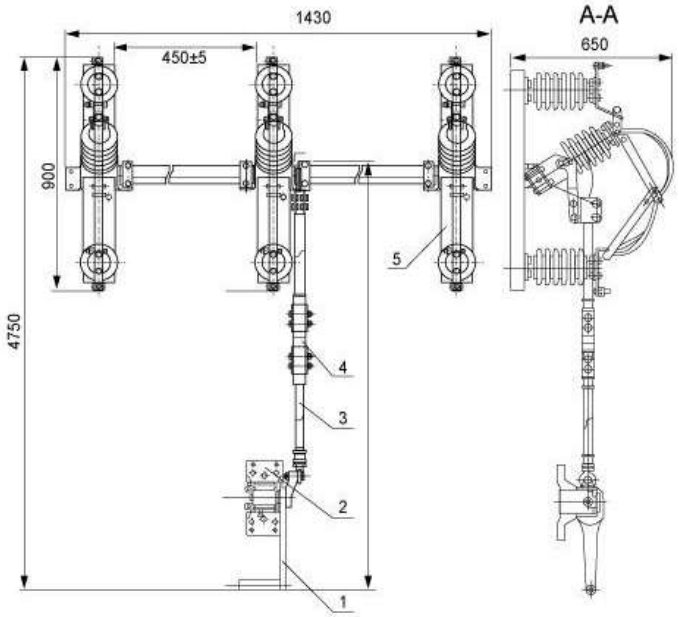
| Type | Rated voltage (kV) | Rated current (A) | Diameter x Length (mm) | Interrupting current (kA) |
|---|---|---|---|---|
| XRNT1 | 17.5 / 24 | 6.3, 10, 16 | ϕ 52 x 292 | 31.5 |
| | | 20, 25, 31.5, 40, 50, 63 | ϕ 76 x 292 | |
| | | 6.3, 10, 16, 20, 25, 31.5, 40 | ϕ 52 x 442 | 63 |
| | | 50, 63, 80,100 | ϕ 76 x 442 | |
| | | 125 | ϕ 88 x 442 | 40 |
| | | 6.3, 10, 16, 20, 25, 31.5, 40 | ϕ 52 x 537 | 63 |
| | | 50, 63, 80,100 | ϕ 76 x 537 | |
| | | 125 | ϕ 88 x 537 | 40 |
| | | 160, *200 | | |
| | | 6.3, 10, 16, 6.3 | ϕ 52 x 442 | 31.5 |
| | | 10, 16, 20 | ϕ 52 x 537 | 40 |
| | | 25, 31.5, 40 | ϕ 76 x 537 | |
| | | 50, 63 | ϕ 88 x 537 | |

**OEM**

- Metal-oxide surge arrester
- Fuse cutouts
- Composite insulator



## Disconnecting switch




### RH-B 11kV-38kV

| Type | Rated valtage kV | Rated current A | 4s Heat steady e.c.A | Shock voltage A | Impulse withstand voltage (kV) | Powe-frequency withstand voltage (kV) |
|---|---|---|---|---|---|---|
| RH-B | 11 | 400 | 12500 | 31500 | 95 | 42 |
| RH-B | 33 | 600 | 12500 | 31500 | 195 | 80 |

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## OEM

- Metal-oxide surge arrester
- Fuse cutouts
- Composite insulator

# Composite Insulator

## Application :

The composite insulator line of CANTOR includes line insulators comprised of line rod, line post, traction line type and line spacer, station insulators comprised of outdoor solid core, indoor solid core type, post and tension hollow post and tension rod, insulating bushing comprised of oil impregnated paper condenser wall bushing and dry type condenser wall bushing. Moreover, shed booster for station insulation, feeding rod for locomotive and dry type polymer current transformer are also available.

The shed housing polymer for CANTOR composite insulator is prepared using specific composition mixing developed by CANTOR experts for years, contributing the highest grade of tracking and corrosion resistance in conformance with IEC standard, which shows no apparent degradation after artificial accelerate ageing for 1000h and natural exposure test for 15 years.

The CANTOR insulator are manufactured with unique one-piece injection molding technique, excluding possibility of interface feakdown. Amain trouble which may destroy the normal operation of insulators. The unique gluing connection of line rod insulator with metal getting keeps FRP rod intact, providing the highest reliability of insulator in respect of its mechanical performance with practically no degradation even in environment of high temperature or severe cold.

The composite insulator, characteristic of small size, light weight, high mechanical strength, shatter-free, easy handling, well shock-resistance, pollution-resistance and minor maintenance, grows fast as a new generation of insulator.

Insulator with specific parameters other than those listed hereafter is required by customer, it can be supplied by technical agreement. If any insulator of other application is needed, CANTOR is willing to proceed cooperative development to meet utmost the customer demand.

## Normal service conditions

a)Ambient air temperature within the range of -40℃ to +50℃.
b)Altitude not exceeding 1500m.
c)Frequency of the A.C. power supply not less than 48Hz and not exceeding 62Hz.
d)Maximum wind speed not exceeding 35m/s
e)Earthquake intensity not exceeding 8 degrees

## Characteristics:

- Small volume and light weight, easy to transport and install.
- The superior in performance and high intensity mechanical enhance reliability of power line.
- Extraordinary hydrophobic and resistance to contamination.
- Long-duration resistance aging and leakage tracking.



KEMA IQNet CQC CE FSK CNL UL IMA

## SUPPLY

- End Fitting, ROD, Silicone
- Semi-manufactured goods
- Porcelain insulator

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# Configuration and Anatomy Design of Composite Insulator

End fittings are steel or ductile iron. They are crimped directly to the rod by a special process originated by CANTOR, and later adopted by many other producers. The crimp develops a high percentage of the rod's inherent tensile strength. It requires no intermovement of the parts to achieve high strength, nor does it introduce potting compounds or adhesives.

Weathersheds are high pressure injection molded by CANTOR , from the proprietary compound. Housings manufactured with silicon alloy rubber exhinit long-term hydrophobicity, high mechnical strength, excellent corona resistance and low permeability to moisture.

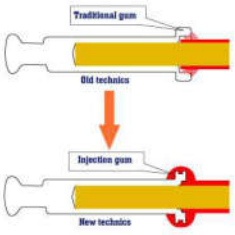
Coating thickness: ≥5mm, same thickness according to the IEC STANDARD.

ROD: adopting the ECR high temperature acid-resistance rod (more than 50 percent glass fibers in cross section)

Labyrinthic configuration designed end fitting, and adopting silicon coating technical, has improved the hydrophobicity and anti-leakage characterics.

Enhancing methods of silicone rubber holds good hydrophobicity and anti-leakage current tracking capacity.

The stable inherent tensile strength and accurancy are because of special rod with advanced compaction and interlinkage techinque.



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## OEM

- Metal-oxide surge arrester
- Fuse cutouts
- Composite insulator

## Composite Insulator Manufacture Flow Chart

**A** Metal instrument cleanout & drying, wipe off mandril roughcast.

**B** Compaction and interlinkage

**C** Degrease and warm-up

**D** Holistic injection pressurize molding

**E** Check the appearance and amend

**F** Secondary vulcanization

**G** Test before package

**H** Set nameplate on the eligible products

**I** Pack and storaged



KEMA IQNet CQC CE FSC SAA AS IMA

## SUPPLY

- End Fitting, ROD, Silicone
- Semi-manufactured goods
- Porcelain insulator

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## Insulator Quality Guarantee

Any products made by CANTOR are according to the ISO9001 management system to ensurance the quality and service.

### Material Incoming Inspection Items

**Core**

a. Strong light test (every piece)
b. Porosity and warter diffusion test
c. Power frequency withstand voltage inspection
d. Tension force loading inspection

**End Fitting**

a. Zinc coating mass testing
b. Go gauge and not go testing

**Silicon**

a. Technical performance testing
b. Hardness
c. The comparative and the proof tracking characterics
d. Inspection data

### Exfactory Inspection

a. Visual inspection
b. 50% rated mechnical load tensile test
c. 50% rated mechnical load bending test
d. 50% rated mechnical load torsion test
e. Power frequency withstand voltage inspection

### Sampling Inspection

a. Leakage current testing
b. The comparative and the proof tracking inspection
c. Lmpulse endurance test and lighting full-wave impulse test.
d. Mechnical tensile test( bending and torsion) broking test

Product design

Load tensile test

Load bending test
Load torsion test

Power frequency withstand voltage inspection

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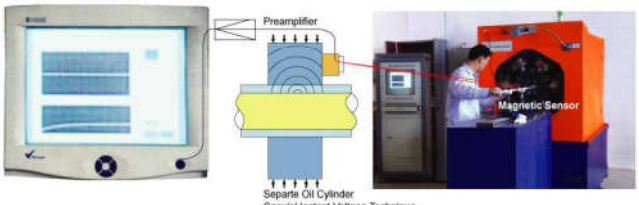
## OEM

- Metal-oxide surge arrester
- Fuse cutouts
- Composite insulator

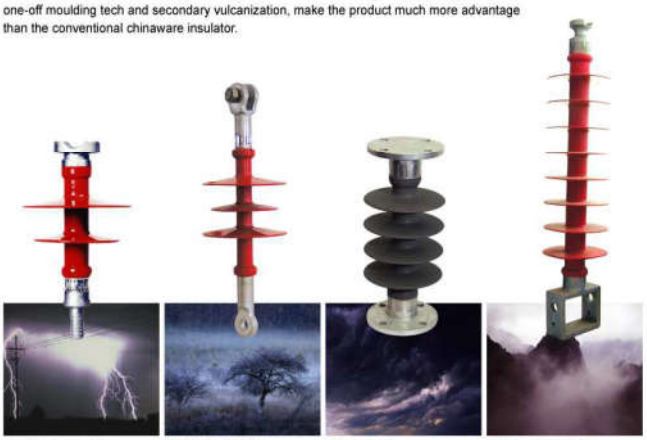
## The Compaction and Interlinkage Technique

The compaction and interlinkage of end fittings adopt advanced acoustic emission detection control system which is used for spaceflight and avigation test, it's sensitive to distinguish several fiberglas' break, and has alarm equipment to make sure the veracity. And it has advanced coaxial isobarically technique, can conquer the labiliza-tion of the compaction and interlinkage.




## Predominant umbrella cover characteristic

Excellent silicon directions for producing chemicals or metallurgical products, advanced one-off moulding tech and secondary vulcanization, make the product much more advantage than the conventional chinaware insulator.



Anti-Thunder Impulsion | Good hydrophobicity | Pollution-proof | Safe operation in fog



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## SUPPLY

- End Fitting, ROD, Silicone
- Semi-manufactured goods
- Porcelain insulator

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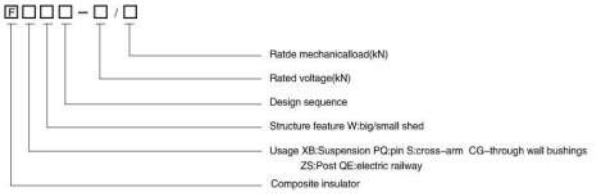
## Model and meaning




### Pin composite insulator

This product is applied to high voltage power line service.And have features of good gydrophobicily,anti-ageing,antileakage trace and elec-tric erode proof,tensile strength and bending strength strong mechanical strength,shock resistance good quakeproof and brittle failure proof,light weight,easy to installation and the installation outline of top and base are the same size with porcelain-pin type,they can exchange to use each other.

### Main technical parameters of pin composite insulator

| Design code | Rated Voltage (kV) | Rated mechanical stretch load (kN) | Structure Height (mm) | Minimum arcing distance (mm) | Minimum nominal creepage distance (mm) | Diameter of shed D(mm) | Lightning impulse withstand voltage (peak)≥(kV) | Power frequency withstand voltage (wet)≥(kV) |
|---|---|---|---|---|---|---|---|---|
| FPQ-10/4T20 | 10 | 4 | 215 | 125 | 280 | 148/118 | 75 | 42 |
| FPQ4-10/5T20 | 10 | 5 | 250 | 165 | 460 | 148/118 | 105 | 42 |
| FPS-105/5 | 10 | 5 | 250 | 180 | 380 | 90 | 105 | 42 |

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## OEM

- Metal-oxide surge arrester
- Fuse cutouts
- Composite insulator

### Suspension composite insulator

This product is special for badly polluted areas, high mecha nical tension load, long span and compact power line. And have featuresof light weight,small volume, unbreakable, anti-bend, high strength for anti-twist and strong explosion protection.

### Main technical parameters of suspension composite insulator

| Design code | Rated voltage (kV) | Rated mechanical stretch load (kN) | Structure Height (mm) | Minimum arcing distance (mm) | Minimum nominal creepage distance (mm) | Lightning impulse withstand voltage [peak] ≥ (kV) | Power frequency withstand voltage (wet) ≥ (kV) | Structure of connected marks |
|---|---|---|---|---|---|---|---|---|
| FXBW4-10/70 | 10 | 70 | 400 | 200 | 480 | 75 | 42 | 16 |
| FXBW4-10/100 | 10 | 100 | 450 | 200 | 480 | 75 | 42 | 16 |
| FXBW4-35/70 | 35 | 70 | 650 | 450 | 1320 | 230 | 95 | 16 |
| FXBW4-35/100 | 35 | 100 | 720 | 520 | 1600 | 230 | 95 | 16 |
| FXBW4-66/70 | 66 | 70 | 900 | 710 | 2140 | 410 | 185 | 16 |
| FXBW4-66/100 | 66 | 100 | 940 | 710 | 2140 | 410 | 185 | 16 |
| FXBW4-110/100 | 110 | 100 | 1240 | 1000 | 3315 | 550 | 230 | 16 |
| FXBW4-145/120 | 145 | 120 | 1480 | 1240 | 4123 | 725 | 355 | 16 |
| FXBW4-220/100 | 220 | 100 | 2240 | 1900 | 6300 | 1000 | 935 | 16 |
| FXBW4-220/160 | 220 | 160 | 2240 | 1900 | 6300 | 1000 | 395 | 16 |
| FXBW4-330/160 | 330 | 160 | 2990 | 2600 | 9075 | 1425 | 570 | 16 |



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## SUPPLY

- End Fitting, ROD, Silicone
- Semi-manufactured goods
- Porcelain insulator

### Suspension composite insulator (OEM)

### Main technical parameters of suspension composite insulator (OEM)

| Design code | Rated Voltage (kV) | Rated mechanical stretch load (kN) | Structure Height (mm) | Minimum arcing distance (mm) | Minimum nominal creepage distance (mm) | Lightning impulse withstand voltage [peak] ≥ (kV) | Power frequency withstand voltage (wet) ≥ (kV) | Structure of connected marks |
|---|---|---|---|---|---|---|---|---|
| FXBW12/70 | 12 | 70 | 390 | 180 | 460 | 105 | 42 | 16 |
| FXBW-15/70 | 15 | 70 | 445 | 225 | 620 | 105 | 42 | 16 |
| FXBW-24/70 | 24 | 70 | 450 | 235 | 635 | 150 | 65 | 16 |
| FXBW-24/70 | 24 | 70 | 450 | 265 | 643 | 150 | 65 | 16 |
| FXBW-28/70 | 28 | 70 | 560 | 380 | 1250 | 230 | 95 | 16 |
| FXBW-33/70 | 33 | 70 | 560 | 380 | 1130 | 230 | 95 | 16 |
| FXBW-35/70 | 35 | 70 | 550 | 390 | 850 | 230 | 95 | 16 |
| FXBW-36/70 | 36 | 70 | 580 | 380 | 1250 | 230 | 95 | 16 |
| FPQ2-24/4 | 24 | 4 | 310 | 180 | 645 | 150 | 65 | 16 |
| FPQ2-36/5 | 36 | 5 | 620 | 460 | 1160 | 230 | 95 | 16 |

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## OEM

- Metal-oxide surge arrester
- Fuse cutouts
- Composite insulator

## Post composite insulator

This product is applied to high voltage power line service.And have features of good gydrophobicily,anti-ageing,antileakage trace and electric erode proof,tensile strength and bending strength strong mechanical strength,withgood perfor-mance in shock resistance good quakeproof & brittle-breakproof,light weight,easy to installation,and the installation outline of top and base are the same size with porcelainping type,they can exchange to use each other.

### Main technical parameters of post composite insulator

| Design code | Rated Voltage (kV) | Rated mechanical stretch load (kN) | Structure Height (mm) | Minimum arcing distance (mm) | Minimum nominal creepage distance (mm) | Diameter of shed D(mm) | Lightning impulse withstand voltage [peak] ≥ (kV) | Power frequency withstand voltage (wet) ≥ (kV) |
|---|---|---|---|---|---|---|---|---|
| FZSW-10/4 | 10 | 4 | 215 | 125 | 290 | 100/90 | 75 | 42 |
| FZSW-20/8 | 20 | 8 | 400 | 320 | 750 | 142 | 150 | 65 |
| FZSW-35/6 | 35 | 6 | 450 | 360 | 946 | 148/118 | 185 | 95 |
| FZSW-66/6 | 66 | 6 | 760 | 630 | 1886 | 160/130 | 410 | 185 |
| FZSW-66/8 | 66 | 8 | 760 | 630 | 2010 | 220/190 | 410 | 185 |
| FZSW-110/10 | 110 | 10 | 1220 | 1080 | 3530 | 220/190 | 500 | 230 |
| FZSW-220/10 | 220 | 10 | 2440 | 2200 | 7060 | 220/190 | 1000 | 395 |
| | | | | | | | | |



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## SUPPLY

- End Fitting, ROD, Silicone
- Semi-manufactured goods
- Porcelain insulator

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## Composite insulators for electric railway

The product is specially used electric railway, it can effectively prevent flashover due to pollution,and lessen the job of cleaning, which is the necessary device that other porcelain type or glass type insulators can never replace.

### Main technical parameters of composite insulators for electric railway

| Design code | Rated voltage (kV) | Rated mechanical stretch load (kN) | Structure Height (mm) | Minimum nominal creepage distance (mm) | Lightning impulse withstand voltage [peak] ≥ (kV) | Power frequency withstand voltage (wet) ≥ (kV) | Structure of connected marks |
|---|---|---|---|---|---|---|---|
| FQX1~25 | 25 | 60 | 650 | 1400 | 270 | 130 | aa |
| FQX2~25 | 25 | 20 | 840 | 1400 | 270 | 130 | bb |
| FQX3~25※ | 25 | 20 | 930 | 1400 | 270 | 130 | bb |
| FQX3~25※ | 25 | 20 | 760 | 1400 | 270 | 130 | ac |
| FQX4~25 | 25 | 20 | 806 | 1400 | 270 | 130 | gh |
| FQX5~25 | 25 | 60 | 645 | 1400 | 270 | 130 | af |
| FQE3~25※ | 25 | 60 | 640 | 1400 | 270 | 130 | ff |
| FQE4~25※ | 25 | 20 | 836 | 1400 | 270 | 130 | gc |
| FQE5~25※ | 25 | 20 | 695 | 1400 | 270 | 130 | de |
| FQE5~25 | 25 | 20 | 695 | 1400 | 270 | 130 | gl |

※ This specification shall be conducted the tdst of bent pull & extension load under force of 4kN. When the bent distance is 100mm, the distortion shall be less than 12mm.

** According to the different requirement, the weight will be not same.

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## OEM

- Metal-oxide surge arrester
- Fuse cutouts
- Composite insulator

## Cross-arm composite insulator

The products are suitable for the innovation of urban electrical nerwork where its streers are narrow.It can effectively reduce the necessary height of the pole/tower,due to high bent resistant capacity, there will complerely avoid the case that porcelain cross-arm happen to crack. More, it can be well pollution resistant.

### Main technical parameters of cross-arm composite insulator

| Design code | Central distance between wire channel and installation axis (mm) | Min.Creepage distance (mm) | Minimum nominal creepage distance (mm) | Installation diameter (mm) | Rated mechanical stretch load (kN) | Power frequency withstand voltage (wet)≥ (kV) | Lightning impulse withstand voltage [peak]≥ (kV) |
|---|---|---|---|---|---|---|---|
| FS-10/2.5 | 390 | 274 | 362 | 18 | 2.5 | 45 | 165 |
| FS-10/2.5 | 400 | 280 | 410 | 18 | 5.0 | 50 | 185 |
| FS-10/2.5 | 620 | 490 | 1060 | 22 | 5.0 | 100 | 265 |
| FS-10/2.5 | 890 | 735 | 1815 | 23 | 6.0 | 185 | 410 |
| FS-10/2.5 | 1240 | 1070 | 3180 | 24 | 10 | 230 | 550 |

## Through wall bushing

The product are one of new generation, inner in sulation applied to new material, outer insulation made of high-temper ature resistant sulfureted silicon rubber,to perform excellent pollution proof function and explosion proof.It is the right trend for the requirem ent for minimzing the size and forbidding oil by power indusstry ureau. It can well meet with the need of urban and suburban electric networke.

FCWB-10/600

FCWB-35/600

### Main technical parameters of through wall bushing

| Design code | Total length (mm) | Body length (mm) | Length of oudoor main body (mm) | Max sleeve umbrella diameter | Minimum nominal creepage distance (mm) | Mechanical bent damage load (kN) | Power frequency withstand voltage | | | Lightning impulse withstand voltage [peak]≥ (kV) | Rated voltage (kV) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Wet (kV) | Breakdown (kV) | Visibke halation (kV) | | |
| FCWB-10/600 | 540 | 460 | 250 | 110 | 380 | 7.5 | 30 | 75 | / | 75 | 10 |
| FCWB-35/600 | 980 | 870 | 435 | 178 | 1030 | 7.5 | 80 | 176 | 185 | 185 | 35 |



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## SUPPLY

- End Fitting, ROD, Silicone
- Semi-manufactured goods
- Porcelain insulator

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## Other Type Insnlators

Insulators for Fuse cutouts

ZW8-12 Support

ZW8-12 Pulling rod

ZW7-40.5/1250 Composite pulling insulator

## Corona Rings

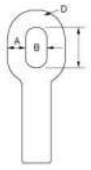
FJH -110 A

FJH -110 B

FJH -110 C

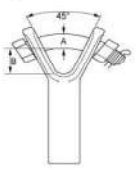
FJH -110-220

## Most Common End Fittings



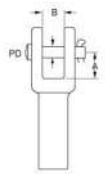
Chain Eye

| SML. | Dimensions mm (in.) A | B | C | D |
|---|---|---|---|---|
| 111 kN (25K lbs.) | 15.74 (0.62) | 25.4 (1.00) | 50.8 (2.00) | 15.74 (0.62) |
| 120 kN | 15.74 (0.62) | 25.4 (1.00) | 50.8 (2.00) | 15.74 (0.62) |
| 133 kN (30K lbs.) | 19.05 (0.75) | 25.4 (1.00) | 50.8 (2.00) | 21.59 (0.85) |
| 160 kN (36K lbs.) | 19.05 (0.75) | 25.4 (1.00) | 50.8 (2.00) | 21.59 (0.85) |
| 210 kN | 19.05 (0.75) | 25.4 (1.00) | 50.8 (2.00) | 21.59 (0.85) |
| 222 kN (50K lbs.) | 19.05 (0.75) | 25.4 (1.00) | 50.8 (2.00) | 21.59 (0.85) |



Y-Clevis

| SML | Dimensions mm (in.) A | B | Bolt Dia |
|---|---|---|---|
| 111 kN (25K lbs.) | 19.05 (0.75) | 38.86 (1.53) | 19 (0.75) |
| 120 kN | 19.05 (0.75) | 38.86 (1.53) | 19 (0.75) |
| 133 kN (30K lbs.) | 22.35 (0.88) | 40.39 (1.59) | 22 (0.88) |
| 160 kN (36K lbs.) | 22.35 (0.88) | 40.39 (1.59) | 22 (0.88) |
| 210 kN | 22.35 (0.88) | 40.39 (1.59) | 22 (0.88) |
| 222 kN (50K lbs.) | 22.35 (0.88) | 40.39 (1.59) | 22 (0.88) |



Straight Clevis

| SML | Dimensions mm (in.) Class | A | B | PD |
|---|---|---|---|---|
| 111 kN (25K lbs.) | ANSI 52-6 | 36 (1.41) | 19 (0.75) | 16 (0.62) |
| 120 kN | IEC 16C | 36 (1.41) | 19 (0.75) | 16 (0.62) |
| 133 kN (30K lbs.) | ANSI 52-6 | 36 (1.41) | 19 (0.75) | 16 (0.62) |
| 160 kN (36K lbs.) | IEC 19L | 46 (1.81) | 21 (0.83) | 19 (0.75) |
| 210 kN | IEC 19L | 46 (1.81) | 21 (0.83) | 19 (0.75) |
| 222 kN (50K lbs.) | N/A | | | |

Ball/Socket

| SML | Class |
|---|---|
| 111 kN (25K lbs.) | ANSI 52-5 |
| 120 kN | IEC 16 mm |
| 133 kN (30K lbs.) | ANSI 52-5 |
| 160 kN (36K lbs.) | IEC 20 mm (ANSI 52-8) |
| 210 kN | IEC 20 mm |
| 222 kN (50K lbs.) | ANSI 52-11 |

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## OEM

- Metal-oxide surge arrester
- Fuse cutouts
- Composite insulator

## ANSI Porcelain Disc Suspension Insulators

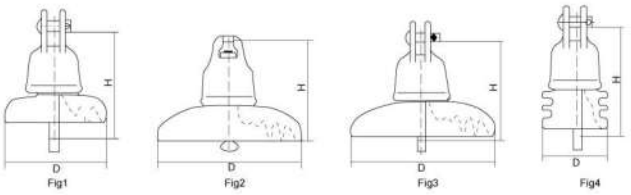

Fig1 Fig2 Fig3 Fig4

### Main technical parameters of ANSI porcelain disc suspension Insulators

| Class ANSI | Fig | Main Dimension in (mm) | | Leakage Distance in (mm) | Combined M&E Strength b (KN) | Mechanical Impact Strength in-1b(H-m) | Time Load Test Value 1b (KN) | Average Flashover Voltage | | | | Power Frequency Puncture Voltage KV | Redio Influence Vol tage | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Power Frequency | | Critical Impulse | | | Test Voltage To Ground KV | Max Riv At 1 Mhz μV |
| | | D (max) | H | | | | | Dry Kv | Wet Kv | Positive Kv | Negative Kv | | | |
| 52-1 | 1 | 6 1/2 (165) | 5 1/2 (141) | 7 (178) | 10000 (44) | 45 (5.0) | 6000 (27) | 60 | 30 | 100 | 100 | 80 | 7.5 | 50 |
| 52-2 | 1 | 8 (203) | 5 3/4 (146) | 8 1/2 (210) | 15000 (67) | 50 (5.5) | 10000 (44) | 65 | 35 | 115 | 115 | 90 | 7.5 | 50 |
| 52-3 | 2 | 10 3/4 (273) | 5 3/4 (146) | 11 1/2 (292) | 15000 (67) | 55 (6.0) | 10000 (44) | 80 | 50 | 125 | 130 | 110 | 10 | 50 |
| 52-4 | 3 | 10 3/4 (273) | 5 3/4 (146) | 11 1/2 (292) | 15000 (67) | 55 (6.0) | 10000 (44) | 80 | 50 | 125 | 130 | 110 | 10 | 50 |
| 52-5 | 2 | 10 3/4 (273) | 5 3/4 (146) | 11 (279) | 25000 (111) | 60 (7.0) | 15000 (67) | 80 | 50 | 125 | 130 | 110 | 10 | 50 |
| 52-6 | 3 | 10 3/4 (273) | 5 3/4 (146) | 11 (279) | 25000 (111) | 60 (7.0) | 15000 (67) | 80 | 50 | 125 | 130 | 110 | 10 | 50 |
| 52-9 | 4 | 4 1/2 (114) | 6 3/4 (160) | 6 3/4 (171) | 10000 (44) | 45 (5.0) | 60000 (27) | 60 | 30 | 100 | 90 | 80 | 7.5 | 50 |



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## SUPPLY

- End Fitting, ROD, Silicone
- Semi-manufactured goods
- Porcelain insulator

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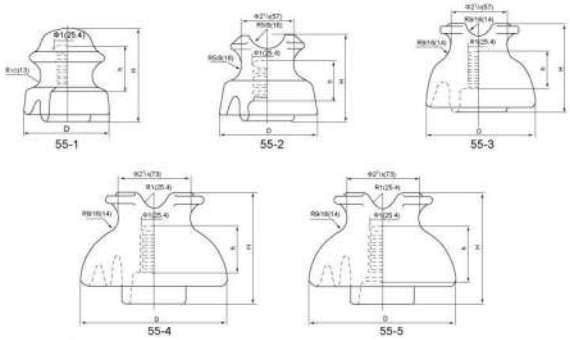
## ANSI Low/Medium Voltage Pin Type Insulators



55-1 55-2 55-3 55-4 55-5

### Main technical parameters of ANSI low/medium voltage pin type Insulators

| Class ANSI | Main Dimension in (mm) | | | Leakage Distance in (mm) | Min.Pin Length in (mm) | Cantilever Strength 1b (KN) | Flashover Voltage | | | | Power Frequency Puncture Voltage Kv | Radio Influence Voltage | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Power Frequency | | Imprise | | | Test Voltage To Ground KV | Max RIVAT 1MHz μV |
| | D (max) | H | h | | | | Dry Kv | Wet Kv | Positive Kv | Negative Kv | | | |
| 52-1 | 3 1/2 (83) | 3 1/2 (89) | 1 3/4 (44) | 4 (102) | 4 (102) | 3000 (13) | 35 | 20 | 50 | 70 | 50 | 5 | 2500/50 |
| 52-2 | 3 3/4 (95) | 3 1/2 (83) | 1 1/2 (38) | 5 (127) | 4 (102) | 2500 (11) | 50/45 | 25 | 75/70 | 95/85 | 70 | 5 | 2500/50 |
| 52-3 | 3 3/4 (121) | 3 1/2 (95) | 1 1/2 (38) | 7 (178) | 5 (127) | 2500 (11) | 65/55 | 35/30 | 100/90 | 130/110 | 90 | 10 | 5500/50 |
| 52-4 | 5 1/2 (140) | 4 3/4 (111) | 1 3/4 (44) | 9 (229) | 5 (127) | 3000 (13) | 70/65 | 40/35 | 110/105 | 140/130 | 95 | 10 | 5500/50 |
| 52-5 | 7 (178) | 4 7/8 (124) | 2 (51) | 15 (305) | 6 (152) | 3000 (13) | 85/80 | 45 | 40/130 | 170/150 | 115 | 15 | 8000/100 |

**canTor**

**CANTOR H.V. Electric Manufacturing**

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## OEM

- Metal-oxide surge arrester
- Fuse cutouts
- Composite insulator

## ANSI Line Post Insulators For High Voltage

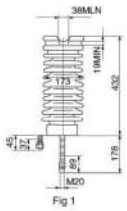

Fig 1

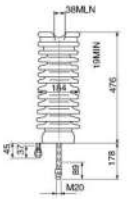

Fig 2

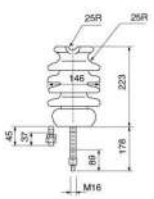

Fig 3

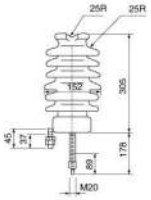

Fig 4

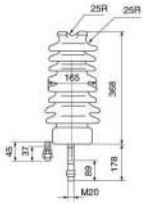

Fig 5

### Main technical parameters of ANSI line post insulators for high voltage

| ANSI class | | 57-1S<br>57-1L | 57-2S<br>57-2L | 57-3S<br>57-3L | 57-4S<br>57-4L | 57-5S<br>57-5L |
|---|---|---|---|---|---|---|
| Fig.No | | 3 | 4 | 5 | 1 | 2 |
| Dimensions of the pin mm | | M16 | M20(M16) | M20 | M20 | M20 |
| Creepage distance mm | | 356h | 559 | 737 | 1015 | 1145 |
| Dry arcing distance mm | | 165 | 241 | 311 | 368 | 438 |
| Cantiever strength KN | | 12.5 | 12.5 | 12.5 | 12.5 | 12.5 |
| Low frequency | Dry flashover KV | 80 | 110 | 12.5 | 150 | 175 |
| flashover voltage | Wet flashover KV | 60 | 85 | 100 | 125 | 150 |
| Critical impulsle | positive KV | 130 | 180 | 210 | 255 | 290 |
| flashover voltage | Negative KV | 155 | 205 | 260 | 340 | 380 |
| Radio influence | Test voltage to ground KV | 15 | 22 | 30 | 44 | 44 |
| votage data | At 1000KHZ Max. RIV uV | 100 | 100 | 200 | 200 | 200 |
| Weight kg | | 5 | 9.8 | 12 | 16 | 18 |



KEMA IQNet CQC CE SII SASO CSA IMA

## SUPPLY

- End Fitting, ROD, Silicone
- Semi-manufactured goods
- Porcelain insulator

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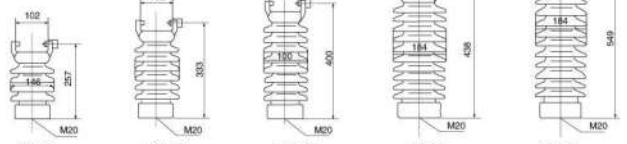
## ANSI Line Post Insulators For High Voltage




### Main technical parameters of ANSI line post insulators for high voltage

| ANSI class | | 57-11 | 57-12 | 57-13 | 57-14 | 57-15 |
|---|---|---|---|---|---|---|
| Creepage distance (mm) | | 356 | 559 | 737 | 1015 | 1145 |
| Dry arcing distance (mm) | | 165 | 241 | 311 | 368 | 438 |
| Cantiever strength (kN) | | 12.5 | 12.5 | 12.5 | 12.5 | 12.5 |
| Low frequency | Dry flashover (kV) | 80 | 110 | 125 | 150 | 175 |
| flashover voltage | Wet flashover (kV) | 60 | 85 | 100 | 125 | 150 |
| Critical impulse | positive (kV) | 130 | 180 | 210 | 255 | 290 |
| flashover voltage | Negative (kV) | 155 | 205 | 260 | 340 | 380 |
| Radio influence | Test voltage to ground (kV) | 15 | 22 | 30 | 44 | 44 |
| votage data | At 1000K Hz Max. RIV (uV) | 100 | 100 | 200 | 200 | 200 |
| Weight (kg) | | 6.8 | 10 | 11.8 | 15.9 | 18.6 |

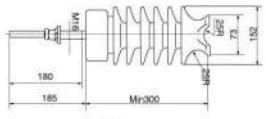


Fig 1

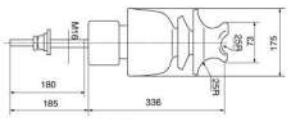


Fig 2

| Type | | ANSI 57-2L-1 | PIN POST |
|---|---|---|---|
| Creepage distance (mm) | | 599 | 520 |
| Protected creepage distance (mm) | | 200 | 260 |
| Dry arcing distance (mm) | | 240 | 260 |
| Cantilever strength (kn) | | 12.5 | 12.5 |
| Power frequency | Dry(kV) | 90 | 90 |
| Withstand voltage | Wet (kV) | 65 | 65 |
| Impulse withstand voltage (kv) | | 150 | 150 |
| Radio influence | Teat voltage to ground (kv) | 22 | 22 |
| Voltage data | Max. Riv at 1000 kh | 100 | 100 |
| Net weight, each, approx., kg | | 9.2 | 10 |