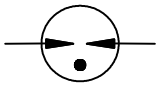
# Gas Discharge Tubes (GDT) 2R-18H Series

## Description

The Gas Discharge Tube (GDT) is a protective device which is filled with certain proportion of noble gas, or mixed gas or other discharge media in the space between metal electrodes and metalized ceramics, and then sealed at high temperature to form a single gap or multi-gap switch type protective device. When the protected circuit or equipment suffers to surge, GDT will change from high impedance state to low impedance state and release the surge energy to reduce the residual voltage of the circuit, and then protect the equipment or human body from the hazard of transient overvoltage.

2R-18H Series gas discharge tubes enable protection modules to be constructed with protection classes for N-PE applications.


## Electrical symbol



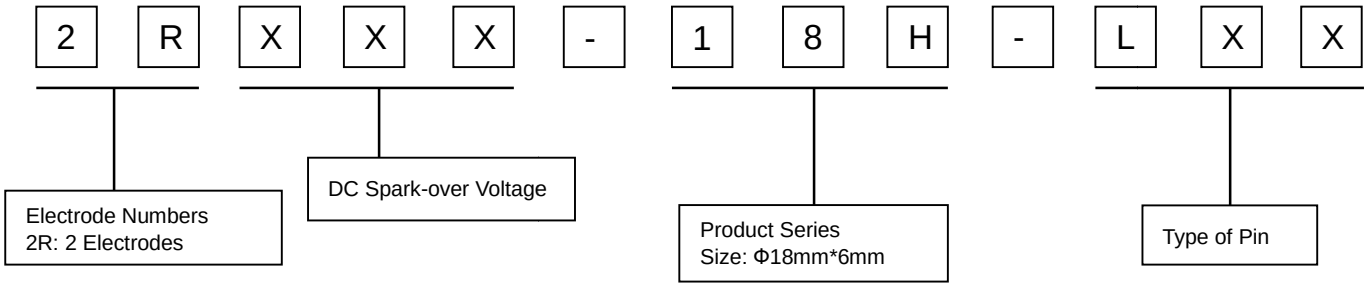
## Features

- Stable performance over life
- Very fast response time
- High insulation resistance
- Non-Radioactive

## Applications

- AC power line N-PE application
- Class I and class II – surge protection

## Part Number Code



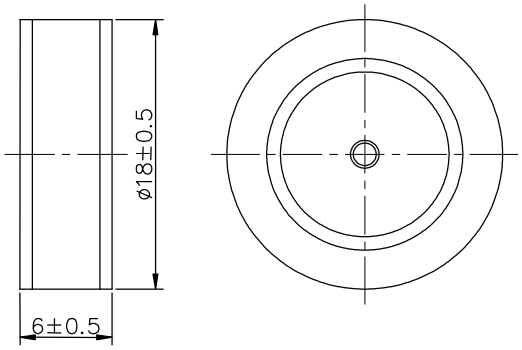
## Electrical Characteristics

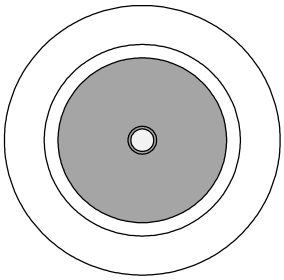
| Model | | | 2R350-18H | 2R600-18H | 2R800-18H | Units |
|---|---|---|---|---|---|---|
| **DC Spark-over Voltage** [1) 2)] | at 100V/S | | 350±20% | 600±20% | 800±20% | V |
| **Impulse Spark-over Voltage** | at 1KV/μS | | <700 | <1000 | <1200 | V |
| **Front of wave spark-over voltage** | at 1.2/50 μs, 6 kV | | <1000 | <1300 | <1500 | V |
| **Class I (according to IEC 61643-11)** | | | | | | |
| Maximum continuous operating voltage | at 50/60Hz | $U_C$ | 110 | 255 | 255 | Vrms |
| Nominal impulse discharge current | 8/20μs 15 times | $I_n$ | 30 | 30 | 30 | KA |
| Impulse discharge current | 10/350μs 5 times | $I_{imp}$ | 10 | 10 | 10 | KA |
| Follow current | at 50/60Hz | $I_f$ | 100 | 100 | 100 | A |
| **Class II (according to IEC 61643-11)** | | | | | | |
| Maximum continuous operating voltage | at 50/60Hz | $U_C$ | 110 | 255 | 255 | Vrms |
| Nominal impulse discharge current | 8/20μs 15 times | $I_n$ | 30 | 30 | 30 | KA |
| Maximum discharge current | 8/20μs 2 times | $I_{max}$ | 60 | 60 | 60 | KA |
| Follow current | at 50/60Hz | $I_f$ | 100 | 100 | 100 | A |
| **AC discharge current (TOV** [3)] **at 1200V)** 1 time 50 Hz, 0.2 s | | | 300 | 300 | 300 | A |
| **Breakdown time** | | | <100 | <100 | <100 | ns |
| - typical values | | | <40 | <40 | <40 | ns |
| **Insulation Resistance** | at DC 100V | | >1 | >1 | >1 | GΩ |
| **Capacitance** | at 1MHz | | <5 | <5 | <5 | pF |
| **Weight** | | | | | | |
| | 2RXXX-18H-LS0 | | ~8.2 | ~8.2 | ~8.2 | g |
| | 2RXXX-18H-LD0 | | ~9.3 | ~9.3 | ~9.3 | g |
| | 2RXXX-18H-LD1 | | ~9.4 | ~9.4 | ~9.4 | g |
| | 2RXXX-18H-LD5 | | ~10.3 | ~10.3 | ~10.3 | g |
| **Operation and storage temperature** | | | -40~+125 | -40~+125 | -40~+125 | °C |
| **Climatic category (IEC60068-1)** | | | 40/125/21 | 40/125/21 | 40/125/21 | |
| **Marking, red positive** | | | **RUILON 2R350-18** | **RUILON 2R600-18** | **RUILON 2R800-18** | |
| **Surface treatment** | | | Matte-tin plated | | | |

1) At delivery AQL 0.65 level II, DIN ISO 2859.
2) In ionized mode.
3) TOV - Temporary over voltage.

## Dimensions (Unit: mm)

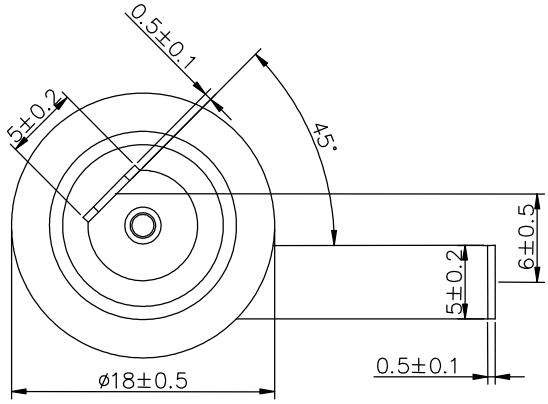
### 2RXXX-18H-LS0

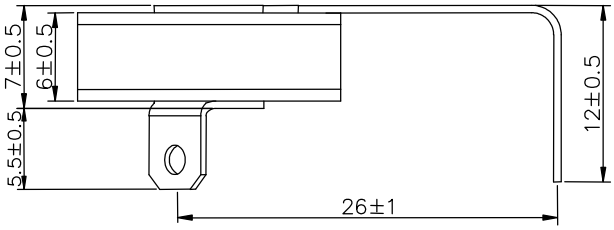


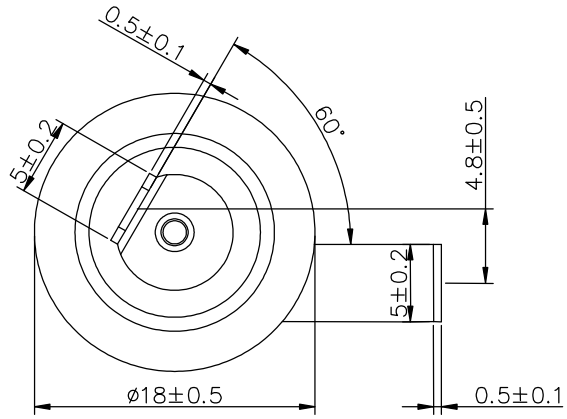
**Welding area:** The shadow part is the welding area, do not exceed the shadow when welding.

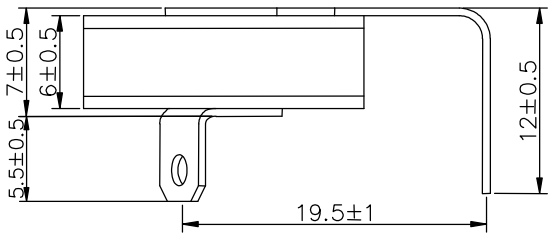
### 2RXXX-18H-LD0



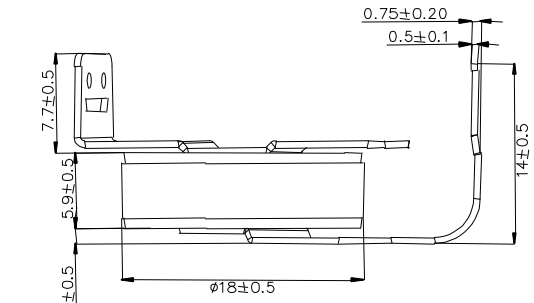



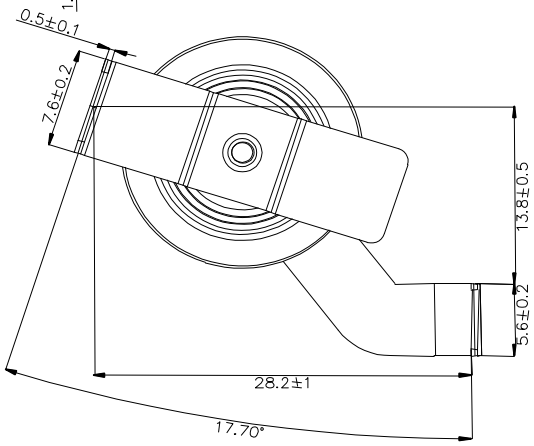

### 2RXXX-18H-LD1



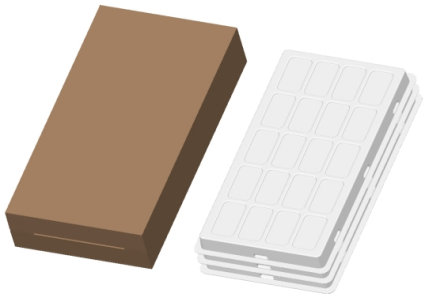
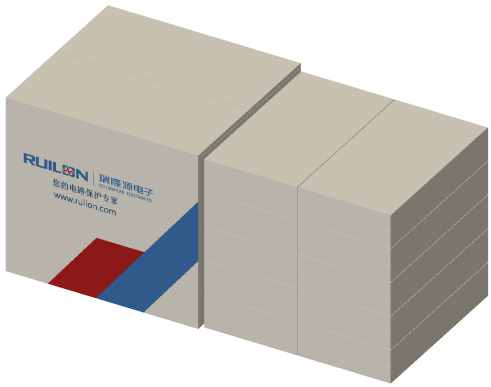

### 2RXXX-18H-LD5



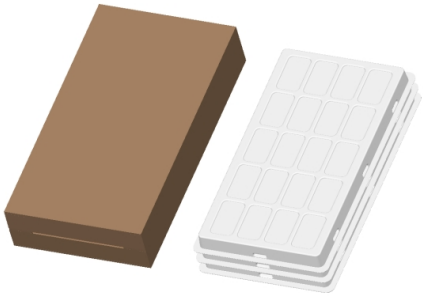
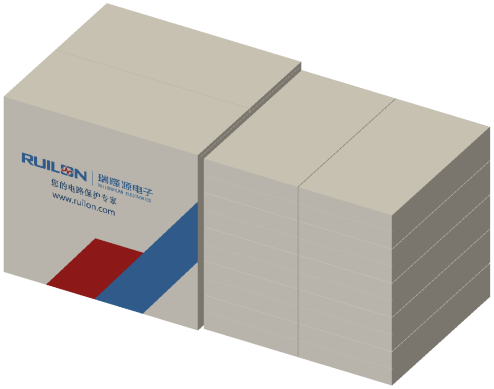



## Packaging Information

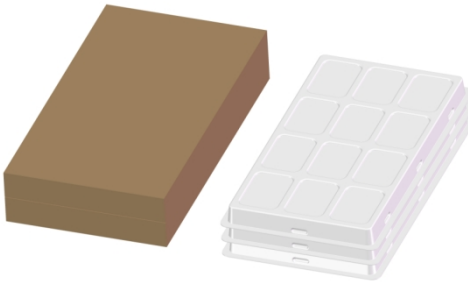
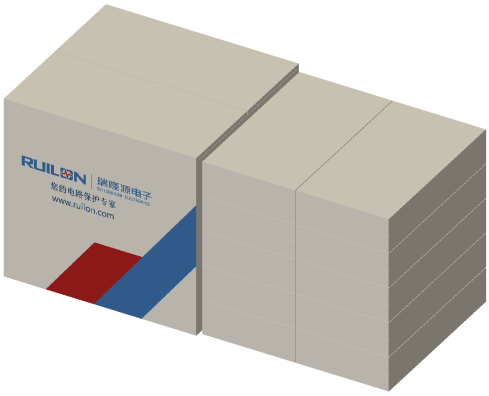
### 2RXXX-18H-LS0

| | PVC tray | Inner Box | Carton |
|---|---|---|---|
| Size | 265×148×17mm | 275×150×50mm | 315×290×272mm |
| Quantity | MPQ: 1 tray=60pcs | MOQ: 1 Inner Box=3 trays=180pcs | 1 Carton=10 Inner boxes=1,800pcs |
| Photos |  |  |  |

### 2RXXX-18H- LD0/LD1

| | PVC tray | Inner Box | Carton |
|---|---|---|---|
| Size | 265×148×17mm | 275×150×50mm | 315×290×272mm |
| Quantity | MPQ: 1 tray=20pcs | MOQ: 1 Inner Box=3 trays=60pcs | 1 Carton=10 Inner boxes=600pcs |
| Photos |  |  |  |

## 2RXXX-18H-LD5

| | PVC tray | Inner Box | Carton |
|---|---|---|---|
| Size | 265×148×17mm | 275×150×50mm | 315×290×272mm |
| Quantity | MPQ: 1 tray=24pcs | MOQ: 1 Inner Box=3 trays=72pcs | 1 Carton=10 Inner boxes=720pcs |
| Photos |  |  |  |

## Terms and definitions

| NO. | Item | Definitions |
|---|---|---|
| 1 | **Gas discharge tube(GDT)** | Gap, or several gaps, in an enclosed discharge medium, other than air at atmospheric pressure, designed to protect apparatus or personnel, or both, from high transient voltages. Also referred to as "gas tube surge arrester". |
| 2 | **DC Spark-over Voltage** | The voltage at which the gas discharge tube sparks over with slowly increasing d.c. voltage. |
| 3 | **Impulse Spark-over Voltage** | The highest voltage which appears across the terminals of a gas discharge tube in the period between the applications of an impulse of given waveform and the time when current begins to flow. |
| 4 | **Impulse discharge current 8/20μs** | Current impulse with a nominal virtual front time of 8μs and a nominal time to half-value of 20μs. |
| 5 | **Impulse discharge current 10/350μs** | Current impulse with a nominal virtual front time of 10μs and a nominal time to half-value of 350μs. |
| 6 | **1,2/50 voltage impulse** | Voltage impulse with a nominal virtual front time of 1,2μs and a nominal time to half-value of 50μs. |
| 7 | **Maximum continuous operating voltage $U_C$** | Maximum rms. voltage, which may be continuously applied to the GDT's mode of protection. |
| 8 | **Nominal discharge current $I_n$** | Crest value of the current through the GDT having a current waveform of 8/20. |
| 9 | **Maximum discharge current $I_{max}$** | Crest value of a current through the Surge arrester having an 8/20 waveform and magnitude according to the manufacturers specification. $I_{max}$ is equal to or greater than $I_n$. |
| 10 | **Impulse discharge current for class I test $I_{imp}$** | Crest value of the current through the Surge arrester having a current waveform of 10/350 with specified charge transfer Q and specified energy W/R in the specified time. |

| | | |
|---|---|---|
| **11** | **Follow current $I_f$** | Current supplied by the electrical power system and flowing through the surge arrester after an $I_n$-discharge current impulse. |
| **12** | **Insulation Resistance** | Insulation resistance shall be measured from each terminal to every other terminal of the GDT. The test is performed with DC50V when normal spark-over Voltage 70~150V, others with DC100V. |
| **13** | **Capacitance** | The capacitance shall be measured once at 1 MHz between all terminals unless otherwise specified. |
| **14** | **Class I** | Surge arrester protects against direct lightning strike. Direct lightning strike is defined as current impulse $I_{imp}$ with waveform 10/350 µs. Withstand capability acc. to IEC 61643-11 standard. |
| **15** | **Class II** | Surge arrester protects against induced surge current. Induced surge current is defined as current impulse $I_n$ and $I_{max}$ with waveform of shorter duration than $I_{imp}$, 8/20 µs. Withstand capability acc. to IEC 61643-11 standard. |

## Cautions and warnings

- Surge arresters must not be operated directly in power supply networks.
- Surge arresters may become hot in case of longer periods of current stress (danger of burning).
- If the contacts of the surge arresters are defective, current stress can lead to the formation of sparks and loud noises.
- Surge arresters may be used only within their specified values. In case of overload, the head contacts may fail or the component may be destroyed.
- Damaged surge arresters must not be re-used.