Datasheet

Gas Discharge Tube (GDT)

Series / Models	2R-12M Series
Product Code	10.15.10.XXXX
Version	A4
Date	2026-09-28
File Number	SP-GDT-175

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Version History

Version	Date	Page	Description	Author
A0	2024-02-28	/	Initial draft	Xia Wu
A1	2024-11-04	Page 4	Update electrical characteristics	Xia Wu
A2	2025-05-23	Page 1,2,3,4	1. Add cover and version history 2. Update description 3. Delete some models	Xia Wu
A3	2026-06-16	Page 4	Add certifications	Xia Wu
A4	2026-09-28	Page 4	Update the electrical characteristics of 90V	Xia Wu

Gas Discharge Tube (GDT) 2R-12M Series

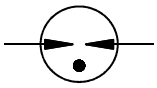
Description

Gas discharge tubes (GDTs) are generally in a high insulation resistance state, equivalent to an open circuit, which has almost no impact on the normal operation of the circuit. When transient overvoltage occurs in the circuit and the voltage amplitude exceeds the breakdown voltage of the GDT, the gas inside the GDT is ionized, causing the GDT to quickly conduct and limit the overvoltage to a lower level, thereby protecting electronic devices or circuit components connected in parallel from high voltage impact damage. After the overvoltage disappears, the GDT immediately returns to a high insulation resistance state, and the circuit resumes normal operation.

The 2R-12M series is a GDT with follow current interruption ability, using advanced manufacturing processes and high-quality materials, with excellent durability and reliability. Compact structure, easy to install in various power equipment. Fast response speed provides reliable protection for electronic devices and ensures stable operation of the power system. In AC power supply, it has excellent ability to follow current interruption. Once abnormal follow current occurs, it can be quickly and decisively turned off to prevent the harm of follow current and ensure the safety of the circuit. The 2R-12M series has a high ability to withstand surge currents and is suitable for N-PE protection.



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

2	R	X	X	X	-	1	2	M	-	L	X	X

- 2R: Electrode Numbers (2R: 2 Electrodes)
- XXX: DC Spark-over Voltage
- 12M: Product Series (Size: Φ11.8mm*12mm)
- LXX: Type of Pin

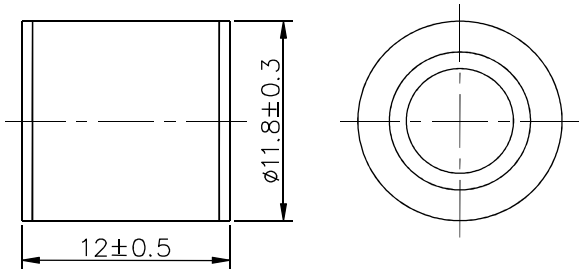
Electrical Characteristics

Model				2R090-12M	2R470-12M	2R600-12M	2R800-12M	Units
DC Spark-over Voltage [1) 2)]	at 100V/S			90±20%	470±20%	600±20%	800±20%	V
Impulse Spark-over Voltage	at 1KV/μS			<600	<900	<1000	<1200	V
Front of wave spark-over voltage	at 1.2/50 μs, 6 kV			<800	<1200	<1300	<1500	V
According to IEC 61643-311								
Nominal impulse discharge current	8/20μs	±5 times		30	30	30	30	KA
Max. impulse discharge current	8/20μs	1 time		40	40	40	40	KA
Class II (according to IEC 61643-11)								
Max. continuous operating voltage	at 50/60Hz		U_C	--	220	255	255	Vrms
Nominal impulse discharge current	8/20μs	15 times	I_n	20	20	20	20	KA
Max. impulse discharge current	8/20μs	1 time	I_{max}	40	40	40	40	KA
Follow current	at 50/60Hz		I_f	--	100	100	100	A
Class I (according to IEC 61643-11)								
Max. continuous operating voltage	at 50/60Hz		U_C	--	220	255	255	Vrms
Nominal impulse discharge current	8/20μs	15 times	I_n	20	20	20	20	KA
Impulse discharge current	10/350μs	5 times	I_{imp}	8	8	8	8	KA
Follow current	at 50/60Hz		I_f	--	100	100	100	A
AC discharge current (TOV [3)] at 1200V)	50Hz, 0.2S	1 time		--	100	100	100	A
Breakdown time				<100	<100	<100	<100	ns
typical values				<40	<40	<40	<40	ns
Insulation Resistance				>1	>1	>1	>1	GΩ
Insulation Resistance Measuring Voltage				50	100	100	100	V_{DC}
Capacitance	at 1MHz			<3	<3	<3	<3	pF
Weight								
2RXXXX-12M-LS0				~4.5	~4.5	~4.5	~4.5	g
2RXXXX-12M-LW0				~5.1	~5.1	~5.1	~5.1	g
Operation and storage temperature				-40~+125	-40~+125	-40~+125	-40~+125	°C
Climatic category (IEC60068-1)				40/125/21	40/125/21	40/125/21	40/125/21	
Certifications [3)]	UL1449	E508408		--	◎	◎	◎	
Marking, blue positive				**RUILON 2R090-12**	**RUILON 2R470-12**	**RUILON 2R600-12**	**RUILON 2R800-12**	
Surface treatment	Matte-tin plated							
Moisture sensitivity level [4)]	1							

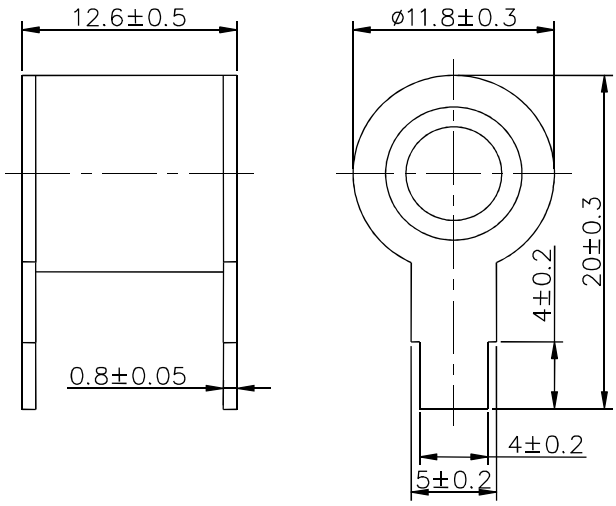
1) At delivery AQL 0.65 level II, DIN ISO 2859.
2) In ionized mode.
3) "◎" indicates that the product has passed the certification, "--" indicates that the product is not certified.
4) Tests according to JEDEC J-STD-020.

Dimensions (Unit: mm)

2RXXX-12M-LS0

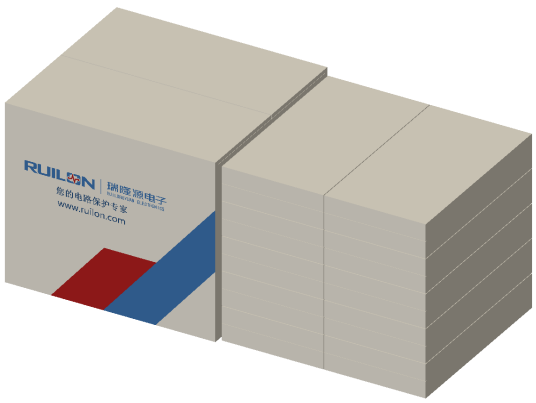


2RXXX-12M-LW0

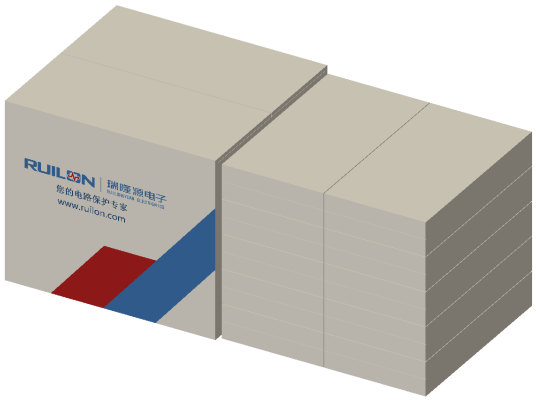


Packaging Information

2RXXX-12M-LS0

	PVC tray	Inner Box	Carton
Size	265×150×17mm	275×150×50mm	315×290×272mm
Quantity	MPQ: 1 tray=40pcs	MOQ: 1 Inner Box=3 trays=120pcs	1 Carton=10 Inner boxes=1,200pcs
Photos			

2RXXX-12M-LW0

	PVC tray	Inner Box	Carton
Size	265×150×17mm	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			

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

- The maximum continuous operating voltage value must be limited within the value of "U_C" (see Electrical Characteristics), and the following current value must be limited within the value of "I_f" (see Electrical Characteristics), so that the gas discharge tube can be properly extinguished during surge attenuation. Otherwise, the gas discharge tube may generate heat and ignite adjacent components.

- Gas discharge tubes may become hot in the event of longer periods of current stress (burn risk). In the event of overload the connectors may fail or the component may be destroyed.

- If the contacts of the gas discharge tubes are defective, current load can cause sparks and loud noises.

- Gas discharge tubes must be handled with care and must not be dropped.

- Damaged gas discharge tubes must not be re-used.

- The electrical characteristics described in this datasheet are only typical characteristics, and all of these characteristics have been confirmed through testing and inspection. If the customer's usage requirements are different from this or have special requirements, please contact Ruilongyuan Electronics Co., Ltd. If protection failure or circuit damage occurs as a result, our company is not responsible for it.

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