

 **SANKŌSHA**

# Catalog for Lightning Protection

Versatile Applications of GDT:  
From Power Device, Network Device to  
Railway Signaling

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ube

SANKOSHA proposes industry-leading lightning protection solutions.  
Don't hesitate to talk to us.

 **SANKŌSHA**

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● For printing reasons, the colors shown in the catalog may differ from those of the actual products.  
● Thank you in advance for understanding that product specifications and external appearance may sometimes undergo slight changes for the sake of improvement.

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# Sankosha Corporation

At Sankosha, we have worked to protect people and society from natural disasters through our core businesses of lightning protection, telecommunications and environmental countermeasures. Not only in Japan, but around the globe, we at Sankosha continue to work with our customers to deliver safety and security to an advanced information society as the world's only comprehensive lightning protection company, through every kind of service, from lightning observation to lightning protection.

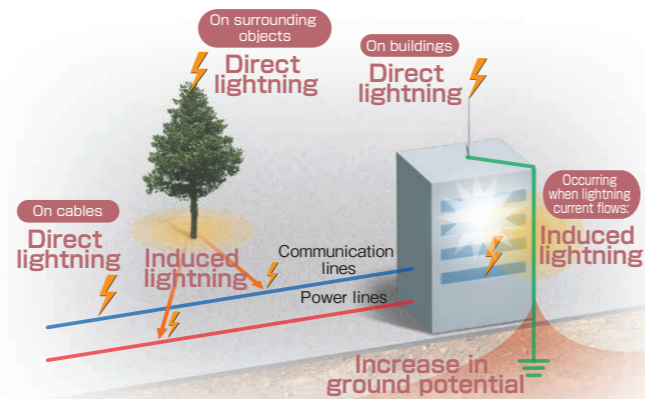
## Lightning Surges

### Direct Lightning

Direct lightning is that lightning directly strikes buildings and other objects on the ground. When an extremely large lightning current is formed, it changes not only into electrical energy but also into heat and mechanical energy momentarily, and is discharged with explosive force, causing damage to various types of equipment and machinery.

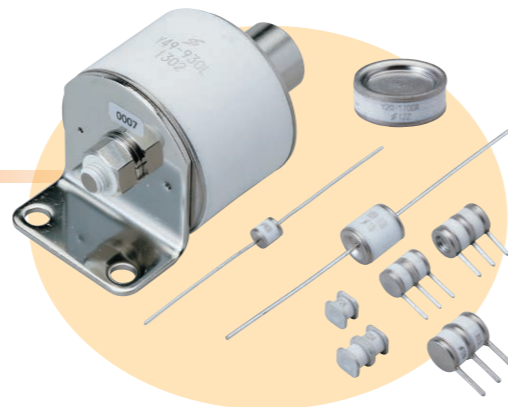
### Induced Lightning

Induced lightning is lightning surge (transient abnormally high voltage current) that is caused from communication and electrical power lines, and can enter via power supply lines, communication lines and earthing, etc. Most lightning damage is caused by induced lightning which destroys communication equipment and computers, and sometimes even power supplies, and therefore, the number of cases of lightning damage has risen dramatically in recent years.



# What's GDT ?

Gas Discharge Tube (GDT) also known as a Gas Discharge Arrester (GDA) — is an electrical protection device designed to protect sensitive electronic equipment and communication lines from high-voltage surges, such as those caused by lightning strikes, power line crosses, or electrostatic discharges.



The Ceramic Gas Tube Arresters manufactured by Sankosha Corporation provide protection for personnel, equipment and circuitry from the abnormally high transient voltages which can be caused by lightning or electromagnetic induction. The arresters are designed with defined surge limiting characteristics. When the abnormal voltage on a line reaches that defined level, sparkover (or breakdown) occurs within the gas tube arrester, the surge is redirected, and people and equipment are protected.

Sankosha's Ceramic Arresters are very durable and extremely gastight. They have precise sparkover voltages and very high AC current withstand capability and impulse withstand capability. Different applications require different types of arresters and Sankosha provides arresters to meet every need. Arrester models vary both in dimension and in electrical characteristics and it is important that arresters be selected in accordance with the requirements of the particular application.

The various standard designs that Sankosha currently produces are described in this catalogue. Arresters for special applications are also available, and we welcome your inquiries if the model you need is not listed here.

## GDT Usage

Gas Discharge Tubes (GDTs) are widely used in various applications to protect electronic equipment and circuits from voltage surges or transient overvoltage, such as those caused by lightning strikes, power line crosses, or switching events. Here are some key applications of GDTs:

### Telecommunication Equipment Protection

- Application** GDTs are commonly used in telecommunication systems, such as telephone lines, data transmission lines, and fiber optic equipment.
- Purpose** They protect sensitive telecom equipment (e.g., switches, routers, and modems) from voltage spikes caused by lightning strikes or other electrical disturbances.
- How** GDTs are placed across the incoming lines to divert surge currents to ground, preventing damage to the connected equipment.

### Power Line and Electrical Systems

- Application** GDTs are used in power systems, including substations, distribution boards, and electrical panels.
- Purpose** To protect electrical systems and equipment from transient overvoltage events, such as those caused by lightning or switching surges.
- How** GDTs are typically installed across power lines to divert high-voltage spikes to ground and protect transformers, circuit breakers, and other components.

### Surge Protection Devices (SPDs) for Consumer Electronics

- Application** GDTs are integrated into surge protection devices for consumer electronics like computers, televisions, home theater systems, and gaming consoles.
- Purpose** To safeguard sensitive devices from voltage spikes that could damage internal components like the power supply or motherboard.
- How** In surge protectors, GDTs act as the primary component that shunts the surge energy to ground, preventing the harmful effects of overvoltage.

### Automotive Electronics

- Application** GDTs are used in automotive electrical systems to protect critical components like sensors, control units, and navigation systems.
- Purpose** To prevent damage from electrical transients, such as those generated by switching inductive loads (e.g., relays or motors) or lightning strikes.
- How** GDTs are often included in automotive surge protection circuits to limit the voltage spikes that might otherwise affect delicate automotive electronics.

### Industrial Equipment and Control Systems

- Application** GDTs are used in industrial control systems, robotics, and machinery that require protection from power surges.
- Purpose** Protect industrial systems from power surges that could lead to costly downtime or damage to motors, PLCs (programmable logic controllers), and other sensitive components.
- How** GDTs are placed across power inputs or signal lines to divert transient voltages, ensuring the stability and longevity of the equipment.

### Renewable Energy Systems (Solar & Wind)

- Application** In renewable energy installations like solar panel arrays and wind turbines.
- Purpose** To protect inverters, control systems, and batteries from surges caused by lightning or grid switching events.
- How** GDTs are incorporated into surge protection circuits to divert excessive voltage to ground, preventing damage to the renewable energy system.

### Medical Equipment Protection

- Application** GDTs are used in medical devices and equipment such as diagnostic tools, patient monitoring systems, and life-support machines.
- Purpose** To protect sensitive medical equipment from power surges that could lead to malfunction or failure.
- How** GDTs ensure that transient overvoltage do not reach the medical devices, preserving the safety and integrity of the equipment.

### Data Centers and Servers

- Application** Data centers and server farms rely heavily on surge protection to ensure uninterrupted service.
- Purpose** GDTs help safeguard server racks, switches, routers, and critical network infrastructure from voltage surges that could cause data loss or hardware damage.
- How** Surge protectors with GDTs divert the surge current away from sensitive components, protecting mission-critical IT infrastructure.

### Power Supply Protection

- Application** GDTs are often found in power supply circuits, especially in uninterruptible power supplies (UPS) or AC/DC adapters.
- Purpose** To protect against voltage spikes that could damage the power conversion components or downstream equipment.
- How** GDTs act as a first line of defense, clamping excessive voltages to a safe level and preventing the surge from propagating through the power supply system.

### Railway Signal System Protection

- Application** GDTs are widely used in railway signal systems to safeguard sensitive control and communication circuits.
- Purpose** To protect against transient overvoltages caused by lightning strikes, switching operations, or power line disturbances that could compromise signaling reliability.
- How** GDTs function as a primary surge protection element, diverting excessive voltage away from critical components and maintaining system integrity under harsh electrical conditions.