



Reliability In Surge Protection Since 1937

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Coaxial Surge Protection Overview

Protection For Radio Communication Equipment

Radio communication equipment deployed in fixed, nomadic or mobile applications is especially vulnerable to lightning strikes because of their application in exposed areas. The most common disruption to service continuity result from transient surges originating from direct lightning strikes to the antenna pole, surrounding ground system or induced onto connections between these two areas. Radio equipment utilized in CDMA, GSM/UMTS, WiMAX or TETRA base stations, must consider this risk in order to insure uninterrupted service. CITEL offers three specific surge protection technologies for Radio Frequency (RF) communication lines that are individually suited for the different operational requirements of each system.

RF Surge Protection Technology

Gas Tube DC Pass Protection

P8AX series

Gas Discharge Tube (GDT) DC Pass Protection is the only surge protection component usable on very high frequency transmission (up to 6 GHz) due to its very low capacitance. In a GDT based coaxial surge protector, the GDT is connected in parallel between the central conductor and the external shield. The device operates when its sparkover voltage is reached, during an overvoltage condition and the line is briefly shorted (arc voltage) and diverted away from sensitive equipment. The sparkover voltage depends on the rise front of the overvoltage. The higher the dV/dt of the overvoltage, the higher the sparkover voltage of the surge protector. When the overvoltage disappears, the gas discharge tube returns to its normal passive, highly insulated state and is ready to operate again. The GDT is held in a specially designed holder that maximizes conduction during large surge events and still very easily removed if maintenance is required due to an end of life scenario. The P8AX Series can be used on coaxial lines running DC voltages up to $\pm 48V$ DC.

Hybrid Protection

DC Pass - CXF60 series

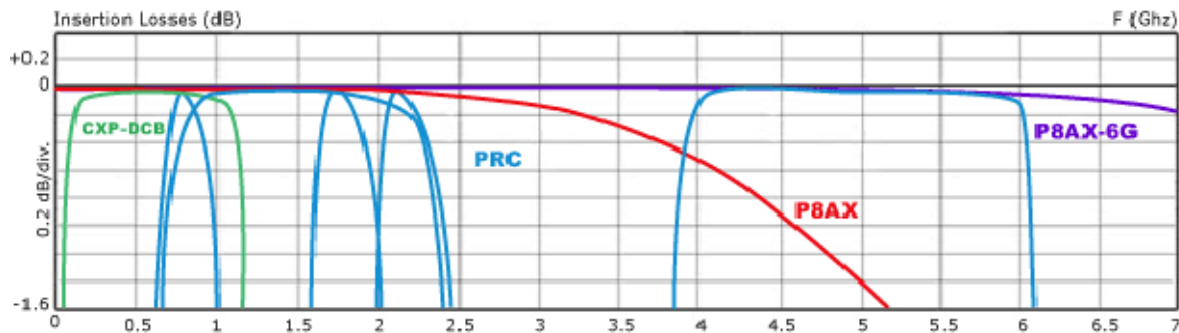
DC Blocked - CXP-DCB series

Hybrid DC Pass Protection is an association of filtering components and a heavy duty gas discharge tube (GDT). This design provides an excellent low residual let through voltage for low frequency disturbances due to electrical transients and still provides a high surge discharge current capability.

Quarter Wave DC Blocked Protection

PRC series

Quarter Wave DC Blocked Protection is an active band pass filter. It has no active components. Rather the body and corresponding stub are tuned to one quarter of the desired wave length. This allows only a specific frequency band to pass through the unit. Since lightning operates only on a very small spectrum, from a few hundred kHz to a few MHz, it and all other frequency's are short-circuited to ground. The PRC technology can be selected for a very narrow band or wide band depending on the application. The only limitation for surge current is the associated connector type. Typically, a 7/16 Din connector can handle 100kA 8/20us while an N-type connector can handle up to 50kA 8/20us.



STANDARDS

UL497B – Protectors for Data Communication and Fire-Alarm Circuits

UL497C – Protectors for Coaxial Communication Circuits

Selecting a Coaxial Surge Protector

The information required to properly select a surge protector for your application is the following:

- Frequency Range
- Line Voltage
- Connector Type
- Gender Type
- Mounting
- Technology

INSTALLATION

The proper installation of a coaxial surge protector is largely dependent on its connection to a low impedance grounding system. The following rules must be strictly observed:

- Equipotential Grounding System: All the bonding conductors of the installation must be interconnected to each other and connected back to the grounding system.
- Low Impedance Connection: The coaxial surge protector needs to have a low resistance connection to the Ground System.
- Location of Protection: The protectors should be placed at the entrance of installation to limit the penetration of lightning current inside the facility in addition to direct placement in front of the sensitive equipment.

Mounting options include:

1) Feed through Mounting by Bulkhead or Mounting Bracket: This is the direct mounting of the surge protector onto the ground frame or ground plate at the installations service entrance.

- Provides perfect connection to the grounding system
- Located at optimal point where surge currents enter at the entrance of the installation
- Good mechanical withstand capability

2) Ground Screw: Connection to the grounding system is directly by wire via ground screw on the chassis and then to grounding system (4 mm² minimum).

MAINTENANCE

CITEL coaxial line surge protectors require no maintenance or replacement under normal conditions. They are designed to withstand repeated, heavy duty surge currents without damage.

Nevertheless, it is prudent to plan for the worst case scenario and, for this reason; CITEL has designed for the replacement of protection components where practical. The P8AX Series incorporates an easy to use GDT holder that allows for the protective component to be replaced without the need for special tools or knowledge. The failure mode for a coaxial surge protector is either fail short to ground or fail open.

The status of your coaxial surge protector can be tested with CITEL's model T1000KE. This unit is designed to test for the DC sparkover voltage of the GDT. The T1000KE is a compact, single push button unit with a digital display. The voltage range of the tester is 0 to 999 volts.