

CA range

Surge protection devices for use on coaxial transmission lines.

NOTE

Adhering to these instructions guarantees maximum performance of this Protection device.

1 Introduction

The CA (CoAxial) range of surge protection devices (SPDs) are designed to protect electronic (principally radio) equipment connected to coaxial transmission lines (also called “feeders”) from damage due to lightning-induced transient over-voltages. The protection element, a gas discharge tube (GDT), limits the voltage between inner and screen conductors of the coaxial cable. The GDT’s low capacitance allows the CA to have a broad bandwidth, from dc to over 2GHz, depending on the connector type. Its relatively high limiting voltage renders it suitable for use with radio transmitters or transceivers using powers of up to several hundred watts.

2. Important safety information



WARNING

Do not carry out installation work when thunder storms are present or threatened. Ensure that no radio frequency (rf) transmitter is supplying power when disconnecting antenna feeders.

Installation principles

- Lightning currents ultimately flow into the ground; that is, soil and rock.
- If the building housing the electronic equipment is at risk from a direct lightning

strike, structural lightning protection with an effective earthing (or “grounding”) system should be fitted (details are beyond the scope of this Guide). Surge protection devices protect electronic equipment, not buildings.

- Similarly, antenna towers should be properly earthed.
- It is better to prevent lightning current from entering an installation than to deal with it once it has entered.
- All cables entering a building and connected to electronic equipment should be equipped with surgeprotection devices. This includes coaxial cables, mains supply, telephone lines, and data cables. Any unprotected input or output renders the whole system liable to damage.
- A single reference potential point must be defined for the protected equipment. This can be the building main earth terminal, or the “earth” connection of the mains surge protection device if this has to be fitted remote from the main earth terminal. It is sometimes called “star point”, and the method, “star point earthing”.
- Surge protection devices should all be connected (“earthed”) to this point. In all cases, the reference potential point must be the same for the SPDs and the protected equipment.

continued

- The shortest possible length of “earth” wire should be used between surge protection devices and the reference potential point, to minimise inductance. To make this possible, all cables should be routed to pass close to the reference potential point, even if this means lengthening them.
- Metal panels are preferable to wires because they have much lower inductance.

Notes:

1. The requirements of surge protection may conflict with other considerations e.g. the earthing of antenna feeders, which may need a longer run of cable than the minimum desirable for the transmission of rf signals.
2. The term “earth” (often alternatively called “ground”) is used in quotes since it is commonly used, but without definition can be meaningless or misleading.

In what follows, “earthed” means ‘electrically connected to the reference potential point’.

4 Installation practice

Please read the Installation Principles section

4.1 Where to route the cable

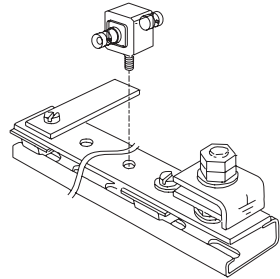
Bring the incoming coaxial cable into the building close to the reference potential point (within 1 metre/1.09 yards). Where present, a bulkhead panel may provide a practical reference potential point:

4.2 Where to site the CA

Mount the CA as close to the reference potential point as possible, taking advantage of available metalwork to provide a good electrical connection. If metalwork cannot be used, mounting brackets are available see the figure opposite).

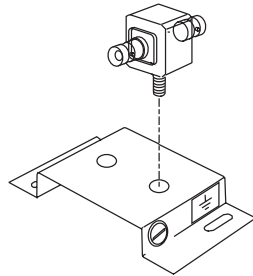
Mounting options

MK mount



- MK2** mounting kit for up to 2 CAs
- MK5** mounting kit for up to 5 CAs
- MK10** mounting kit for up to 10 CAs

MC mount



- MC1** mounting bracket for 1 CA device
- MC2** mounting bracket for up to 2 CAs

4.3 Earthing the CA

Case 1: Coaxial cable screen earthed at bulkhead panel:

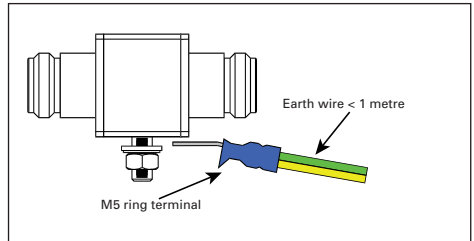
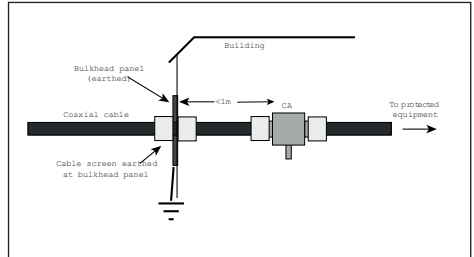
- Fit CA within 1 metre/1.09 yards of bulkhead.
- No need to separately earth CA.

Case 2: Coaxial cable screen earthed via CA:

- Mount CA on available earthed sheet metal if practical; recommended clearance hole diameter 5.2mm (0.21”).

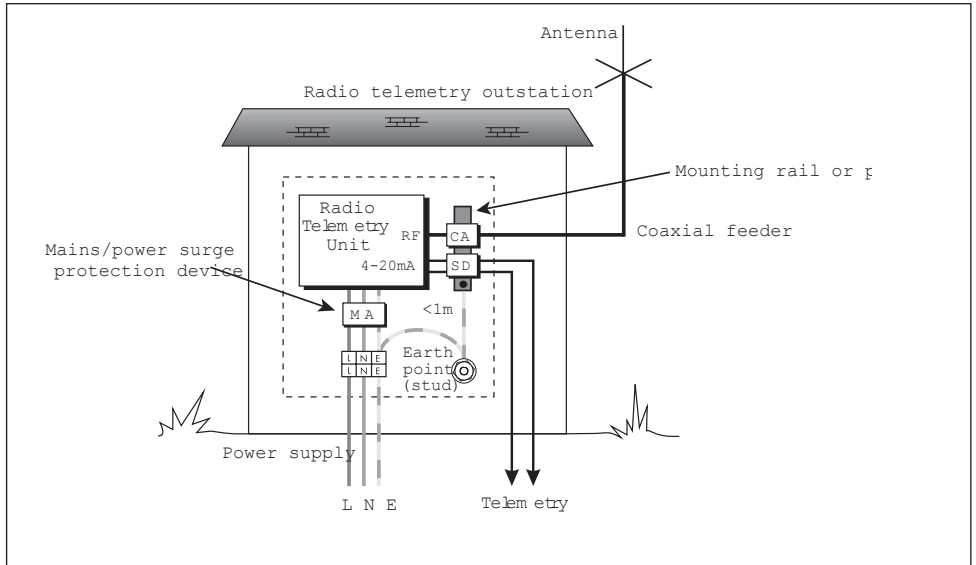
If not:

- Mount CA close to earth point (<1 metre/1.09 yards).
- Earth CA using wire, cross section 2.5mm (0.1”) or greater. Connection should be made with the aid of an M5 ring crimp terminal or solder tag, either to the CA mounting bolt or the earthing bolt on the MC mount. The MK mount requires an M8 ring terminal.
- Keep wire as short as possible (<1metre/1.09 yards) to minimise inductance. (Increasing cross sectional area of a wire has relatively little effect on inductance.



4.4 Example

An example of the protection of a radio telemetry outstation, illustrating the points above, is shown below.

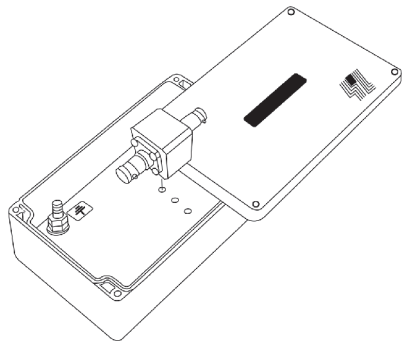


5 Weatherproofing and corrosion resistance

The CA has an Ingress Protection (IP) rating of IP65, which means that it will not allow ingress of dust and there should be no ill-effects from low pressure jets of water (equivalent to moderate rainfall).

The materials and platings used have been selected to minimise bi-metallic corrosion. Silver plated connectors and bodies are standard, and stainless steel nuts, screws and washers are used throughout.

However, it is wise to shield the CA from exposure to moisture, salt spray or corrosive atmospheres, especially if the connector type used is not inherently weatherproof. A weatherproof enclosure is available if desired (see the figure to the right). Self-amalgamating tape is also commonly used.



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