How to apply protection and what to use

We've described how protection should be installed on all cables which enter or leave the building (except fibre optic); the power supply local to important equipment; electronic equipment outside the main building(s).

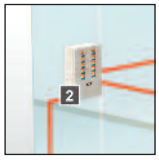
With the aid of the illustration we can see how this might be applied in practice.

Protect incoming and outgoing electrical services

We'll start by considering the main (office) building in isolation.

Incoming mains power supplies

Install protection on the incoming mains power supply at the incoming distribution board(s).

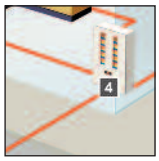


If, as in this example, there are any other power supplies entering the building install protection on these near where they enter the building.

Outgoing mains power supplies

Outgoing supplies can provide transient overvoltages with a route back into the building's power distribution system.

Install protection on supplies to other buildings. (Note how, if correctly positioned, the protector at the incoming distribution board (1), also protects against transients from the outgoing supply to the UPS building.)

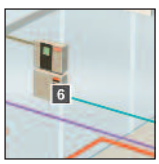


Install protection on outgoing supplies to site services, such as CCTV systems and site lighting.

Protect all incoming/outgoing data communication, signal and telephone lines (unless fibre optic).

Telephone lines

Incoming telephone lines and extensions that leave the building have protectors installed on them at the PBX's distribution frame.

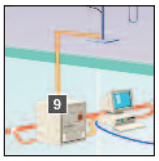


In our example, there is a direct (i.e. not via the PBX) telephone line to an alarm panel, which also needs protecting.

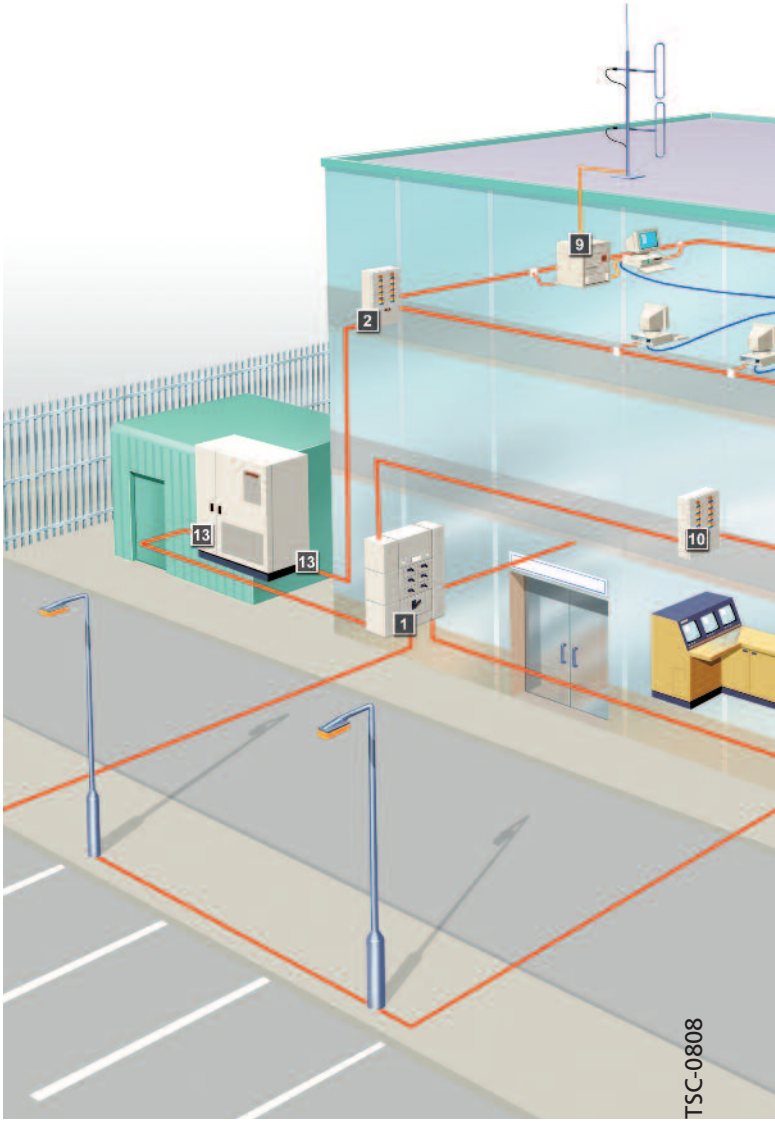
Signal and data communication lines

Protectors are installed on CCTV video cables from outdoor cameras to prevent damage to the control desk.

A protector is installed at the network hub to protect it from transients on the between building data link.



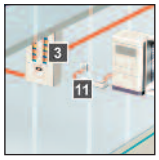
Equipment such as our RF receiver, with antenna (or satellite) links will also need protecting.



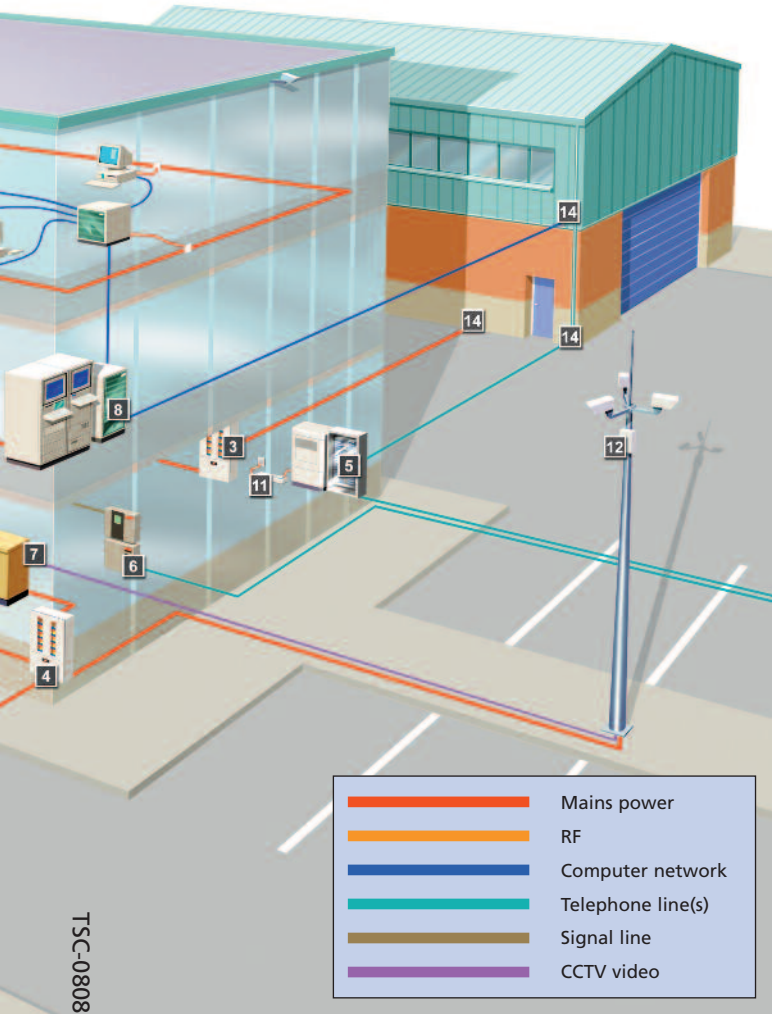
Protect the power supply locally to important equipment

Within the building transient overvoltages can be injected on to the mains power supply (downstream of the protector at the incomer). Consequently, protectors should be installed close to important pieces of equipment.

Protection is installed on the local distribution board feeding the servers and network hub. (Note how the top floor PC network and RF receiver is protected by the protector on the distribution board (2).)



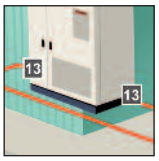
The telephone PBX is protected locally by a plug-in protector.



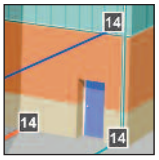
Protect electronic equipment outside the building

Electronic equipment outside the main building in ancillary buildings, on site or in the field should also be protected.

Protect outdoor CCTV cameras with protectors on the power supply, and video cable (and, if relevant, telemetry control line).



If the UPS is housed in a separate building with a separate earth, incoming and outgoing supplies will need to be protected. This is because most modern UPS systems contain electronics that makes them vulnerable to being disabled by transient overvoltages. To prevent transient overvoltage damage to the UPS it must have a protector installed on its input and (because its outgoing supply leaves the building) on its output. A protector will also need to be installed on the power supply into the main building (2).



Protection is also installed on mains power, data communication and telephone lines entering the neighbouring building. Additional protection (not shown) may be required within this building (whether it's a computer-controlled warehouse or automated manufacturing operation with PLCs, drives and computer controls).

Protector selector

(1) Mains wire-in protectors
(2) Mains wire-in protectors
(3) Mains wire-in protectors
(4) Mains wire-in protectors
(5) PBX telephone/ISDN line protection
(6) Plug-in telephone line protection, or
Wire-in telephone line protection
(7) CCTV video protectors
(8) Computer network protector
(9) RF signal protector
(10) Mains wire-in protector
(11) Plug-in mains protector
(12) Protectors for
low current mains power supplies,
CCTV video and
telemetry lines
(13) Mains wire-in protectors
(14) Mains wire-in protectors
Computer network protector
PBX telephone/ISDN line protection