

## Surge Protection Devices for Overvoltages of Atmospheric Origin

The protection of installations from the effects of overvoltages of atmospheric origin (lightning) is a specialist topic and although we are not experts in the field, we have acquired knowledge on the subject through the incorporation of a range of Surge Protection Devices (SPD) on major projects for the Construction, Outdoor Event, Rail, Military and Nuclear sectors. Our Projects Team are happy to provide input to specifiers and customers whenever SPDs are being considered for incorporation within our different products.

With regards to relevant standards, BS EN 62305 now details lightning protection requirements for buildings and BS7671 Regulation 443 details requirements for the incorporation of SPDs within installations. Of particular note, Section 443.2.4 provides criteria for risk assessments on installations which might need protection for reasons other than those arising from "normal" external influences (AQ).

As a general guide, SPDs should be manufactured in accordance with BS EN 61643 and selection of the correct device requires the following to be established:

- Class of protection required (Type 1, 2 or 3)
- Voltage protection level ( $U_p$ )
- Maximum continuous operating voltage ( $U_c$ )
- Circuit design current ( $I_b$ )
- Temporary over-voltages ( $U_{TOV}$ )
- Nominal discharge current ( $I_{nspd}$ ) and impulse current ( $I_{imp}$ )
- Prospective fault current and the follow current interrupt rating
- Earthing arrangement of the supply (TN-C-S, TNS, TT, IT)

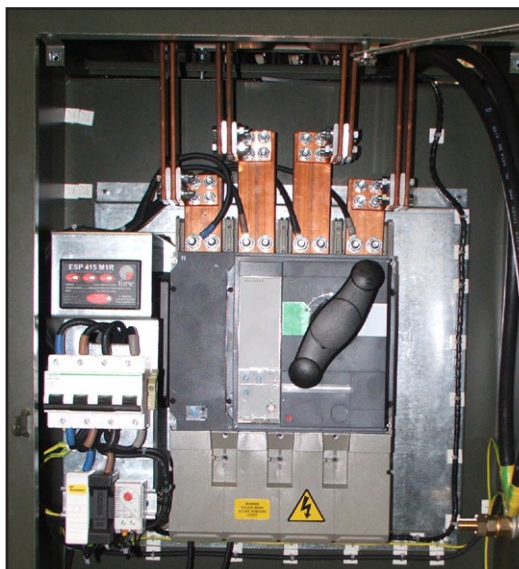
Having identified the correct Type of device, the most important factor in SPD selection is the voltage protection level ( $U_p$ ). The SPD's voltage protection level must be lower than the impulse withstand voltage ( $U_w$ ) of the equipment being protected. Lightning impulse current ( $I_{imp}$ ) is only relevant where Type 1 surge protection is required i.e. where a building or structure is at risk from a direct lightning strike and incorporates a lightning protection system. Once in possession of the above details, we can recommend SPDs from a range of manufacturers to satisfy the key requirements.

When SPDs are incorporated in to our assemblies, they need to be protected by an overcurrent protective device (OCPD), which usually comprises of HRC fuses but can be a suitably rated MCB or MCCB. The SPD manufacturer will specify the maximum rating of the OCPD. However, it is also necessary to provide discrimination between the supply OCPD and the OCPD feeding the SPD. As a rule of thumb the OCPD protecting the SPD should be rated at approximately half the value of the upstream OCPD, up to the maximum fuse rating specified by the SPD manufacturer.

If you would like to discuss the issues relating to the incorporation of SPDs in to our assemblies, please contact our Projects Team. There is also some additional information on SPDs in Technical Data Sheet ref. TDS20, which is available in the Downloads section of our website.



4 Pole Type 1 Protector supplied via  
63A HRC fuses



4 Pole Type 1 Protector supplied via  
a 125A 4P MCB



2 no. 4P Type 2 Protectors supplied via  
50A 4P MCBs