

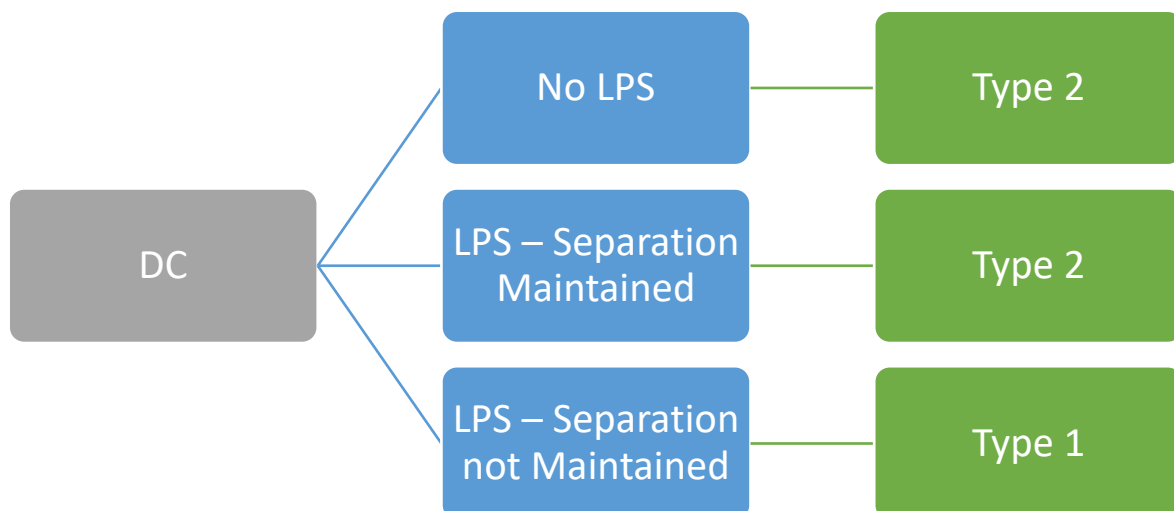
New regulation 712.443.101 states that where protection against transient overvoltage is required by section 443, such protection shall also be applied to the DC side of the PV installation. So, for example, the solar installation as on the roof of an industrial building where the regulations in section 443 require SPD's to be installed, SPD's would now also need to be installed on the DC side of the installation to protect both the PV panels and the inverter.

When a PV system is installed within the protected volume of the LPS system, the PV system should be separated from all parts of the LPS in accordance with BSEN 62305-3, which describes the calculation for the correct separation distance. If the separation distance is not met, then to BSEN 62305 a type 1 device will be needed to protect the installation from the effects of lightning.

All SPD's installed on the DC side of a PV installation shall comply with BSEN 61643-31. When the inverter incorporates an SPD, it is only considered as fulfilling the SPD requirement if the manufacturer specifies its use for the DC side of the PV installation, otherwise, it will need an external SPD. Varistors included in the inverter are not considered an SPD.

Generally, the SPD will be a Type 2, unless the building has an external lightning protection system. If the LPS does not have the correct separation distance according to BSEN 62305-3, a type 1 device will be required.

Figure 1

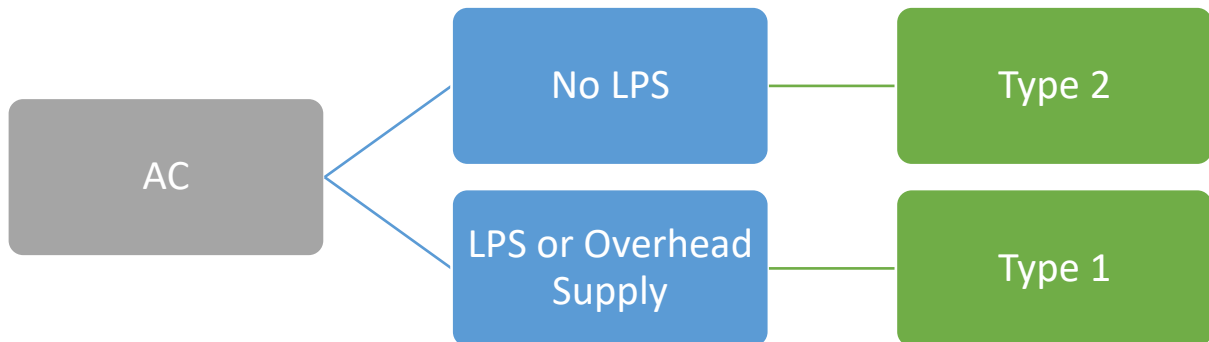


On selection of the SPD for the PV system, care must be taken to ensure that the following guidelines are met:

- The U_p of the SPD must not exceed the U_w of the equipment to be protected (If you do not have this information, table 712.1 in BS7671 will provide average ratings)
- The U_{cpv} should be greater than or equal to the $U_{oc\ max}$ of the PV array
- Type 2 SPD's should have a minimum I_n of 5kA
- Type 1 SPD's Should have a minimum I_{imp} of 12.5kA

Where the inverter is located more than 10 meters away from the origin of the installation, an SPD shall be installed near the inverter, in addition to the SPD at the origin of the installation. The type of device will depend on the installation, figure 2 will help to determine what is required.

Figure 2



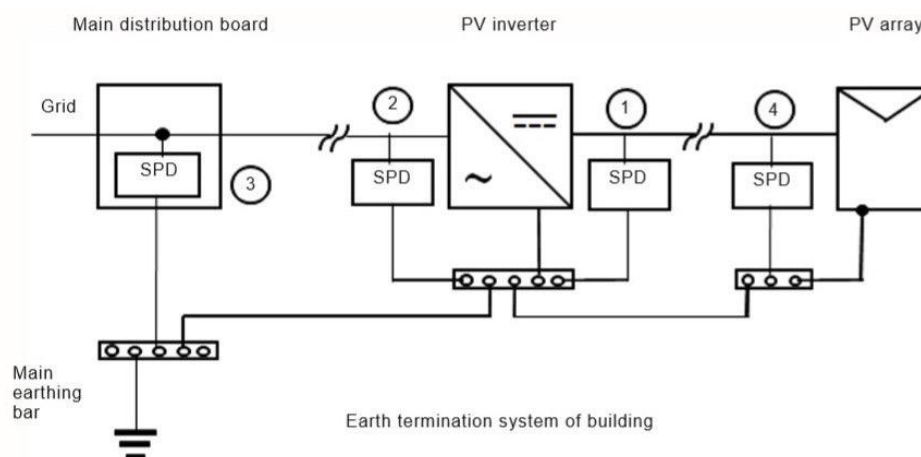
SPD's on the DC side shall be located as close as possible to the inverter, and to provide protection additional SPD's may be required further from the inverter.

Figure 3 is recreated from BS IEC 61643-32. It details the locations required for SPD's on a PV installation.

AC side: The SPD at location 3 is the main incomer, which is required under BS 7671, section 443 or BSEN 62305, if an LPS system is present. If the SPD at location 3 is more than 10 meters from the PV inverter, an additional SPD should be installed at location 2, the type of this device can be decided using figure 2.

DC side: If an SPD is located at location 3, then a DC SPD is required at location 1, the type can be decided using figure 1. If the PV array is located more than 10 meters away from the SPD at location 1, then an additional SPD can be installed at location 4 to provide local protection for the PV array.

Figure 3



If you would be interested in free CPD training on all things surge protection related, please visit www.surgedevices.co.uk and register directly through our training academy.

Alternatively, for more information on the use of surge protection devices contact the surge protection experts on 01484 851747, or email us at info@surgedevices.co.uk.