

PV Fact Sheet

09 | Earthing of PV installations

Earthing of the surge protection in a PV installation

This fact sheet focuses on photovoltaic installations on top of buildings within the European Union. One essential part of such an installation is the PV combiner box. These boxes are used to combine several strings and to protect against overvoltage and feature many more functions.

In the event of a lightning strike, overvoltages occur within a radius of approx. 2 km, which can affect and destroy all electrical equipment - including a PV system. For this reason, the following rules must be considered within the EU for the commissioning of a PV system. These requirements are defined in the EN* 51643-32:2020.

Which advantages does surge protection offer?

Surge protection products are used to shield devices against the high voltages created, for instance, by lightning strikes. This is achieved by means of varistors, which lower their resistance with rising voltage. If a sudden surge occurs, the varistors lose almost all resistance and thereby redirect the overload into the earth connector.

In order to reliably discharge this overload, it must be ensured that each surge device is connected to an equipotential bonding rail. In the PV system shown below, the DC SPD (1) is connected to the equipotential bonding rail (A) and the DC SPD (2) to the equipotential bonding rail (B). The PV modules are also connected to the equipotential bonding rail (A). Looping the earth line of the PV modules through e.g. the DC SPD, which is usually a combiner box, is not permitted for safety reasons. This type of installation ensures that protection is still provided when the generator junction box is removed. The individual equipotential bonding bars are finally brought together at the main earthing connection point.

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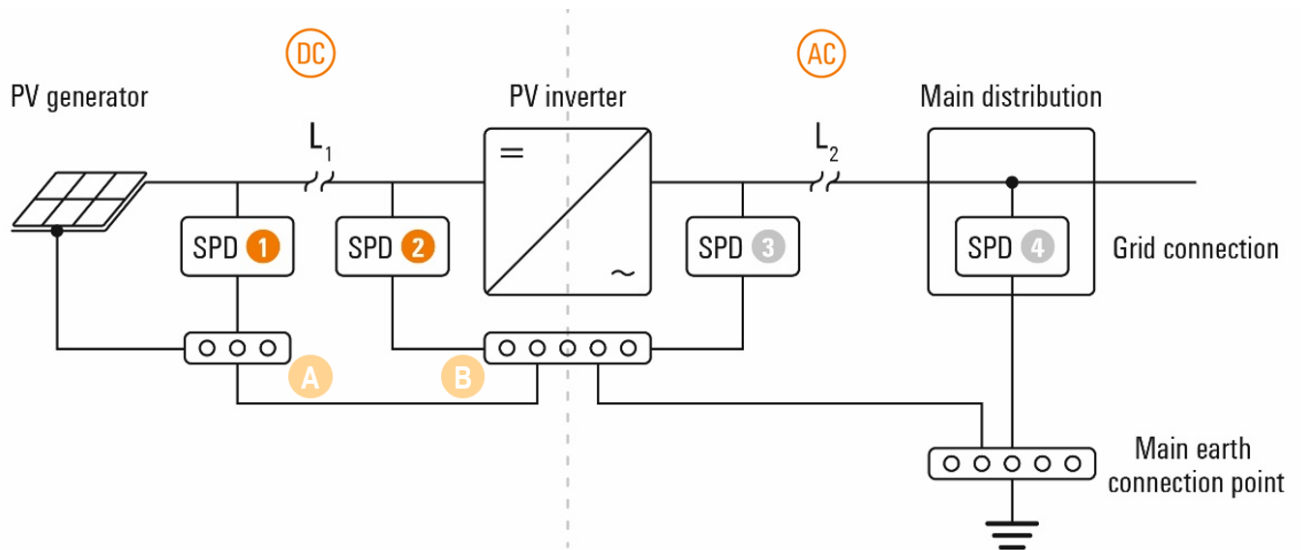


Figure 1: Source: EN 51643-32:2020 - Installation of SPDs in a building without external lightning protection

Advantages of Weidmüller products

PV Next combiner boxes and overvoltage protection boxes (OVP Boxes) are small enough to be placed close to the PV modules. This means that they can safeguard against thermal damages to the building/house in the event of a lightning strike. The voltage protection units (VPUs) can be replaced very easily and quickly thanks to their design as plug-in elements. In addition, the failure of a VPU can be easily detected using the remote contact or the signal fields.



Figure 1: Weidmüller PV Next combiner box



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