LIGHTNING PROTECTION AND EQUIPOTENTIAL BONDING
iFIX OST-WEST
VERSION 2022

The smart substructure for photovoltaic installations

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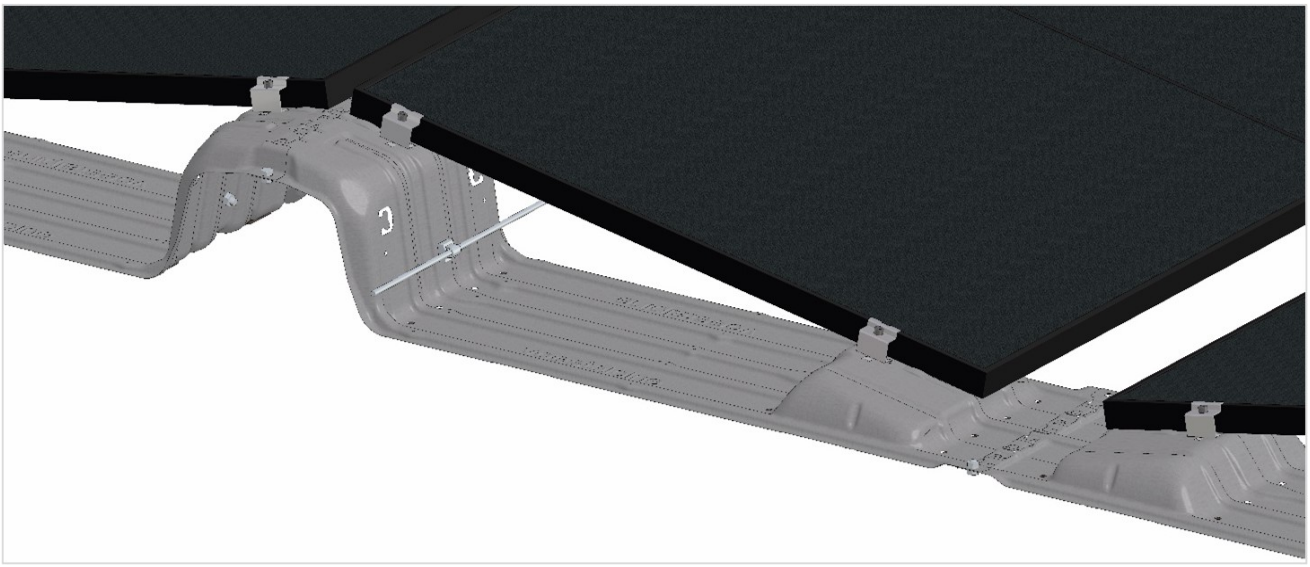
ONE STEP AHEAD.

FUNDAMENTALS

This document contains instructions regarding equipotential bonding and lightning protection for the electrical design of PV systems with the iFIX OW mounting system version 2021. All information provided here should be viewed only as a non-binding recommendation. The responsibility for the standard-compliant design of the electrical system always lies with the installation company carrying out the work or with a lightning protection planning office. Planning and execution must comply with national and local standards.

We would like to point out that this recommendation was prepared on the basis of German standards. The components and system connectors used in iFIX OW have been tested for lightning current load capacity, making it easy to implement a complete, standard-compliant, external lightning protection system for the PV system. The lightning current load capacity of the iFIX OW system connectors has been verified by the accredi-ted DEHN Test Centre, test report no. 2284_FRM dated January 09, 2023.

Figure 1: iFIX OW – example showing connection possibilities for equipotential bonding and lightning protection.



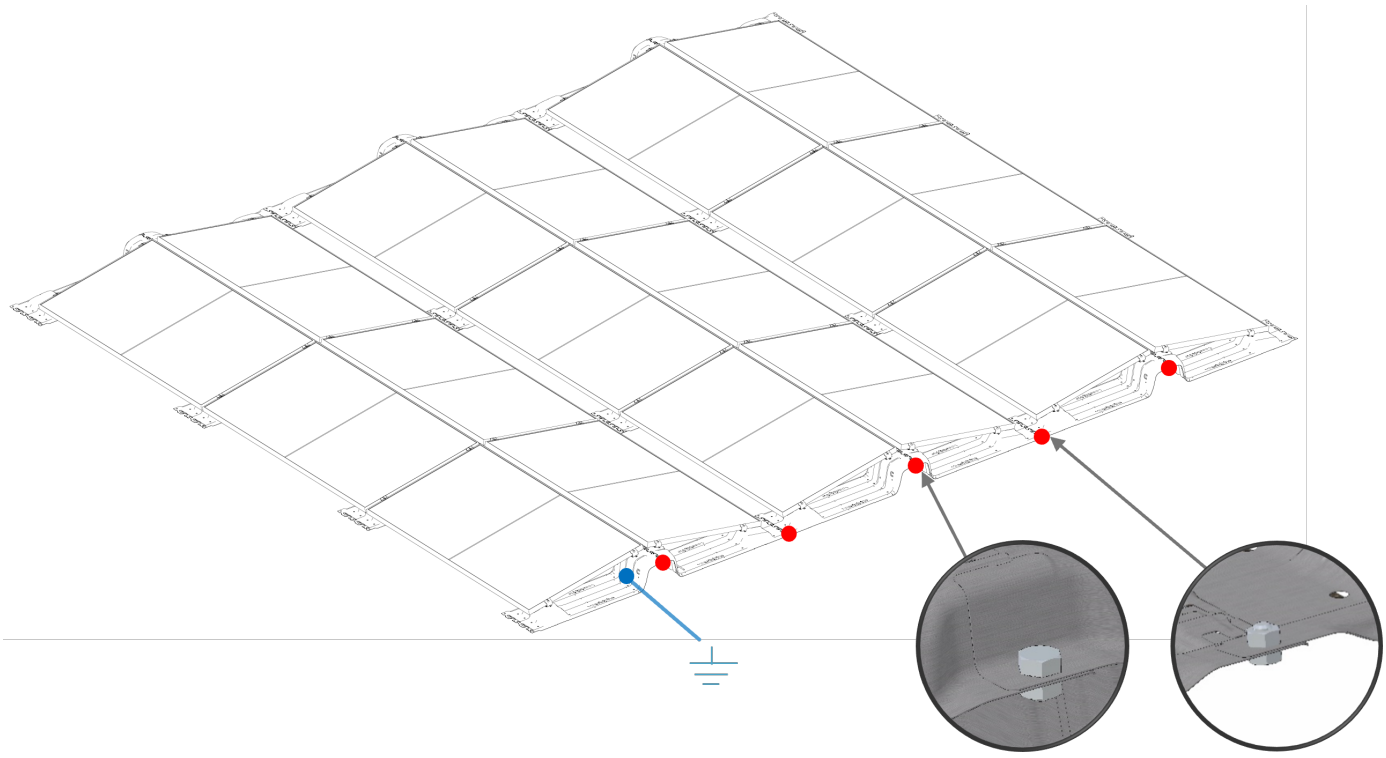
EQUIPOTENTIAL BONDING

It is generally recommended to include a PV system's components in the on-site equipotential bonding in accordance with DIN VDE 0100-712 and DIN VDE 0100-540. There must be an electrically conductive connection between all of the substructure's accessible components. The installer of the system ultimately decides whether and where equipotential bonding is necessary.

Depending on the module manufacturer's specifications, the module frames may need to be included in this equipotential bonding. Ideally, equipotential bonding should be installed so that it will continue to function when modules are removed from the layout for servicing. iFIX module center and end clamps are basically designed with grounding function so that there is a low-resistance connection within the PV module rows. Within each PV module array, each row must be connected to ground. The connections must be made in at least 6 mm² copper (or equivalent).

Figure 2 : Clamps

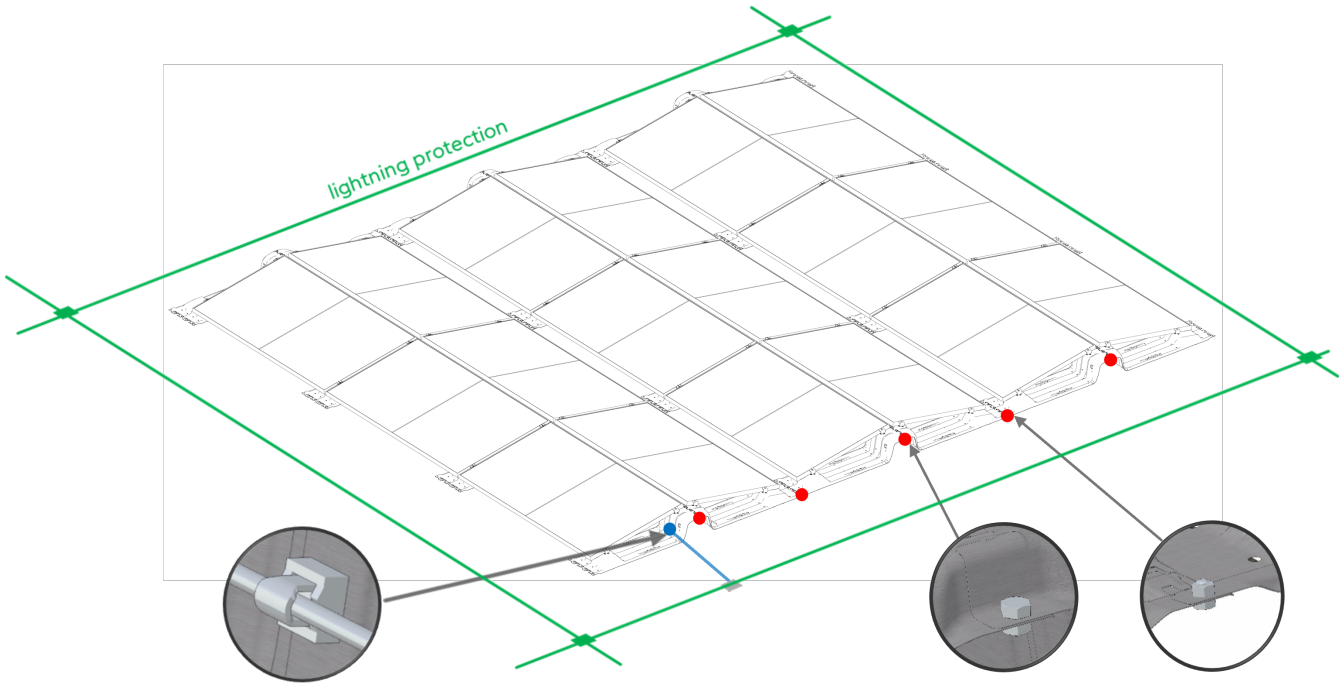
Figure 3: Equipotential bonding
The figure shows the equipotential bonding within a PV module field with the provided connectors



LIGHTNING PROTECTION IN COMPLIANCE WITH SEPARATION DISTANCES

If a PV system is to be installed on a flat roof that has an external lightning protection system, make sure that the PV system's structural elements do not impair the functioning of the lightning protection system. We recommend designing the PV system so that it can be retroactively included in the protection area of the building's lightning protection. Ideally, the minimum separation distance between the PV system and the lightning protection system should be maintained (see VDE 0185-305-3 Supplement 5). Do not shorten these separation distances at any point unless specially insulated cable runs are used where the two systems are close to each other.

Figure 4: Blitzschutz unter Einhaltung von Trennungsabständen. Die Abbildung zeigt ein PV-Modul-Feld mit den vorgesehenen Verbindern und die Anbindung an den bestehenden Blitzschutz mit Runddraht

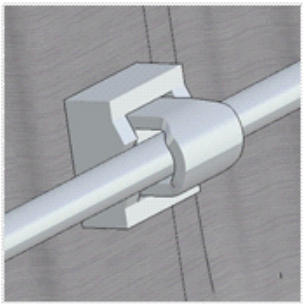


LIGHTNING PROTECTION IN COMPLIANCE WITH SEPARATION DISTANCES

Since in this case the relevant standards require the PV system to be connected to the lightning protection system, no separation distances have to be taken into account. The substructure's internal connectors must be low-resistance connected to the lightning protection system's components at as many points as possible. Since the PV system's equi-potential bonding can no longer be separated from the lightning protection, all connectors must be designed with lightning current load capacity and with cross sections of at least 16 mm² copper (or equiva-lent).

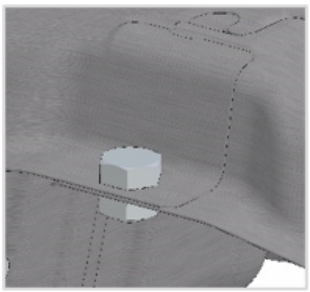
iFIX OW 2021 meets the necessary prerequisites for this type of integrated lightning protection. The internal system connectors have been tested specifically for this application in line with the test methods in DIN EN 62561-1 (VDE 0185-561-1):2017-12, section 6.3.1 and section 6.4. Suitable connector components are available.

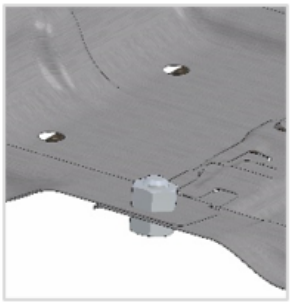
Connection components:



Clamping screw connector

from Dehn, part no. 301000, with a tightening torque of 20 Nm in combination with round aluminum wire.





Hexagon bolt M10 x 12 mm

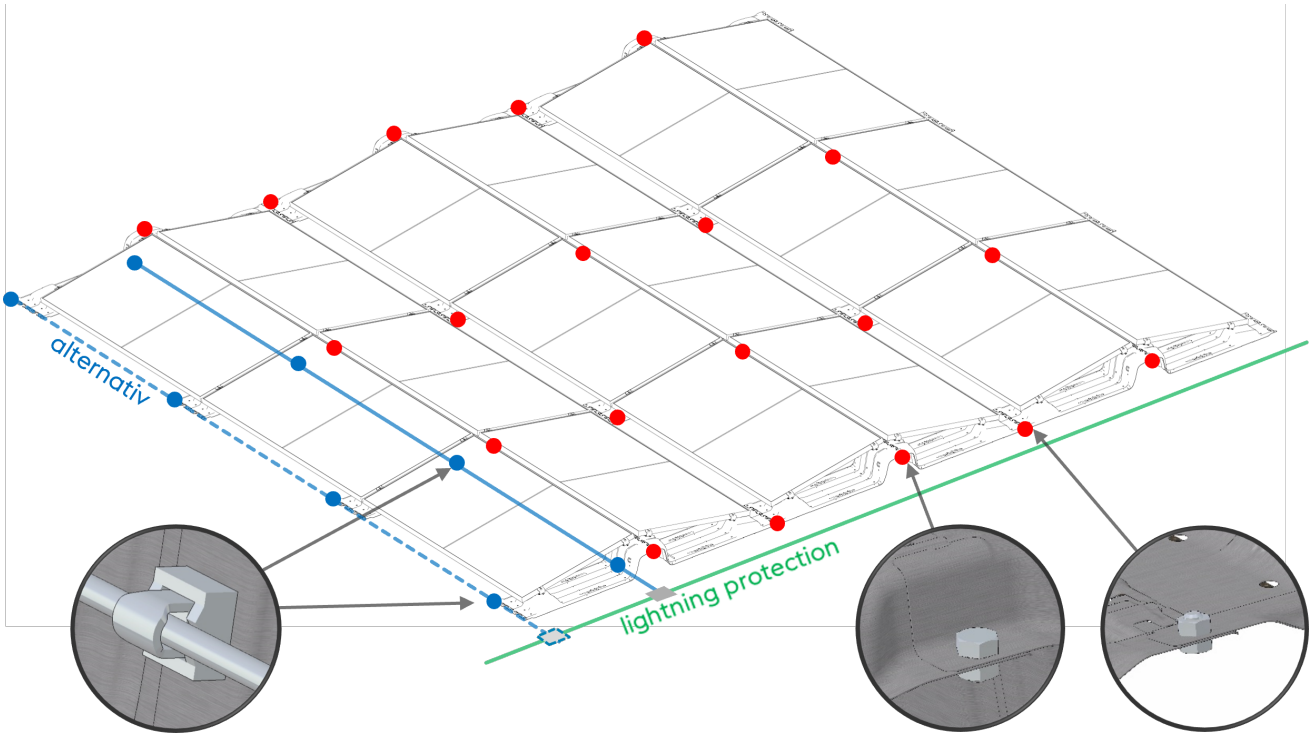
With thread to head A2 - Din 933, width across flats 17 mm, head height 6.4 mm

Hexagon nut M10

A2 - DIN 934/ISO 4032, width across flats 17 mm, Height 8 mm Tightening torque 20 Nm

LIGHTNING PROTECTION WITHOUT MAINTAINING SEPARATION DISTANCES

Figure 5 : Lightning protection without compliance with separation distances. The figure shows a PV module array with the provided connectors and the connection to the existing lightning protection with round wire



TO BE OBSERVED

Suitable expansion elements must be provided for round wire lengths of more than 15 meters. If there are gaps in the module layout, make sure that all modules are integrated in the equipotential bonding and lightning protection. The detailed requirements regarding lightning current load capacity and the design of the arresters are described in the relevant standards. The entire wiring concept must be coordinated with a lightning protection planning office or a lightning protection specialist.

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