

PV Fact Sheet

06 | Enclosures of the combiner boxes

This fact sheet focuses on photovoltaic installations in solar parks worldwide. 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.

Why is it good that the enclosures of the combiner boxes are class II?

Every device or object has a basic (functional) insulation or necessary insulation to ensure its correct operation. The enclosures used in Weidmüller combiner boxes have a class II protection system, which consists of supplementing the functional insulation with a second protective insulation so that, in the event of failure of the first insulation, no accessible metal parts can be exposed to voltage. The receptors, the protection system of which is double insulation, are identified by the symbol of a square inside a square.

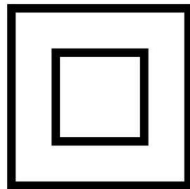


Image 1. Class II protection symbol.



Image 2. Example of an Weidmüller combiner box label.

Fiberglass vs Metallic enclosures. Which is better?

The material chosen for enclosures is the Fiberglass, here are the reasons why the Weidmüller made this selection:

1. Oxide: In aggressive environments such as tropical climates, high humidity or salt spray, the useful life of a metal cabinet is very short, while a polyester cabinet can last several years without modifying its mechanical qualities.
2. Easy mechanization: The machining is very complex and dangerous to perform on a metal cabinet because it destroys the corrosion protection of the metal, while on the other hand, on polyester it is fast, simple, and safe.
3. Reduced risk of accidents: With a metal cabinet there is a risk of electric shock, however, polyester is fully insulating, polyester withstands up to 1500 Vdc while properly protected metal only 1000 Vdc, the same as plastic cabinets.

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4. Self-extinguishing: The fiberglass-reinforced polyester (GPR), is fire resistant, passing the glow wire test at 960 °C according to IEC 60695-2-10. In addition to not spreading flame, it is self-extinguishing, which is not achieved with plastic cabinets. (Confirm with Pol this data)
5. Electromagnetic compatibility: The enclosures do not interfere electromagnetically with other equipment, and at the same time, they function correctly with disturbances that may be caused by other systems within the working environment.
6. UV Protection + low thermal conductivity: Polyester is an excellent electrical insulator. Thanks to its UV resistance and polyester's ability to dissipate heat on all sides, Weidmüller enclosures are prepared for high temperatures and constant exposure to sunlight. Unlike metal enclosures, which, when exposed to the sun, become so hot that they render the electrical equipment they are intended to protect unusable.
7. Halogen-free: The enclosure is manufactured without halogen components in its formulations. As a result, it offers high resistance to fire propagation and eliminates the release of toxic or harmful gases as well as the formation of opaque fumes produced in the combustion of plastic envelopes. (Confirm with Pol this data)
8. Resistance to chemical agents: Thanks to the fiberglass, the enclosure has excellent mechanical properties: resistance to impact and torsion. At operating temperature, they do not deteriorate the surface of the product and produce only a negligible loss of mechanical properties. Polymerization during shaping means that it does not melt or drip at high temperatures and gives it very good resistance to chemical agents.
9. Saltwater resistance: Polyester has a good chemical resistance against the most common agents such as salt water and oil or gases such as ozone. These chemical agents do not damage the surfaces and do not generate significant losses in their mechanics.
10. Lightweight: Comparing a polyester enclosure with a metal one of the same size, it can be seen that the GPR enclosure weighs half as much. This feature facilitates assembly, reduces accidents at work and saves time in shipment.