

Case Study

Weiss Technik realises climate test chambers for tests on XXL solar modules

WHY

PV modules are becoming larger and larger
Limited space in test laboratories
Climate tests with optimised use of space

HOW

Turnkey solution
Customer-specific one-off production

WHAT

Especially slim and tall test chamber
Test space with components corrosion-resistant
Design for tests in accordance with IEC 61215

WHY | The challenge.

Due to the requirements of increased use on free agricultural spaces and set-up on water surfaces among other things, photovoltaic modules are becoming larger and larger. In order to be able to test such XXL modules, which are up to 3 m² in size, the Fraunhofer Institute for Solar Energy Systems (if not released: a leading research institute for solar power) needs a large climatic test chamber for its test laboratory. This should have as small a footprint as possible.

The test chamber must enable three temperature and humidity tests in accordance with the standard IEC 61215: the thermal cycling test, the humidity-freeze test and the damp-heat test. During the tests, a maximum temperature change rate of 3.33 K/min may be reached, but the standard leaves room for interpretation for the development of a more economical variant with smaller refrigerating unit. The required temperature range is -40 °C to +90 °C, the humidity range 20 to 90 % r.h.

The test space must be constructed in such a way that it does not become damaged by the corrosive outgassing of the PV modules.

HOW | The idea.

A particularly tall and slim test chamber was developed in close cooperation with the customer. In it, PV modules up to 2700 mm high and 1200 mm wide can be tested in an upright position. It is based on the tried-and-tested ClimeEvent-PV test chambers, the test chamber of which has been extended upwards. In order to slide the modules in easily, fastening rails are positioned in the test space.

As protection against corrosive outgassing of the PV modules, the test cell and the components in the test space are made of 1.4404 stainless steel and welded completely without silicone joints. Heating, heat exchanger and other components inside the test space are made of Incoloy[®], an especially corrosion-resistant nickel-iron-chrome alloy.



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WHAT | The solution.

XXL climatic test chamber **ClimeEvent C/5/-50/+150/2/PV**

The test space has a volume of 5 m³ and is 1200x2700x1450 mm (WxHxD) in size. There are three comb-shaped fastening rails mounted on the rear wall of the test space, allowing up to ten PV modules to be fixed in place in an upright position. The technology is installed behind the test space, the overall dimensions are 1520 x 3370 x 4000 mm (WxHxD). For quick and easy set-up and startup, the compact test chamber is delivered upright on a frame.

The test chamber is controlled via the digital measuring and control system SIMPAC[®] and the tried-and-trusted WEBS[®] software. The operation, program and monitoring unit with its webpanel is mounted on the test space door.

Temperature testing in the range of -60 to +150 °C and climate testing in the range of +10 to +95 °C can be carried out with a relative humidity of 10 to 95%. For the temperature tests, we fulfil the requirements of DIN EN 61215 and, if required, we can also realise higher temperature change rates can be realised. The water-cooled refrigerating system works with the refrigerants R-449A and R-469A. An alternative version with CO₂ as refrigerant is possible.



Your advantages at a glance:

- Design optimised in terms of energy use
- Tried-and-trusted standard components, individual adaptation
- Compact system, simple to install (plug & play)
- Corrosion-resistant design
- Planning, development, construction, assembly, startup, calibration and service from a single provider



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