

Case Study

Climate test chamber for outdoor set-up for testing safety equipment.

WHY

Quality and qualification testing of personal protective equipment including IP protection type tests

HOW

Turnkey solution
Customer-specific one-off production

WHAT

Compact system for outdoor set-up with sun simulation, sprinkling and IP protection type test

WHY | The challenge.

A climate test chamber is ordered for the quality and qualification testing of personal protective equipment (PPE), such as helmets and protective clothing. In addition to the effects of heat, cold and humidity, the impact of rain and direct sunlight on the test specimens is to be examined in the chamber. IP protection type tests for water in accordance with IPX 3/4/5/6K should also be possible.

The test chamber, including machine compartment, is to be set up outside and requires appropriate protection against weather conditions. The customer plans to install a weather-protection canopy.

HOW | The idea.

To be developed is a complete customer-specific compact system, in which the test space, machine compartment and personnel airlock stand beside each other on a base frame. This allows for the transportation of the testing system in one piece, simplifies set-up and ensures that it can be relocated at a later stage.

For a realistic rendering of sunlight in sunlight simulation tests, 4000 W daylight lamps are combined with a reflector system and electronic ballast units. The daylight lamps are installed on the roof of the chamber. Installing them on the outside of the chamber ensures stable ambient temperatures during operation and thus the lamps' stable light spectrum for reproducible test results. The sprinkling system is installed underneath the chamber roof. A personnel airlock is added for the set-up and execution of IP protection type tests for water, for example. The airlock has electricity and water connections as well as the sensors for these tests.



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WHAT | The solution.

Compact climate test chamber with various additional modules

The 9.30m-long compact system comprises three parts: a 24m³ test chamber, a machine compartment for control cabinets and machine components and a temperature-controlled personnel airlock. The system is controlled via the SIMPAC[®] digital measurement and regulation system and the WEBSeason[®] software. The operation, program and monitoring unit with its webpanel is mounted on the test space door.

Temperature testing in the range of -40 to +90 °C and climate testing in the range of +10 to +90 °C can be carried out with a relative humidity of 10 to 95%. The sprinkling system enables rain simulation over a reference area of 2m². The sunlight simulation system mounted on the roof of the chamber is protected from dust and weather influences by a sealed housing.

For the IP protection type tests for water, the following elements are integrated in accordance with DIN EN 60529 (VDE 0470-1):2014 and ISO 20653:2013: a test specimen holder with wheels, a water supply container, feed pumps and supply lines as well as a splash sprinkler for IPX3/4 and a jet tube with nozzle and jet tunnel for IPX5/6K.



Your advantages at a glance:

- ▣ Versatile testing systems for outdoor set-up, customised to meet client requirements
- ▣ Planning, development, construction, assembly, startup, calibration and service from a single provider
- ▣ Compact systems that are easy to transport and set up; can be moved later to a new set-up location
- ▣ High-precision testing technology for reproducible test results



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