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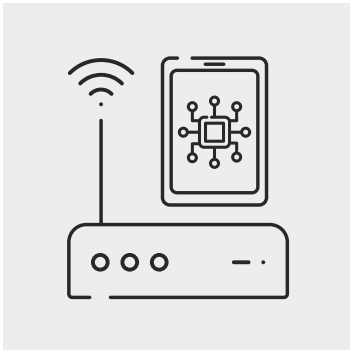

Mini Cube (Accelerated Life Testing Lab)

Testing the operation of electronic equipment in extreme climatic conditions

The test in a nutshell

Humidity

Cooling capacity

terraXcube

terraXcube is Eurac Research's extreme climate simulation centre at the NOI Techpark in Bolzano, South Tyrol, Italy.
Within its chambers, even the most extreme of all our Planet's environmental conditions can be created. By combining hypobaric and altitude technology with state-of-the-art environmental simulation, we aim to investigate the effects of extreme climate conditions on humans, ecological processes and industrial products.
The climate chambers differ in size and equipment and can accommodate people, plants and other living organisms for up to extended periods and have the space to accommodate large machines and products.
Each day our team breaks new ground with scientists and industry partners and prepares the path to gain discoveries.

Test description

The objective of these tests is to simulate the action of specific electrical equipment when operating in extreme environmental conditions (low temperatures or hot and humid environments).
The equipment to be tested is delivered to the technicians and placed in the Mini Cube (Accelerated Life Testing Lab) climatic chamber at the Eurac Research Institute for Renewable Energy. It is connected to the power supply and to the external communication ports to monitor functionality. Temperature sensors are then installed.
Once the door is closed, the correct communication is verified, and the data acquisition system is configured. At this point, testing can begin.
First, the cold start test is carried out. The chamber is brought to -25°C and once the test object has reached thermal equilibrium the object is powered up and the protocol functionality tests are carried out, these can include the power-up and correct loading of firmware, as well as the correct operation of all functions and parts.
Subsequently, operation is tested in hot and humid environment conditions. The equipment, in standby mode, is brought to a temperature of 40°C and a relative humidity of 95%. When thermal equilibrium is achieved, is the equipment is put into operation. The test consists of monitoring the temperature at different points on the equipment and detecting any overheating to verify the effectiveness and correct design of the cooling system.

Upon customer request, long-term tests can also be carried out to verify visual and functional changes to the equipment or parts of it (e.g. visual changes to screens and monitors, corrosion of circuits, damage to screws and joints, etc.).

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Mini Cube (Accelerated Life Testing Lab) - General Characteristics and Environment Control

Internal dimensions	1.30 m x 1.52 m x 2.20 m (L x W x H)
Load Capacity	Photovoltaic modules with a total weight of up to 240 kg
Temperature Range According to IEC 60068-3-5	-40...+90°C (variability ± 1°C in time ± 2°C in space)
Temperature Rate of Change According to IEC 60068-3-5	1.7°C/min (-40...+85°C), 1.7°C/min (+85...-0°C), 1°C/min (+0...-40°C)
Relative Humidity +10 °C< T <+90°C and according to IEC 60068-3-6	20...95% (variability ± 5% in time ± 5% in space)

Other Features

Power supply	230Vac 1~ 50Hz, 32 A; 400Vac 3~ 50Hz, 125A
Data-acquisition equipment	
Network connection	Gigabit-Ethernet (1000BaseT) PoE, Wi-Fi