

# Requirements of a climate chamber

The controlled maintenance of humidity is an essential factor in a climate chamber. In practice, this is achieved by an actively adjustable system for humidification and dehumidification in which the water supply is outside the working chamber.

The water from the external water tank is heated up in a vaporator and fed as steam into the inner chamber of the **climate chamber**. A humidity sensor continually measures the humidity content in the inner chamber, thus enabling a controlled humidification, generally from between 10 and 98% rh (relative humidity). For dehumidification purposes the inner chamber is condensed out at a specific point, by means of a cold humidity trap.

## Regulating temperature

The requirements made of temperature regulation are fundamentally different for **climate chambers** and **temperature control chambers** on the one hand and **humidity chambers** and **constant climate chambers** on the other. Because of the large temperature range, **climatic test chambers** must be designed with high performance in mind. An important means of comparison are the average heating up and cooling down times specified in the technical data in Kelvin per minute (K/min determined according to DIN IEC 60068-3-5).

In humidity chambers and constant climate chambers, on the other hand, tests are usually performed at constant temperatures and over a long period of time, often several months. Decisive quality criteria in this case are thus the precise maintenance of temperature, along with energy efficiency. For this reason, some manufacturers provide these appliances with an energy-saving and precisely adjustable heating and cooling system with Peltier elements (see also Peltier cooling in the cooled incubator).

A technical distinction is made in **climate chambers** as to



Memmert constant climate chamber HPP

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whether they are cooled or not. A large number of appliances can be found in practice which in terms of their temperature range, performance, light spectrum, size or fittings are designed for specific applications such as plant growth, photovoltaics, seed, etc. (details on the basic operation and features of a **temperature control chamber**).

[Overview Glossary Temperature control chamber](#)

Picture credit: Memmert GmbH + Co. KG

Autor:

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