

Climatic Test Chambers **CTC / TTC**



Standardised temperature and climate testing for the quality assurance of form and function

Rapid heating up and cooling down in a temperature range from -42 °C to $+190\text{ °C}$

Active humidification and dehumidification for control range between 10% and 98% relative humidity

100% AtmoSAFE

Regulated turbo-ventilation

Fast humidity recovery time

>>>> www.memmert.com

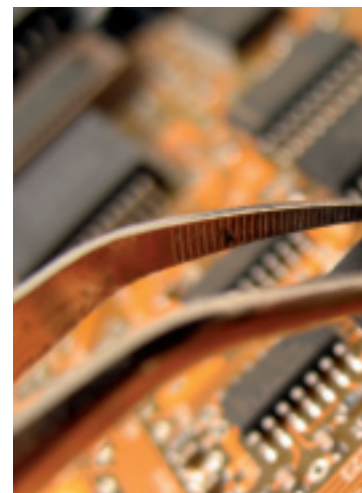




The high flyer of testing technology!

100% AtmoSAFE: In our CTC and TTC environmental test chambers we simulate the perfect atmosphere for climate and temperature tests, specifically in accordance with DIN EN 60068-2-1, 2-2, 2-3 and 2-30. Forty ramps that can be configured directly on the device, an active humidification and dehumidification from 10 to 98% rh and a precise temperature control from $-42\text{ }^{\circ}\text{C}$ to $+190\text{ }^{\circ}\text{C}$ provide an almost unlimited flexibility for controlled material and function tests, as well as for ageing tests.

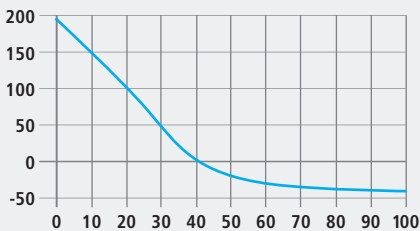
2 appliance variations with 256 litres chamber volume:
Climatic test chamber CTC 256 with humidity control
Temperature test chamber TTC 256



Economical at high performance

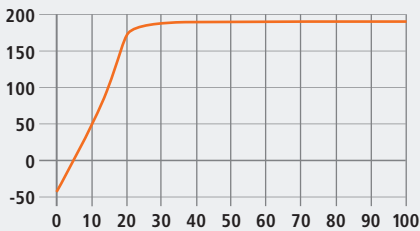
The high level of standardisation and the highly efficient principle of identical parts in our production allow us to have an extensive range of standard features, along with constantly excellent quality and productivity at an outstanding cost/benefit ratio. Thus our CTC and TTC environmental test chambers cool down from +180 °C to -40 °C in only 80 minutes, for example, and heat back up again from -40 °C to +180 °C in only 20 minutes. But our high-flyers in test engineering prove to be extremely cost-efficient not only in their procurement costs, but also in their running costs.

Cooling down speed CTC / TTC 256



+180°C to -40°C in 80 minutes*

Heating up speed CTC / TTC 256



-40 to +180°C in 20 minutes*

*to 98% of setpoint

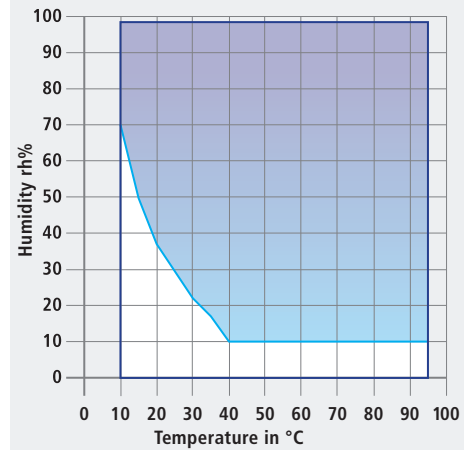
Reliable and efficient climate technology

The components of our climate system are of the highest quality and interact perfectly for a quick, precise and energy-saving change in temperature. The 3-layer insulation system for the chamber, derived from aerospace engineering applications, impresses with an excellent K-value. This prevents the moisture penetration of the insulation material, which permanently ensures the insulating capacity. The electronically controlled injection of refrigerant (chlorine-free, ozone-neutral R 404 A) guarantees an optimal cooling capacity throughout the entire temperature range, and thanks to the automatic defrosting system, the CTC and TTC test chambers run in continuous operation without interruption. The stainless steel evaporator stands out with a long and corrosion-free product life, the twin-compressor, regulated according to the output, saves valuable energy and the temperature-dependent adjustable-speed condenser fan ensures a low noise level in partial load operation.

Active humidification and dehumidification (CTC only)

The electronically controlled active humidification and dehumidification guarantees a precise and quick regulation of humidity between 10 and 98% rh in all situations, while the set temperature in the chamber is constantly maintained. The required setpoint temperatures and humidity can be adhered to with precision, even in regions with a high ambient temperature and extremely high or low humidity. The 2-stage hot steam generator with a separate water preheater copes with large amounts of water and ensures that the set humidity is quickly reached.

Adjustment range of temperature and relative humidity rh%





The reliable hardness test for form and function!

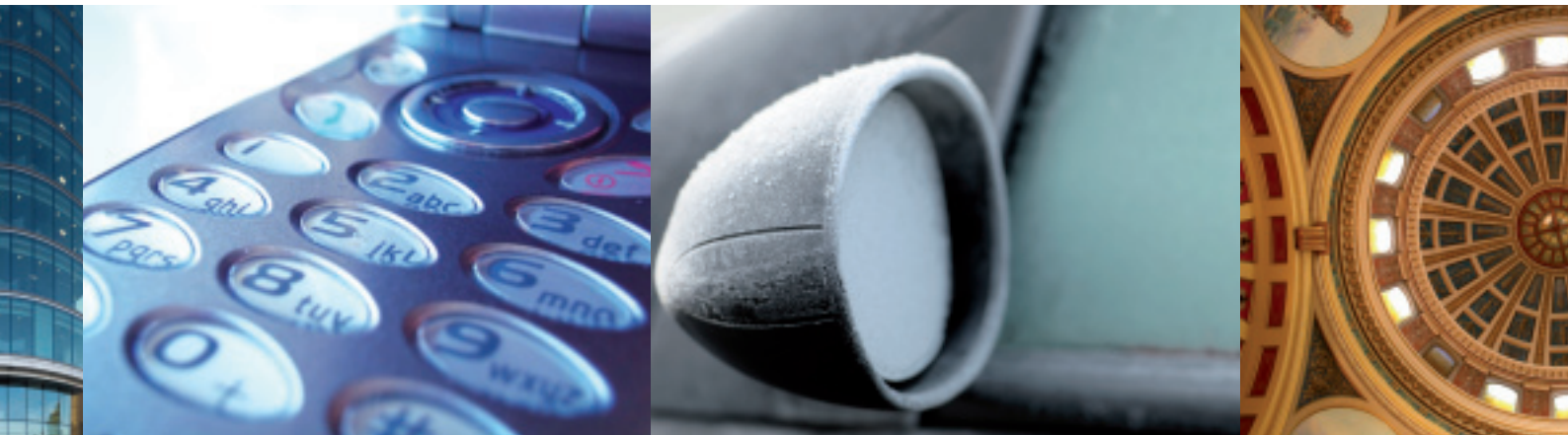
High capacity reserves for cooling and heating guarantee that test standards are tightly maintained. The unsurpassed fittings in terms of programming, storage and documentation make it very easy to operate these efficient and absolutely precise test chambers, and lastingly reduce process times. A special bonus: pre-programmed chip cards enable rapid and manipulation-proof access to common test standards.

Corrosion-resistant and hygienic stainless steel

We profess our uncompromising faith in stainless steel. Apart from essential components in climate technology, working chamber, evaporator and also the casing are made of this high-quality material. No corrosion, even after many years of use in practice under extreme climatic conditions.



Chamber exclusively made of high-grade, completely recyclable stainless steel 1.4301 (ASTM 304). Residue-free cleaning due to very smooth and hygienic surfaces.



Comfort for highest quality

Over 60 years of customer orientation forms the basis for maximum comfort:

- Clear and easy to clean underglass function display
- Available only from Memmert: the patented push/turn control for intuitive operation of the entire menu
- Heated, multi-layered insulation, double-sealed stainless steel door
- 2 x 25 Watt steam-tight halogen lamps
- Low noise (55 dBA)
- Extremely service-friendly refrigeration system
- MEMoryCard XL for programming and logging up to 40 ramps for temperature and humidity (for CTC)
- Water supply from two 10-litre tanks (for distilled water) with automatic switching to full tanks (for CTC)
- Large usable chamber space with low floor space requirement
- Mobile due to standard castors and appliance width that fits through laboratory doors
- 80 mm entry port in right side wall made of silicone (closable)

Your safety check: extensive documentation

The CTC and TTC environmental test chambers are GLP- and GMP-compliant. The basic fittings for reliable quality assurance:

- "Celsius" standard software for programming and logging, as well as optionally available (extra charge) for FDA-compliant software
- Internal ring memory for seamless, manipulation-proof long-term documentation of temperature, humidity, operating mode and status messages (approx. 3 months)
- Parallel printer interface for printouts of temperature control processes (USB printer via converter possible)
- USB interface for programming and storage, optional Ethernet at extra charge





Your navigation system: flexible programming

A must for the exact simulation of environmental conditions in research and development: various set values of temperature and humidity can be combined on up to 40 time ramps via the menu, and to an unlimited amount via the "Celsius" standard software. The SPWT function guarantees that the programme is only continued after reaching the exact temperature and humidity set values.

Safeguarding your process: 100% precision

Technical perfection for error-free test procedures that can be replicated:

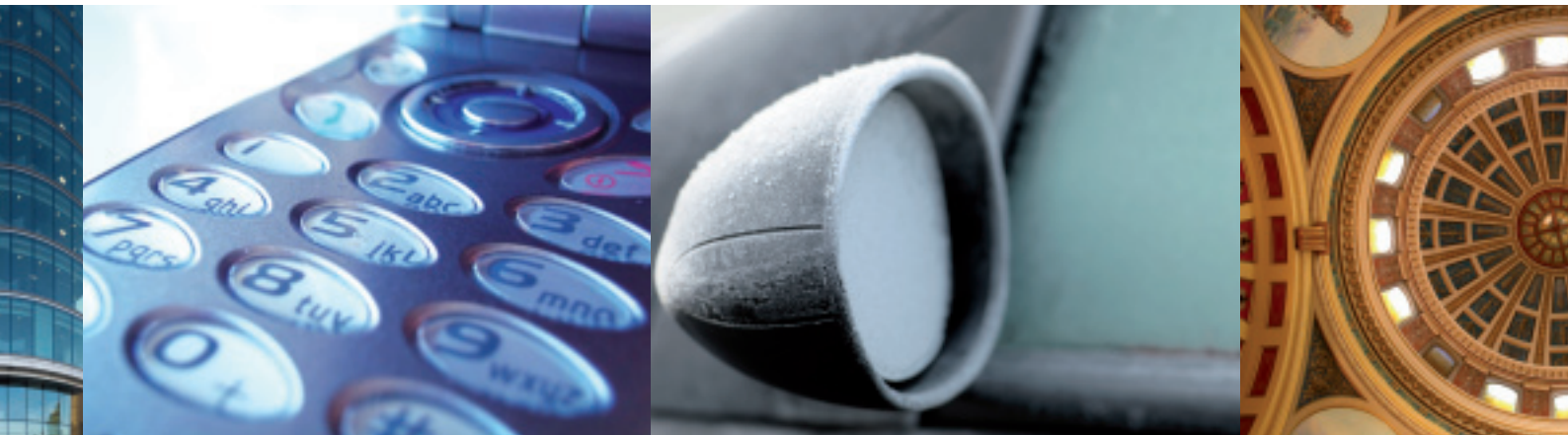
- Reduced cooling down and heating up times as well as homogenous temperature distribution through powerful heating and cooling system
- High-performance, adjustable-speed air circulation up to 1,200 m³ per hour, adjustable from 10 to 100%
- High-quality and maintenance-free capacitive humidity sensor for high measurement precision and long-term stability
- Multifunctional, fuzzy-supported control
- Calibration option for temperature and humidity directly on the controller

Your standard features: more safety

Approved functions for zero error:

- Integrated self-diagnosis system with optical and acoustic error message
- Multiple temperature monitoring
- Unique Memmert ASF (Automatic Safety Function): integrated over- and under-temperature monitoring automatically follows the set value at freely selectable tolerance band
- Two high-grade platinum temperature sensors Pt 100 in a 4-wire circuit with mutual sensor monitoring and function control at equal working temperature
- Acoustic and visual warning signal if temperature or humidity limits are crossed, and if water container is empty
- Protection from operation by unauthorised persons: optional, chamber-linked personal User-ID-Card (extra charge)





Timer module

- 1 Time indication (here, real time)
- 2 Text messages

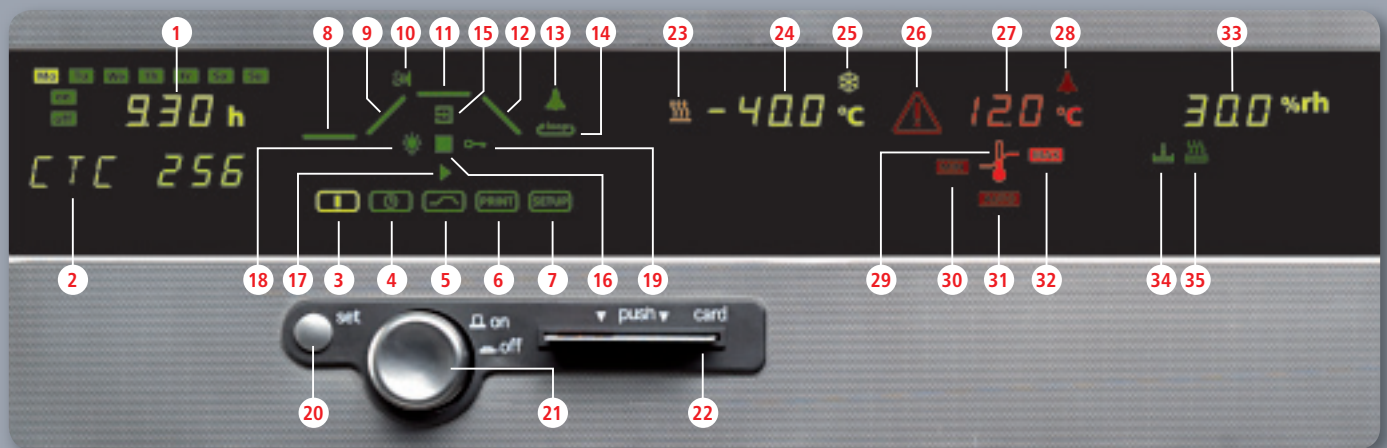
Temperature module

- 23 Heating
 - 24 Setpoint/actual temperature
 - 25 Cooling (active)
- Temperature adjustment:
– 42 °C up to +190 °C
(without humidity)
+10 °C up to +95 °C (with humidity)
only CTC
 - Variation (time): ± 0.2 – 0.5 K
Uniformity (spatial): ± 0.5 – 2 K

Monitor module

- 26 Visual alarm
- 27 Alarm limit
(heating switch-off temperature)
- 28 Sounder on alarm
- 29 Temperature limiter
- 30 Low alarm limit
- 31 Automatic alarm limit (ASF)
- 32 High alarm limit

Acoustic and visual alarm on temperature and humidity out of limit and on other errors



Control panel CTC

Operating mode

- 3 Normal operation (active)
- 4 Week timer*
- 5 Ramp timer
(Relative time programme)
- 6 Printer
- 7 Configuration
- 8 Wait (at programme start)
Hold (during programme)
- 9 Heating ramp
- 10 Setpoint Wait – programme continues
when set value is reached
- 11 Hold ramp
- 12 Cooling down ramp
- 13 Sounder at ramp timer end
- 14 Repeat function
- 15 Edit (ramp timer)
- 16 Stop (ramp timer)
- 17 Start (ramp timer)
- 18 Lighting
- 19 Data manipulation prevented through
optional (extra charge) User-ID-Card
- 20 Set key
- 21 Push/turn control
- 22 Chip card reader for MEMoryCard
and optional (extra charge) User-ID-Card

*Weekly timer, programmable with one ON and OFF time per weekday; additional group function (e.g. Mo – Fr)

Humidity module

- 33 Setpoint/actual humidity
 - 34 Water level in storage tank
 - 35 Steam generation
- Humidity range: 10 – 98% rh
 - Variation (time) ± 1.5% rh max.

