



...Technology needs a good climate, too!



*test chambers*



- ✓ **test chambers**
- test segments**
- testing technology for building material**
- special equipment**

# Climatic simulation

## The tasks

Climatic test chambers have a wide range of application in research and development as well as in industry. They serve the different temperature admission of test pieces regardless of the outside temperature and humidity. The main fields of application lie in:

- temperature investigations
- establishment of international standard climates and arbitration climates according to given time function and course of programme investigations of:
  - ¥ temperature- and humidity-dependent properties of material,
  - ¥ parameters of structural elements and finished products,
  - ¥ biological processes under stable and changing climatic conditions
- stress tests with materials and construction elements

To guarantee a flexible adaptation to the desired field of work, temperature and climatic test chambers are available.

## The realization

The main stress of the general concept of the Feutron climatic simulation lies on the simplest control of all functions of the test equipment and the highest reliability with a maximum efficiency. Therefore, our test units are delivered as compact equipment ready to be plugged in. With respect to function and running, the automatic control units always apply with the state-of-the-art. A microprocessor, specifically designed for Feutron climatic simulation-test chambers, enables an easy programme running and therefore guarantees, even with a large variety of programmes, an immediate start of the test facility without an extended working-in time. Among the remarkable features of the Feutron climatic simulation-test chambers are the following:

- compact systems of 100 dm<sup>3</sup> to 2000 dm<sup>3</sup>
- CFC-free insulating material and refrigerating medium
- interior room completely made from non-corroding high-quality steel
- large, illuminated window in the work-space door
- air-conditioning systems outside the test room
- homogeneous air flow in the work space
- self-calibrating measurement entries
- maintenance-low, long time-stable, high temperature-resistant humidity sensor
- many possibilities of combination because of manufacture in modular design system



## The result

As a result of the more than 50 years of Feutron climatic simulation experience, we guarantee the highest quality in the field of temperature and air conditioning test technology. As all our products are completely developed and designed in our own house, we are able to work flexible and adaptable to a large extent. Resulting from this, our climatic test chambers can be perfectly adapted to your distinctive work tasks. Moreover, we also offer an outstanding service.

Feutron climatic test chambers are remarkable because of their excellent temperature and humidity stability with regard to space and time. This was proved true by several independent institutions. Consequently, an optimal testing environment will be created for you, regardless of the geometry of the test piece. A wide range of additional options facilitates a useful completion of the standard range for the many different areas of responsibilities.

# Climatic simulation

## Basic equipment

- two separate cooling circuits for high parameter stability when in climatic operation and for economic operation
- freely programmable microprocessor control
- clear display with 16 lines to show all input-, operation and service parameters
- analogue output and interface RS 232
- feed through and shelf
- window with test room lighting



## options

- high speeds of change in temperature
- customized test room dimensions (size, shape, position)
- additional drier in the field of low temperature and low humidity steam
- humidifier in the field of high temperature and high humidity
- multi-channel possibility to connect recording devices
- data output from matrix printer
- data exchange and remote programming of test chambers under Windows
- test chamber on wheels for free and easy positioning
- automatic cut-off for active (exothermic) test pieces at the end of the test programme
- water-cooled refrigeration equipment
- horizontally and vertically movable work space, e.g. for combined climate and vibration test
- split make of test chambers, i.e. placing of work space and cooling equipment and liquefier unit resp. in different places to lower the heat load and the noise level within the work room
- several additional feed-throughs for measuring instruments as well as for hands in order to influence the test piece during the test
- temperature-test data acquisition on the test piece via electrical-resistance thermometer
- UV-, IR-simulation
- rain simulation and salt water spraying
- **further options on demand**



depiction  
100 dm<sup>3</sup> work space volume



depiction  
200 to 600 and 1700 dm<sup>3</sup> work space volume



depiction  
800 dm<sup>3</sup> work space volume



depiction 2000 dm<sup>3</sup> work space volume



# Climatic simulation

## Outline of products of standard test chambers

volume (dm <sup>3</sup> )	interior dimensions (mm) w x h x d	exterior dimensions (mm) w x h x d	range of temperature °C	humidities* (% rel. hum.)
100	500 x 500 x 400	810 x 1730 x 1030	+ 5...100/180; -40...100/180; -75...100/180	10...98
200	720 x 690 x 560	1500 x 2070 x 1060	+ 5...100/180; -40...100/180; -75...100/180	10...98
400	720 x 860 x 620	1500 x 2210 x 1110	+ 5...100/180; -40...100/180; -75...100/180	10...98
600	770 x 1020 x 745	1550 x 2300 x 1205	+ 5...100/180; -40...100/180; -75...100/180	10...98
800	770 x 1380 x 745	1700 x 2190 x 1370	+ 5...100/180; -40...100/180; -70...100/180	10...98
1700	1200 x 1200 x 1200	1960 x 2400 x 1700	+ 5...100/180; -40...100/180; -70...100/180	10...98
2000	2000 x 1000 x 1000	2970 x 2370 x 1360	+ 5...100/180; -40...100/180; -70...100/180	10...98

\*Climatic test chambers only; test chambers with other work space capacities or climatic parameters on demand, window in all test chambers 500 x 600 mm. The external dimensions are given plus attaching parts and fan motor

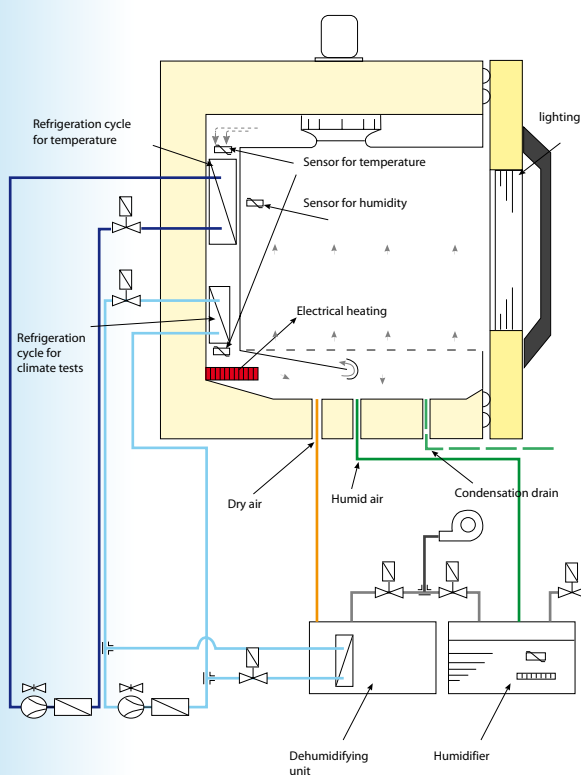
## Technical Data

temperature range: -75/-40/+5...100/180 °C  
 climatic range: 10...95 °C  
 temperature tolerance: ± (0,2...0,5)K  
 humidity range: 10...98 % rel. humidity  
 humidity tolerance: ± (2...3)% rel. humidity

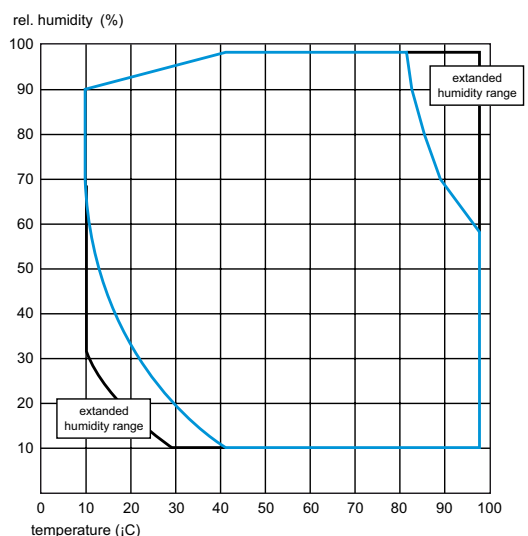
change of speed cooling:  
 3 k/min average (standard)

change of speed heating:  
 3 K/min. average (standard)

## Design - climate chamber



## Performance range



# Climatic simulation

## Temperature shock chamber

### Application

- change of temperature according to
- 60068-2-14 Na. Nb DIN EN 0
- MIL StD 883 D Meth. 1010.7, 1011.9
- IPC-TM-650

### Technical Data

- range of temperature
- coldchamber  $-75^{\circ}\text{C}$ É  $+180^{\circ}\text{C}$
- hotchamber  $+10^{\circ}\text{C}$ É  $+200^{\circ}\text{C}$
- volume of lift cage  $160\text{ dm}^3$

### Advantages

- extensive basic equipment, e.g. 2 windows, 3 shelves
- separate use of both test rooms as temperature chambers
- large number of cycles without defrosting processes or aid media, as the drive system allows a simple and safe sealing against ambient temperature
- large test cage volume



## Test chambers for dynamic vibrators

### Application

- mechanical shock with heat or cold
- vibration with overlapping of temperature and humidity

### Technical data

- work space volume:  $280\text{ dm}^3$  to  $1700\text{ dm}^3$
- range of temperature:  $-70^{\circ}\text{C}$ É  $+180^{\circ}\text{C}$
- humidity range: 10...95% r.F.

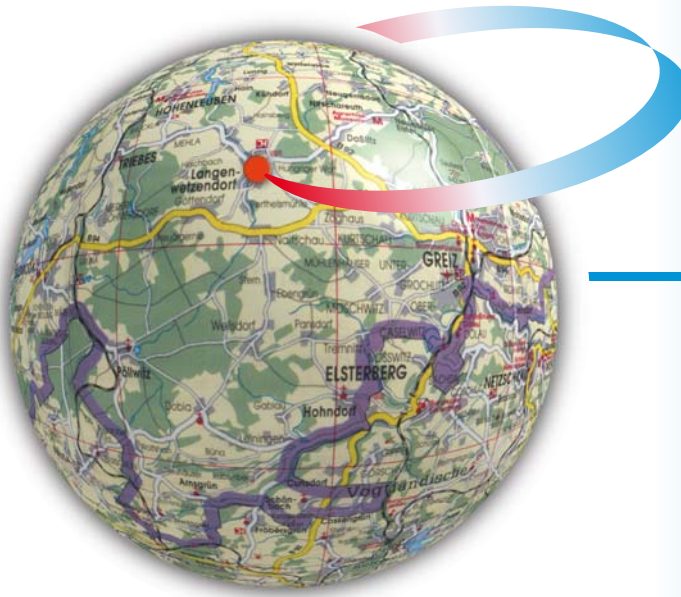
### Advantages

- combined tests with vibration (vertically or horizontally) possible
- usable as a separate temperature chamber



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