



# Upon Demand – Optimal Temperature and Humidity

Temperature Test Chambers WT Series  
Climate Test Chambers WK Series

# Reproducible Environmental Conditions ...

## Basis ...

With the WT series for performing temperature tests and WK series for performing climate tests Weiss Umwelttechnik proves yet again that even sophisticated and proven products can be further developed to super-  
bness.

As one of the leading manufacturers of simulation systems world-wide, Weiss Umwelttechnik once again sets the pace with this development:

In technology, design, construction, digital program control, system control, handling and last but not least in environmental compatibility.

A well-balanced price-performance ratio headed as usual the list of priorities during development.

Whoever performs reproducible tests in conjunction with research, development, production and quality control, places importance on excellent quality as well as on straightforward and field-proven operation at a reasonable price.

## Application ...

The test chambers of the WT and WK series permit reproducible temperature and climate tests for application in all sectors of quality control and improvement.

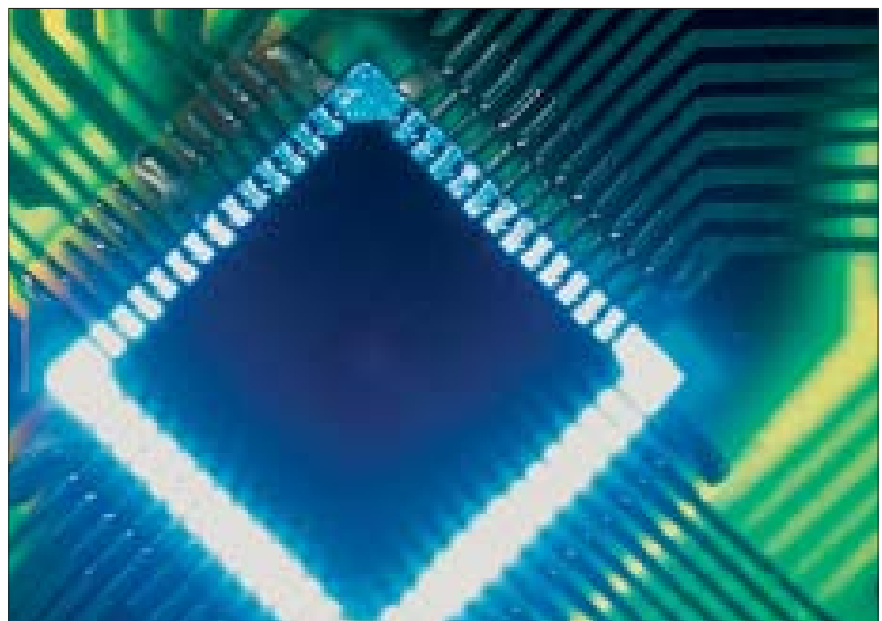
Regardless of the shape and nature of the specimens, high temperature constancy is achieved thanks to the efficient, homogeneous temperature conditioning and climate conditioning of the test space which in turn ensures accurate test results.

A wide range of standard test space volumes is available for a great variety of applications.

The climate and temperature working ranges comply with all relevant testing standards such as DIN, ISO, MIL, IEC, DEF or ASTM.

The digital measuring and control system **SIMCON/32\*-NET** with 32 bit processor developed by Weiss Umwelttechnik offers virtually unlimited programming possibilities for operator-defined climate profiles.

In conjunction with the software package **SIMPATI\*** an extremely uncomplicated simulation management system is available that ensures complete documentation and management of complex test series.



# ...for Reliable Test Results

## The Advantages at a Glance...



- Touch panel with simple, menu-guided operation (no programming knowledge necessary)
- 32 bit processor
- Networking with other test devices possible
- Test spaces are easy to clean thanks to special welding and embossed shelf supports
- Test Space lighting with automatic switch-off
- Control unit (swing-out) and touch panel in Protection Class IP 54
- Easily accessible system elements guarantee minimum service and maintenance times (condenser, water tank, psychrometer)
- Error diagnostic system for supporting maintenance and repair
- Considerably longer service life of psychrometer due to self-cleaning wet bulb sensor
- Automatic replenishing of water without interruption of operation (large storage tank)
- Standart port holes (50 and 125 mm diameter) for inserting supply lines



- The test chambers are of modular design and ready for connecting so that installation or commissioning at user premises is not necessary.
- The entire system is designed for use under extreme conditions and guarantees reliable functioning and long service life.
- Efficient, homogeneous temperature and climate conditioning of the test space
- Optimized airflow with all test space volumes
- Intelligent efficiency control irrelevant of ambient conditions
- Specimen protection devices  
 $t_{\min} / t_{\max}$
- Lockable door latch
- Low power consumption
- Environmentally-friendly, high-quality insulation
- Legs with individual height adjustment
- Powder coating
- 2 temperature values are calibrated (+23 and +80 °C)
- 2 climatic values are calibrated (23 °C / 50 % r.h. and 95 °C / 50 % r.h.).<sup>1)</sup>

<sup>1)</sup> only valid for WK test chambers

# Function...

## Functional Principle...

An airstream that is temperature and/or climate conditioned exactly to the entered set values flows continuously through the test space. Baffle plates on the floor and ceiling of the test space guarantee optimum distribution of the air and temperature throughout the test space. All test spaces are provided with an optimized airflow; the 1,000 l and 1,500 l test chambers have two fans for circulating the air.

Components for conditioning the air are located in the air circulation compartment at the rear of the test chamber.

The large axial fan with external drive motor draws the air out of the test space.

This circulating air then flows through a finned heat exchanger by which it can be cooled. A specially designed heat exchanger prevents undesired condensation from forming on its surface during climate operation and ensures maximum temperature and humidity constancy (in time). An electrical heater installed in front of the heat exchanger in the direction of the airflow heats the circulating air. The airstream then passes over a water bath; integrated heating and cooling elements ensure that the water is tempered quickly and exactly. The humidity of the test space air adapts according to the water temperature.

The newly developed, patented climate system also enables a high relative humidity even with a heat load.

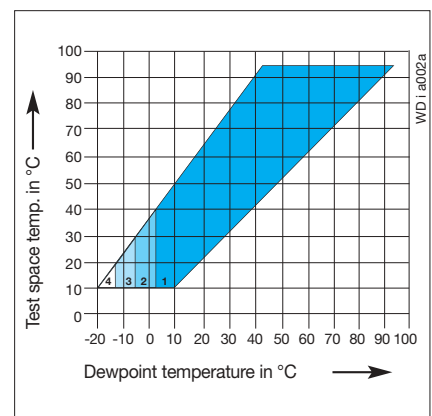
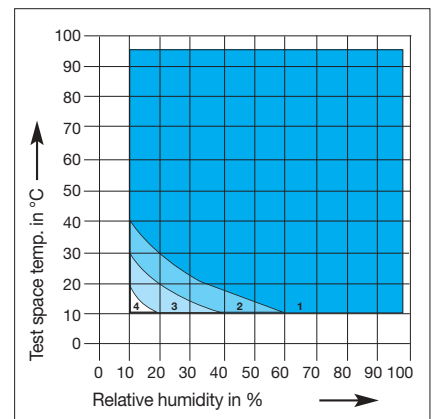
The humidity of the test space air is measured psychrometrically by two resistance thermometers Pt 100 as per DIN IEC 751. The dry and wet bulbs are located next to each other in the airstream. The wick of the wet bulb sensor is automatically wetted and thus less prone to contamination!

The **SIMCON/32\*-NET** controls both temperature and humidity.



## Humidity Diagrams:

- 1 = Standard working range
- 2 = Dewpoint range +4 °C to -3 °C discontinuously
- 3 = Dewpoint extension from -3 °C to -12 °C controlled (option compressed air dryer)
- 4 = Dewpoint extension to -20 °C controlled (option compressed air dryer and capacitive sensor)



## Design Features...



The external housing is made of corrosion-resistant, galvanized steel plate, painted in two different colours, (RAL 5000 blue and RAL 9002 grey white).

The stainless steel test space is welded vapour-tight.

The environmental-friendly insulation between the test space and the housing guarantees maximum insulation values and thus low operating costs.

The test space door is hinged on the left. The door handle ensures that the door closes tightly and is also equipped with an integrated safety device that opens the door should excess pressure prevail in the test space.

The large observation window (optional) allows an excellent view into the interior of the test chamber and is multipleglazed and heated to prevent condensation. The large observation window can be replaced by a combination of a window and reach-through ports.

All sizes are equipped with 2 standard port holes (50 and 125 mm diameter) that are located on the left and right side of the test chamber and can be used for inserting measuring and control cables, other supply connections or additional equipment.

In addition to the programmable monitoring of threshold values by the **SIMCON/32\*-NET**, the test systems are equipped with an adjustable safety cut-out against high and low temperatures (specimen protection with separate sensor) as per EN 60519-2 (1993). Signals are either optical or acoustic. A potential-free contact is also available.

Every electrical functional circuit is equipped with its own safety device that shuts down the relevant circuit or the entire test chamber if a fault develops.

The electrical system complies with recognized technical regulations as well as with the accident prevention regulation "Electrical Systems and Electrical Equipment" (BGV A2) and relevant VDE/EN regulations. All test chambers comply with the EMC Low Voltage and Machine Directives.

The hermetic refrigeration cycles operate with environmental-friendly refrigerants without ozone-depleting potential (CFC-free).



# Operation...

## Parameter and Program Control with the Digital Measuring and Control System SIMCON/32\*-NET

The test systems of the WT and WK series can be operated via

- Touch panel or
- Notebook operating terminal.

The programs created are transferred to the measuring and control system **SIMCON/32\*-NET**.

The test chambers are equipped with a serial interface for the upgrading of configurations.

Linking to peripheral systems not only allows for compatibility and flexibility but also opens up new opportunities in the field of environmental simulation technology.

Thanks to compatibility with all software products of Weiss Umwelttechnik many more convenient operating and monitoring features are available.

**SIMCON/32\*-NET** is a self-monitoring, digital 32 bit measuring and control system specially designed for use in test systems. With its computing efficiency **SIMCON/32\*-NET** fulfils the requirements of process technology and facilitates easy input thanks to the touch panel that has been specially developed by Weiss Umwelttechnik.

The touch panel – also suitable for graphics (resolution 320 x 240 pixel) is part of the standard equipping of the WT an WK series.

The **SIMCON/32\*-NET** system handles all the functions necessary for control. In addition to temperature and humidity control it also has an efficient software PLC that coordinates and monitors all functions and provides information on interruptions in operation.



## Special Features ...

- Touch panel, adjustable in height for the easy input of parameters and performing program operation. Graphical representation of set and actual values, operating time and number of remaining cycles etc., including help function.
- Program memory for up to 100 programs with a total of 1,000 program steps, 250 loops and 9,999 program cycles
- Software support of the potential-free switching inputs and outputs
- 4 each potential-free switching inputs and outputs
- Two-level password access that protects against unintentional editing
- Integrated threshold value monitoring system for temperature and humidity
- Diagnostic system provides information on interruptions in operation and logs the machine operating times and switching frequencies of the individual system components
- Parallel printer interface (Centronics) for graphic documentation for HP Deskjet Color and EPSON printer
- Serial interface RS 232 C, galvanically isolated, for connecting to a host computer system (e.g. notebook operating terminal) or for networking
- Compatible with simulation management software SIMPATI\* for uncomplicated management and logging of data records
- 2 expansion slots for measuring, input and output modules.

## Simulation Package for Test System Integration SIMPATI\*

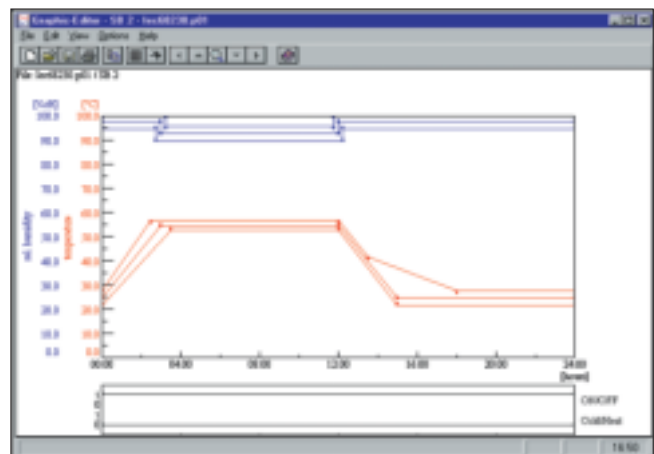
The computer-supported simulation management software SIMPATI\* provides complete documentation and graphical evaluation. When installed on the optional notebook operating terminal, the user has access (under Windows) to the full potential of a PC.

In particular for

- Controlling testing sequences
- Storing measuring data
- Creating uncomplicated test programs with the aid of the graphics editor
- Networking up to 32 systems
- Printing measuring data as graphics and copying in other programs for evaluation purposes.

Via internal interfaces SIMPATI\* is compatible with

- Microsoft WinWord
- Microsoft Paint
- Microsoft Excel
- Labview
- Special user software via online and socket interfaces.



# Equipment...

## Standard Design

- High and low temperature safety cutout (specimen protection as per EN 60519-2 (1993) adjustable, with separate sensor
- Dehumidifier coil to prevent condensation forming on specimens
- Psychrometric humidity measurement
- Touch panel, adjustable in height
- Parallel printer interface for HP Deskjet Color and EPSON printer
- Serial interface RS 232 C
- 4 each potential-free switching inputs and outputs
- Contactless switching of the heater
- Port holes 50 mm and 125 diameter on the left and right side
- Shelf

### Extras for WK Series

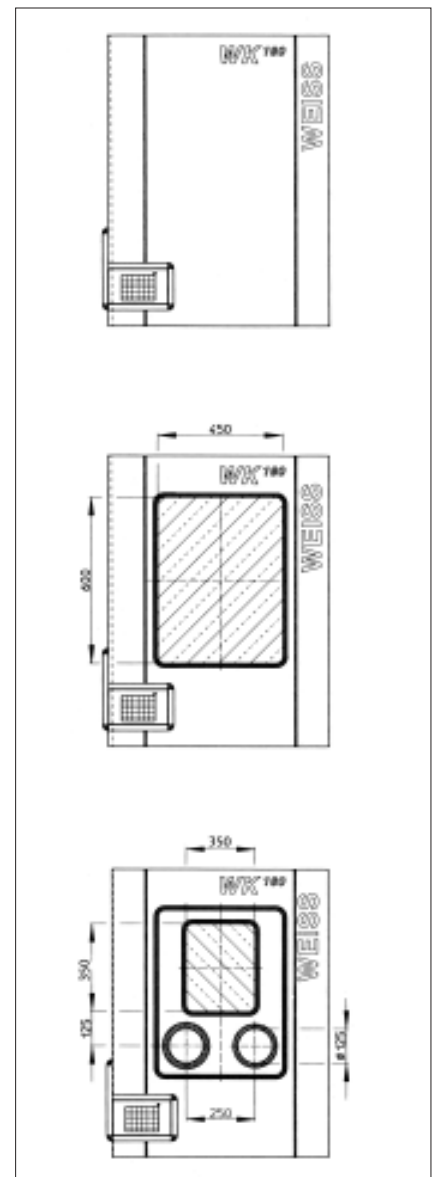
- **SIMCON/32\*-NET** is additionally equipped with a humidity computer and integrated threshold value monitoring system for humidity
- Display indicating lack of water
- Special temperature conditioning system in the climate working range for high temperature and humidity constancy.

## Options

- Large observation window with lighting
- Ethernet-/LAN-interface (10/100 MBit) in connection with **SIMPATI\*** for integration network
- Software package **SIMPATI\*** for Windows 98, Windows 2000, Windows NT 4.0, Windows XP Prof.
- HP Deskjet Color or EPSON black/white printer for connecting to the parallel printer interface
- Additional potential-free switching inputs and outputs
- Measuring data acquisition system for Pt 100 and voltage signals  $\pm 10$  V
- Configuration modules for interface standards such as RS 422, RS 485 (4-pole), IEEE 488.2 and optical waveguide
- Water-cooled version for cooling tower, chilled water or mains water
- Mobile version
- Analog outputs for set and actual values
- Enhanced heating and cooling capacity
- Additional Pt 100 sensor/thermo elements
- Speed-controllable fan
- Window with reach-through port holes
- Lighting
- Fresh air purge system
- Shelves
- Port holes 50 mm, 80 mm, 125 mm diameter
- Other supply voltages and frequencies
- Calibration deviating from standard.

### Extras for WK Series

- Dewpoint extension in climate working range
- Capacitive humidity measurement
- Cleaning device for humidifiersystem
- Special accessories on request



## WT Series and WK Series

Series	WT/WK	180/ 40	180/ 70	340/ 40	340/ 70	600/ 40	600/ 70	1000/ 40	1000/ 70	1500/ 40	1500/ 70
Test space volume	l	190	190	335	335	600	600	990	990	1540	1540
Test space dimensions	Height	mm approx.	750	750	750	750	950	950	950	950	950
	Width	mm approx.	580/ 540 <sup>7)</sup>	580/ 540 <sup>7)</sup>	580/ 540 <sup>7)</sup>	580/ 540 <sup>7)</sup>	800/ 760 <sup>7)</sup>	800/ 760 <sup>7)</sup>	1100/ 1060 <sup>7)</sup>	1100/ 1060 <sup>7)</sup>	1100/ 1060 <sup>7)</sup>
	Depth	mm approx.	450	450	765	765	800	800	950	950	1475
Exterior dimensions <sup>1)</sup>	Height	mm approx.	1775	1775	1775	1775	1995	1995	1995	1995	1995
	Width	mm approx.	780	780	780	780	1000	1000	1300	1300	1300
	Width <sup>4)</sup>	mm approx.	870	870	870	870	1090	1090	1390	1390	1390
	Depth <sup>2)</sup>	mm approx.	1285	1285	1600	1600	1660	1660	1855	1855	2380
	Depth <sup>3)</sup>	mm approx.	1495	1495	1810	1810	1865	1865	2060	2060	2585
<b>Performance for temperature tests</b>											
Maximum temperature	°C	+180	+180	+180	+180	+180	+180	+180	+180	+180	+180
Minimum temperature	°C	-45	-70	-45	-70	-40	-70	-40	-70	-40	-70
Average cooling rate	K/min <sup>6+8)</sup>	3.5	2.3	3.5	2.0	3.0	2.5	3.0	2.5	2.5	2.3
Linear cooling rate	K/min <sup>5+6)</sup>	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Average heating rate	K/min <sup>6+8)</sup>	4.0	4.0	3.2	3.0	4.0	4.0	4.0	4.0	3.5	3.5
Max. heat compensation	W <sup>6)</sup>	2800	1000	2800	1000	2500	2400	4500	2750	4200	2600
Temperature deviation	K <sup>8)</sup>	±0.1 to ±0.5 in time, ±0.5 to ±2.0 spatial									
Calibration values		+23 °C and +80 °C									
<b>Performance for climate tests</b>											
<b>only WK</b>											
Temperature range	°C	+10 to +95									
Dewpoint temperature range	°C	+4 ... 94 °C (to -3°C) <sup>9)</sup> (to -12°C) <sup>10)</sup>									
Humidity range	% r.h.	10 to 98									
Humidity deviation	% r.h.	±1 to ±3 in time									
Temperature deviation	K <sup>8)</sup>	±0.1 to ±0.3 in time, ±0.5 to ±1.0 spatial									
Max. heat compensation	W <sup>6+12)</sup>	400	400	400	400	500	500	500	500	500	500
Calibration values		+23 °C / 50 % r.h. and +95 °C / 50 % r.h.									
Electrical connection		3/N/PE AC, 400 V ±10 %, 50 Hz <sup>11)</sup>									
		CEE-connector, 16 A									
Protection class touch panel electrical section / test chamber		IP 54 / IP 22									
Max. installed load	kW approx.	4.9	5.9	4.9	5.9	7.8	9.1	11.5	13.8	11.5	13.8
Max. current consumption	A approx.	12.5	14	12.5	14	15	19	22	29	22	29
Sound pressure level [free field 1 m distance from front]	dB(A) approx.	58	60	58	60	61	63	62	64	62	64
Condenser		air-cooled / water-cooled optional									
Weight	kg	425	460	490	500	600	675	840	910	920	995

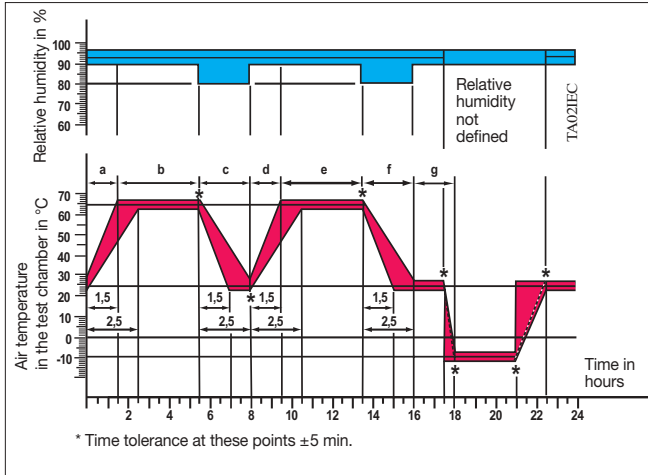
Permissible ambient conditions of +10 ... +35 °C and max. relative humidity of 75 % r.h.

- 1) By dismantling components the external dimensions can be reduced
- 2) Without touch panel
- 3) With touch panel
- 4) With door handle and hinge
- 5) Between +125 °C and -25 °C with types .../40, +125 °C and -40 °C with types .../70
- 6) The performance data refer to +25 °C ambient temperature, 400 V nominal voltage, without specimen, without extras and heat compensation, with water cooling at a flow temperature of +28 °C
- 7) Width between the shelves
- 8) [IEC 600 68-3-5], in a temperature range of +180 ... -40/-70 °C
- 9) Intermittent operation
- 10) Dewpoint extension optional
- 11) Other voltages and frequencies optional
- 12) In a range from +25 °C to +95 °C and < 90 % r.h.

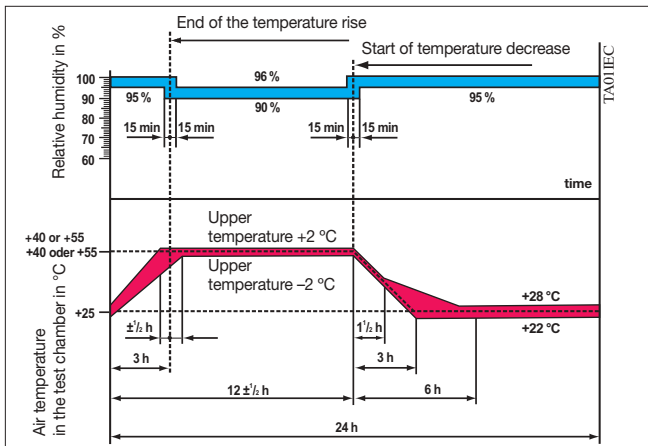
We reserve the right to make any technical alterations.

# The Standards – we have the Proven Solution ...

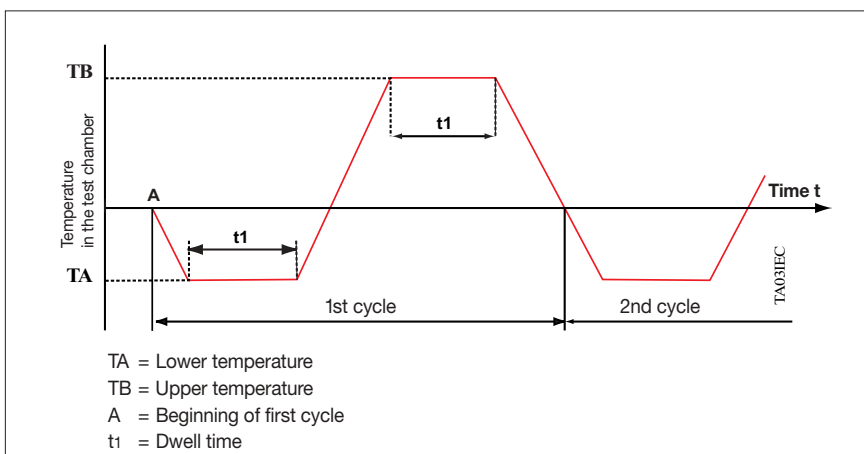
## IEC 68-2-38 Test Z/AD, Fig. 2a



## DIN IEC 68-2-30 Prüfung Db, Version 1 (humidity heat, cyclic)

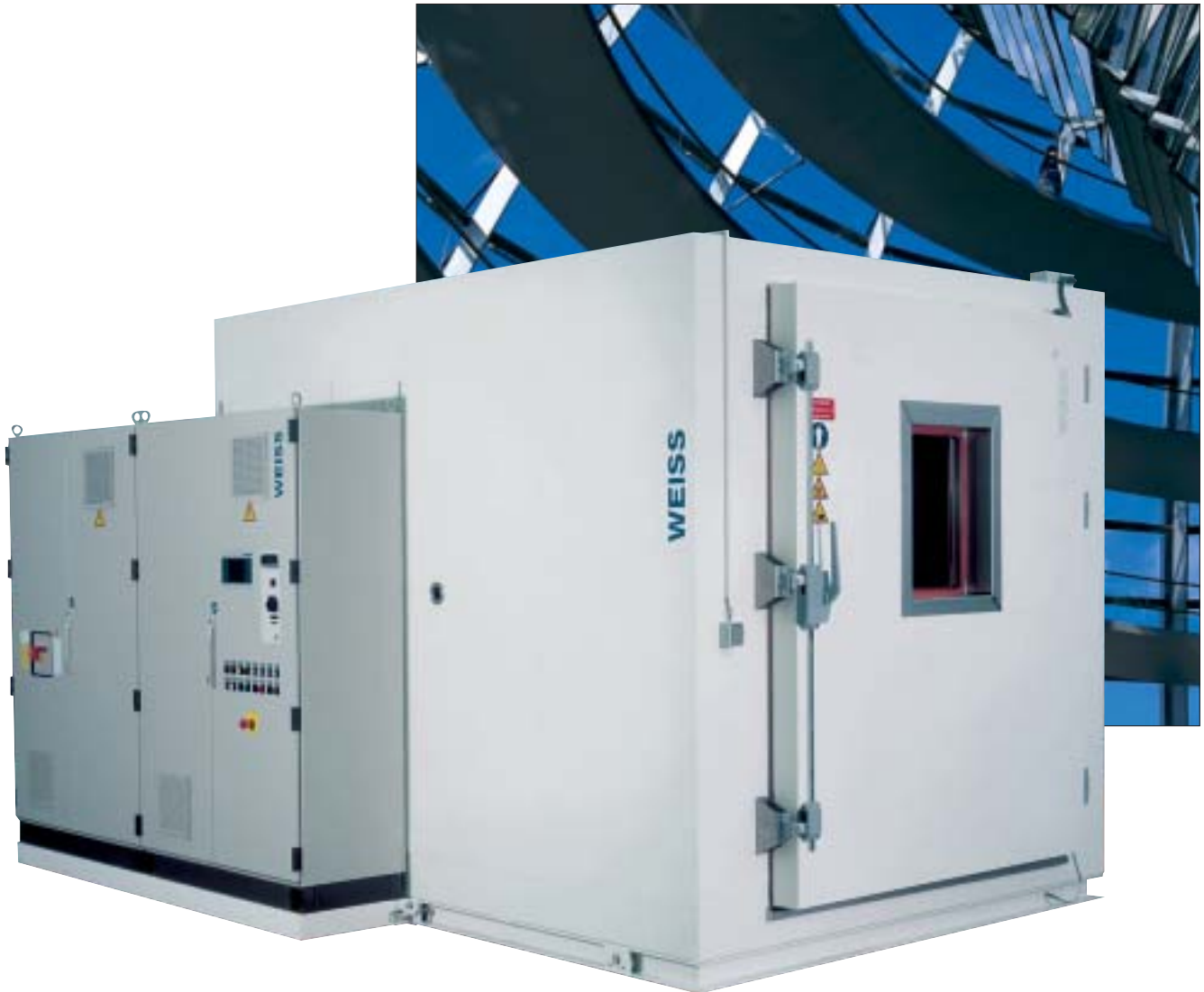


## DIN IEC 68-2-14 Test Nb (Temperature change with defined rate, one-chamber method)



# ... Variable Sizes

## Walk-in Temperature and Climate Chambers



The walk-in temperature and climate chambers of the WT/WK Series were specially developed for large test objects which cannot be tested in a normal test chamber.



# Test Technology for Professionals. Test the Best...



A complete line of systems is available offering test space volumes ranging from approx. 60 l to 1,500 litres, a working range from  $-75 \dots +180 \text{ }^\circ\text{C}$  and relative humidity values ranging from 10 ... 98 % r.h.

We also offer an extensive line of field-proven test systems specially for simulating exposure to weather, temperature shock, corrosion and long-time tests for application in research, development, quality control and production.

Of course, Weiss – as one of the leading producers of environmental simulation systems world-wide – offers the entire spectrum of high-tech test systems starting from a series of cost-effective test systems up to customized walk-in chambers and in-line systems.

If it's know-how, service and reliability that you are looking for – contact Weiss Umwelttechnik.

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