

# Perfection in performance, equipment and design

WT3 and WK3 Temperature and Climate Test Chambers



Weiss Umwelttechnik GmbH  
Simulationsanlagen • Messtechnik



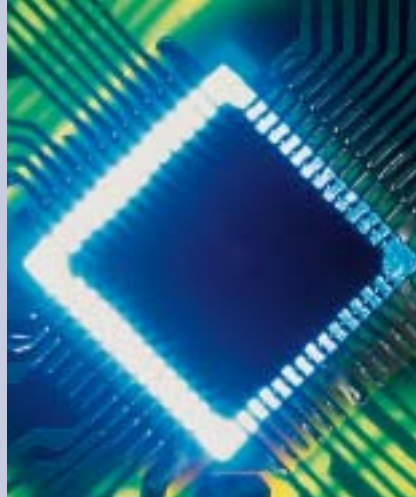
# Reliable test results ...

## The basics ...

Characteristics, function and service life of systems or components are influenced by varying thermal and climatic conditions during transport, storage and use.

For this reason, tests have to be carried out in order to safeguard and optimise the quality of the product.

The temperature and climate test chambers produced by Weiss Umwelttechnik set new standards with regard to ease of operation, performance and equipment.



Weiss Umwelttechnik GmbH is one of the leading manufacturers of standard test devices and systems for environmental simulation worldwide.

The product range comprises test systems of all test chamber volumes for temperature and climatic testing, simulation of exposure to weather, temperature shock, corrosion and long-time testing – in research, development, quality control and production.

Walk-in systems and in-line plants are designed, produced and installed in accordance with customer specifications.

An excellent after-sales service ensures optimum support for our customers and a high degree of operational safety of our systems.



## ... by means of reproducible environmental conditions

### The excellent features ...



### Infotainment ... Virtually without any limits

- Large 12" TFT-colour touch screen display with simple, menu-guided user interfaces as a convenient interface with the operator
- Lighted CONTROLPAD\* for displaying the operating mode and the actual values in the front of the test chamber
- Industrial PC with Windows XP Embedded
- Integrated recording of measurement data
- Recording of test program and measurement data directly on the hard disk
- USB and Ethernet interface
- Printer connection via USB interface
- High availability of the systems through integrated process visualisation and diagnostic system
- High-precision temperature and climate conditions due to auto-adaptive control
- Networking with other test systems possible
- Remote control and remote monitoring possible via intranet or internet
- Integrated service information system

### Perfection in performance, equipment and design

- Optimised test space lighting with automatic timed switch-off
- Performance optimised climate and temperature conditioning system creates power reserves for your tests
- Ports (Ø 50 and 125 mm) for inserting the supply lines – even in the standard version of the equipment
- Self-cleaning humidity sensor with considerable increase of the service life
- Optimised guidance of the air and temperature distribution – better than  $\pm 1.5$  K spatially guaranteed
- For very safe operation the test chambers are designed for extreme environmental conditions
- Compliance with demanding state-of-the-art test standards by means of increased humidification output
- Large water container easily accessible
- Low noise level
- Standard humidity bath flushing to prevent contamination of humidification water
- Long-time testing 85 °C/85% r. h. – our WK3 climate test chambers are the solution
- Factory calibration of temperature and humidity values is part of our standard
- Supply connections located in a central and protected position in the rear part of the device

**For further equipment details please see page 8.**

# Function ...

## The functional principle ...

An airstream that is temperature conditioned and/or air conditioned precisely to the entered set values continuously flows through the test space and ensures an optimum spatial distribution of air and temperature.

The circulating air duct installed at the rear wall of the test chamber contains the modules required for conditioning the air.

Generously dimensioned axial fans with an external drive motor draw the air out of the test chambers. (The test chambers with a test space volume of 1000 l and 1500 l have two circulating air fans each.) This circulating air then flows through a fin-type heat exchanger in which it is cooled if required. Special circuits prevent any undesired formation of condensate during air-conditioning operation and ensure the best possible constancies in terms of temperature and humidity. An electrical heater installed behind the heat exchanger heats the circulating air. The stream of air then passes over a water bath; integrated heating elements ensure quick and precise heating of the water.

The patented air-conditioning system also enables a high relative humidity even with a heat load.

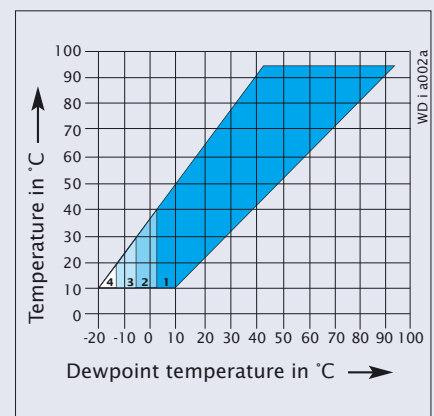
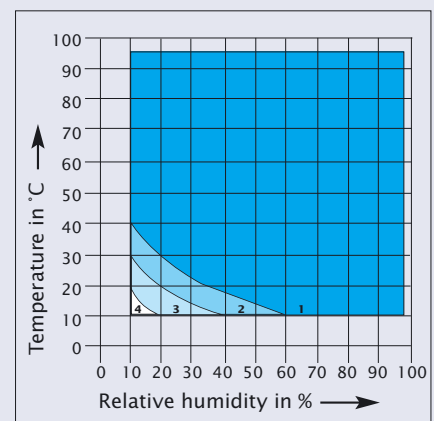
The humidity of the test space air is measured psychrometrically. Dry and wet thermometers are positioned one next to the other in the stream of circulating air. Depending on the climate the humidity sensor thermometer is wetted automatically and cleaned in the process. This considerably increases the service life.

The 32-bit control and monitoring system of SIMPAC\* ensures controlling of temperature and humidity.



## Humidity diagrams:

- 1 = Standard working range
- 2 = Dewpoint range +4 °C ...-3 °C discontinuously
- 3 = Dewpoint extension from -3 °C ...-12 °C controlled (option: compressed air dryer)
- 4 = Dewpoint extension to -30 °C controlled (option compressed air dryer and capacitive sensor)



## Design features

The test chambers are designed in a modular system and are ready to be plugged in so that assembly or commissioning on site can be dispensed with. The external housing designed as a self-contained construction is made of corrosion-resistant and galvanized steel sheet and painted in two colours (solvent-free powder-coated, RAL 5000 blue and RAL 9002 grey white).



The stainless steel test space is welded vapour-tight.

Its environmentally friendly insulation free of asbestos and CFC guarantees the best possible insulation values and, hence, the lowest possible operating costs.

The door latch ensures an optimum closing pressure while ensuring protection against excess pressure at the same time.

The large observation window which is available as an option allows an optimum view of the test space and it is equipped with multiple glazing and heated in order to prevent the formation of condensate.

Even in the standard version of the equipment all sizes are equipped with two standard ports (Ø 50 and 125 mm). These are located on the left and on the right side of the test chamber and can be used for inserting measurement and control cables, other supply connections or additional equipment.

Moreover, the test chambers are equipped with an adjustable safety cut-out against high and low temperatures (test specimen protection with separate sensor) according to EN 60519-2 (1993). Any alarm is issued visually as well as acoustically.

In addition, a potential-free contact is available.

Every electrical functional circuit is equipped with its own safety facility which shuts down the functional circuit affected or the entire test chamber in case of a malfunction.

The electrical system complies with the approved state of the art in the field, the safety regulation "Electrical Systems and Facilities" (BGV A3) as well as with the relevant VDE regulations. All test chambers fulfil the EMC, low-voltage and machinery directive.

The hermetic refrigeration circuits operate with environmentally friendly refrigerants free from chlorine without any ozone-depleting potential (CFC-free).



# Operation ...

## Control and program control with the digital measurement and control system

### Computer Integrated Control

Our test chambers are equipped with an integrated industrial computer system with a 12" TFT-colour touch screen display to facilitate operation, monitoring and documentation. The Windows SIMCONTROL\* software package provides maximum user comfort, transforming the test chamber into a communications wizard.

Simulation programs and test results are saved on the hard disk and can be exchanged via Ethernet or USB interface or they can be printed out on a USB printer.

Complete test information is at the user's fingertips, and the function of the unit is explained in an easily understandable manner on the integrated process visualisation system. The interaction between compressors, heating systems and valves is clearly illustrated.

Programming of tests is realised with a graphic editor. The programs are administrated on the hard disk.

In addition to the colour touch screen display, the CONTROLPAD\* installed in the door provides information regarding the current temperature and relative humidity in the unit. Its functions keys are available for direct switching on and off of testing and of the test chamber lighting. It has an alarm display and an acoustic alarm. The diagnosis system is activated on the touch screen display at the touch of a button.

The software is available in several languages.

Control is governed by the 32-bit I/O system SIMPAC\* with integrated soft PLC. A web server can place test and diagnosis information on the internet via Ethernet if desired.

### Online-Service

In addition to the integrated maintenance function, the units have an online service function, enabling our specialists from headquarters to establish an online data link to the



Operating mode display

unit on site via internet or mobile telephone and to analyse the problem. The online link provides our experts with all the data they require in order to support the service technician optimally on site.

If the unit is connected to the network, it can be reached and even controlled at almost any place in the world. To that end, network access to the file system of the unit on the intranet is sufficient or, after authorisation clearance, on the internet itself.

Operation is the same on the unit or on the network and there is full access to all simulation programs and saved archives.

### Networking

The units are compatible with the SIMPATI\* software package and can be integrated into their networking environment. (data logging operation in SIMPATI\*).

# ... and documentation

## Special features ...

### Technical data

- Industrial PC
- Windows XP Embedded
- Colour touch screen display  
800 x 600 pixels

### Interfaces

- Ethernet 100/10 megabits
- RS 232 C
- USB for stick or printer

### Customers inputs/ outputs

- 4 potential-free outputs for test specimen control
- 4 inputs (24 V DC)

## Options

### Additional measurement equipment

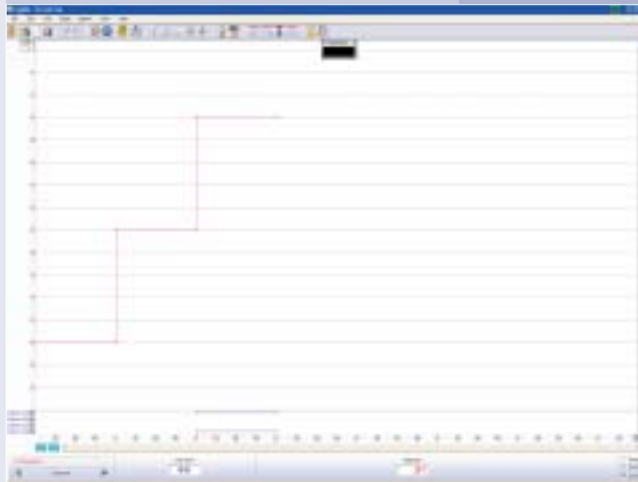
- Pt100 (8 or 16 pieces)
- Analog inputs 0-10 V, 4-20 mA  
(8 or 16 pieces)
- Analog outputs 0-10 V  
(6-12 pieces)
- Interface RS 232/485 or  
RS 232/IEEE 488
- Interface RS 485/422

### PC software

- SIMPATI' software package for  
networking and evaluation of  
the test results

### USB stick

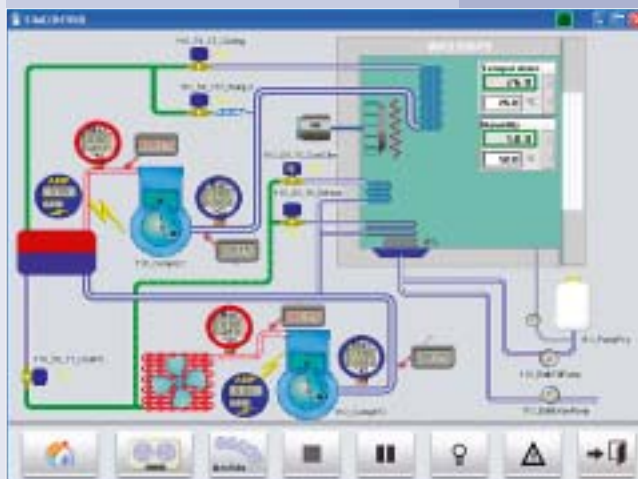
- For external saving of programs  
and measurement data
- Adapter for integration into  
WLAN (optionally RS 485)



Program editor



Graphic evaluation



Process visualisation

# Equipment ...

## Standard version

- 12" TFT-colour touch screen display for convenient entering of fixed values and programs with graphic representation of the target and actual values, runtime, etc.
- CONTROLPAD\* for displaying of temperature values, lighting, start/stop, etc. on the front panel of the device
- Auto-adaptive control system
- Psychrometric humidity measurement with automatically wetted, self-cleaning sensor
- Protection against condensation on test specimen
- Refrigeration unit, air-cooled
- Ports Ø 50 mm and 125 mm in the left and right side panel
- Safety cut-out against high and low temperatures (protection of test specimen as per EN 60519-2 (1993) adjustable, with separate sensor
- Insertion rack
- Adjustable and vibration absorbing feet
- 4 potential-free outputs
- 4 inputs (24 V DC)
- Serial interface RS 232 C
- Ethernet and USB interface
- Potential-free contact for specimen disconnection
- 2 temperature values are calibrated (+23 °C and +80 °C)

## Additional equipment for WK3 series

- Humidity calculator and an integrated limit value monitoring system for humidity
- Large water container, easily accessible
- Automatic feeding in of additional water without interruption of operation
- Display of the humidity values at the CONTROLPAD\*
- Humidity bath flushing for cleaning of the humidifier water
- 2 climate values are calibrated (23 °C/50% r.h. and 95 °C/50% r.h.)

## Options

- Large observation window with lighting
- SIMPATI\* software package for Windows XP
- Printer with USB interface
- Water-cooled version for cooling tower, chilled water or mains water
- Mobile installation by means of moveable version
- Speed-controllable fan in order to vary the circulating air volume flow
- Fresh air purge facility in order to keep the air in the test chamber clean
- Shelves for optimum use of the test space
- Ports Ø 50, 80 and 125 mm for connection of the test specimens
- Temperature measurement on the test specimen
- Other voltages and frequencies
- Calibration in deviation to the standard
- Independent capacitive humidity sensor (temperature and humidity measurement) on a terminal 0-10 V
- Door hinged on right side
- Additional calibration (WKD – Factory Calibration and DKD – German Calibration Service)



- Reinforced test chamber floor up to 150 kg
- Floor for heavy loads up to 500 kg (only available as of 600 l)
- Flat notches or notches for the fixed placement of connected test specimens
- Ports in the area of the roof

## Additional equipment for WK3 series of models

- Dewpoint extension in climate working range up to -12 °C with dehumidifier coil
- Capacitive humidity measurement
- Pressure-resistant demineralisation cartridge
- Dewpoint extension up to -12 °C controlled as well as up to -30 °C uncontrolled with compressed air dryer
- **Special equipment accessories tailored according your demand**



**The excellent features are shown at a glance on page 3.**

## WT3 series of models and WK3 series of models

Type	WT/WK	180/ 40	180/ 70	340/ 40	340/ 70	600/ 40	600/ 70	1000/ 40	1000/ 70	1500/ 40	1500/ 70
Test space contents	Litre	190	190	335	335	600	600	990	990	1540	1540
Test space dimensions	Height approx.	mm	750	750	750	750	950	950	950	950	950
	Width approx.	mm	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 approx.	mm	450	450	765	765	800	800	950	950	1475
Outside dimensions	Height approx.	mm	1775	1775	1775	1775	1995	1995	1995	1995	1995
	Width approx.	mm	780	780	780	780	1000	1000	1300	1300	1300
	Width <sup>4)</sup> approx.	mm	870	870	870	870	1090	1090	1390	1390	1390
	Depth <sup>2)</sup> approx.	mm	1385	1385	1700	1700	1760	1760	1955	1955	2480
	Depth <sup>3)</sup> approx.	mm	1585	1585	1900	1900	1960	1960	2155	2155	2680
<b>Performance for temperature tests</b>											
Maximum temperature	°C	+180	+180	+180	+180	+180	+180	+180	+180	+180	+180
Minimum temperature	°C	-42	-72	-42	-72	-45	-75	-45	-75	-45	-75
Temperature changing rate cooling	K/min <sup>6+8)</sup>	4,0	3,0	4,0	3,0	3,0	2,5	3,0	2,5	2,5	2,3
Temperature changing rate heating	K/min <sup>6+8)</sup>	4,0	4,0	3,2	3,2	4,0	4,0	4,0	4,0	3,5	3,5
Temperature changing rate linear	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
Maximum heat compensation	W <sup>6)</sup>	2800	1500	2800	1500	2500	2500	4500	3000	4200	3000
Temperature fluctuation	K <sup>8)</sup>	±0.1 to ±0.5 in time, ±0.5 to ±1.5 spatial									
Calibration values		+23 °C and +80 °C									
<b>Performance for climate tests</b>											
<b>only WK3</b>											
Temperature range	°C	+10 to +95									
Dewpoint temperature range	°C	+4 to 94 °C {up to -3 °C} <sup>9)</sup> {up to -12 °C} <sup>10)</sup>									
Humidity range	% r.F.	10 to 98									
Humidity fluctuation	% r.F.	±1 to 3 in time									
Temperature fluctuation	K <sup>8)</sup>	±0.1 to ±0.3 in time, ±0.5 to 1.0 spatial									
Maximum 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					CEE connector, 32 A				
Type of protection, electrical parts, max.		IP 54									
Electrical connection approx.	kW	4,1	5,5	4,1	5,5	7,8	9,1	11,5	13,8	11,5	13,8
Max. current consumption approx.	A	12,5	14	12,5	14	15	19	22	29	22	29
Sound pressure level <sup>13)</sup> approx.	dB(A)	56	57	56	57	61	62	62	63	62	63
Condenser		optionally air-cooled/ Water-cooled									
Weight	kg	425	460	490	500	600	675	840	910	920	995

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

- 1) The external dimensions can be reduced by dismantling components
- 2) Without PC colour touch screen display
- 3) Total depth of the test unit
- 4) With door latch and hinge
- 5) Between +125 °C and -25 °C for the models .../ 40 and +125 °C and -40 °C for the models .../ 70
- 6) The performance data refer to +25 °C ambient temperature, 400 V nominal voltage, without specimen, with additional equipment and heat compensation, with water cooling at a flow temperature of 28 °C
- 7) Width between the shelf supports
- 8) According to IEC 600 68-3-5, in temperature range from +180 to -40/-70 °C
- 9) Intermittent operation
- 10) Dewpoint extension as an option
- 11) Other voltages and frequencies as an option
- 12) In the range from +25 °C to 95 °C and <90 % r.h.
- 13) free field measurement 1 m from the front

We reserve the right to make any technical alterations. Some equipment photos show chambers with optional accessories.





## Walk-in temperature and climate chambers



### Temperature and climate test chambers of modular construction, series M.C.S.

The walk-in temperature and climate chambers of the WT/WK series were specially developed for large test objects.

The test chamber is available in 5 standardized sizes (8, 12, 16, 21, 28 m<sup>3</sup>). The machine unit comprises a fan, refrigeration unit, humidification and heating equipment, switch cabinet and system control.

It is completely pre-assembled and tested at the Weiss factory and connected to the installed cell on site.

Thus, the installation time on site is reduced considerably.

Depending on the customers requirements, we can configure the complete system. For configuration purposes, we simply require the following data:

- Desired mode of operation (temperature or climate tests)
- Desired cooling or heating rate
- Desired test chamber size

Special ranges and sizes are possible on request. Please contact us.

# Test Technology for Professionals. Test the best ...



A complete line of systems for temperature and climate testing is available offering test space volumes ranging from approx. 34 l to 2160 l, working ranges from -75 ... +180 °C and 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 Umwelttechnik – 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 customised walk in chambers and in-line systems as per customer specifications.

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

Further information, offices in Germany, subsidiaries and representatives worldwide are available at

**[www.weiss.info](http://www.weiss.info)**



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