

## **Technical Description**

### **Salt Spray Test Chamber**

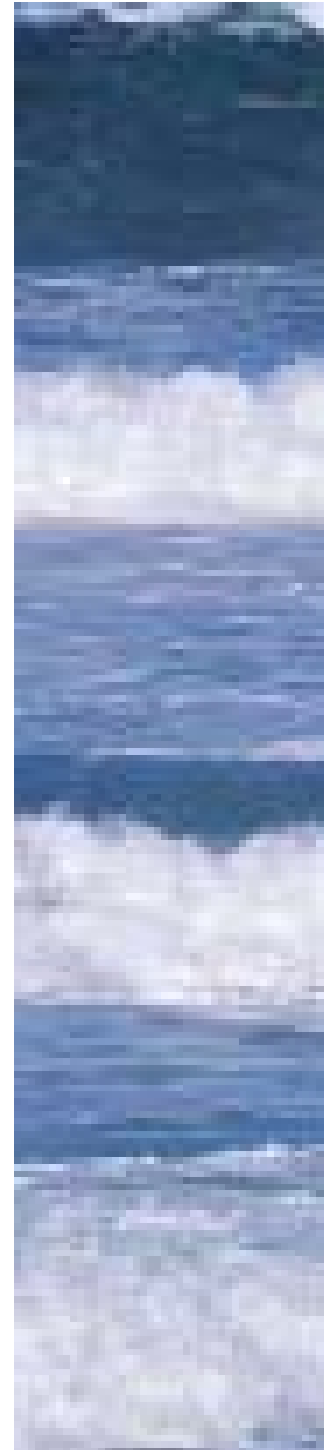
#### **System Weiss**

**Mat. No. 67862130**

**Type SC450**

## Facts

- **Control and programming** via **S!MCON/32\*-NET**.
- Easy operation on ergonomically positioned **colour touch panel**.
- **Corrosion-resistant housing** made of recyclable polyethylene.
- Test space made from **glass fibre reinforced plastic that resists impact, corrosion and ageing**.
- **Acrylic glass nozzle** in spray duct for optimum spray mist distribution.
- **Sturdy design**, the material selection guarantees a long durability.
- **Optimum heat insulation**.
- **External heating of test space** in safe 42 Volt design.
- Light test space hood, can be opened by 75 °; specimens can be positioned using a crane.
- **Hydrostatic sealing** of hood.
- **Ergonomic positioning of operating panel** and display instruments.
- Colour touch panel in protection type IP 54 with easy, menu-guided operation (no programming knowledge required).
- **Digital filling level display**, integrated in the operating panel.
- **Error diagnostic system** and inspection system to facilitate maintenance and repair.
- **Alarm and safety equipment**.
- Automatic water supply.
- **Long-term tests** are no problem due to the brine tank with a volume of 180 l.
- **Easy brine filling** via an aperture of approx. 125 mm with  $\varnothing$  with screw cap.
- Turn-key, modular construction.
- User friendly construction.



## 1 Technical Description

### 1.1 Standards for Salt Mist and Climate Alternating Test Units

Extract of the most important standards (national and international) met by Weiss Systems.  
Concentration and quality as well as admixtures of spray solvent should be taken from the respective standard.  
All indications are given without any obligation and responsibility on our part.

Standard	Edition	Country	Temperature in the test space	Spray solvent	Condensate of the fog	Course of the test	Test duration	Specimen arrangement	Spray pressure	Remarks
DIN 50017	replaced by DIN EN ISO 6270-2 09/05									
DIN EN ISO 6270-2 CH	09/05	GER	40 ± 3			continuous	acc. to the individual instruction	60° to the horizontal line		approx. 100% rel. humidity; water level in test space min. 10 mm; conden. forming on specimen
DIN EN ISO 6270-2 AHT	09/05	GER	40 ± 3  (18 ... 28 °C)			8 h condensed water test climate  16 h cooling-down chamber opened/vented	24 h	60° to the horizontal line		approx. 100% rel. humidity; water level in test space min. 10 mm; conden. forming on specimen  below 100% rel. humidity.
DIN EN ISO 6270-2 AT	09/05	GER	40 ± 3  (18 ... 28 °C)			8 h condensed water test climate  16 h cooling-down chamber closed	24 h	60° to the horizontal line		approx. 100% rel. humidity; water level in test space min. 10 mm; conden. forming on specimen

Standard	Edition	Country	Temperature in the test space	Spray solvent	Condensate of the fog	Course of the test	Test duration	Specimen arrangement	Spray pressure	Remarks
DIN 50021	replaced by DIN EN ISO 9227 10/06									
DIN EN ISO 9227 NSS	10/06	GER	35 ± 2	NaCl 5 %ig (50 ± 5 g/l)	1,5 ± 0,5 ml per 80 cm <sup>2</sup> and h	continuous	2 h to 1000 h or acc. to the individual instruction	20 ± 5 ° to the vertical line	0,7-1,4 bar	ph-value of the absorbed NaCL solution 6,5 –7,2 with (+25 ± 2)°
DIN EN ISO 9227 AASS	10/06	GER	35 ± 2	NaCl 5 %ig (50 +/-5 g/l) + pure acetic acid	1,5 ± 0,5 ml per 80 cm <sup>2</sup> and h.	continuous	2 h to 1000 h or acc. to the individual instruction	20 ± 5 ° to the vertical line	0,7-1,4 bar	ph-value of the absorbed NaCL solution 3,1 - 3,3 bei (+25 ± 2)°C
DIN EN ISO 9227 CASS	10/06	GER	50 ± 2	NaCl 5 %ig (50 +/-5 g/l) + pure acetic acid + cupric chloride	1,5 ± 0,5 ml per 80 cm <sup>2</sup> and h	continuous	2 h to 1000 h or acc. to the individual instruction	20 ± 5 ° to the vertical line	0,7-1,4 bar	ph-value of the absorbed NaCL solution 3,1 - 3,3 bei (+25 ± 2)°C

<sup>1</sup> The ph-value of the NaCL solution is adjusted with pure acetic acid that the sprayed and absorbed solution has a ph-value of 3,1 to 3,3 with (+25 ± 2)°C.

<sup>1</sup> The sprayed and absorbed NaCL solution with cupric chloride + pure acetic acid needs a ph-value of 3,1 to 3,3 with (+25 ± 2)°C.

Standard	Edition	Country	Temperature in the test space	Spray solvent	Condensate of the fog	Course of the test	Test duration	Specimen arrangement	Spray pressure	Remarks
DIN 40046 Blatt 11	Replaced by DIN IEC 68-2.11									
DIN IEC 68 Teil 2-11	08/82	GER	35 ± 2	NaCl of 5% ± 0,1	1,0 - 2,0 ml per 80 cm <sup>2</sup> and h	continuous	16; 48; 96; 168; 336; 672 Std.	Mode of utilisation acc. to the individual instruction		pH- value of the solution 6,5 - 7,2
DIN EN ISO 6988	01/95	GER	40 ± 3			continuous or acc. to the individual instruction	24 h continuous or 8 h at SO <sub>2</sub> atmosphere with 16 h storage at ambient atmosphere or acc. to the individ. instruction	acc. to the individual instruction		0,067% Vol. SO <sub>2</sub> <sup>1</sup>
ASTM B117-79	1979	USA	35 +1,1 -1,7	NaCl of 5 % ±1	1,0 - 2,0 ml pro 80 cm <sup>2</sup> and Std.	continuous	acc. to the individual instruction	15 - 30 ° to the vertical line	0,6 - 1,5 bar	pH- value of the solution 6,5 - 7,2
MIL STD 810F Method 509.4	01/00	USA	35 ± 2	NaCl of 5 % ± 1	1,0 - 3,0 ml pro 80 cm <sup>2</sup> and Std.	continuous	48 h or acc. to the individual instruction	15 - 30 °C to the vertical line	0,85 - 1,25 bar	pH- value of the solution 6,5 - 7,2
MIL STD 202F Method 101D	04/80	USA	35 +1,1 -1,7	NaCl 5% ±1	0,5 - 3,0 ml pro 80 cm <sup>2</sup> and Std.	continuous	48 or 96 Std.	15 ° to the vertical line	0,85 - 1,25 bar	pH- value of the spray solvent 6,5 - 7,2
BS 2011 Part 2.1Ka	1982	GB	35 ± 2	NaCl 5% ± 1	1,0 - 2,0 ml pro 80 cm <sup>2</sup> and Std. min. 16 Std.	continuous	16 to 672 Std.			pH-value of the solvent 6,5 - 7,2 at 35 ± 2°C
VG 95 210 page 2	03/70	GER	35 +1,1 -1,7	NaCl 5%ig or NaCl 20%	0,5 - 3,0 ml 80 cm <sup>2</sup> and Std. min. 16 Std.	continuous	48 or 96 h	15 ° to the vertical line	0,85 - 1,25 bar	pH- value of the solvent 6,5 - 7,2
VG95 332 page 14	10/72	GER	35 ± 2	NaCl 5% ± 0,5	1,0 - 3,0 ml 80 cm <sup>2</sup> and h.min.16h	continuous	acc. to the individual instruction	acc. to the individual instruction	0,8 - 1,2 bar	pH- value of the solvent 6,5 - 7,2

<sup>1</sup> The theoretic SO<sub>2</sub>-concentration at the beginning of the cycle is 0,067% of the chamber volume. The water level in the test space is 0,67 vol. % of the chamber volume.

## 1.2 Technical Description SC 450

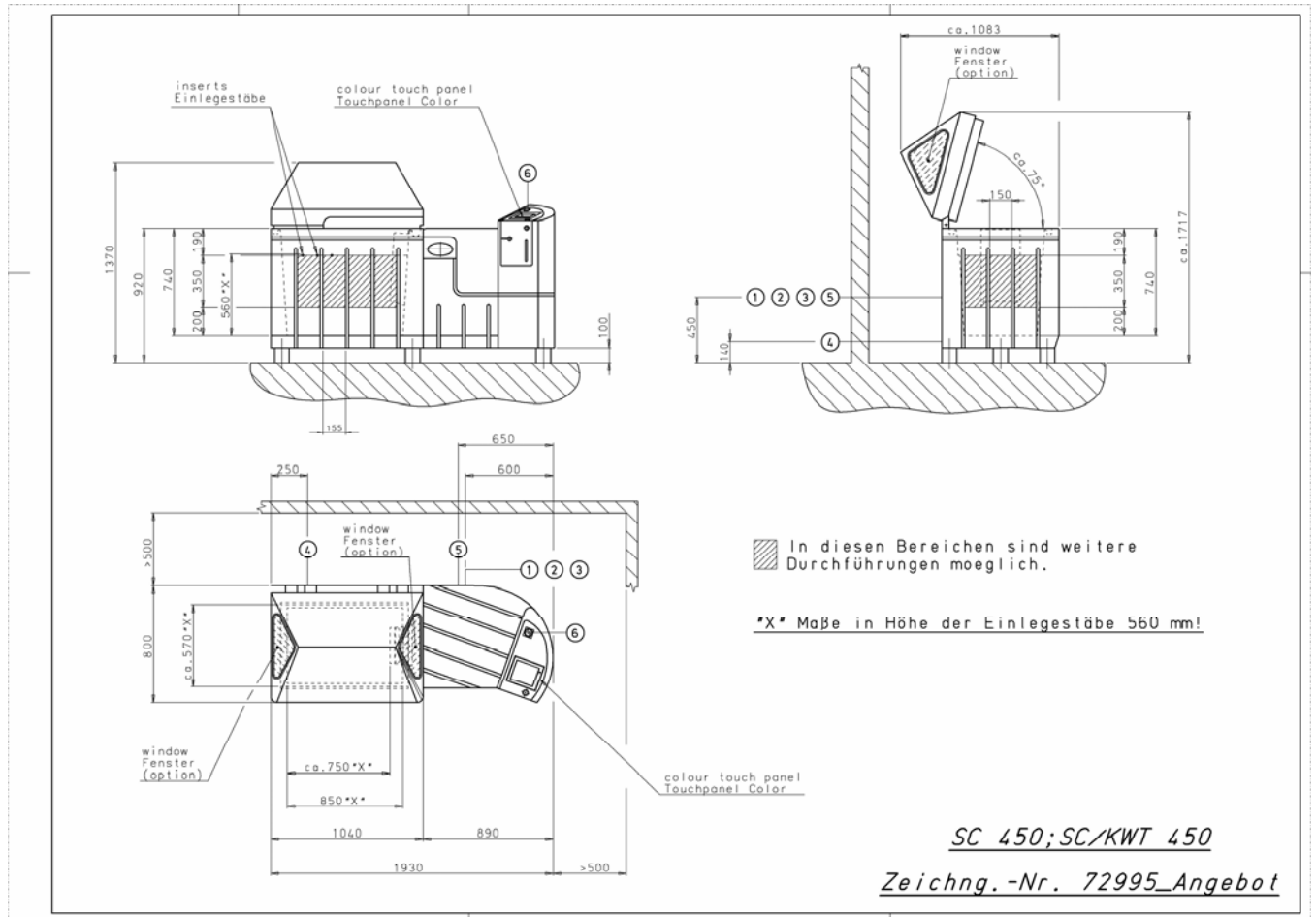
### Test Space

Material	glass fibre reinforced polyester container (GFR) polyethylene hood (PE)
Dimensions	height with hood approx. 1190 mm height without hood approx. 740 mm width approx. 850 mm width to spray duct approx. 750 mm depth approx. 570 mm
Spray channel	height approx. 460 mm width approx. 100 mm depth approx. 250 mm fixed on the right test space wall
Volume	approx. 480 l
Max. load	100 kg as surface load

### Exterior Housing

Material	polyethylene
Dimensions	height with hood approx. 1370 mm height without hood approx. 920 mm width approx. 1930 mm depth approx. 800 mm
Exterior finish	
- housing	similar to RAL 9002 (grey-white)
- test chamber hood	RAL 5000 (violet blue)

### 1.3 Installation Drawing



- |   |   |                       |
|---|---|-----------------------|
| 1 | power supply                                    |                       |
| 2 | water supply (demineralised or de-salted water) | R ¾", flexible hose   |
| 3 | compressed air                                  | R ¼", coupler plug    |
| 4 | condensed water drain                           | counter-pressure-free |
| 5 | exhaust air                                     | counter-pressure-free |
| 6 | main switch                                     |                       |

## 1.4 Equipment

High-precision nozzle	1 off made from acrylic glass, arranged in the spray channel
Control system	S!MCON/32*-NET
Test specimen bracket	1 off, for max. 17 standardised specimen panels (dimensions approx. 100 x 50 x 1 mm)
Specimen holder	7 bars 1 shelf on floor

## 1.5 Performance Data

### Temperature range

- salt spray test 5 K above ambient temperature to +50 °C
- condensed water test 5 K above ambient temperature to +45 °C

Temperature constancy ±1 K (in time)

Calibration in salt spray test +35 °C test space temperature  
+49 °C humidifier temperature

Calibration in condensed water test +40 °C test space temperature

Perfect operation of the plant is only guaranteed at an ambient temperature between +18 and +28 °C (according to DIN 50 014).

The performance data and constancies are proven in a steady state condition without specimens at an ambient temperature of +23 °C (±2 °C).



## **1.6 Control and Programming s!MCON/32\*-NET**

Colour touch panel	VGA, graphic, background-lighted LCD-display
Program memory	100 programs
Segments	max. 1000
Loops	250 (nested)
Program cycles	max. 9999
Password protection	two levels, to prevent accidental settings
Limit value monitoring system	for temperature and humidity
Diagnostic system	for information on operating times and possible operating failures
Serial interface	for connection to a computer system (e.g. Note-book operating panel) or for networking
Centronic interface	as standard

## 1.7 Other

Compressed air	min. 4 bar / max. 10 bar, connection ¼ “ required quality of compressed air: remaining pollution max. 0,2 mg/m <sup>3</sup> as oil and dust (<5 μ)
Air flow rate during salt-spray test	approx. 2 m <sup>3</sup> /h at 0 °C and 1 bar
Humidification water	deionised, conductance max. 20 μS/cm, pre-pressure min. 3 bar / max. 5 bar, connection ¾ “with flexible hose 2,5 m length
Water consumption during salt-spray test	approx. 0,4 l/h
Brine storage tank	approx. 180 l
Condensation drain	counter-pressure free, connection via PVC pipe, exterior diameter 25 mm (Attention! Saline condensate)
Exhaust air	PVC-pipe outer diameter 50 mm (Attention! Saline exhaust air)
Power supply *	208/220/230/240/254 V; 1 PH; 50/60 Hz
Mains plug	shock-proof socket
Noise emission	as per EN 61000-6-3
Noise immunity	as per EN 61000-6-1
Connected load	max. 2,0 kVA, fuse protection 16 A
Weight	approx. 180 kg

\* Please indicate required power supply when ordering.

## **2 Design and Function**

### **2.1 Construction**

Salt Spray Test Chambers are delivered ready for connection.

The exterior housing is made from self-supporting, recyclable polyethylene and is designed with a two-coloured exterior finish.

The test unit is compact in design and is equipped with five height-adjustable pedestals. The machine unit, incorporating the operating equipment is located on the right side of the test chamber. The ergonomically arranged operating and display instrumentation is clearly visible and directly accessible.

All machine unit parts are easily accessible by removing the lightweight hood. A tray with a loading capacity of max. 10 kg is located beside the operating and display panel.

The colour touch panel of the control system is fitted to the front side of the housing for convenient operation. It comprises all timer and control functions.



## 2.2 Exterior Housing and Test Space

The test chamber consists of a plastic container made of GFRP-laminate (glass fibre reinforced polyester). It is equipped with a lightweight polyethylene hood that can be opened to up to 75°. Optimum insulation between the exterior housing and the test chamber guarantees excellent temperature constancy and reduced energy consumption.

The test chamber is provided with all supply and drainage connections, and with different locations for specimen holding bars.

The design of the test chamber hood meets the requirements of the relevant standards. The roof has a slope of at least 30°, ensuring that droplets run down the side walls, to prevent condensation from dripping onto the specimen.

The test chamber and hood are hydrostatically sealed by a circumferential water gutter that prevents salt mist from escaping. The gutter is wider and deeper on the right-hand side of the test chamber to allow for the installation of measuring and connection cables. The specimen inside the test chamber may be connected to an exterior measuring unit.



## 2.3 Test Chamber

The spray nozzle is located in the upper part on the right side of the test chamber. The spray channel has an opening for salt fog on its top and bottom. Spray nozzle, tubes for compressed air and brine and any other parts that come into contact with the salt solution are made of plastic.

The used salt solution is drained via the drainage in the test chamber floor. Excess salt mist is emitted through the exhaust air fitting.

The test chamber comprises no other equipment, thus maximising use of available space. A specimen holding device for standard plates is included in the standard equipment.



## 2.4 Temperature Conditioning

The test chamber is conditioned by low voltage electric heating elements. The heating elements are fixed at the outside of the test chamber.

The required temperature is set on the colour touch panel and displayed as actual value.

## 2.5 Humidification

Various test specifications require the supply of humidified compressed air. For this purpose, the compressed air is passed through a humidification system, where it is saturated with humidity.

An electric heater heats-up the humidifier water until it reaches the required temperature. The water bath temperature is set on the colour touch panel. Set and actual values are displayed digitally.



## **2.6 Spraying of the Salt Fog**

The volume of compressed air set on the built-in reducing air unit is passed through the humidification system to the spray nozzle. There, the salt solution is sucked out of the brine supply reservoir by means of compressed air distributed in the test chamber by injection. The acrylic glass nozzle in the spray channel ensures an optimum distribution of the spray fog inside the test space.

The brine flow volume can be set and monitored at the flow meter which is integrated in the operating panel.



## **2.7 Salt Fog Test/ Condensed Water Test**

During salt fog tests the specimens are continuously exposed to fine salt fog, which in combination with rising test space temperatures accelerates corrosion. Therefore, comparative, accelerated testing of the corrosion behaviour of different specimens is possible under defined conditions.

During condensed water tests the specimens are exposed to extremely high air moisture. The test chamber design ensures that water condenses continuously on the specimen.

The water reservoir is filled manually.

## 2.8 Control and Programming

S!MCON/32\*-NET is a self-monitoring, digital 32 bit measuring and control system and has been designed especially for the use of salt spray test systems. Thanks to its computing efficiency S!MCON/32\*-NET meets the requirements of process technology and facilitates the input due to the touch panel that has been especially developed by Weiss Umwelttechnik.

- **Colour touch panel**

The colour touch panel, suitable for graphics with a resolution of 640 x 480 pixels (VGA), is the standard operating panel. It is arranged ergonomically in the operating panel and thus allows a convenient input of fixed values and program operation with graphic display of set points and actual values, the operating time and number of remaining cycles etc. including help function. Furthermore, the touch panel has the following special features:

- \* Background-lighted display
- \* Operation by slightly touching the function symbols
- \* Graphic symbols for programming functions
- \* Graphic display of actual values
- \* Menu-guidance
- \* Easy programming of individual test programs
- \* Safe storing of individual programs, which can be activated at any time
- \* Easy activation of stored test programs
- \* Help function
- \* Operation state displayed by means of light diodes

- **System**

S!MCON/32\*-NET handles all the functions necessary for control and programming. In addition to the control of temperature and humidifier temperature it also contains an efficient Software PLC according to IEC 1131 standard, which coordinates, monitors all functions and provides information on operating failures.



## **2.9 Additional Safety Devices**

In addition to the programmable limit value monitoring system of the **S!MCON/32\*-NET** each heater is protected by a thermostat with an additional temperature limiter. Safety thermostats with restart locking switch off the entire test chamber in case of failures.

## **2.10 Permanently Memorised Overheating Safety Thermostat**

The saturator for compressed air is secured by a permanently memorised overheating safety thermostat.

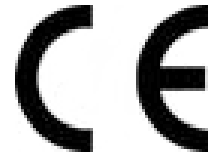


### 3 Power Supply

Each functional circuit is equipped with its own safety device, which turns off the affected circuit or the entire chamber in case of trouble. The trouble is indicated optically.

Wiring and electrics are governed by the latest technology and strictly conform to safety regulations for electrical installations and materials (BGV A2), as well as to the relevant VDE regulations.

Our Salt Spray Test Chambers have a lockable main switch (according to VDE).



### 4 General Information

In the constant effort to improve our product, we reserve the right to make construction or design changes without notice or obligation.

Please note that for easy installation of the Corrosion test chamber the exterior dimensions indicated in the technical data must be observed.

The chamber is designed to be installed in normal rooms. The max. admissible ambient temperature for storage and installation is +55 °C (+131 °F).<sup>1</sup>

The admissible ambient temperature for operation of the chamber is from +18°C to +28°C (+64°F to +82°F).

The performance data indicated were determined with empty test space and refer to an appliance without additional ports or devices, which represent a thermal load with an ambient temperature of max. +25°C.

Performance data cannot be guaranteed in ambient conditions other than those stated.

The image shows a certificate from TÜV SÜD Management Service GmbH. The certificate is titled "CERTIFICATE" and certifies that Weiss Umwelttechnik GmbH, located at Greizer Straße 41 - 49, D-35447 Reiskirchen-Lindenstruth, has established and applies a Quality Management System for the development, manufacture and sale of devices and installations in the field of environmental simulation and measuring technique as well as servicing of these products. The certificate is based on an audit performed on March 20, 2009, with report number 70749716. The requirements according to ISO 9001:2008 are fulfilled. The certificate is valid until 2012-05-11 and has a registration number of 12 100 36021/01 TMS. The certificate is signed by M. Woytel, dated March 20, 2009. The certificate is issued by TÜV SÜD Management Service GmbH, with offices in Zertifikatsstelle, Rinderstraße 65, 80339 München, Germany. The certificate is registered with IAF (International Accreditation Forum) and is part of the TÜV SÜD Management Service GmbH certification system.



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## 5 Scope of Delivery

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Mat. No.	Description
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### Salt Spray Test Chamber, System Weiss, SC450

Complete and ready for connection

including:

- programmable S!MCON/32\*-NET control system
- colour touch panel VGA
  - \* background-lighted, graphic colour LCD display
  - \* program storage with 100 programs with 1000 segments in total
  - \* password protection against unauthorised use
  - \* integrated inspection system
  - \* guaranteed dwell time function
  - \* battery-buffered real time clock
- serial interface RS 232 C
- precision atomising nozzle inside the spray channel
- control unit for compressed air
- heated compressed air humidifier with automatic water supply
- adjustable flow meter and dosing device for brine
- combined brine reservoir and supply tank (180 l) made of plastic for long-term testing
- specimen holder for plates
- corrosion-resistant, stable support pipes for specimen positioning
- floor shelf
- broad, deepened gutter, positioned on right side, for measuring and connection lines
- overflow pipe of test space floor drain for condensed water test DIN EN ISO 6270-2
- height-adjustable feet
- safety devices
- calibration in salt spray test (+35 °C test space temperature / +49 °C humidifier temperature)
- calibration in condensed water test (+40 °C test space temperature)
- technical documentation/operating manual
- 4-stage, digital filling level indicator for brine tank