CE

# Vötsch
### Industrietechnik

## Climatic Test Chamber  VC 4020 / VC 7020
## VC 4033 / VC 7033
## VC 4057 / VC 7057

## Hermetically sealed
## With CTC Control

# Operating
# Instructions

GB

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## Table of contents

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## 1. Introduction

### 1.1 General Information

**This manual shall be read carefully before operating the system in order to avoid malfunctioning and resultant damage.**

The manual contains information and directions regarding installation and operation. The mode of operation, faults and fault rectification are also described.

For details on the Terminal see separate operating instructions.

Observe the three comments **DANGER, WARNING** and **NOTE**:

| DANGER |
| --- |

is used, if non-compliance with the instructions may endanger living beings or the environment.

| WARNING |
| --- |

is used, if non-compliance with the instructions may cause damage to the system or test specimen.

| NOTE |
| --- |

is used to indicate any form of assistance.

Please observe further safety symbols on the system, e.g.

| DANGER |
| --- |

Warning about dangerous electrical voltage

Wear protective gloves !

09.1996

*optional accessory

1

| 1.2 | **Warranty** | Report any damage immediately to the carrier and the manufacturer. |

No warranty can be given in case of improper use contrary to the instructions in this manual.

This system has been designed, manufactured and inspected before delivery with all due care in accordance with the EC guidelines as per the enclosed declaration of conformity.

The system meets the class A specifications for conducted and emitted interference according to EN 55011.

It is imperative for the safety of the system that the necessary maintenance and repair work should be performed by our service organisation (for the address see chapter 6.6) or by authorized service outlets. Only use original spares.
Needless to say that the user himself can service and clean the system in accordance with the maintenance schedule (chapter 6.4).

| 1.3 | **Normal use and application** | The climatic test system has been designed and constructed for temperature and humidity tests. It permits testing methods to determine the effects of temperature and humidity on the material properties and reliability of a test specimen. |

**Improper, inadmissible use**

⚠️

**DANGER**

- Inflammable and explosive gases, fluids, dusts , inflammable, explosive, toxic, corrosive test specimens or other test specimens representing a danger when exposed to the temperature range of the system must not be placed in the test space or in the vicinity of the system. This also applies to substances which may create an explosive atmosphere with air.

- The test chamber is not intended to accommodate living beings as this is extremely dangerous to life and limb.

- The test chamber must not be used for heating or storing food.

## 1.4 Safety standards and Instructions

| DANGER/WARNING |

- Thorough knowledge of the operating instructions for test system and terminal is a prerequisite for operating the test system. These operating instructions are to be kept near the test system.

- For translations into other languages the statements and specifications of the German operating instructions are binding.

- Pull the mains plug prior to performing maintenance work!

- A pressure and seal test has been carried out on the refrigeration circuit.

- Important notes for the user regarding installation and operation of refrigerating plants in VBG 20 (section IV, para. 18 and 19 and section V, paragraph 30) shall be observed when operating the system.

- Operation and maintenance of the system may only be performed by trained personnel. The user has to compile an operating manual on the basis of these operating instructions taking the relevant local and plant-internal conditions and the language for the operating personnel into consideration.

- With regard to installation and operation of the system the relevant laws, specifications and guidelines of the country in question must be observed in addition to this manual.

- The system may cause radio interference.

- The test space is only protected against excess temperature when the system is switched on. For this reason, heat-emitting test specimens must never be placed in the test space when the system is switched off. Fire hazard !

- Ensure that the pressure compensation aperture (see chapter 2.1) is always open.

- Connectors may only be plugged when the system is switched off.

- In case of fans with variable speed*, please note that the system must not be connected to a residual-current-operated circuit-breaker < 300 mA.

- Whenever $CO_2$* is used, make sure the room is well ventilated. Exhaust air must be led to outdoor atmosphere. Danger of suffocation! The applicable MAC values and $CO_2$ safety regulations must be observed.

When using the entry ports:

- Safety standards applicable to electrical systems, e.g. VDE 0100 part 410 and DIN EN 60204 part 1 as well as the relevant accident prevention regulations must be observed.

- Only use lines which are resistant to temperature and humidity.

- The entry and notch* ports must be sealed with suitable material.

Certain basic rules must be observed even for reliable safety devices. Improper use may represent a danger to life and limb of the operator or third parties or result in destruction of the test specimen or the system.

- Do not remove protective covers (e.g. grid of test space fan or condenser fan).

- Do not render safety devices ineffectual. Do not bridge or manipulate them.

- The electrical section is to be opened by experts only. Set the main switch to "0", pull the mains plug and ensure that the system cannot be switched on before opening.

These points are <u>not</u> to be considered as mere tips, but as a warning against rash action. Such manipulations are particularly dangerous as others know nothing about them and have confidence in the safety of the system.

## 1.5 Safety devices

Safety devices switch the system off permanently under the following circumstances:

- Excess temperature in the test space

- Excess temperature at the adjustable operating temperature limiter*

- Excess pressure in the refrigeration circuit

Please note that these safety devices are only working when the system is switched on.

*optional accessory

| 1.6 | **Opening the test space door in an emergency** | An emergency release is provided for the 330 l and 570 l versions which is directly connected with the door lock. It can be actuated from the inside by means of a pushbutton. When the pushbutton is pressed the door opens even when locked. To reset, the part of the lock which is now in the door must be released. Insert the locking part again into the mating lock and pull back the pushbotton. Ensure that the locking part catches. |
|---|---|---|
| 1.7 | **Separate operating instructions** | Please observe the documentation concerning the following equipment: |

- Printer LX 300*

- Printer HP Deskjet 660 C*

- Programmable six-colour printing recorder*

- Interface converter IEEE*

- Software TSI / TSI-MT*

- Demineralization unit*

- Corrosive gas dosing system*

- E4-Terminal

- C-Terminal*

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## 2. Preparation for initial operation

### 2.1 Layout

Layout VC 4020 / VC 7020
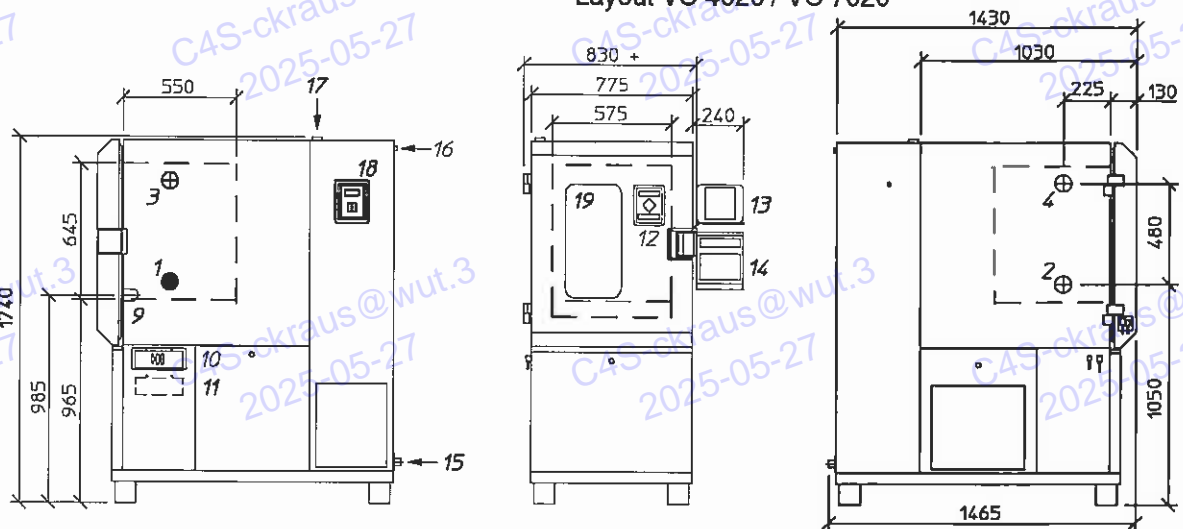


⊙ Entry port NW 80 mm
installed in basic version

○ Entry port
NW 50 mm*, NW 80 mm* or NW 125 mm*
additional installation position

1-4 Number of installation positions

5-8 Not assigned

9 Notch port*

10 Connector panel

11 Connector panel

12 E4-Terminal

13 Programmable six-colour
printing recorder*

14 C-Terminal*

15 Drain for test space and
humidification water

16 Mains connection,
cable length approx. 3.5 m

17 Pressure compensation

18 Main switch with adjustable operating temperature limiter*

19 Door with window*

# Useful width

+ For narrow entry openings components (e.g. hinges) may be screwed off to minimize width.

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Layout VC 4033 / VC 7033



⬤ Entry port NW 80 mm
installed in basic version

◯ Entry port
NW 50 mm*, NW 80 mm* or NW 125 mm*
additional installation position

1-8 Number of installation positions

9 Notch port*

10 Connector panel

11 Connector panel

12 E4-Terminal

13 Programmable six-colour
printing recorder*

14 C-Terminal*

15 Drain for test space and
humidification water

16 Mains connection,
cable length approx. 3.5 m

17 Pressure compensation

18 Main switch with adjustable operating temperature limiter*

19 Door with window*

# Useful width

+ For narrow entry openings components (e.g. hinges) may be screwed off to minimize width.

Layout VC 4057 / VC 7057
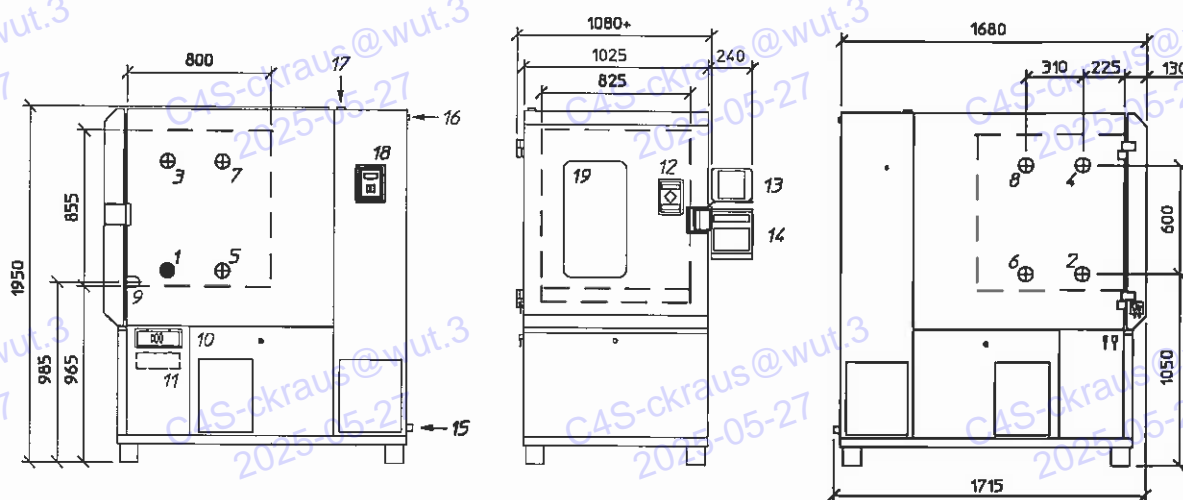


⊙ Entry port NW 80 mm
   installed in basic version

○ Entry port
   NW 50 mm*, NW 80 mm* or NW 125 mm*
   additional installation position

1-8 Number of installation positions

9 Notch port*

10 Connector panel

11 Connector panel

12 E4-Terminal

13 Programmable six-colour
   printing recorder*

14 C-Terminal*

15 Drain for test space and
   humidification water

16 Mains connection,
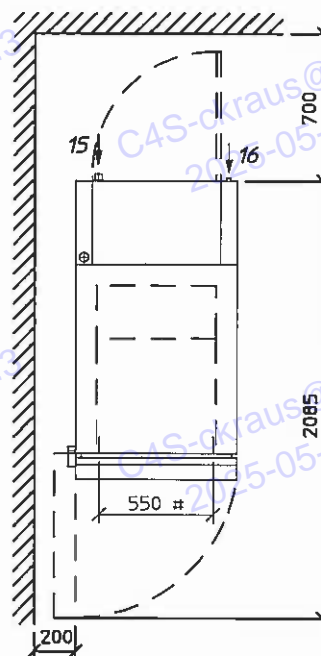   cable length approx. 3.5 m

17 Pressure compensation

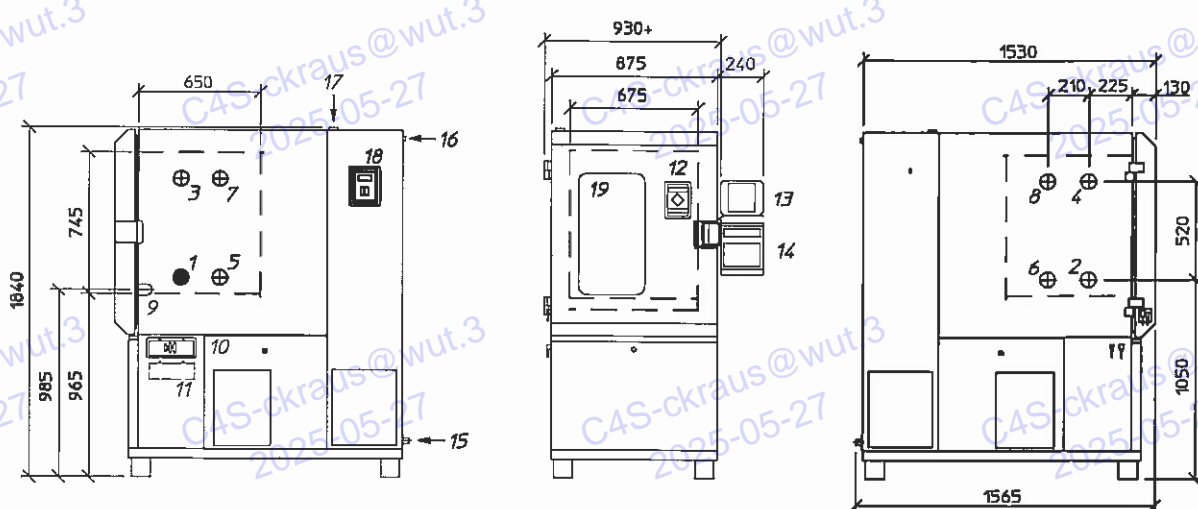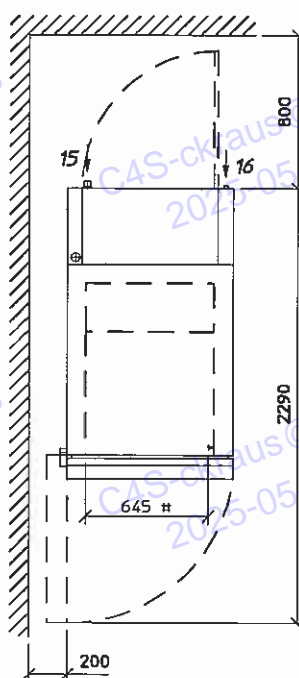18 Main switch with adjustable operating temperature limiter*

19 Door with window*

# Useful width

+ For narrow entry openings components (e.g. hinges) may be screwed off to minimize width.
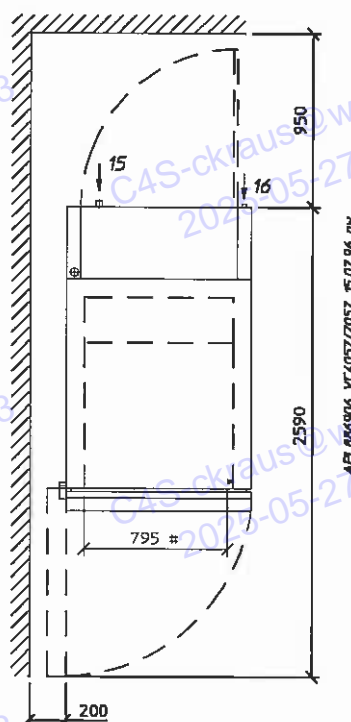
## 2.2    Supply connections

All connections are located at the rear of the system.
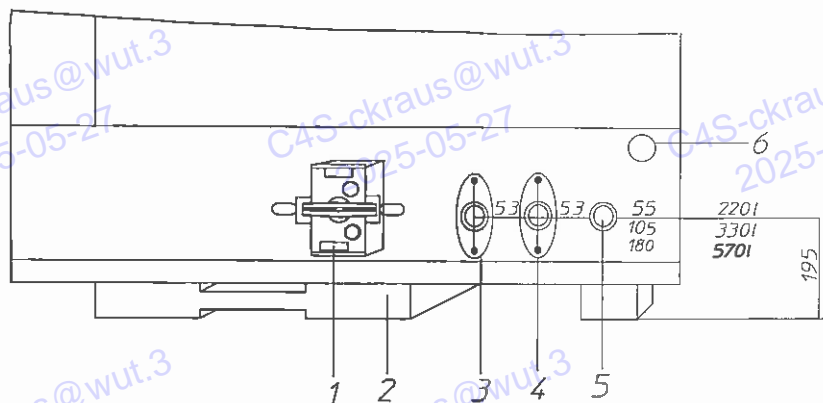


Connections

1    Multiway valve*

2    Water receptacle*

3    Cooling water inlet*, internal thread R 3/4"

4    Cooling water return*, internal thread R 3/4"

5    Drain for test space and humidification water, hose nozzle NW 10 mm

6    Automatic water replenishment*, external thread R 3/4"

## 2.3    Installation

The system is to be installed as follows:

-    Unpack the system

-    Remove the accessories from the test space or box. Check that they are complete and undamaged.

-    Place the system on an even and horizontal surface. Put a spirit level on the test space floor and align by turning the feet.

| WARNING |
| --- |

The system must be operated with mounted
feet or castors to assure ventilation
of the mechanical section.

-    Apply the wheel brake on mobile versions and turn feet to relieve the castors.

- Ensure that mains voltage and frequency correspond to the specifications on the rating plate (beneath the main switch). Ensure that on-site fuse protection is adequate.

    **Special voltage***
    If the on-site mains voltage/frequency differ from our standard values as specified in chap. 3.4 "Technical data", the system must be connected by an expert in accordance with the "Special voltage" manual enclosed.

- Ensure that the connecting cable is undamaged

- Connect the system to the mains supply

- Connect the test space drain to a floor drain or place the water receptacle* (2, illustration chapter 2.2) underneath the drain and connect with a piece of hose.

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⚠️

| WARNING |

When using the demineralization unit* or automatic water replenisment*, the test space drain must always be connected to a floor drain as the water receptacle is not provided with a water level monitoring device.

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- Set up the connection for automatic water replenishment*

- Connect cooling water inlet* and return*.
    Check water quality and install a dirt filter (to be provided by the customer) in the cooling water inlet if necessary.

- Installing the six-colour printing recorder*:
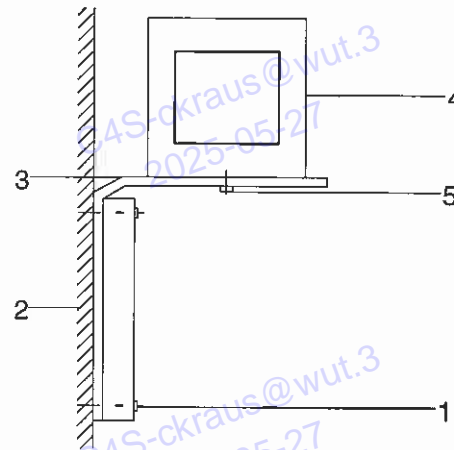


Fitting the console

- Undo six screws (1) and remove plastic plate (2)

- Position the console (3) against the chamber, put the plastic plate over it and secure with the six screws

- Place the six-colour printing recorder (4) on the console and secure with the knurled nut (5)

- Insert the mains supply cable into "Supply Recorder" on the connector panel

- Insert the connecting cable into "Analog I/O" on the connector panel

- See chapter "Supply Recorder" for details on connection X37 for free measuring points

- Fitting the C-Terminal* :
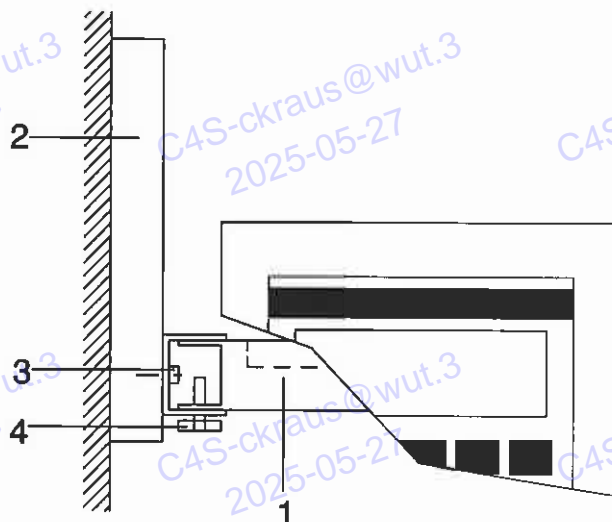
Fitting the C-Terminal

- Insert the supporting bracket (1) with the recess at the top into the plastic plate (2).

- Tighten the screw (3) with the enclosed Allan key.

- Insert the C-Terminal into the recess of the supporting bracket.

- Plug the connecting cable into "Control Panel" on the connector panel.

- Secure the C-Terminal in the desired position with the fixing screw (4).

- The C-Terminal may be fastened to the supporting bracket with the additional fixing screw provided.

- Installing the optional accessory compressed-air dryer
  (see following drawing):

    - Remove dryer and accessories from the box.

    - Check that contents are complete and undamaged.

### Contents:

- Compressed-air dryer assembly

- Screws 4 x M6

- Compressed-air hose with plug

- Documentation

Report any damage immediately to the carrier and the manufacturer.

### Technical data:

| | |
|---|---|
| Differential pressure | 200 mbar at 7 bar g |
| Flow rate | 9 $m^3$/h at 7 bar g |
| Noise level | 75 dB (A) |
| Pressure dew point | -40 °C |
| Weight | 6.5 kg |

### Supply connections:

| | |
|---|---|
| Compressed-air connection | DN 7.2 type 26 1/2" |
| Admissible pressure range | 4 bar to 10.5 bar |
| Air inlet temperature | -5 °C to +50 °C |
| Working pressure | 7 bar |

## Installation

Fix the dryer to the left-hand side as follows:
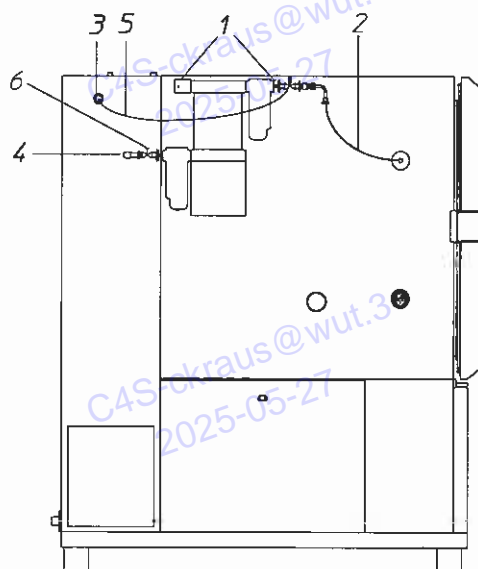


Compressed air dryer

- Secure the dryer to the system with the screws (1) provided

- Screw hose (2) to the dryer (using a spanner size 17)

- Insert the plug into the port

- Insert cable (5) into socket on the test system (3)

- Connect compressed-air (4) (DN 7.2 connection, type 26 1/2")

- Open manual stop valve (6)

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**NOTE**

Close the manual stop valve
if no dried air is required.

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Activating the dryer:
(see chap. 3.3.1 in the separate operating instructions for the Terminal)

- via digital switching channel in case of E4-Terminal

- via additional functions in case of C-Terminal*

- $CO_2$ shock cooling*

  The $CO_2$ solenoid valve with corresponding connecting piece  UNF 7/16"
  is located at the rear of the system.

| WARNING |
|---|

Only use bottles with offtake pipes to remove liquid. Do
not subject $CO_2$ bottles to temperatures exceeding
+ 31°C (contents are liable to vapourize). Max.
permissible operating excess pressure
is 73 bars.

Connect the $CO_2$ bottle in the following order:

- Screw the bottle connection with seal onto the $CO_2$  bottle.

- Put the $CO_2$ hose through the socket at the rear of the system and
  connect it to the solenoid valve.

- Insert the $CO_2$ sealing cap with pressure compensation opening into the
  entry port.

| WARNING |
|---|

When using $CO_2$ without sealing cap, at least 1/3
of the port must remain open for
pressure compensation.

- Open $CO_2$ bottle, check connections for tightness. The applicable MAC
  values must be observed ($CO_2$ vapour must be led to outdoor atmosphere).

| DANGER |
|---|

The room must be adequately ventilated ! Generally
applicable MAC values and $CO_2$ safety standards
must be observed.  If MAC values are exceeded,
$CO_2$ vapour must be led to outdoor atmos-
phere. Danger of suffocation !

- Activate $CO_2$ shock cooling via switching channel on the Terminal (when
  working in manual mode, this must be done after every start).
  If $CO_2$ shock cooling fails to respond:

  - Check filter at the bottle connection and clean if necessary

  - Check electrical connector at the $CO_2$ solenoid valve

  - Activate the switching channel

- Optional acccessory adjustable air flow rate:

  A variable-speed fan is used for reducing the quantity of circulating air in the test space. The setting range is from 50% to 100%.

  The system is provided with a connecting cable for a non-detachable connection on site. The mains connection must have a separate protective conductor of min. 10 mm$^2$ Cu (VDE 0160, section 6.5 and E-EN 50178 regulations). The additional PE terminal is located on the back of the system.

## 2.4 Preparation for initial operation

Prepare the system for initial operation as follows:

- Ensure that the system has been correctly installed in accordance with chapter 2.3.

- In case of heat-emitting test specimens, ensure they are disconnected when the system is switched off.

- Seal all entry ports and notch ports* with the plugs supplied, otherwise the water consumption during humidity tests will be too high and the setpoints cannot be achieved.

- Fill the reservoirs with humidification water (max. 24 l) and psychrometric water (max. 4 l) via the filling ports (see chapter 3.2) or ensure automatic water replenishment*.
  For water quality see chapter "Technical Data".

| NOTE |
| --- |

On systems without optional accessory "automatic water replenishment", the water level drops significantly during initial filling as the pipe system is filled.
In case of long-term programs we would recommend topping up immediately so that the reservoir is at least half full.

- Set the main switch to "I".

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## 3. Description

### 3.1 Design
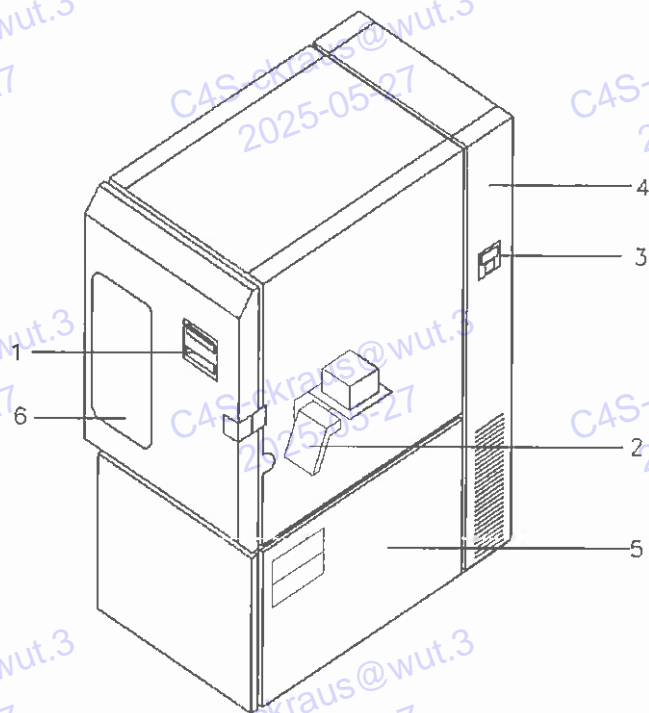
Climatic test chamber

1　E4-Terminal

2　C-Terminal*

3　Main switch

4　Electrical section

5　Mechanical section

6　Test space

**Mechanical section**　　The mechanical section is accessible from all sides. It contains the refrigeration and humidification assemblies (s. chapter 3.2). Cooling is effected directly.

**Test space**　　The test space is made of high-grade steel, material no. 1.4301. It is accessible from the front through a lockable door.

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**Air guidance**

The air is drawn in at the centre of the rear panel and re-enters the test space at the top and bottom via air guide plates.
The high air flow rate ensures even distribution of air in the test space
This guarantees rapid transfer of the respective air conditions to the test specimen.
The assemblies required for thermal conditioning and humidifcation are located in the air conditioning space. They consist of:

- heat exchanger made of copper piping with aluminium fins

- electric heating

- humidification and dehumidification pan

**Measuring sensors**

The temperature and humidity measuring sensors are located under the insert floor. They are accessible from the front.

**Entry ports**

Entry ports are provided on the right and/or left side through which measuring lines may be run into the test space. Observe the relevant safety instructions in chapter 1.4.

**Electrical section**

The electrical section contains all control modules and electrical components (control board and fuses).

**Control**

The controller ensures constant temperature and humidity control and stable control response.

The system can be equipped with optional accessories (see chapter 3.5).

## 3.2 Mechanical structure
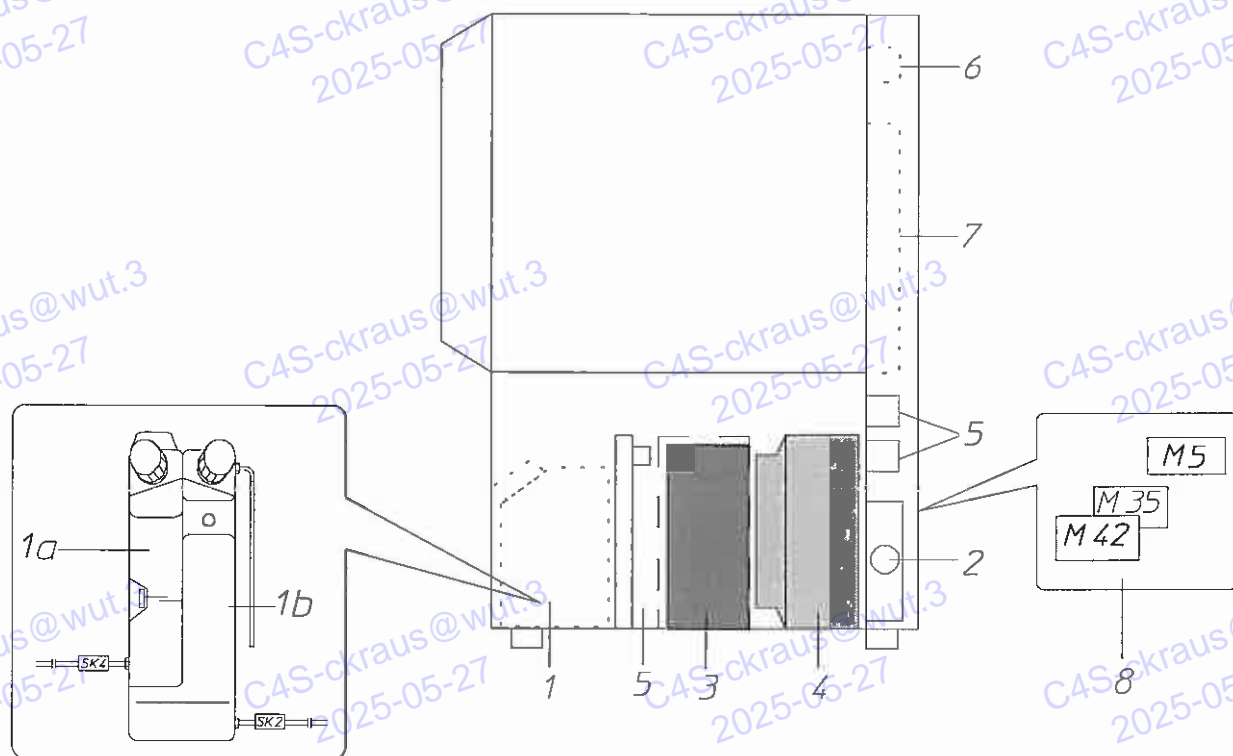


Mechanical structure

1 Reservoir for humidification and dehumidification system (1b)
and psychrometric water (1a)

2 Humidity system

3 Compressor (two compressors series 7...)

4 Condenser with condenser fan

5 Pressure switch F2, (F3) and control pressure switch F17

6 Fan motor for air circulation in the test space

7 Control unit

8 Pumps

## 3.3 Control unit

### 3.3.1 Control unit in general

The electrical section contains the microprocessor-based control and monitoring system. The following data can be entered on the Terminal and will be displayed:

- digital input of temperature in °C and humidity in % relative humidity

- digital display of set and actual value of temperature and % relative humidity (r.h.)

- manual and automatic mode
  program memory for max. 99 test programs with 99 program lines each, total max. 2000 program lines

- digital customer I/O for controlling additional functions with up to 3 digital outputs. 3 digital inputs can be interrogated via interface

- software temperature limiter for minimum and maximum test space temperature

See separate operating instructions for details on the Terminal.

---

**WARNING**

The following note concerning heat-emitting
test specimens must be observed

The system switches off automatically in case of faults thus disabling the cooling system. Heat-emitting test specimens would heat up the test space to inadmissible levels. It is therefore necessary to ensure that heat emission from the test specimen is interrupted when the system is switched off. This may be triggered for example by the appropriately converted potential-free contact.

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**3.3.2   Adjustable operating temperature limiter\***

The operating temperature limiter\* (see drawing below) is used for test specimen protection.

The maximum temperature is set with a screwdriver at the potentiometer (1)  and represented in the display (2).

The temperature set must be approx. 5 - 10 K higher than the maximum temperature setpoint of the system.
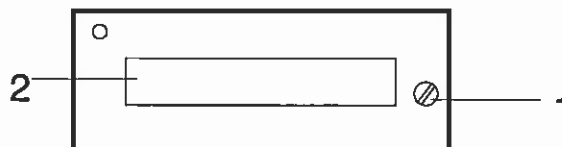
Adjustable operating temperature limiter\*

The temperature sensor can be moved freely throughout the test space and can therefore be attached to the most sensitive spot of the test specimen. For tests without test specimen protection the sensor may be placed in the mounting provided.

*optional accessory

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### 3.3.3    Connector panel

Connectors may only be plugged when the system is switched off.
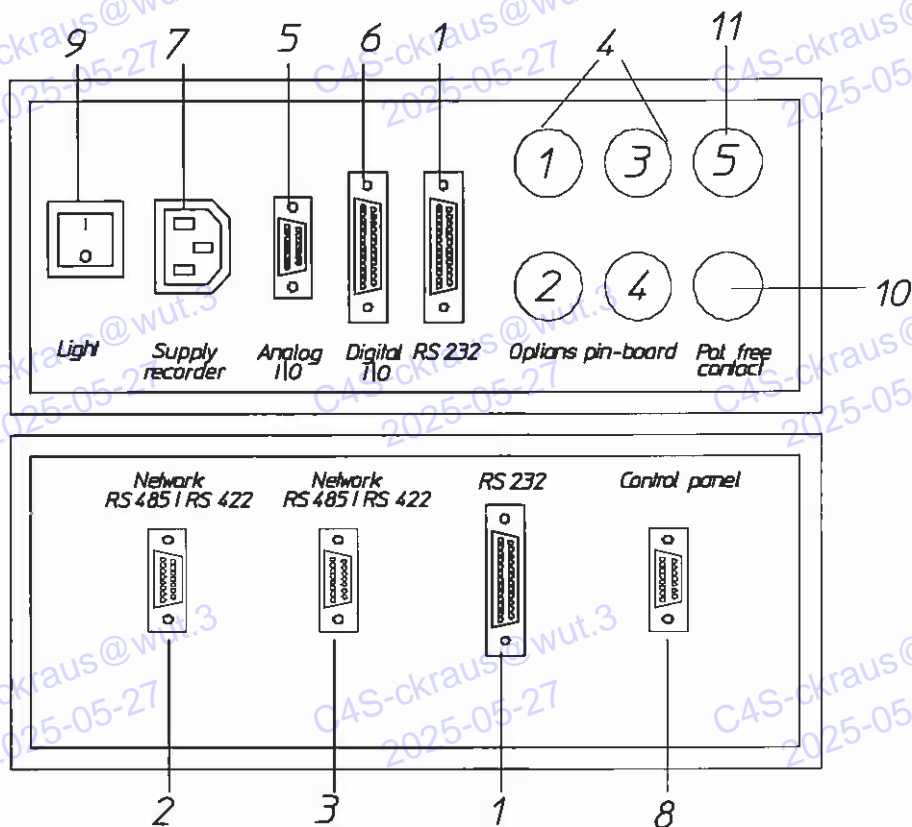
Connector panel

| 1, 2, 3 | Interfaces RS 232 and RS 485* / RS 422* |
| 4 | Mobile temperature sensors* |
| 5 | Analog I/O* |
| 6 | Digital I/O |
| 7 | Supply recorder* |
| 8 | Control panel* |
| 9 | Light switch |
| 10 | Potential-free contact |
| 11 | Measuring sensor* for temperature and humidity |

Depending on the optional accessories ordered the position of these connections may differ.

### 3.3.3.1 RS 232 Interface

The RS 232 interface is used for external control via computer.
The 25-pole sub D socket is assigned as follows:

| | PC | | System |
|---|---|---|---|
| TxD Output | Pin 2 | | Pin 2 |
| RxD Input | Pin 3 | | Pin 3 |
| Ground | Pin 7 | | Pin 7 |
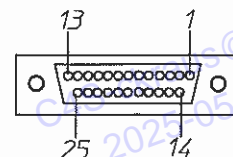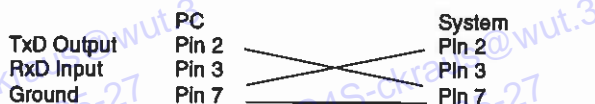
### 3.3.3.2 RS 485/RS 422* Interface

The network RS 485/RS 422* interfaces are used to network several systems.
The 15-pole sub D sockets are assigned as follows:
The pin assignment to PC is only applicable in connection with Interface Converter* RS 232 / RS 485, ordering code 883632.

| | PC | | System | |
|---|---|---|---|---|
| Signal Gnd | Pin 1 | | Pin 1 | |
| Rx- | Pin 11 | | Pin 11 | Tx- |
| Tx- | Pin 9 | | Pin 9 | Rx- |
| Rx+ | Pin 4 | | Pin 4 | Tx+ |
| Tx+ | Pin 2 | | Pin 2 | Rx+ |
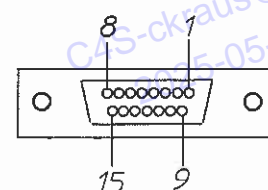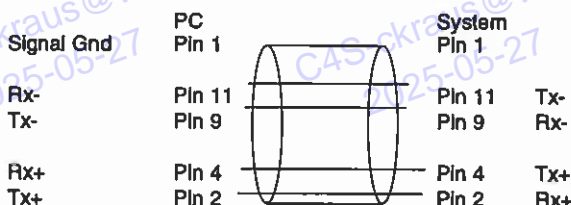
### 3.3.3.3 Mobile temperature measuring sensor*

Sockets 1 - 4 are provided for mobile temperature measuring sensors*. Put the temperature measuring sensor through the entry port and fix it at the desired spot in the test space. Plug the connector into "Options pin-board" on the connector panel and seal the entry port.

The connection is used for external acquisition of temperature values.
The 4-pole socket is assigned as follows:

| | |
|---|---|
| - Pt 100 1 | Pin 1 |
| + Pt 100 1 | Pin 2 |
| Shield | Pin 3 |
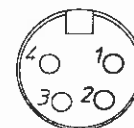
If the system is equipped with optional accessory Analog I/O*, please refer to chapter "Analog I/O" for pin assignment.

### 3.3.3.4 Temperature and humidity measuring sensor*

A plug connection (socket 5) is provided for the independent capacitive humidity measuring sensor* and the Pt 100 temperature measuring sensor*.

As a result, the humidity range over +60 °C is slightly reduced (see diagram "humidity range").

The 4-pole plug provided must be connected on site and inserted at "Options pin-board" on the connector panel.

The 4-pole socket 5 is assigned as follows:

| | |
|---|---|
| - Actual temperature and humidity | Pin 1 |
| + Pt 100 1 actual temperature | Pin 2 |
| + Actual humidity | Pin 3 |
| Shield | Pin 4 |

| Output of temperature values: | 0 to 10 V equivalent to -100 °C to +200 °C |
|---|---|
| Output of humidity values: | 0 to 10 V equivalent to 0 % to 100 % |
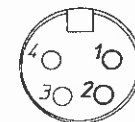
### 3.3.3.5 Analog I/O*

The Analog I/O* connection is used for external acquisition of actual temperature and humidity values. Outputs 0 - 10 V = -100 °C to +200 °C or 0 to 100% r.h.

Max. insulation voltage to ground 1 kV-DC.

The 15-pole sub D socket is assigned as follows:

| | |
|---|---|
| - Actual temperature | Pin 1 |
| + Actual temperature | Pin 9 |
| - Actual humidity | Pin 2 |
| + Actual humidity | Pin 10 |
| - Pt 100 1 | Pin 3 |
| + Pt 100 1 | Pin 11 |
| - Pt 100 2 | Pin 4 |
| + Pt 100 2 | Pin 12 |
| - Pt 100 3 | Pin 5 |
| + Pt 100 3 | Pin 13 |

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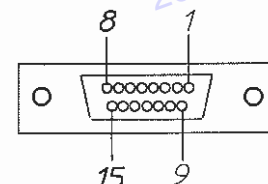
### 3.3.3.6  Digital I/O

The Digital I/O connection comprises the digital inputs and outputs which can be freely programmed within a program or as an additional function in manual mode (max. output load 24 V, 0.5 A, max. input load 24 V-DC, approx. 30 mA). Max. insulation voltage to ground 1.0 kV-DC.
The 25-pole sub socket is assigned as follows:

| Input 1 | +24 V | Pin 1 |
|---------|-------|-------|
| Input 2 | +24 V | Pin 14 |
| Input 3 | +24 V | Pin 2 |
| Input 4 | +24 V | Pin 15 |
| Common | GND | Pin 5 |

| Pin 7 | Output 1 |
|-------|----------|
| Pin 12 | Output 1 |
| Pin 8 | Output 2 |
| Pin 10 | Output 2 |
| Pin 19 | Output 3 |
| Pin 22 | Output 3 |
| Pin 20 | Output 4 |
| Pin 24 | Output 4 |
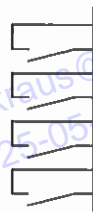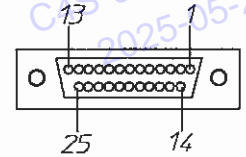
### 3.3.3.7  Fault indication

The connection for the potential-free contact is taken to socket "Pot. free contact" (max. load 24 V, 0.5 A ).
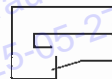
| Pin 1 | Fault indication |
|-------|------------------|
| Pin 2 | Fault indication |
| Pin 3 | Fault indication |
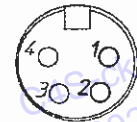
In case of malfunction pin 1 and 3 are closed, during operation pin 2 and 3 are closed. If the potential-free contact is used, make sure it is compatible with the on-site measuring system.

### 3.3.3.8  Supply Recorder*

The connection Supply Recorder* is used to supply the six-colour printing recorder (max.load 230 V, 2 A).

### X 37

Free measuring points are available at connection X37 on the back of the recorder housing (-100°C to +200°C equivalent to 0-10 V).
The 15-pole sub D socket is assigned as follows:

| Channel 3 | Pin -/+  3; 11 |
|-----------|----------------|
| Channel 4 | Pin -/+  4; 12 |
| Channel 5 | Pin -/+  5; 13 |
| Channel 6 | Pin -/+  6; 14 |
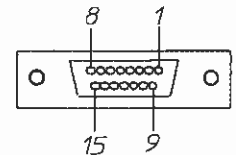
### 3.3.3.9  Control Panel*

The connection Control Panel* is used to connect the C-Terminal* to the system.

### 3.3.3.10 Test space illumination

The test space illumination is located at the ceiling. It can be operated via the switch "Light" on the connector panel.

### 3.4 Technical data

**General installation requirements**

Dry, ventilated locations with

| | |
|---|---|
| Ambient temperature | +15°C to +35°C |
| Max. relative humidity | 75% |

Do not expose the system to direct sunlight and avoid installing in the vicinity of heat sources.
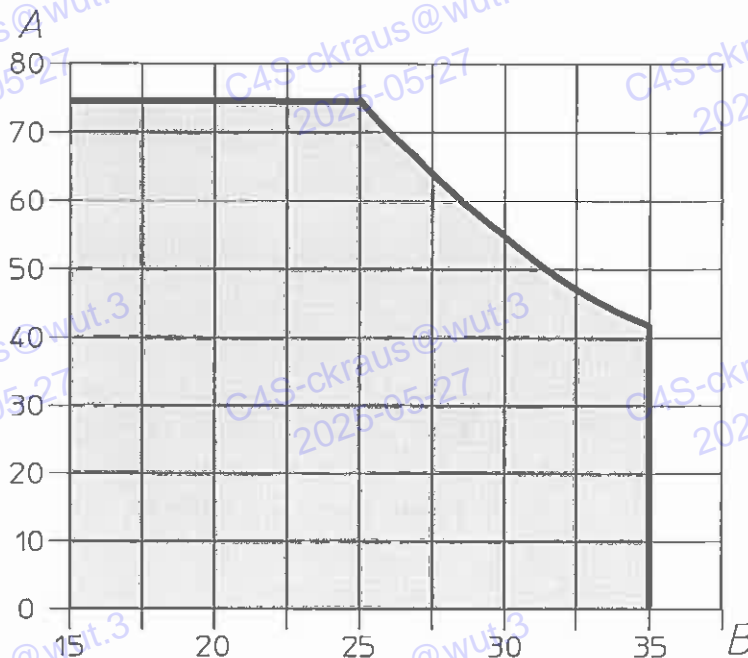


A = Relative humidity % r.h.
B = Ambient temperature °C

Environmental requirements

*optional accessory

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| | |
|---|---|
| Test space | high-grade steel, material 1.4301 |
| Load on floor | max. 150 kg/m2 |
| Load per shelf | max. 30 kg |
| Total rack load | max. 80 kg |
| | |
| Test space illumination | 12 V, 20 W |
| | |
| Protection class | IP 20 |

EMC Test (Electromagnetic compatibility)
in accordance with EN 55011

| | |
|---|---|
| conducted interference | Class A |
| emitted interference | Class A |

Interference immunity in accordance with EN 50082

**Humidification and dehumidification
system**

| | |
|---|---|
| Reservoir for humidification water | 24 l |
| Reservoir for psychrometric water | 4 l |
| | |
| Water quality for humidification water and psychrometric water | - demineralized<br>- pH value 6 to 7<br>- conductivity max. 10 µS/cm |
| | |
| Water quality for cooling water* | - Without impurities<br>- max. grain size 40 µm,<br>- pH value approx. 7<br>- water pressure 3 to 6 bar<br>- differential pressure ≥ 2 bar<br>- water temperature +12°C to +28°C |
| | |
| Cooling water connection | see chapter 2.1 and 2.2 |

---

NOTE

To avoid the formation of microorganisms (algae)
in the psychrometric water, it is advisable to
disinfect the water with Aqua Top
(see maintenance chapter "Aqua Top")
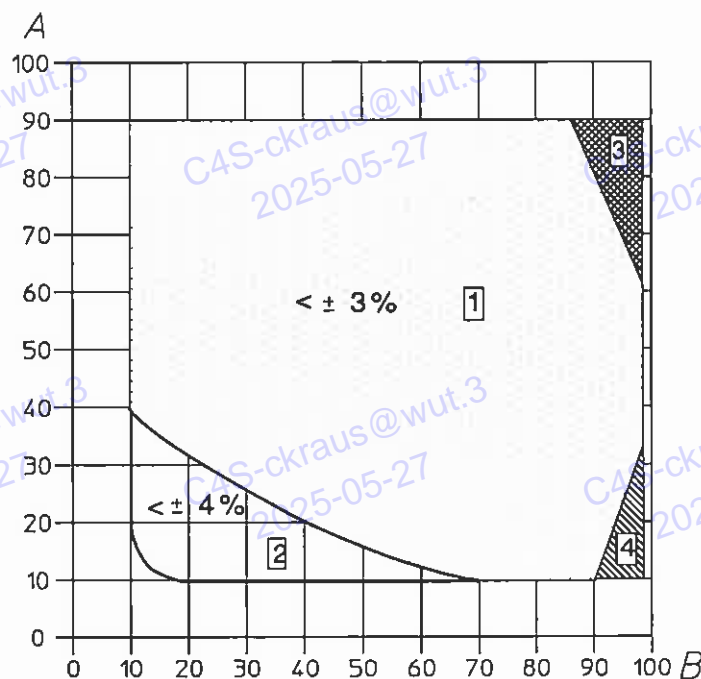
A = Test space temperature in °C
B = Relative humidity % r.h.

Humidity range

**Humidity range for:**

- normal operation 1,3 und 4 (5 °C dew point limit)
- additional dehumidifcation* 2 (-10 °C dew point limit)
- capacitive humidity measuring system* 1 und 4
- dew point control 1

**Temporal fluctuations for climatic standard state**

| | |
|---|---|
| 23 °C / 65% r.h. | Temperature ±0,1 K<br>Humidity < ±1,5% |
| 85 °C / 85% r.h. | Temperature ±0,1 K<br>Humidity < ±1% |

The values refer to the basic version of the system at an ambient temperature of +25 °C: with psychrometric control; temperature measurement in the air inlet.

| Climatic test chamber | VC 4020 | VC 7020 | VC 4033 | VC 7033 | VC 4057 | VC 7057 |
|---|---|---|---|---|---|---|
| **Characteristics for temperature tests** | | | | | | |
| Temperature range | -40°C to +180°C | -70°C to +180°C | -40°C to +180°C | -70°C to +180°C | -40°C to +180°C | -70°C to +180°C |
| Temporal temperature fluctuation under stabilized conditions | ± 0,5 K | | | | | |
| Spatial temperature fluctuation under stabilized conditions | ± 1,5 K | | | | | |
| Temperature change rate according to DIN 50011 part 12 | see respective diagrams on the following pages | | | | | |
| Heat compensation | | | | | | |
| Wall distance of the measuring points | 100 mm | | | | | |
| **Characteristics for climatic tests** | | | | | | |
| Temperature range | +10°C to +90°C | | | | | |
| Temporal temperature fluctuation under stabilized conditions | ± 0,3 K | | | | | |
| spatial temperature fluctuation under stabilized conditions | ± 1,0 K | | | | | |
| Wall distance of the measuring points | 100 mm | | | | | |
| Humidity range | 10% to 98% r.h. | | | | | |
| Dew point range | +5°C to +89,5°C | | | | | |
| Temporal humidity fluctuation under stabilized conditions | ±1 to 3% r.h. | | | | | |
| Heat compensation in the range +25°C to +90°C, at rel. humidity of >90% | 400 W | | | | | |

| Climatic test chamber | VC 4020 | VC 7020 | VC 4033 | VC 7033 | VC 4057 | VC 7057 |
|---|---|---|---|---|---|---|
| Humidification water consumption at constant +40°C and 92% r.h. | < 2 l/24 h | | | | | |
| **Installation and operational data** | | | | | | |
| Test space dimensions | see layout chapter 2 | | | | | |
| Housing dimensions | see layout chapter 2 | | | | | |
| Weight | approx. 450 kg | approx. 490 kg | approx. 510 kg | approx. 565 kg | approx. 580 kg | approx. 670 kg |
| Rated voltage | 400 V, $^{+6}_{-10}$%, 3/N, 50 Hz or 440 V, $^{+6}_{-10}$%, 3/N, 60 Hz | | | | | |
| Rated power | 4,2 kW | | 5.0 kW | 5.1 kW | 5.0 kW | 5.1 kW |
| Rated current | 9,8 A | 12 A | 13.5 A | 14 A | 13.5 A | 14 A |
| On-site fuse protection | 16 A slow | | | | | |
| **Noise measurement acc. to DIN 45635 part 1 accuracy class 2** | | | | | | |
| Sound pressure level measured at a distance of 1 m from the front | < 58 dB (A) | | | < 63 dB (A) | | |
| Sound power level | < 76 dB (A) | | | < 82 dB (A) | | |

All figures represent average values of standard systems, taken at an ambient temperature of +25 °C and rated voltage of 400 V / 50 Hz or 440 V / 60 Hz, without test specimen and without optional accessories.

## Temperature change rate without test specimen
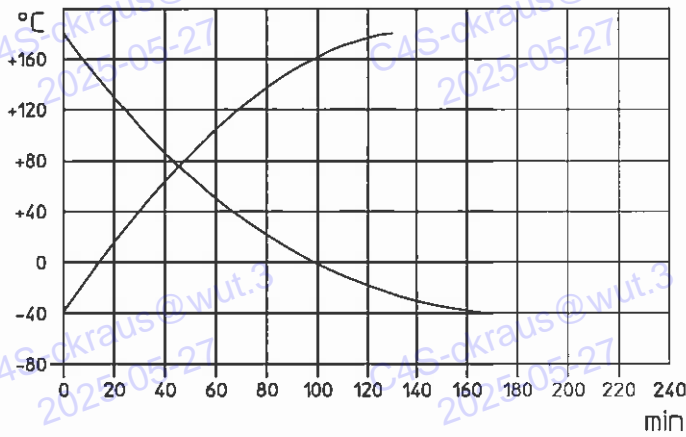
VC 4020
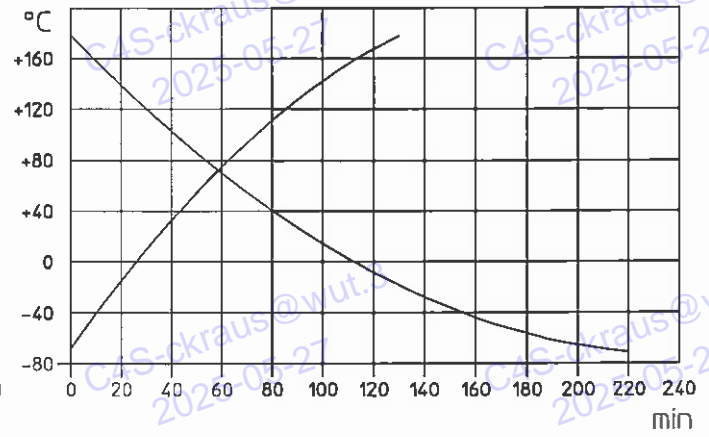
VC 7020

## Heat compensation

VC 4020

VC 7020

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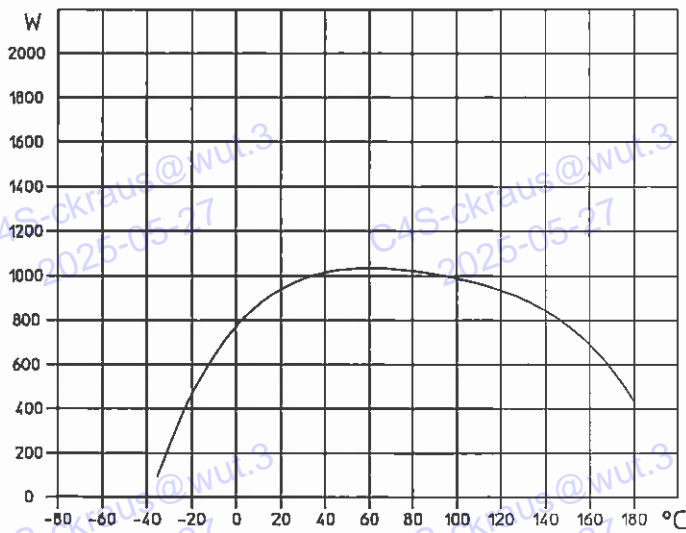
## Temperature change rate without test specimen
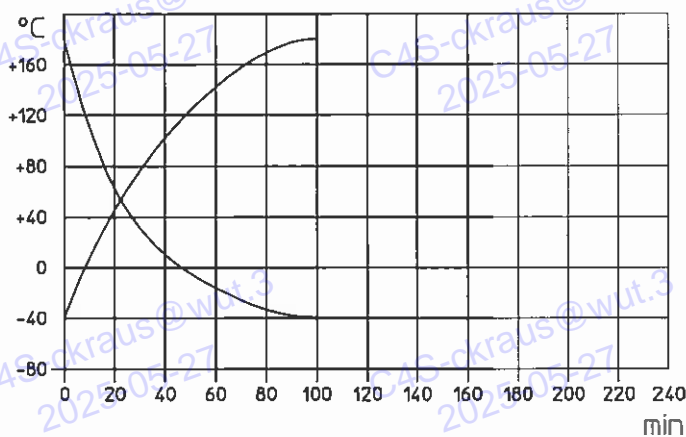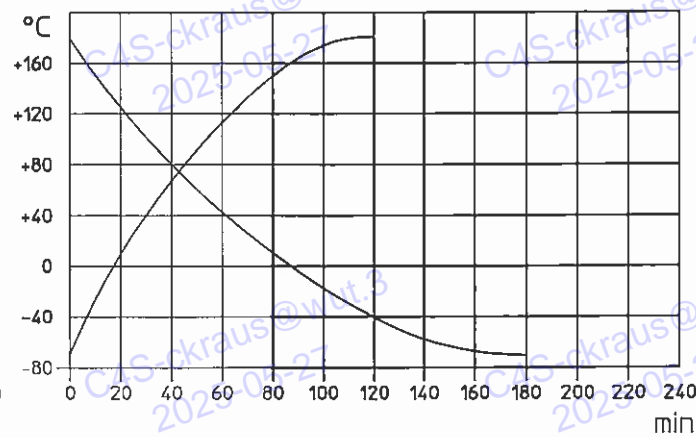


VC 4033



VC 7033

## Heat compensation



VC 4033



VC 7033

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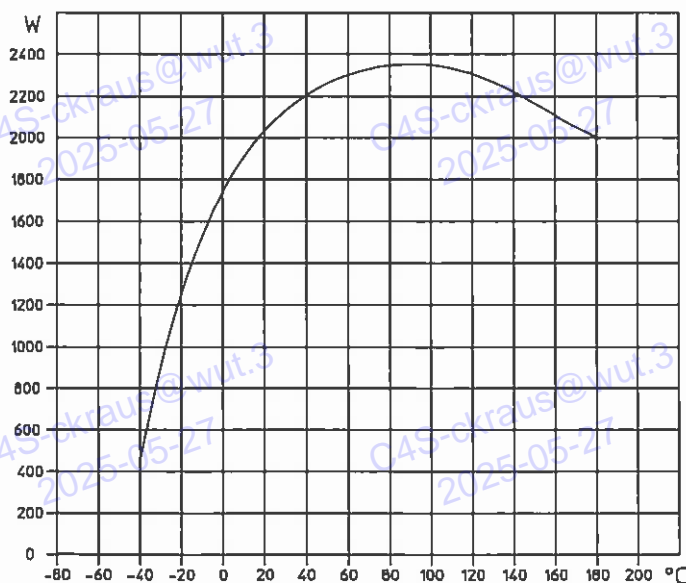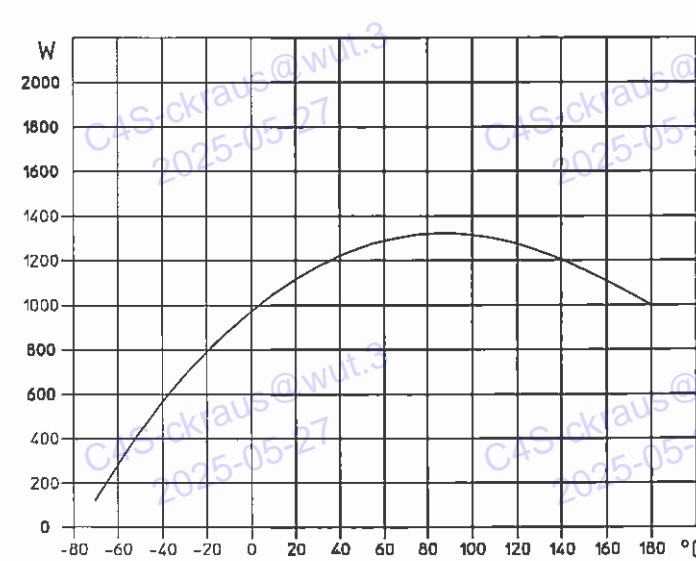
## Temperature change rate without test specimen
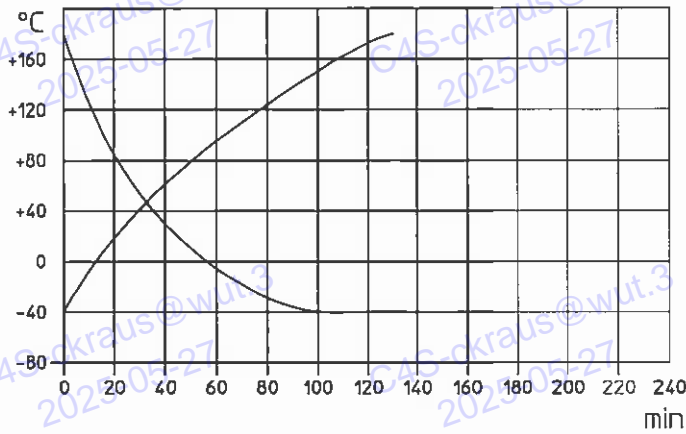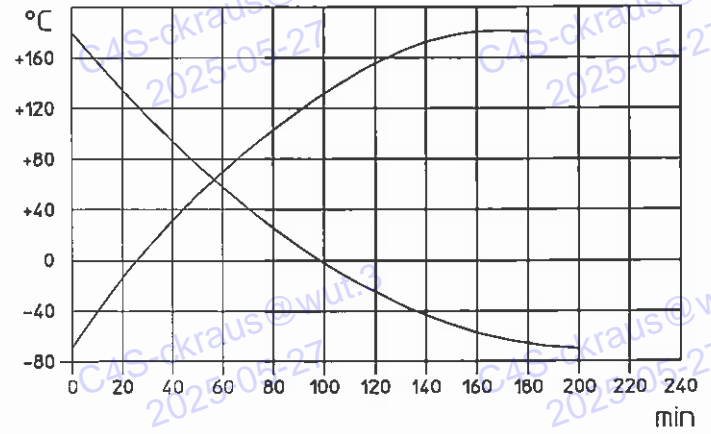
VC 4057

VC 7057

## Heat compensation

VC 4057

VC 7057

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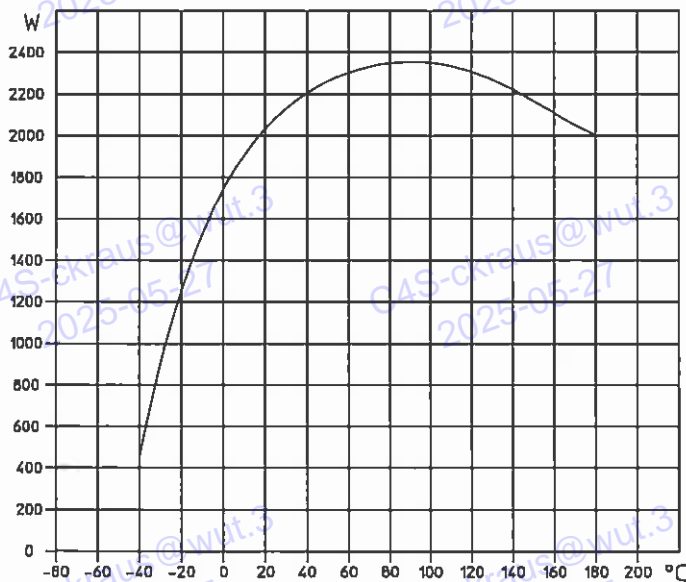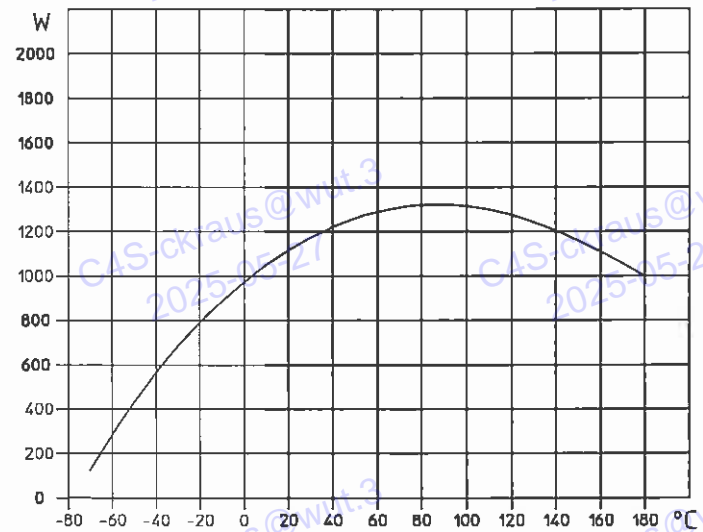
**3.5     Optional accessories**     The system may be equipped with optional accessories.
The installation to be carried out by:

**F** = Factory
**S** = Service
**U** = User

| NOTE |
|------|



The system must be equipped with original accessories
from the manufacturer

| Ordering Code | Installed by | Equipment | System Type |
|---|---|---|---|
| 88 12 13 | F - S | 50 mm entry port | |
| 88 12 14 | F - S | 80 mm entry port | |
| 88 32 58 | F - S | 125 mm entry port | |
| 88 36 13 | F | Notch port | |
| 88 32 37 | U | Additional plug for notch port | |
| 88 37 21 | U | Insert shelf of stainless steel | VC 4020/7020 |
| 88 12 17 | U | | VC 4033/7033 |
| 88 12 18 | U | | VC 4057/7057 |
| 88 69 75 | S - U | Adjustable air flow rate | |
| 88 40 09 | S - U | Compressed air dryer | |
| 88 36 39 | F - S | $CO_2$ shock cooling | |
| 88 52 61 | F - S | Printer HP Deskjet 660 C | |
| 88 28 56 | F - S | Printer LX 300 single-colour, black | |
| 88 52 63 | F - S | Printer LX 300 multi-colour printer | |
| 88 52 64 | U | Colour extension kit for LX 300 | |
| 88 28 60 | F - S | Printer software | |
| 88 32 55 | F - S | Programmable six-colour printing recorder | |
| 88 42 14 | F - S | Preparation for connection of a programmable six-colour printing recorder | |
| 88 32 97 | F - S | Analog transducer card I/O | |
| 88 27 21 | U | C-Terminal | |
| 88 28 59 | F - S | Connection for C-Terminal | |
| 88 28 58 | F - S | Temperature measurement on the test specimen | |
| 88 32 59 | F - S | Sensor for temperature and humidity measurement | |
| 88 32 60 | F - S | Additional humidity control via capacitive humidity measuring system | |

| Ordering Code | Installed by | Equipment | System Type |
|---|---|---|---|
| 88 12 35 | S - U | Connecting cable for interface RS 232 | |
| 88 12 27 | S - U | Interface converter IEEE 488 to RS 232 | |
| 88 36 32 | S - U | Interface converter RS 232 to RS 485 | |
| 88 52 51 | F - S | Interface RS 485/422 (plus network card) for networking | |
| 88 12 28 | U | Adapter cable  25-pole to 9-pole | |
| 88 19 01 | S - U | Software TSI | |
| 88 54 01 | S - U | Software TSI-MT | |
| 88 12 31 | F - S | Mobile version | |
| 88 55 18 | F | Water-cooled refrigeration unit | VC 4020 |
| 88 55 19 | F | | VC 7020 |
| 88 55 20 | F | | VC 4033 |
| 88 55 21 | F | | VC 7033 |
| 88 55 22 | F | | VC 4057 |
| 88 55 23 | F | | VC 7033 |
| 88 11 95 | F - S | Demineralization unit | |
| 88 50 33 | S - U | Spare cartridge for demineralization unit | |
| 88 32 76 | F - S | Automatic water replenishment | |
| 88 37 74 | F - S | Alarm signal for water replenishment | |
| 88 40 90 | F - S | Multiway valve for draining the test space humidification water | |
| 88 24 94 | U | Water receptacle | |
| 88 26 22 | F - S | Adjustable operating temperature limiter | |
| 88 43 96 | F - S | Door with window | VC 4020/7020 |
| 88 43 97 | F - S | | VC 4033/7033 |
| 88 43 98 | F - S | | VC 4057/7057 |
| 88 43 99 | F - S | Door with window and two handhole ducts | VC 4020/7020 |
| 88 44 00 | F - S | | VC 4033/7033 |
| 88 44 01 | F - S | | VC 4057/7057 |
| 88 28 64 | F - S | Corrosive gas dosing system | VC 4033/7033 |
| 88 28 65 | F - S | Corrosive gas dosing system | VC 4057/7057 |
| 88 17 91 | F - S | Additional dosing line | |
| 88 36 20 | F - S | Preparation for retrofitting a corrosive gas system | |
| 88 16 71 | F - S | Additional corrosive gas container | VC 4033/7033 |
| 88 18 36 | F - S | | VC 4057/7057 |

| Ordering Code | Installed by | Equipment | System Type |
|---|---|---|---|
| 88 42 42 | F - S | Dehumidification for the heating phase | VC 4.... |
| 88 42 43 | F - S | | VC 7.... |
| 88 37 77 | F - S | Dehumidification for dew point -10°C | |
| 88 68 70 | S | Spare parts package | VC 4020 |
| 88 68 71 | S | | VC 7020 |
| 88 68 72 | S | | VC 4033 |
| 88 68 73 | S | | VC 7033 |
| 88 68 74 | S | | VC 4057 |
| 88 68 75 | S | | VC 7057 |
| 88 65 02 | B | Climatic test standards | |

Further information on optional accessories is available on request.

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## 4. Operation

### 4.1 General Information

The test system can be operated in manual (fixed value operation) or automatic mode.

Extensive test sequences may be programmed with EDIT.

The test system can be controlled by a computer and the TSI software via the RS 232 interface or in ASCII mode.

The test specimen is protected against excessively high temperatures by the adjustable operating temperature limiter*.

The upper and lower temperature limits can be set with the software temperature limiter on
the Terminal (see separate operating instructions for
the Terminal).

Permissible temperature limits and mechanical loads in the test space must be observed (see chapter "Technical Data").

Refer to chapter 5 in case of faults during operation.

## 4.2    Putting into operation

-    Ensure that the test space is suitable for the intended test specimen
     with regard to weight, corrosive effect, heat etc.

-    Ensure that the installation has been carried out in accordance with
     chapter 2.3.

-    Check that maintenance work as specified in chapter 6 has been
     carried out. Maintenance work becoming necessary during the intended
     test period should be performed beforehand for reasons of safety.

-    Put the test specimen into the test space.

> **DANGER**
>
> The test space and inside of the door may be hot
> or extremely cold. Avoid contact.

-    Ensure that entry ports are sealed with the plugs supplied.

-    Check cooling water supply on water-cooled* systems.

-    Set the main switch to "I".

-    Put optional accessories into operation.

> **NOTE**
>
> If optional accessory "adjustable air flow rate" is used, please note
> that this will affect the temperature and humidity performance.
> To compensate, the duration of test must be adapted accordingly.

-    Observe the safety instructions.

-    Set the desired maximum temperature at the adjustable operating temper-
     ature limiter.*

-    Put external systems into operation.

-    The humidification sleeve must be removed when temperature tests
     exceeding 100 °C are performed (see chapter 6.5.7). The humidification
     sleeve may subsequently be re-used.

-    After automatic initialization of the program the start menu "OFF" appears.

- Set the optional accessory multiway valve (see drawing below)
  (select water drain or water return as desired)
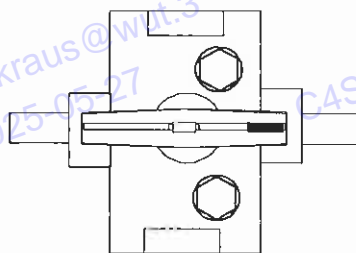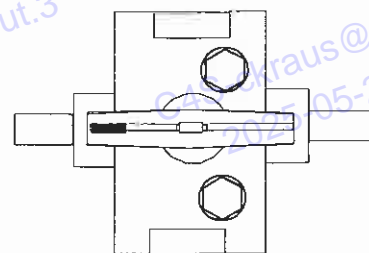
Water drain                                    Water return

Multiway valve*

**WARNING**

The multiway valve must be set to either of the positions
shown above, otherwise the humidification water
may freeze or vaporize.

**WARNING**

In case of test specimens which give off aggressive substances
(e.g. chlorine), or which contaminate the humidification water,
the multiway valve must be in position 'water drain'.

The controller is now ready for operation.
The following modes are available:

- Manual (fixed value) mode
- Automatic mode
- EDIT-program

For details on operating modes please refer to the enclosed operating in-
structions for the Terminal.

## 4.3 Operating modes

### 4.3.1 Manual mode

Fixed temperature or temperature/humidity values run in manual mode.
It is possible to change values, switch humidity on or off and process test programs with EDIT during operation.

### 4.3.2 Automatic mode

Test programs created with EDIT run in automatic mode. It is possible to process other test programs with EDIT during operation.

In automatic mode it is possible to run fixed standard programs with test standards for this series of test systems.

| Program location | Test standard |
|---|---|
| 101 | DIN 40046-2 |
| 102 | IEC 68-2-30 DB Var. 1 |
| 103 | IEC 68-2-30 DB Var. 2 |
| 106 | IEC 68-2-4 Test D |
| 107 | BS 2011 Part 2.1, Test Da |
| 108 | MIL-STD 883 Meth.1004.4<br>IEC 68-2-38<br>MIL-STD 202 E Meth. 106 D |
| 110 | MIL-STD 810 Meth.507.2.2 Cycle 4 |
| 111 | MIL-STD 331 Meth.105.1 |
| 112 | MIL-STD 810 Meth. 507.3 |
| 113 | MIL-STD 810 Meth. 507.1 |

### 4.4 EDIT program

Test programs are created and managed with EDIT.
The structure is described in the enclosed operating instructions for the Terminal.

A maximum of 99 test programs with 99 program lines each and a maximum of 10 loops may be stored.
These test programs run in automatic mode.

## 4.5     Putting out of operation



| DANGER |

The test space and the inside of the door may still be
hot or extremely cold .  Avoid contact.

-     Bring the system back to room temperature.

-     Put external systems out of operation.

-     Put optional accessories out of operation.

-     Ensure that start menu "OFF" is displayed.

-     Set the main switch to "0".  For shorter stops  (e.g. when loading or
      unloading the test space), the start menu "OFF" is sufficient.

-     Remove the test specimen from the test space.

-     If the system is put out of operation during a period when there is a
      danger of frost, the water must be drained from the humidification
      system and reservoir as follows:

      -     Open the rear door. Remove front cover and cover on the right.

      -     Set humidity to 00 (see separate operating instructions for
            E4-terminal).  Humidification water flows out.

      -     Open hose clip SK 3 for approx. 2 min.

      -     Squeeze hose clips SK 2 and SK 4

      -     Detach both hose ends from pump M 42 (see chapter 3.2)

      -     Enter humidity value and switch system on for approx. 1 min.

      -     Fix hose to pump M42

      -     Drain reservoir in accordance with 6.5.7

      -     Refit in reverse order

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**5.** **Fault diagnosis and rectification**

Faults which occur during operation are signalled by the red ERROR indicator lamp. The system is switched off permanently.

Proceed as follows in case of faults:

- Rectify the fault.
  The following table lists the faults, their possible cause and rectification. Contact our service organisation if a fault occurs frequently.

- Acknowledge the error message.

- Continue operation of the system.

| Index | Fault message | Cause | Rectification |
|-------|---------------|-------|---------------|
| 0 | Humidity out of range | Actual humidity value over or below the test chamber configuration | Check values entered and adjust setpoint to humidity range (see technical data) |
| 1 | Software test specimen protection temperature | Actual temperature value over or below the test chamber configuration | Check values entered and adjust setpoint to temperature range (see technical data) |
| 2 | Test specimen protection* | Limit for test specimen protection exceeded | Check limit value and programmed setpoint |
| 3 | Low water in humidity system | No water in humidity system or pump not working | Fill reservoir with water (see chapter 2.4; refer to Technical Data for water quality) |
| 4 | Temperature limiter test space | Temperature fuse has tripped or is broken | Switch off system and contact the service organisation |
| 5 | High pressure (pre-) compressor | Excess pressure in the refrigeration circuit | Switch off the system. Clean condenser (with brush or vacuum cleaner). On water-cooled systems check water inlet, clean filter, check water pressure and water inlet temperature. Put system into operation again. |
| 6 | Fill water in humidity system | The supply for water replenishment is used up | Top up reservoir with water (for water quality see technical data). The system remains in operation. |
| 7 | High pressure (low-) compressor | Excess pressure in the refrigeration (low cooling) circuit | See Index 5. If fault message persists, contact the service organisation. |
| 8 | Fill water in humidity system | The water supply for the psychrometric measuring unit is used up | Top up reservoir with water (for water quality see technical data). System switches over to dew point control. |

| Index | Fault message | Cause | Rectification |
|-------|---------------|-------|---------------|
| 9 | Thermal protection test space fan | Thermal protection of test space fan triggered | Switch off the system. Check motor for smooth running and contamination. Check cooling air supply. Clean and remove impurities. |
| 10 | Pressure gas temperature precooling | Pressure gas temperature is too high | Contact the service organisation |
| 11 | Pressure gas temperature low cooling | Pressure gas temperature is too high | Contact the service organisation |
| 18 | Reservoir empty | No water in the reservoir | Fill reservoir with water (for water quality see chapter 'Technical data') |

Contact our service organisation if a fault cannot be rectified with the aforementioned measures. For the address see chapter 6.6.

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## 6. Maintenance

### 6.1 General Information

Regular care and maintenance are essential for optimum operation over many years.

Some basic maintenance work is incorporated in the maintenance schedule and may be performed on site, by trained personnel only.
This does not replace the expert maintenance offered by our service organisation.

### 6.2 Disposal of waste resulting from servicing

Our service organisation has the technical facilities required for expert disposal of refrigerants, oils and mechanical components resulting from servicing.
If desired, our service organisation will take back the materials and parts to be disposed of, at customer's expense.

### 6.2.1 Disposal of system

The following safety instructions must be observed when disposing of the system:

$$\boxed{\textbf{DANGER}}$$

- Destroy the door lock to prevent persons from being trapped.

- The refrigerants used are specified on the rating plate. Refrigerants must not be discharged to the environment but require expert disposal.

- Compressor oil must be consigned to a waste oil disposal plant.

- The thermal insulation consists of asbestos-free mineral fibre which should be disposed of as ordinary refuse.

With regard to the specified materials and the disposal of the remaining components the national and local waste disposal regulations valid at the time of disposal must be observed.

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| 6.3 | Consumables |

The following consumables are used during maintenance work:

| Ordering code | Designation |
|---|---|
| 60 87 33 86 | Print head for six-colour printing recorder* |
| 60 87 33 85 | Paper roll for six-colour printing recorder* |
| 60 88 50 33 | Cartridge for demineralization unit* SD 2000 |
| 60 88 56 66 | Halogen bulb 12 V / 20 W |
| 60 88 22 15 | Humidification sleeve |
| 60 88 32 37 | Plug for notch port* |
| 60 88 41 98 | Aqua Top |
| 60 87 70 50 | Filter elements for compressed-air dryer* |
| 60 87 70 51 | Adsorption agent for compressed-air dryer* |

Consumables may be ordered from the address stated in chapter 6.6.

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## 6.4 Maintenance schedule

| Interval | Assembly | Maintenance work |
|---|---|---|
| After every test | Test space | Clean test space in accordance with 6.5.1 |
| | Test space door | Clean seals in accordance with 6.5.2 |
| After 500 operating hours | Humidification sleeve | Change humidification sleeve in acordance with 6.5.8 (more often if sleeve turns yellow) |
| | Condenser | Check for deposits of dust and clean in accordance with 6.5.3 |
| | Cooling water inlet* | Clean filter in accordance with 6.5.4 |
| Monthly | Humidification and dehumidification system, psychrometric measuring system | Clean reservoir in accordance with 6.5.7 |
| Yearly / after 10 000 operating hours at the latest | Compressed-air dryer* | Change adsorption agent and filter elements in accordance with separate operating instructions |
| As necessary | Six-colour printing recorder* | Change paper in accordance with separate operating instructions |
| | Six-colour printing recorder* | Change ribbon in accordance with separate operating instructions |
| | Demineralization unit* | Change cartridge in accordance with separate operating instructions |
| | Test space illumination | Change halogen bulb in accordance with 6.5.6 |

## 6.5 Maintenance work

| **DANGER** |
| --- |

Switch off the system - set main switch to "0" - and pull the mains plug prior to performing maintenance work!

| **WARNING** |
| --- |

Do not use sharp tools when performing maintenance work.

### 6.5.1 Cleaning the test space

The inner walls and the bottom of the test space should be cleaned with clear water and subsequently dried after every test in order to prevent corrosion. If necessary remove and clean the test space floor. Be careful not to damage the Pt 100 sensors.

| **NOTE** |
| --- |

Unwashed, mounted PCBs and some plastics set chlorides free. In conjunction with high humidity levels and the nickel chromium steel used chlorine leads to stress corrosion cracking.

| **WARNING** |
| --- |

Regular cleaning of the test space prevents such damage.

If corrosive deposits have formed they must be removed immediately. Polish up with stainless steel cleaning wool in order to avoid scratches on the surface.

### 6.5.2 Cleaning the test space door

The seal on the test space door must be cleaned with clear water and subsequently dried after every test in order to prevent sticking and freezing up. Check with a paper strip if the sealing is tight. If this is not the case, contact the service organisation.

### 6.5.3 Cleaning the condenser

Check the air-cooled condenser of the refrigeration unit regularly for deposits of dust.
Clean the condenser with a handbrush every three months.
Clean more often in dusty environments to prevent excess pressure within the refrigeration circuit.

---
**DANGER**
---

Wear protective gloves !

Water-cooled* systems are equipped with a water-cooled condenser instead of an air-cooled one. A cooling water flow regulator with a built-in dirt filter (see chapter 6.5.4)  is installed ahead of the condenser.

### 6.5.4 Cleaning the dirt filter

A dirt filter has been installed to protect the cooling water circuit from contamination.
This dirt filter must be checked regularly (depending on the water quality) for impurities and cleaned as follows:

- Shut off the cooling water inlet

- Open the rear door

- Unscrew the threaded cap (1) with with a fork wrench SW 27 holding the dirt filter in place with a suitable tool (pipe wrench or fork wrench SW 32) to prevent distortion.

- Remove the dirt filter (2) and clean it with water

- Refit the dirt filter in reverse order.

Dirt filter

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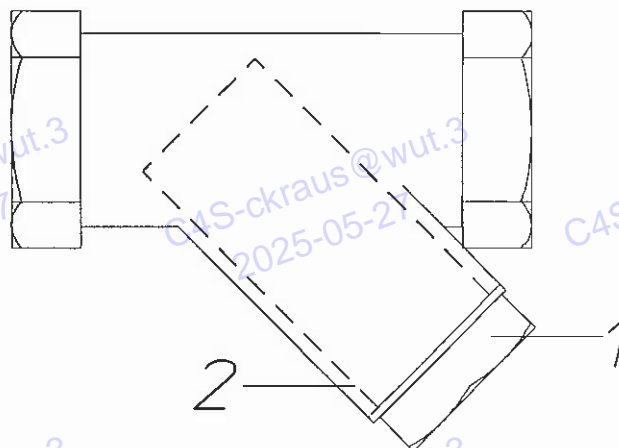
**6.5.5 Checking the water level**

Check the water level in the humidity system reservoir and the psychro-metric measuring device and replenish via the filling port (unnecessary if demineralization unit* or automatic water replenishment* are fitted). Before topping up the reservoir, the water receptacle* must be emptied. The reservoir for humidification water is larger than the water receptacle, therefore the water receptacle must be emptied during a test period.

| WARNING |
|---|

Do not re-use the water from the water receptacle.
Only use destilled or demineralized water for
topping up (see chapter "Technical data").
When the water is dirty the system must
be completely refilled.

In case of low humidification water the system continues with the set temperature values.

In case of low psychrometric water the system switches automatically to dew point control.

**6.5.6    Replacing the halogen bulb**

The light is located at the test space ceiling.

- Unscrew the glass.

- Remove the defective bulb.

- Take the new bulb in a clean cloth and insert.

- Screw the glass back in again.

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### 6.5.7    Cleaning the reservoir
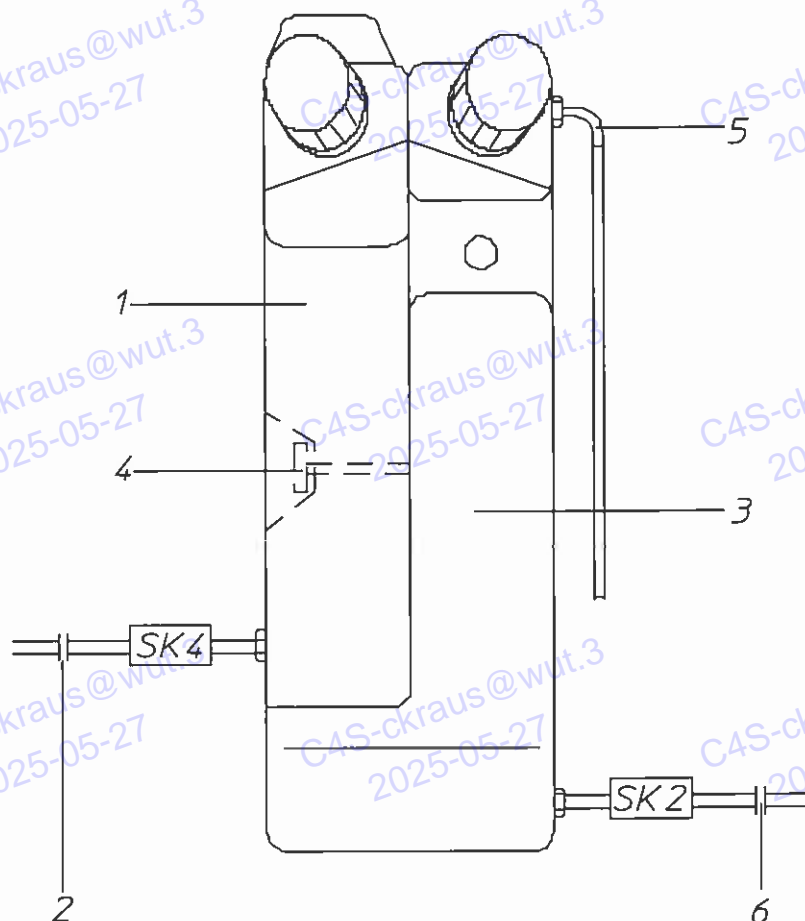
Reservoir

1    Reservoir for psychrometric water

2    Joint SK 4

3    Reservoir for humidification water

4    Knurled screw

5    Overflow

6    Joint SK 2

**Reservoir for
psychrometric water**

- Remove the front cover.

- Squeeze hose clip SK 4

- Detach hose from joint SK 4

- Undo the knurled screw

- Remove reservoir and empty it carefully
  (do not shake as this may damage the float switch)

- Rinse the reservoir

- Refit the reservoir in reverse order

- Fill the reservoir. Observe instructions given in chapter 6.5.9

**Reservoir for
humidification water**

- Remove  front cover and cover on the right

- Switch off automatic water replenishment*

- Detach hose from overflow

- Squeeze hose clips SK 2 and SK 4

- Detach hoses at joints SK 2 and SK 4

- Introduce hose with SK 2 in appropriate vessel on site.
  Open SK 2 and drain the reservoir

- Turn reservoir and remove it from its support.
  Empty residual water carefully

- Rinse the reservoir

- Refit the reservoir in reverse order

- Fill the reservoir

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**6.5.8   Replacing the humidification sleeve**

The humidification sleeve of the temperature sensor is replaced as follows:
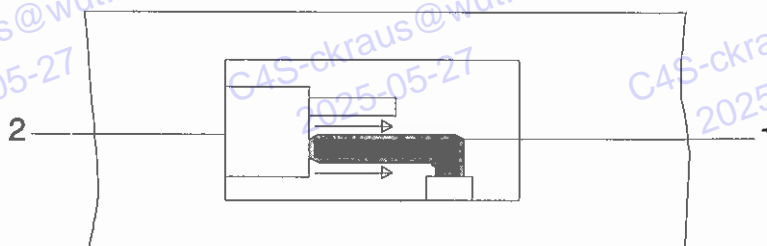


Replacing the humidifiation sleeve

-   Seize the old humidifcation sleeve (1) with nails of thumb and middle finger and pull it off carefully toward the right.

-   Cut the new humidification sleeve to a length of approx. 140 mm. It must cover the entire temperature sensor.

-   Fit the dry humidification sleeve over the lower temperature sensor and insert it carefully into the humidification pipe.
    Be careful not to bend the humidification sleeve when inserting it into the pipe.

| **WARNING** |

Do not push the glass body of the measuring sensor into the holder (2) and make sure that the visible measuring resistor filament is completely covered by the humidification sleeve.

**6.5.9   Aqua Top**

To avoid the formation of microorganisms (algae) in the reservoir for psychrometric water, it is advisable to disinfect the water with Aqua Top. Aqua Top is biodegradable.
We recommend to pour the contents of one bottle (20 ml) into the reservoir when changing the water or when topping up.

## 6.6 Maintenance by the service organisation

Comprehensive maintenance and annual inspection of safety devices are necessary to ensure optimum performance over many years.
Our service organisation assumes responsibility for performing these tasks. This is laid down in a maintenance contract.

In Germany:

Vötsch Industrietechnik GmbH
Service Centre
D-35447 Reiskirchen-Lindenstruth
Tel.: 06408 / 84-0
Fax.: 06408 / 6 45 47

or

Vötsch Industrietechnik GmbH
Frommern
Beethovenstrasse 34
D-72336 Balingen

**P.O. Box address:**
P.O. Box 10 04 53, D-72304 Balingen
Tel.: 07433/303-0
Fax: 07433/303-220

abroad:

Our representative.

**NOTE**

To ensure speedy service, please quote the following particulars when reporting a fault:

Type of system, order and ID no.**
System accessories
Program version
Fault messages in the fault menu

** See rating plate below the main switch.

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**R**

**S**

**T**

**W**

**X**

ASCII - communikationport description

commisionsno. : VC7207
Chamber name  : VC7020/57
date .......  : 09/03/98
controller .. : CTC

Chamber communicationsport default settings:
- protokol ........ : ASCII
- baudrate ........ : 9600
- chamberadress .... : 00
- art of com.port .. : RS 232
- language ........ : deutsch

How you can change the default com.port settings, please
read the controller serive manual.
(E-Terminal cap.: 3.5  and  C-Terminal cap: 3.2)

The chamber is fixed as a slave. She never be answered
without a question.

chamber data format   : - 8 databits
                        - 1 startbit
                        - 1 stopbit
                        - no parity

data format  start sign      : one $ sign

data format chamberadress    : 2-signed integer

data format  end sign        : one <CR> sign

data format  nom./akt.value  : 4 for-,point,1 after comma sign

data format  dig.in/output   : allways 8-bit block
(not used bits filled with zero; 0=OFF 1=ON)

data format error number     : 2-signed integer (look E-Terminal)

data format error text       : 31 charakter (look C-Terminalt)

data format program no       : 4-signed integer

read Chamber VC7020/57  (VC7207)

Caution! If the digital output AL-ERROR is high, you can get
the error with the F-command and quit it with the
Q-command.

```
command from PC:  (value only exambles !!)
start sign ...................... : $
chamberadress (always 2 integer)  : 00 (here chamber 1)
command ......................... : I
end sign ........................ : <CR>
```

```
chamber answer    : (value only exambles !!)
 0. analog nominal value Temper    : 0010.0 (example 10.0)
 0. analog actual value  Temper    : 0011.2 (example 11.2)
 1. analog nominal value humidity  : 0010.0 (example 10.0)
 1. analog actual value  humidity  : 0011.2 (example 11.2)
 2. analog naminal value Pt100 1   : 0000.0 (not used)
 2. analog actual value  Pt100 1   : 0011.2 (example 11.2)
 3. analog naminal value Pt100 2   : 0000.0 (not used)
 3. analog actual value  Pt100 2   : 0011.2 (example 11.2)
 4. analog naminal value Pt100 3   : 0000.0 (not used)
 4. analog actual value  Pt100 3   : 0011.2 (example 11.2)
 5. analog naminal value Pt100 4   : 0000.0 (not used)
 5. analog actual value  Pt100 4   : 0011.2 (example 11.2)
 6. analog nominal value fan t.spa : 0010.0 (example 10.0)
 6. analog actual value  fan t.spa : 0011.2 (example 11.2)

 0. digital output    on        : 0 not used
 1. digital output    start     : 1 switched ON
 2. digital input     AL-ERROR  : 0 switched off
 3. digital output    Temper    : 1 switched ON
 4. digital output    humidity  : 0 switched OFF
 5. digital output    dew point : 1 switched ON
 6. digital output    cap.humid : 0 switched OFF
 7. digital output    dehumidit : 1 switched ON
 8. digital output    add.dehum : 0 switched OFF
 9. digital output    compr.air : 1 switched ON
10. digital output    corr. gas : 0 switched OFF
11. digital output    CO2 cool. : 1 switched ON
12. digital output    free out1 : 0 switched OFF
13. digital output    free out2 : 1 switched ON
14. digital output    free out3 : 0 switched OFF
15. digital output    free out4 : 1 switched ON
16. digital input     free in 1 : 0 switched OFF
17. digital input     free in 2 : 1 switched ON
18. digital input     free in 3 : 0 switched OFF
19. digital input     free in 4 : 1 switched ON
20. digital output    AbgOben_T : 0 switched OFF
21. digital output    AbgUntenT : 1 switched ON
22. digital output    Abgl. T   : 0 switched OFF
23. digital output    AbgObenTP : 1 switched ON
24. digital output    AbgUnteTP : 0 switched OFF
25. digital output    Abgl. TP  : 1 switched ON
26. bit only for fill up         : 0
27. bit only for fill up         : 0
28. bit only for fill up         : 0
29. bit only for fill up         : 0
30. bit only for fill up         : 0
31. bit only for fill up         : 0
end sign ........................ : <CR>
```

read Chamber VC7020/57  (VC7207)

Example  : (| remarks linefeed)
PC -> Chamber :$00I<CR>
Chamber -> PC :0010.0 0011.2 0010.0 0011.2 0000.0 0011.2 0000.|
|0 0011.2 0000.0 0011.2 0000.0 0011.2 0010.0 0011.2 0101010101|
|010101010101010101000000<CR>|

```
write Chamber VC7020/57 (VC7207)

Attension!! If you set a nominal value you must be switch on
the digital output with the same name !
Not used channels fill up (see dataformat)

command from PC:  (value only exambles !!)
start sign ...................... : $
chamberadress (always 2 integer)  : 00 (here chamber 1)
command ......................... : E
 0. analog nominal value Temper  : 0010.0 (example 10.0)
 1. analog nominal value humidity : 0010.0 (example 10.0)
 2. analog nominal value not used : 0000.0 (fill up with 0)
 3. analog nominal value  not used : 0000.0 (fill up with 0)
 4. analog nominal value  not used : 0000.0 (fill up with 0)
 5. analog nominal value  not used : 0000.0 (fill up with 0)
 6. analog nominal value fan t.spa : 0010.0 (example 10.0)

 0. digital output     not used   : 0
 1. digital output     start      : 1 switched ON
 2. digital output     not used   : 0
 3. digital output     Temper     : 1 switched ON
 4. digital output     humidity   : 0 switched OFF
 5. digital output     dew point  : 1 switched ON
 6. digital output     cap.humid  : 0 switched OFF
 7. digital output     dehumidit  : 1 switched ON
 8. digital output     add.dehum  : 0 switched OFF
 9. digital output     compr.air  : 1 switched ON
10. digital output     corr. gas  : 0 switched OFF
11. digital output     CO2 cool.  : 1 switched ON
12. digital output     free out1  : 0 switched OFF
13. digital output     free out2  : 1 switched ON
14. digital output     free out3  : 0 switched OFF
15. digital output     free out4  : 1 switched ON
16. digital input      not used   : 0 (not write enable)
17. digital input      not used   : 0 (not write enable)
18. digital input      not used   : 0 (not write enable)
19. digital input      not used   : 0 (not write enable)
20. digital output     AbgOben_T  : 0 switched OFF
21. digital output     AbgUntenT  : 1 switched ON
22. digital output     Abgl. T    : 0 switched OFF
23. digital output     AbgObenTP  : 1 switched ON
24. digital output     AbgUnteTP  : 0 switched OFF
25. digital output     Abgl. TP   : 1 switched ON
26. bit only for fill up          : 0
27. bit only for fill up          : 0
28. bit only for fill up          : 0
29. bit only for fill up          : 0
30. bit only for fill up          : 0
```

write Chamber VC7020/57 (VC7207)

```
31. bit only for fill up              : 0
end sign ......................... : <CR>

Chamber answer    :
O.K. sign      : 0
end sign .... : <CR>

Examble  : (| remarks linefeed)
PC -> Chamber :$00E 0010.0 0010.0 0000.0 0000.0 0000.0 0000.0 0010.|
|0 10101010101010100000101010000000<CR>|
chamber -> PC :0 <CR>
```

write gradient VC7020/57 (VC7207)

```
command from PC:  (value only exambles !!)
start sign ........................ : $
chamberadress (always 2 integer)   : 00 (here chamber 1)
command ........................... : U
 0. gradient up-speed    Temper    : 0001.0 (example 1.0)
 0. gradient down-speed  Temper    : 0002.0 (example 2.0)
 1. gradient up-speed    humidity  : 0001.0 (example 1.0)
 1. gradient down-speed  humidity  : 0002.0 (example 2.0)
 2. analog nominal value  not used : 0000.0 (fill up with 0)
 2. analog nominal value  not used : 0000.0 (fill up with 0)
 3. analog nominal value  not used : 0000.0 (fill up with 0)
 3. analog nominal value  not used : 0000.0 (fill up with 0)
 4. analog nominal value  not used : 0000.0 (fill up with 0)
 4. analog nominal value  not used : 0000.0 (fill up with 0)
 5. analog nominal value  not used : 0000.0 (fill up with 0)
 5. analog nominal value  not used : 0000.0 (fill up with 0)
 6. gradient up-speed    fan t.spa : 0001.0 (example 1.0)
 6. gradient down-speed  fan t.spa : 0002.0 (example 2.0)
end sign ......................... : <CR>

Chamber answer    :
O.K. sign      : 0
end sign .... : <CR>

Examble  : (| remarks linefeed)
PC -> Chamber :$00U 0001.0 0002.0 0001.0 0002.0 0000.0 0000.00000.0|
| 0000.00000.0 0000.00000.0 0000.00001.0 0002.0 <CR>|
chamber -> PC :0 <CR>
```

read error VC7020/57 (VC7207)

command from PC:  (value only exambles !!)
start sign ........................ : $
chamberadress (always 2 integer)   : 00 (here chamber 1)
command ........................... : F
end sign .......................... : <CR>

chamber answer    : (value only exambles !!)
errornumber   : 01  (ex: error no 1)
errortext     : software test spec.protection..
end sign ... : <CR>

example :
PC -> Chamber :$00F<CR>
Chamber -> PC:01 software test spec.protection.. <CR>


quit error

Attensione! It will always be quitt the first error !

command from PC:  (value only exambles !!)
start sign ........................ : $
chamberadress (always 2 integer)   : 00 (here chamber 1)
command ........................... : Q
end sign .......................... : <CR>

chamber answer    : (value only exambles !!)
counter of aktual errors ......... : 00
end sign ......................... : <CR>

Examble  :
PC -> Chamber :$00Q<CR>
Chamber -> PC:00<CR>

automaticprogramm start/stop  VC7020/57 (VC7207)

xxxx is equal to the number of the automatic programm
you will be startet
Is xxxx equal the 0000, you will be stopped the
aktual automatic programm !
command from PC:  (value only exambles !!)
start sign ..................... : $
chamberadress (always 2 integer)  : 00 (here chamber 1)
command ......................... : P
programm number .............. : xxxx
end sign ........................... : <CR>

chamber answer    :
O.K. sign ........ : 0
end sign ....... : <CR>

exemble  : prog.nr 7 start
PC -> Chamber :$00P0007<CR>
Chamber -> PC:0<CR>

Chamber: VC7020/57    (VC7207)

errornumber/errortext                              quitt-enable

```
00 ...... humidity out of range              .   no
01 ...... software test spec.prot. temp      .   no
02 ...... test specimen protection           .   no
03 ...... low water in humiditysystem        .   no
04 ...... temperaturlimiter test space       .   no
05 ...... high pressure (pre-)compressor .       no
06 ...... fill water in humiditysystem       .   yes
07 ...... high pressure (low-)compressor .       no
08 ...... low water in psychrometric syst.   .   no
09 ...... Thermal protect.test space fan .       no
11 ...... press. temperatur(low-)cooling .       no
18 ...... low water water supply min         .   no
```

Analog Channel        input-range min          max

```
0    Temper    .. [°C] .....  -075.0    0185.0
1    humidity  .. [%rh] .....  0005.0    0100.0
2    Pt100 1   .. [°C] .....   0000.0    0000.0
3    Pt100 2   .. [°C] .....   0000.0    0000.0
4    Pt100 3   .. [°C] .....   0000.0    0000.0
5    Pt100 4   .. [°C] .....   0000.0    0000.0
6    fan t.spa .. [% ] .....   0050.0    0100.0
```

Digital Channel  Type

```
0    on           not changable
1    start        write Output
2    AllError     read Input
3    Temper       controller active
4    humidity     controller active
5    dew point    write Output
6    cap.humid    write Output
7    dehumidit    write Output
8    add.dehum    write Output
9    compr.air    write Output
10   corr. gas    write Output
11   CO2 cool.    write Output
12   free out1    write Output
13   free out2    write Output
14   free out3    write Output
15   free out4    write Output
16   free in 1    read Input
```

Chamber: VC7020/57   (VC7207)

Digital Channel  Type

```
17     free in 2  read Input
18     free in 3  read Input
19     free in 4  read Input
20     AbgOben_T  write Output
21     AbgUntenT  write Output
22     Abgl. T    write Output
23     AbgObenTP  write Output
24     AbgUnteTP  write Output
25     Abgl. TP   write Output
```

chamberconfiguration

```
commisionsno. : VC7207
Chamber name  : VC7020/57
date ......... : 09/03/98
controller .. : CTC
```

```
Analog Input                    input-range        protection-range
no name      unit    short     min       max       min       max
 0 Temper     [°C] t       -75.000   185.000   -80.000   190.000
 1 humidity   [%rh] U         5.000   100.000     0.000   110.000
 2 Pt100 1    [°C] 1Pt     -300.000   300.000   -70.000   180.000
 3 Pt100 2    [°C] 2Pt     -300.000   300.000   -70.000   180.000
 4 Pt100 3    [°C] 3Pt     -300.000   300.000   -70.000   180.000
 5 Pt100 4    [°C] 4Pt     -300.000   300.000   -70.000   180.000
 6 fan t.spa  [% ] fan       50.000   100.000    50.000   100.000
```

```
Analog Output
no name        type       min==0    max==10V or 20mA
 0 Temper      actual    -100.000   200.000
 1 humidity    actual       0.000   100.000
 2 Pt100 1     actual    -100.000   200.000
 3 Pt100 2     actual    -100.000   200.000
 4 Pt100 3     actual    -100.000   200.000
 5 fan t.spa   nominal      0.000   100.000
```

```
Digital Channel
no      name        type
 0      Temper      controller active
 1      humidity    controller active
 2      dew point   write Output
 3      cap.humid   write Output
 4      dehumidit   write Output
 5      add.dehum   write Output
 6      compr.air   write Output
 7      corr. gas   write Output
 8      CO2 cool.   write Output
 9      free out1   write Output
10      free out2   write Output
11      free out3   write Output
12      free out4   write Output
13      free in 1   read Input
14      free in 2   read Input
15      free in 3   read Input
16      free in 4   read Input
17      AbgOben_T   write Output
18      AbgUntenT   write Output
19      Abgl. T     write Output
20      AbgObenTP   write Output
21      AbgUnteTP   write Output
```

Digital Channel
```
no      name         type
22      Abgl. TP     write Output
```

error
```
errornumber/errortext                         quitt-enable
00      humidity out of range                 no
01      software test spec.prot. temp         no
02      test specimen protection              no
03      low water in humiditysystem           no
04      temperaturlimiter test space          no
05      high pressure (pre-)compressor        no
06      fill water in humiditysystem          si
07      high pressure (low-)compressor        no
08      low water in psychrometric syst       no
09      Thermal protect.test space fan        no
11      press. temperatur(low-)cooling        no
18      low water water supply min            no
```

switchcyclecounter
```
no name       unit       short set      reset
 0 h.counter h          B.h   no        no
```

ASCII - communikationport description

```
commisionsno. : VC4207
Chamber name  : VC4020/57
date ....... : 07/05/96
controller .. : CTC
```

Chamber communicationsport default settings:
```
 - protokol ........ : ASCII
 - baudrate ........ : 9600
 - chamberadress .... : 00
 - art of com.port .. : RS 232
 - language ........ : deutsch
```

How you can change the default com.port settings, please
read the controller serive manual.
(E-Terminal cap.: 3.5  and  C-Terminal cap: 3.2)

The chamber is fixed as a slave. She never be answered
without a question.

```
chamber data format   : - 8 databits
                        - 1 startbit
                        - 1 stopbit
                        - no parity
```

data format   start sign      : one $ sign

data format chamberadress    : 2-signed integer

data format   end sign       : one <CR> sign

data format   nom./akt.value : 4 for-,point,1 after comma sign

data format   dig.in/output  : allways 8-bit block
(not used bits filled with zero; 0=OFF 1=ON)

data format error number     : 2-signed integer (look E-Terminal)

data format error text       : 31 charakter (look C-Terminalt)

data format program no       : 4-signed integer

read Chamber VC4020/57  (VC4207)

Caution! If the digital output AL-ERROR is high, you can get
the error with the F-command and quit it with the
Q-command.

```
command from PC:   (value only exambles !!)
start sign ...................... : $
chamberadress (always 2 integer)  : 00 (here chamber 1)
command ......................... : I
end sign ........................ : <CR>


chamber answer    : (value only exambles !!)
   0. analog nominal value Temper     : 0010.0 (example 10.0)
   0. analog actual value  Temper     : 0011.2 (example 11.2)
   1. analog nominal value humidity   : 0010.0 (example 10.0)
   1. analog actual value  humidity   : 0011.2 (example 11.2)
   2. analog naminal value Pt100 1    : 0000.0 (not used)
   2. analog actual value  Pt100 1    : 0011.2 (example 11.2)
   3. analog naminal value Pt100 2    : 0000.0 (not used)
   3. analog actual value  Pt100 2    : 0011.2 (example 11.2)
   4. analog naminal value Pt100 3    : 0000.0 (not used)
   4. analog actual value  Pt100 3    : 0011.2 (example 11.2)
   5. analog naminal value Pt100 4    : 0000.0 (not used)
   5. analog actual value  Pt100 4    : 0011.2 (example 11.2)
   6. analog nominal value fan t.spa  : 0010.0 (example 10.0)
   6. analog actual value  fan t.spa  : 0011.2 (example 11.2)

   0. digital output    on            : 0 not used
   1. digital output    start         : 1 switched ON
   2. digital input     AL-ERROR      : 0 switched off
   3. digital output    Temper        : 1 switched ON
   4. digital output    humidity      : 0 switched OFF
   5. digital output    dew point     : 1 switched ON
   6. digital output    cap.humid     : 0 switched OFF
   7. digital output    dehumidit     : 1 switched ON
   8. digital output    add.dehum     : 0 switched OFF
   9. digital output    compr.air     : 1 switched ON
  10. digital output    corr. gas     : 0 switched OFF
  11. digital output    CO2 cool.     : 1 switched ON
  12. digital output    free out1     : 0 switched OFF
  13. digital output    free out2     : 1 switched ON
  14. digital output    free out3     : 0 switched OFF
  15. digital output    free out4     : 1 switched ON
  16. digital input     free in 1     : 0 switched OFF
  17. digital input     free in 2     : 1 switched ON
  18. digital input     free in 3     : 0 switched OFF
  19. digital input     free in 4     : 1 switched ON
  20. digital output    _____      : 0 switched OFF
  21. digital output    _____      : 1 switched ON
  22. digital output    _____      : 0 switched OFF
  23. digital output    _____      : 1 switched ON
  24. digital output    _____      : 0 switched OFF
  25. digital output    _____      : 1 switched ON
  26. bit only for fill up            : 0
  27. bit only for fill up            : 0
  28. bit only for fill up            : 0
  29. bit only for fill up            : 0
  30. bit only for fill up            : 0
  31. bit only for fill up            : 0
end sign ........................ : <CR>
```

read Chamber VC4020/57  (VC4207)

Example  : (| remarks linefeed)
PC -> Chamber :$00I<CR>
Chamber -> PC :0010.0 0011.2 0010.0 0011.2 0000.0 0011.2 0000.|
|0 0011.2 0000.0 0011.2 0000.0 0011.2 0010.0 0011.2 0101010101|
|01010101010101010101000000<CR>|

write Chamber VC4020/57 (VC4207)

Attension!! If you set a nominal value you must be switch on
the digital output with the same name !
Not used channels fill up (see dataformat)

command from PC:  (value only exambles !!)
start sign ..................... : $
chamberadress (always 2 integer)  : 00 (here chamber 1)
command ......................... : E
 0. analog nominal value Temper   : 0010.0 (example 10.0)
 1. analog nominal value humidity : 0010.0 (example 10.0)
 2. analog nominal value  not used : 0000.0 (fill up with 0)
 3. analog nominal value  not used : 0000.0 (fill up with 0)
 4. analog nominal value  not used : 0000.0 (fill up with 0)
 5. analog nominal value  not used : 0000.0 (fill up with 0)
 6. analog nominal value fan t.spa : 0010.0 (example 10.0)

 0. digital output      not used   : 0
 1. digital output      start      : 1 switched ON
 2. digital output      not used   : 0
 3. digital output      Temper     : 1 switched ON
 4. digital output      humidity   : 0 switched OFF
 5. digital output      dew point  : 1 switched ON
 6. digital output      cap.humid  : 0 switched OFF
 7. digital output      dehumidit  : 1 switched ON
 8. digital output      add.dehum  : 0 switched OFF
 9. digital output      compr.air  : 1 switched ON
10. digital output      corr. gas  : 0 switched OFF
11. digital output      CO2 cool.  : 1 switched ON
12. digital output      free out1  : 0 switched OFF
13. digital output      free out2  : 1 switched ON
14. digital output      free out3  : 0 switched OFF
15. digital output      free out4  : 1 switched ON
16. digital input       not used   : 0 (not write enable)
17. digital input       not used   : 0 (not write enable)
18. digital input       not used   : 0 (not write enable)
19. digital input       not used   : 0 (not write enable)
20. digital output      _____   : 0 switched OFF
21. digital output      _____   : 1 switched ON
22. digital output      _____   : 0 switched OFF
23. digital output      _____   : 1 switched ON
24. digital output      _____   : 0 switched OFF
25. digital output      _____   : 1 switched ON
26. bit only for fill up           : 0
27. bit only for fill up           : 0
28. bit only for fill up           : 0
29. bit only for fill up           : 0
30. bit only for fill up           : 0

write Chamber VC4020/57 (VC4207)

31. bit only for fill up               : 0
end sign ......................... : <CR>

Chamber answer    :
O.K. sign     : 0
end sign .... : <CR>

Examble  : (| remarks linefeed)
PC -> Chamber :$00E 0010.0 0010.0 0000.0 0000.0 0000.0 0000.0 0010.|
|0 1010101010101010000010101000000<CR>|
chamber -> PC :0 <CR>

```
write gradient VC4020/57 (VC4207)

command from PC:  (value only exambles !!)
start sign ......................... : $
chamberadress (always 2 integer)     : 00 (here chamber 1)
command ............................ : U
 0. gradient up-speed    Temper   : 0001.0 (example 1.0)
 0. gradient down-speed  Temper   : 0002.0 (example 2.0)
 1. gradient up-speed    humidity : 0001.0 (example 1.0)
 1. gradient down-speed  humidity : 0002.0 (example 2.0)
 2. analog nominal value  not used : 0000.0 (fill up with 0)
 2. analog nominal value  not used : 0000.0 (fill up with 0)
 3. analog nominal value  not used : 0000.0 (fill up with 0)
 3. analog nominal value  not used : 0000.0 (fill up with 0)
 4. analog nominal value  not used : 0000.0 (fill up with 0)
 4. analog nominal value  not used : 0000.0 (fill up with 0)
 5. analog nominal value  not used : 0000.0 (fill up with 0)
 5. analog nominal value  not used : 0000.0 (fill up with 0)
 6. gradient up-speed    fan t.spa : 0001.0 (example 1.0)
 6. gradient down-speed  fan t.spa : 0002.0 (example 2.0)
end sign ......................... : <CR>

Chamber answer     :
O.K. sign      : 0
end sign .... : <CR>

Example  : (| remarks linefeed)
PC -> Chamber :$00U 0001.0 0002.0 0001.0 0002.0 0000.0 0000.00000.0|
| 0000.00000.0 0000.00000.0 0000.00001.0 0002.0 <CR>|
chamber -> PC :0 <CR>
```

read error VC4020/57 (VC4207)

command from PC:  (value only exambles !!)
start sign ....................... : $
chamberadress (always 2 integer)   : 00 (here chamber 1)
command .......................... : F
end sign ......................... : <CR>

chamber answer     : (value only exambles !!)
errornumber  : 01  (ex: error no 1)
errortext    : software test spec.protection..
end sign ... : <CR>

examble :
PC -> Chamber :$00F<CR>
Chamber -> PC:01 software test spec.protection.. <CR>


quit error

Attensione! It will always be quitt the first error !

command from PC:  (value only exambles !!)
start sign ....................... : $
chamberadress (always 2 integer)   : 00 (here chamber 1)
command .......................... : Q
end sign ......................... : <CR>

chamber answer     : (value only exambles !!)
counter of aktual errors ......... : 00
end sign ......................... : <CR>

Example  :
PC -> Chamber :$00Q<CR>
Chamber -> PC:00<CR>

automaticprogramm start/stop  VC4020/57 (VC4207)

xxxx is equal to the number of the automatic programm
you will be startet
Is xxxx equal the 0000, you will be stopped the
aktual automatic programm !
command from PC:   (value only exambles !!)
start sign ...................... : $
chamberadress (always 2 integer)   : 00 (here chamber 1)
command ......................... : P
programm number .............. : xxxx
end sign ...................... : <CR>

chamber answer      :
O.K. sign ........ : 0
end sign ........ : <CR>

example  : prog.nr 7 start
PC -> Chamber :$00P0007<CR>
Chamber -> PC:0<CR>

Chamber: VC4020/57   (VC4207)

errornumber/errortext                      quitt-enable

```
00 ...... humidity out of range          . no
01 ...... software test spec.prot. temp  . no
02 ...... test spezimen protection       . no
03 ...... low water in humiditysystem    . no
04 ...... temperaturlimiter test space   . no
05 ...... high pressure (pre-)compressor . no
06 ...... fill water in humiditysystem   . yes
08 ...... fill water in humiditysystem   . no
09 ...... Thermal protect.test space fan . no
10 ...... press. temperatur (pre-)cooling. no
18 ...... low water water suply min      . no
```

| Analog Channel | input-range | min | max |
|---|---|---|---|
| 0 | Temper   .. [°C] ..... | -045.0 | 0185.0 |
| 1 | humidity .. [%rh] ..... | 0005.0 | 0100.0 |
| 2 | Pt100 1  .. [°C] ..... | 0000.0 | 0000.0 |
| 3 | Pt100 2  .. [°C] ..... | 0000.0 | 0000.0 |
| 4 | Pt100 3  .. [°C] ..... | 0000.0 | 0000.0 |
| 5 | Pt100 4  .. [°C] ..... | 0000.0 | 0000.0 |
| 6 | fan t.spa .. [% ] ..... | 0050.0 | 0100.0 |

| Digital Channel | Type |
|---|---|
| 0 | on | not changable |
| 1 | start | write Output |
| 2 | AllError | read Input |
| 3 | Temper | controller active |
| 4 | humidity | controller active |
| 5 | dew point | write Output |
| 6 | cap.humid | write Output |
| 7 | dehumidit | write Output |
| 8 | add.dehum | write Output |
| 9 | compr.air | write Output |
| 10 | corr. gas | write Output |
| 11 | CO2 cool. | write Output |
| 12 | free out1 | write Output |
| 13 | free out2 | write Output |
| 14 | free out3 | write Output |
| 15 | free out4 | write Output |
| 16 | free in 1 | read Input |
| 17 | free in 2 | read Input |

Chamber: VC4020/57    (VC4207)

Digital Channel  Type

| 18 | free in 3 | read Input |
| 19 | free in 4 | read Input |
| 20 | _____ | write Output |
| 21 | _____ | write Output |
| 22 | _____ | write Output |
| 23 | _____ | write Output |
| 24 | _____ | write Output |
| 25 | _____ | write Output |

chamberconfiguration

commisionsno. : VC4207
Chamber name  : VC4020/57
date ....... : 07/05/96
controller .. : CTC

```
Analog Input                   input-range        protection-range
no name      unit     short    min       max       min       max
 0 Temper     [°C] t     -45.000   185.000   -50.000   190.000
 1 humidity   [%rh] U      5.000   100.000     0.000   110.000
 2 Pt100 1    [°C] 1Pt  -300.000   300.000   -40.000   180.000
 3 Pt100 2    [°C] 2Pt  -300.000   300.000   -40.000   180.000
 4 Pt100 3    [°C] 3Pt  -300.000   300.000   -40.000   180.000
 5 Pt100 4    [°C] 4Pt  -300.000   300.000   -40.000   180.000
 6 fan t.spa  [% ] fan    50.000   100.000    50.000   100.000
```

```
Analog Output
no name      type       min==0    max==10V or 20mA
 0 Temper    actual     -100.000  200.000
 1 humidity  actual        0.000  100.000
 2 Pt100 1   actual     -100.000  200.000
 3 Pt100 2   actual     -100.000  200.000
 4 Pt100 3   actual     -100.000  200.000
 5 fan t.spa nominal       0.000  100.000
```

```
Digital Channel
no      name         type
 0      Temper       controller active
 1      humidity     controller active
 2      dew point    write Output
 3      cap.humid    write Output
 4      dehumidit    write Output
 5      add.dehum    write Output
 6      compr.air    write Output
 7      corr. gas    write Output
 8      CO2 cool.    write Output
 9      free out1    write Output
10      free out2    write Output
11      free out3    write Output
12      free out4    write Output
13      free in 1    read Input
14      free in 2    read Input
15      free in 3    read Input
16      free in 4    read Input
17      _____     write Output
18      _____     write Output
19      _____     write Output
20      _____     write Output
21      _____     write Output
```

appendix  B                                                    page 2

Digital Channel
```
no      name          type
22      _____      write Output
```

error
```
errornumber/errortext                      quitt-enable
00      humidity out of range              no
01      software test spec.prot. temp      no
02      test spezimen protection           no
03      low water in humiditysystem        no
04      temperaturlimiter test space       no
05      high pressure (pre-)compressor     no
06      fill water in humiditysystem       si
08      fill water in humiditysystem       no
09      Thermal protect.test space fan     no
10      press. temperatur (pre-)cooling    no
18      low water water suply min          no
```

switchcyclecounter
```
no name        unit      short set     reset
 0 h.counter   h         B.h   no      no
```

# Vötsch
*Industrietechnik*

**Vötsch Industrietechnik GmbH**
Umweltsimulation ● Wärmetechnik

Postfachadresse:
Postfach 10 04 53, D-72304 Balingen

Frommern, Beethovenstraße 34
D-72336 Balingen

Telefon: (07433) 303-0
Telefax: (07433) 303-112

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