

# Chromatographic Air circulated Refrigerator

**TC 601**

also in accordance with DIN 13277



**External Dimensions:**  
W = 600 mm  
D = 610 mm  
H = 2013 mm

**Internal Dimensions:**  
W = 498 mm  
D = 496 mm  
H = 1280 mm

**Capacity:** 400 l

**Temperature Range:** 2°C to 20°C  
**Optional:** -5°C to 20°C

## Housing

galvanized sheet steel with high quality white coating, antibacterial coated. With 4 castors.

**Optional:** stainless steel (Backplane, as well as top and bottom side of the cabinet of galvanised sheet steel)

## Interior space

Inner case of galvanized sheet steel with high quality white coating, antibacterial coated. Cleaning friendly by rounded corners, slippery surface in the interior, meets highest hygiene requirements

**Optional:** stainless steel

## Insulation

high density foamed-in-place polyurethane, with a thickness of 50 mm. CFC-free

## Circulation air cooling

for rapid and uniform temperature control, reducing temperature gradients to a minimum. When the door is "open" the circulating fan is switched off automatically by a micro switch in order to prevent warmer ambient air being drawn in.

## Door

Three-layer thermally insulating glass door, supplied as standard with right hand hinge, also available with left hand hinge at no extra cost. Grease resistant magnetic seal.

**Optional:** with door lock

## Interior fittings

**LED-Interior lighting** with automatic ON/OFF micro switch

**3 pcs grating-type shelves** (dim.: 460x470 mm), white coated (max. 12 shelves possible)

**double socket /damp room design**, installed in refrigerator room, 230 V, 50 Hz, ON/OFF by illuminated switch on control panel

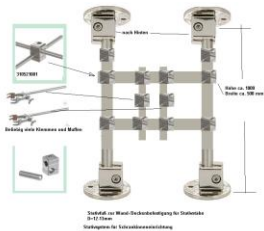
**1 pc cable port with cover** Ø 40 mm, for example to create access for operator measurement lines etc.

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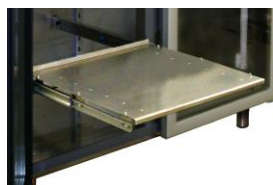
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**TC 601**

**Optional:** **Stainless Steel drawer compartments**, with **2 lengthwise dividers** (max. 11 drawers possible) with telescopic-type guides on rollers with stops, drawer dimensions: 430x400x77 mm (WxDxH)  
Usable width between the lengthwise dividers: 126 mm (lengthwise dividers easily removable)



**Optional:**  
**Chromatographic-pillar-retainer**  
Of 18/8 steel stand rod, incl. universal camps  
Execution and installation according to customer requirements



**Optional:**  
**Telescope-leaf for your Akta system in example**  
Of galvanized sheet steel (max. workload 50 kg/ or 100 kg)

**Control system** located above the door

## Touchscreen temperature controller, TC 2015



Language in German / English adjustable

**Working range from 2°C to 20°C**

**Optional:** from -5°C to 20°C  
(provided that the ambient temperature is around 4°C above the set point)

Temperature accuracy +/- 1,8°C after stabilising (with 50% filling)

- **Touchscreen Display**, size 12,5 cm (5")
- **PT1000 temperature sensor** for better temperature control accuracy
- **Digital temperature setting and display** with an accuracy of 0.1°C
- **Power supply** of 100-240V, 50-60Hz
- **Password protected** to prevent manipulations
- **Data import/export** via USB or Ethernet
- **Alarm**
  - Noticeable optical alarm signalling by red / blue flashing screen
  - Audible alarm
  - Mute the audible alarms, with continuous warning indication on the display and automatic return after 3 minutes when the alarm situation still exists
  - Alarm acknowledgment with password protection

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## Acoustic and optical alarm indication when

- High and low temperature (variably adjustable)
- Door open - alarm, (adjustable)
- Power failure
- Temperature sensor failure
- Defrost-time transgression (variable adjustable)
- Optional: cooling machine monitoring with overheat protection

- **Alarm memory** (not deleted) for the last 100 alarm conditions, with the possibility of review on the display and archiving the data via USB or Ethernet. Memory can not be deleted.
- **Event memory**  
In the event log all the operations of the controller are saved, such as:
  - Doorways
  - Parameter changes
  - Cooling equipment function, etc
 - Storage for approximately 4 weeks, with the possibility of review on the display and archiving the data via USB or Ethernet.
- **Graphical display of the temperature profile in the display**  
Illustration of the actual value and if requested of the product sensor on the display and archiving via USB or Ethernet. View period freely selectable.
- **Network Connection**  
2 Ethernet ports 10/100 Mbps available. This interface can be accessed directly on the log data of the controller to import in the software.
- **NO/NC contact**  
Alarm signal time delayed (adjustable)
- **Language:** English / German, other languages on request
- **Maintenance message:** Notification that maintenance should be carried out.
- **Test facilities** for Alarm limits and battery charge status
- In the housing of the temperature regulator there are all relevant components for using the cabinet. Plug-in connectors of the electrical supply pipes enable a **service friendly exchange**.
- **Optional**
  - Battery Module  
In case of power failure self-contained supply of the temperature controller with a powerful battery. All control functions are saved for about 72 hours.
  - 4...20 mA Output
  - WLAN-Module
  - Interface, RS 485 (galvanically isolated)
  - Software  
This software enables you to check at a glance several cooling units. It was designed to be user friendly and enables you to process your data in an intuitive manner.
  - Alarm system
    - Independent product sensor for reference measurement
    - Product protection against low temperatures. By dropping below the setpoint value, the cooling machine will switched off
    - Battery module as a standard feature

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### Refrigerating unit

fully hermetically sealed, forced ventilation, fitted on vibration - absorbing mounts (ambient temperature max. 32°C), low noise (50 dB(A)), energy saving compressor with high quality vaporisation system.

Refrigerant: R290 or equivalent.

### Defrost

Automatic, with time and thermal monitoring by dew water evaporation.

During the defrost period, the temperature inside the cabinet (only the air temperature – not the stored goods) will arise for a short time.

### Electrical Data

Power supply 230 V/50 Hz /single phase

**Optional: 60 Hz**

Power input 0,20 kW

Fuse 16 A

Power cable: 2,0 m with schuko plug

### Packing details (palletized)

Dimensions: ca. 70x80x218 cm

Net weight: 100 kg

Gross weight: 120 kg

**Country of Origin: European Union**

Customs clearance code: 8418 5090

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## Special Equipment and Accessories:



### GSM Modul

Connecting to the potential-free output. In case of an alarm either a message or a call will be sent automatically. Archiving of 1000 phone numbers is possible. The GSM module is equipped with a rechargeable battery. Automatic alert via SMS when the credit has been used on the SIM card. 6 units can be connected per module. The SIM card is not included



### Round Chart recorder

to record temperature, permanently installed in control panel. Comes as standard with battery back-up power supply for continuous operation (mains independent). The replaceable recording discs are suitable for 24 hours or 7-day periods. The actual temperature is plotted with a black felt tip pen on the chart. Internal temperature measurement. Measurement range: -10°C to 40°C  
The unit comes with 100 round charts (day or week)



### Door lock including 2 keys

Optional: electronic door lock, via temperature controller TC 2015



### Mains socket / damp room design

Installed inside the cabinet, 230 V, 50 Hz  
ON/OFF by switch on control panel



### Cable port with cover (approx. 40 mm Ø).

### Cable port with PG-gland

for example, to create access for operator measurement lines, etc.

Optional: with **separate sensor** kind and version as desired by the customer

**Dew water collector tank** for manual emptying  
(e.g., for using this cabinet in operating rooms and clean rooms)

### Wireless data logger system

For controller-independent temperature recording



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## Qualifications

### DQ (Design Qualification)

**Definition:** Documented proof that the quality-related, GMP-related requirements has been adequately addressed in the design of equipment, including buildings, premises and auxiliary equipment

The user-requirement profiles (specifications) are documented and confirmed by us. On request, a specification can be created by us.

### IQ (Installation Qualification)

**Definition:** Documented proof that critical equipment and systems have been delivered and installed in accordance with the set requirements and government regulations.

The IQ documentation is worked out by us especially for the delivered machine and is made available to you. The IQ documentation has to be carried out by the customer itself.

### OQ (Operational Qualification)

**Definition:** Documented proof that critical equipment and systems in accordance with the set requirements in the whole operating range are working as intended in accordance with predetermined limits.

The OQ documentation is worked out by us especially for the delivered machine and is made available to you. The OQ documentation has to be carried out by the customer itself.

### CQ (Calibration Qualification) according to DIN 13277:2022-05

**Definition:** Documented proof that critical measuring equipment in the intended range in accordance with predetermined tolerances operate reliably under current operating conditions

**Verifying the temperature in the unloaded cooling unit** (after reaching the steady state)

**1 temperature on 3 measuring levels with 5 measuring points each**

(Measurement with calibrated PT 1000 sensors). Test time 4 hours, then open door for 60 seconds.

During this time, the limit values specified in DIN 13277:2022-05 must not be exceeded. Repeat the door opening after one hour.

The temperature measurements are carried out on our premises. The evaluation of the measurements, including graphical representation, is made in written form. The values must not exceed the limit values specified in DIN 13277:2022-05. **(Other measuring methods possible on request)**

### PQ (Performance-Qualification) according to DIN 13277:2022-05

**Definition:** Documented proof that critical equipment and systems in accordance with the set requirements in the whole workspace under current working conditions (with product) provide the requested services

The calibration described above is carried out under real conditions on site. Optionally, the measurement can be carried out in a loaded or unloaded state. The measurement evaluation, including graphical representation, is made in written form. The values must not exceed the limits specified in DIN 13277:2022-05. **(Other measuring methods possible on request)**