

## Laboratory Ultra Low Deep Freezer (upright)

**TC 301**



(Ill. similar)

**External Dimensions:**  
**W = 875 mm**  
**D = 665 mm**  
**H = 1335 mm**

**Internal Dimensions:**  
**W = 630 mm**  
**D = 452 mm**  
**H = 620 mm**

**Capacity:** 175 l

**Temperature range:** -60°C to -82°C

### Housing (high size)

Galvanized sheet steel with high quality white coating. Equipped with 4 swivelling castors and 2 levelling adjusters.

### Interior space

of **stainless steel**. Cleaning friendly by rounded corners, slippery surface in the interior, meets highest hygiene requirements.

### Insulation

More effective insulation with vacuum insulation panels, Thermal conductivity < 0,005 W/m/K. The operating time of the compressors is reduced and your electricity consumption is cut by 15 %.

### Door

Single-leaf door including door lock, with right-hand hinge as standard. With door frame heating for easier opening of the door.

### Interior fittings

**2 compartments** with interior doors to reduce the cooling loss

**1 pc** stainless steel shelf

**1 pc** cable port

### Optional:

- additional shelves

- Stainless steel frame with drawers

- Stainless steel frame with fixed shelves

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**TC 301**



**High quality electronic temperature regulator**  
**Digital selected- and actual value display, permanently readable.**  
 Selected value can be adjusted by foil coated button  
**Temperature Range: -60°C to -82°C**  
 Temperature accuracy at -80°C +/- 3°C after stabilising

**Acoustic and optical alarm indication, when**

- selected value is exceeded or insufficient
- “Door open” Alarm
- Blocked condenser alarm
- Mains failure alarm
- Condenser filter alarm (washable)
- Regulator can be bolted against manipulation.

The freezer is equipped with remote alarm contact and cable entry port.

In case of a power outage, the unit is supplied with electricity from an independent self-loading accumulator (accu)

**Unique safety system: Maximum protection of your specimens**

The samples protection must be efficient in any circumstance, even in unlikely case of low voltage/electronic system outage. The BoSS system compensates for that potential issue and will engage the compressors permanently, maintaining a permanent deep freeze production.

**Your great advantage, your specimens will survive!**

- The thermostat is equipped with a 24-volt battery. In case of voltage drop of the battery below 20 volts (for example, by failure of the electronic board), the compressor will be permanently connected to the 230-volt supply.
- No emergency-service necessary

**Refrigeration unit**

Powerful, hermetically sealed air compressors. Compressors works as a cascade system. Acoustic insulation and specially adapted low temperature refrigeration give a noise level.  
 Environmentally friendly refrigerant: Stage 1: R290 / Stage 2: 170

**Defrost**

manually

**Electrical Data**

Power supply            230 V/50 Hz /single phase    **Optional:** 208V/60Hz or 110V/ 50/60Hz  
 Power input            800 W  
 Fuse                      16 A  
 Power cable:            1,5 m with schuko plug

**Packing details** (in wooden box)

Dimensions:            approx. 110x90x160 cm  
 Net weight:             185 kg  
 Gross weight:         235 kg  
**Country of Origin:     European Union**  
 Customs clearance code: 8418 4080

**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

**- Cryogenic battery option**

To achieve optimised performance. The cryogenic accumulator provides a delayed temperature rise in the event of a power failure, giving the user up to 18 hours to protect their samples. The room temperature, the volume of the contents in the freezers and the frequency of door openings can influence the temperature fluctuations.

**- RS 485 Interface**

**- CO<sub>2</sub> safety system**

Includes controller, alarm backup and CO<sub>2</sub> valve

**- Flexible CO<sub>2</sub> high pressure hose**

As a connection between freezer and CO<sub>2</sub> supply

**- Independent PT 100 sensor,**

Measuring range: -100°C to +50°C, for connection to on-site temperature recorder

**\*\*\* additional accessories on request \*\*\***



## 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)**