Laboratory Ultra Low Deep Freezer TC 302-Premium

Ideal for daily use, with frequent door opening

External Dimensions:	**W = 875 mm** **D = 965 mm** **H = 1280 mm**
Internal Dimensions:	**W = 630 mm** **D = 752 mm** **H = 716 mm**
Capacity:	**340 l**
Storage Capacity:	**24.000 Cryotubes 2ml**
Temperature range:	**-60°C to -86°C**

Housing
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
Vacuum insulation boards (VIP, VACUPOR), combined with high-density PU foam, provide optimum insulation.

Cooling unit
Powerful and economical compressors in cascade connection, enable a rapid temperature reduction, <4 hours from 22°C to -86°C! (Maximum ambient temperature 32°C).
Environmentally friendly refrigerant: Stage 1: R290 / Stage 2: R170

Door

Door single leaf, including door lock.
With ergonomic handle. A built-in sensor supports the correct closing of the door.
With door frame heating for easier opening of the door. With a unique design, the flexibility of the seal allows a perfect sealing of the freezer and minimizes ice formation.

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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technische Änderungen vorbehalten

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Touchscreen Temperaturregler

Temperature Range: -60°C to -86°C
Temperature accuracy at -80°C +/- 5°C after stabilising

- **Digital temperature setting and display with an accuracy of 0.1°C**
- **Password protected to prevent tampering**
- **Display statistics, temperature history, alarm messages, etc.**
- **Data export via SD, USB or RFID**
- **Adjustment of brightness and contrast**
- **Power saving mode - screen is activated when a user is nearby**
- **Ability to leave a message on the screen**

Alarm signal acoustic and visual

- **Over and under the setpoint.**
- **"Door open" alarm with adjustable delay**
- **high pressure error**
- **power failure**
- **Compressor filter alarm (filter washable)**
- **Security system "BoSS" activated**

The freezer is equipped **with remote alarm contact.**

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

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Energy efficiency

The energy consumption is strongly influenced by: the set temperature, the frequency of the door opening, the ambient temperature, etc. The energy consumption is measured realistically. That does not mean when empty, but under real conditions with large numbers of samples. Under these circumstances, for example, the TC 304 model (690 l) consumes 12.5 kWh / 24 h at an ambient temperature of 22°C.

The Ultra-Deep Freezer offers the user in the "Best Practice" program recommendations on how the current power consumption can be reduced. (E.g., use of the Eco or Standby mode, cleanliness of the filter, ambient temperature, door opening frequency, etc.).

Easy to repair and maintain

- Diagnostic menu
  Freezer and key parameters at a glance including key indicators: real-time information on pressure, power consumption, plate heat exchanger temperature, critical component status battery, mains relay contacts.
- LED indicators provide fast alarm identification (BoSS active, low battery, T ° alarm, ...)
- "Plug & play" electronics
  Fast exchange of electronic components, without special tools
- Extendable cooling unit
  The cooling unit is mounted on a removable tray. An immediate replacement of the cooling system is possible and can prevent the return of the device to the workshop

Defrost
manually

Electrical Data

Power supply	230 V/50 Hz /single phase **Optional: 208V/60Hz., or 110V/50/60 Hz.**
Power input	900 W
Fuse	16 A
Power cable:	1,5 m with schuko plug

Packing details (in wooden box)

Dimensions:	approx. 100x110x160 cm
Net weight:	approx. 223 kg
Gross weight:	approx. 273 kg
Country of Origin:	**European Union**
Customs clearance code:	8418 4080

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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

- 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_2 safety system
Includes controller, alarm backup and CO_2 valve

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

- Various **stainless steel or aluminium racks** available for storage. Please contact us.

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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 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.
exceeded. **(Other measuring methods possible on request)**

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