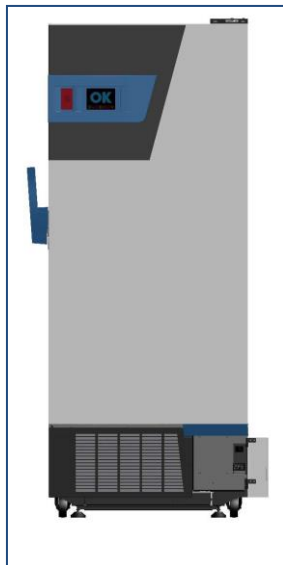


# Laboratory Ultra Low Deep Freezer

## Ideal for long-term storage

# TC 304-Basic



(Ill. similar)

<b>External Dimensions:</b>	<b>W = 875 mm</b> <b>D = 970 mm</b> <b>H = 1990 mm</b>
<b>Internal Dimensions:</b>	<b>W = 630 mm</b> <b>D = 752 mm</b> <b>H = 1436 mm</b>
<b>Capacity:</b>	<b>690 l</b>
<b>Storage capacity:</b>	<b>48.000 cryotubes 2 ml</b>
<b>Temperature range:</b>	<b>-60°C to -86°C</b>

### 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. Thermal conductivity: < 0.005 W/m/K

### 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).

Refrigerant: Stage 1: R 417a / Stage 2: R508a / R508b

(Optionally with environmentally friendly refrigerant R290 / 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

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

**3 pcs** stainless steel shelves (max. load 75 kg per shelf)

**1 pcs** cable port for temperature sensors

### Optional: additional shelves

**Stainless steel frame with drawers**

**Stainless steel frame with fixed shelves**

**Additional inner door (interior layout with 5 interior doors)**

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## Laboratory Ultra Low Deep Freezer Ideal for long-term storage

## TC 304-Basic

### Temperature controller with optical and acoustical alarm



Status display "OK"

### Temperature Range: -60°C to -86°C

Temperature accuracy at -80°C +/- 5°C after stabilising

### Indicators et alarms LED

The main display allows a clear and visible display of indicators and warning lights. They have a simplified color code to help you easily understand the type of defect:

- Green: Normal running
- Orange: minor defect (make the necessary arrangements as soon as possible)
- Red: major defect (make the necessary arrangements immediately)

### Displayed messages:

- Power supply
- Over and under temperature alarm
- High pressure, compressor 1
- Battery Level
- Door open
- Continuous runtime compressor
- CO<sub>2</sub> injection active

### Battery-backed (24V), allows alarms even in the event of a power failure

Temperature controller to adjust the set point at bottom right. Actual value continuously visible



Optional is the freezer equipped **with remote alarm contact**.

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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.

### Easy to repair and maintain

- LED indicators provide fast alarm identification (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
- Clogging of the filter causes a decrease in the performance of the freezer or even a stop in the most critical cases. The filter is removable for easy cleaning and maintain a high level of performances

### Defrost

manually

### Electrical Data

Power supply	230 V/50 Hz /single phase	<b>Optional: 208V/60 Hz. or 110V/50/60 Hz.</b>
Power input	1150 W	
Fuse	16 A	
Power cable:	1,5 m with schuko plug	

### Packing details (in wooden box)

Dimensions:	approx. 117x940x215 cm
Net weight:	approx. 330 kg
Gross weight:	approx. 350 kg
<b>Country of Origin:</b>	<b>European Union</b>
Customs clearance code:	8418 4080

## Laboratory Ultra Low Deep Freezer Ideal for long-term storage

## TC 304-Basic

### Special Equipment and Accessories:

#### Unique safety system BOSS: 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



#### 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.

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

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

#### - Independent PT 100 sensor,

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

#### - Potential-free output

(NO/C/NC)

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

# Laboratory Ultra Low Deep Freezer

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# TC 304-Basic



## 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)**