

# Laboratory Ultra Low Deep Freezer

## Ideal for long-term storage

# TC 304-Basic



|                             |  |
|-----------------------------|--|
| <b>External Dimensions:</b> | <b>B = 875 mm</b><br><b>D = 965 mm</b><br><b>H = 2000 mm</b> |
| <b>Internal Dimensions:</b> | <b>B = 630 mm</b><br><b>D = 752 mm</b><br><b>H = 1436 mm</b> |
| <b>Capacity:</b>            | <b>690 l</b>   |
| <b>Temperaturerange:</b>    | <b>-55°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.

### 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**

### Optional: additional shelves

**Pull-out shelf, tilt protected**

**Stainless steel frame with drawers**

**Stainless steel frame with fixed shelves**



*Pull-out shelf, tilt protected*

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### Touchscreen Temperaturregler



**Temperature Range: -55°C to -86°C**  
Temperature accuracy at -80°C +/- 3°C after stabilising

**Status display "OK"**

- Digital temperature setting and display with an accuracy of 0.1 ° C
- Data export via SD, USB or RFID

#### Alarm signal acoustic and visual

- Over and under the setpoint.
- "Door open" alarm
- 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

#### 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.

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### Easy to repair and maintain

- 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 | <b>Optional: 230 V/60 Hz., or 110V/50/60 Hz.</b> |
| Power input  | 1500 W                    |  |
| Fuse         | 16 A                      |  |
| Power cable: | 1,5 m with schuko plug    |  |

### Packing details (in wooden box)

|                           |                           |
|---------------------------|---------------------------|
| Dimensions:               | approx. 100x110x230 cm    |
| Net weight:               | approx. 330 kg            |
| Gross weight:             | approx. 380 kg            |
| <b>Country of Origin:</b> | <b>European Community</b> |
| 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



#### 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.

The unit comes with 100 round charts (day or week)



#### Cable port

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

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

#### CO<sub>2</sub> Safety system

Includes controller, backup alarm 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

#### RS 485 interface

#### Gloves couple, TC 320-G

**Thermal protection Gloves for the ultra low temperature especially for some uses between +70°C and -150°C**

Wrist with a tightening stretch on the back, Compliant with the EN420 norm and the CEE/89/86 - EN388 - EN511, Equipment in Class 2 for the individual protection. These gloves don't protect against the liquid gaz projections.

**Size 7 / 10**

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

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**Wireless data logger, complete**  
For independent temperature recording

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**consisting of:**

### Wireless data logger, SPY RF U1

1-channel for Pt100, 4-20mA / 0-1V / contact on-off, with display

Measurement accuracy at 23°C: +/- 0,3°C

Resolution: 0,1°C

Battery: Lithium - Battery

Recording interval: 1 sec. to 90 minutes

Internal memory: 10.000 measurements

Usable range: 1km LOS

Communication: via radio 868 Mhz

Power: 25 mW

incl. 1 pcs. Sensor of stainless steel, Ø 4,0mm L=30mm

Pt100 class A with plugged cable of PTFE

Measurement area: -200°C...+200°C

**Length:** 3 meter **Optional: 8 meter**

Delivery contents: wall mounting holder and plug protection

### Software - Basic Version for single user

- Maintenance of multiple Wireless data logger
- collect the recorded data of the Wireless data logger
- Back up data (tamper-proof)
- Prepare the data in terms of graphics or charts
- Excel exportable
- Maintenance of alarms via potential free contact at the Modem or Alarmsystem (SMS, phone call, blinking light, buzzer)

### SPY RF USB-Modem for data transfer to the PC via USB-connector

- Communication with infinite numbers of Wireless data logger
- Remote alarm via integrated potential contact
- including wall mounting holder

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### **Optional:**

**Sensor of stainless steel** Ø 4,0mm L=30mm Pt100 class A,  
with plugged cable of PTFE, Measurement area: -200°C...+200°C  
**Length: 8 Meter**

#### **SPY RF Relay (Repeater)**

- Allows the data transfer of the data logger about bigger distances
- Can transfer dates of one or several SPY RF data logger
- Electricity supply about power supply unit and battery in case of power failure
- with 2 output ranges: 25mW to communicate with the data logger and 500mW to communicate with the modem.
- Delivered with wall mounting fixture
- Ambient temperature: from -10°C to +70°C

#### **SPY RF Alarm - realtime alerting**

- i.e. by limit exceeded or power failure
- Local warning
- Integrated acoustical and optical Alarm
- Power supply via external power adapter and spare battery in case of power failure
- Button for local alarm quitt
- Relais output for remote alarm (GSM-Modem, telephone dialer)
- including wall mounting holder

#### **SPY RF Telephone dialer**

- In the speech modus it called up to 6 different subscriber and informed them about the kind of failure
- This ergonomically linguistic aid provides high operational ease.
- requires an analogue phone line
- Individual adjustment of identification, alarms and alarm quitt
- requires an external power supply (included)

#### **GSM-Modem I for switch contact**

##### **For use with:**

##### **Software - Basic Version and SPY RF USB-Modem, or SPY RF Alarm**

- Enables to send SMS messages
- Modem registered also power failure and send SMS immediately.

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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)

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

#### Checking the temperature in the cabinet

**1 Temperature on 3 different measuring points** (measured with calibrated PT 100 sensor) evenly located on the shelves. Inspection time 6 hours, open door after that of 30 seconds. The inside temperature of the cabinet must have been stabilized itself within 1 hour on the set point temperature.

The measurements are carried out in the empty state.

The temperature measures are carried out in our company, represented graphically and provided to you.

The values may not dropping below or above the tolerances given by us.

(Additional measuring points on request)

### PQ (Performance-Qualification)

*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.

The values may not dropping below or above the tolerances given by us.