Laboratory Ultra Low Deep Freezer Chest TC 312

External Dimensions: **W = 2100 mm**
D = 920 mm (incl. handle and hinge)
H = 1032 mm

Internal Dimensions: **W = 1436 mm**
D = 630 mm
H = 765 mm

Capacity: **690 l**

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
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 %

Lid
Lid equipped with lockable handle and spring-loaded snap latches. With frame heating for easier opening of the lid

Interior fittings
1 cable port

Optional: Upright stainless-steel frame

(W:144 x D:140 x H:737) mm (max.40 frames possible)

Number of cryo boxes per rack	Dimension cryo boxes
12 St.	133x133x51 mm
7 St.	133x133x95 mm

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Gesellschaft für Labortechnik
und Umweltsimulation mbH
Hüttenstraße 9
D-30165 Hannover

Homepage www.tritec-klima.com
E-mail info@tritec-klima.de
Phone ++49-511/3523508
Fax ++49-511/3521715
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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 -86°C
Temperature accuracy at -80°C +/- 5°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. (Ambient Temperature 25°C).
Refrigerant: Stage1: R 417a / Stage 2: R508a

Defrost
manually

Electrical Data

Power supply	230 V/50 Hz /single phase	**Optional: 208V/60Hz or 110V / 50/60Hz**
Power input	1800 W	
Fuse	16 A	
Power cable:	2,0 m with schuko plug	

Packing details (in wooden box)

Dimensions:	approx. 230x110x140 cm
Net weight:	340 kg
Gross weight:	380 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

Cable port
for example, to create access for operator measurement lines, etc.
Optional: with **separate sensor** kind and version as desired by the customer

- **4…20 mA output**

- **CO_2 safety system**
  Includes controller, alarm backup and CO_2 valve
- **Flexible CO_2 high pressure hose**
  As a connection between freezer and CO_2 supply

- **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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