Laboratory Ultra Low Deep Freezer (upright) TC 301

(Ill. similar)

External Dimensions:	**B = 875 mm** **D = 665 mm** **H = 1335 mm**
Internal Dimensions:	**B = 630 mm** **D = 452 mm** **H = 620 mm**
Capacity:	**175 l**
Temperaturerange:	**-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
Solid door, lockable, supplied as standard with right hand hinge. Heated silicone door seal with 3 lips limits frost formation. Heated pressure equaliser for instant door opening.

Interior fittings
2 compartments with interior doors to reduce the cooling loss
1 pcs stainless steel shelves

Optional: **additional shelves**
Stainless steel frame with drawers
Stainless steel frame with fixed shelves

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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 -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.
Refrigerant: R 417a/R508a

Defrost
manually

Electrical Data

Power supply	230 V/50 Hz /single phase **Optional:** 60 Hz
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 Community**
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_2 Safety system
Includes controller, backup alarm and CO_2 Valve
Flexible CO_2 high pressure hose
As a connection between freezer and CO_2 supply

RS 485 interface

Independent PT 100 sensor with 4-20 mA output,
Measuring range: -100°C to +50°C, for recording

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 normand the CEE/89/86 - EN388 - EN511, Equipment in Class 2 for the individual protection. These gloves doesn'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

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
- Maintenace 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 infinete numbers of Wireless data logger
- Remote alarm via integrated potential contact
- including wall mounting holder

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technische Änderungen vorbehalten

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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.

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