

## Laboratory Air circulated Deep Freezer (undercounter)

**TC 231**



<b>External Dimensions:</b>	<b>B = 620 mm</b>
	<b>D = 620 mm</b>
	<b>H = 840 mm</b>
<b>Internal Dimensions:</b>	<b>B = 500 mm</b>
	<b>D = 460 mm</b>
	<b>H = 520 mm</b>
<b>Capacity:</b>	<b>140 l</b>
<b>Temperaturerange:</b>	<b>-5°C to -20°C</b>

(Ill. similar)

### Housing (high size)

Galvanized sheet steel with high quality white coating. 4 feet, height adjustable.

**Optional: stainless steel** (Backplane, as well as top and bottom side of the cabinet of galvanised sheet steel)

### Interior space

Galvanized sheet steel with high quality white coating. Cleaning friendly by rounded corners, slippery surface in the interior, meets highest hygiene requirements

**Optional: stainless steel**

### Integration and foundation possible. A sufficient ventilation has to be respected!

**Attention:** If the optional tritec TC 2015 temperature controller is installed, the total height of the unit changes to 940 mm.

### Insulation

high density foamed-in-place polyurethane, with a thickness of 50 mm. CFC-free

### Circulation air cooling

for rapid and uniform temperature control, reducing temperature gradients to a minimum. When the door is "open" the circulating fan is switched off automatically by a micro switch in order to prevent warmer ambient air being drawn in.

### Door

Solid door supplied as standard with right hand hinge, also available with left hand hinge at no extra cost. Grease resistant magnetic seal..

**Optional: with door lock**

### Interior fittings

**2 pcs. Grating-type shelves** (dim: 400x500 mm) white coated (max.5 pcs.),

**Optional: Stainless-steel drawer compartments with 2 lengthwise dividers** (max. 5 drawers possible)

with telescopic-type guides on rollers with stops,)

Drawer dimensions: 380x450x77 mm (BxDxH)

Usable with between the lengthwise dividers: 110 mm (lengthwise dividers easily removable)

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**Control system** located above the door

**High quality electronic temperature controller**



**Actual value permanently displayed.**  
Set value adjustable digitally by switches.

**Temperature range** from -5°C to -20°C

**Acoustic signal** when the set value is undercut or exceeded  
**Potential-free connection socket** for extern alarm indication

**Optional:** Temperature regulator TC 2015

### **Refrigeration unit**

fully hermetically sealed, forced ventilation, fitted on vibration - absorbing mounts (ambient temperature max. 32°C), low noise (50 dBa/1m), energy saving compressor with high quality vaporisation system.  
Refrigerant: environment friendly R 134a

**Defrost**  
manual

### **Electrical Data**

Power supply	230 V/50 Hz (optional: 60 Hz) /single phase
Power input	500 W
Energy consumption	1,6 W (24 hours)
Fuse	10 A
Power cable:	1,5 m with schuko plug

### **Packing details** (palletized)

Dimensions:	approx. 65x70x105 cm
Net weight:	60 kg
Gross weight:	70 kg
<b>Country of Origin:</b>	<b>European Community</b>
Customs clearance code:	8418 4020

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### Special Equipment and Accessories:

#### Touchscreen temperature controller, TC 2015



Working range from -5°C to -20°C

Language in German / English adjustable

- **Touchscreen Display, size 12,5 cm (5")**
- **PT1000 temperature sensor for better temperature control accuracy**
- **Digital temperature setting and display with an accuracy of 0.1 °C**
- **Power supply of 100-240V, 50-60Hz**
- **Password protected to prevent manipulations**
- **Data import/export via USB or Ethernet**
  
- **Alarm**
  - Noticeable optical alarm signaling by red / blue flashing screen
  - Audible alarm
    - Mute the audible alarms, with continuous warning indication on the display and automatic return after 3 minutes when the alarm situation still exists
  - Alarm acknowledgment with password protection
  
- **Acoustic and optical alarm indication when**
  - High and low temperature (variably adjustable)
  - Door open - alarm, (adjustable)
  - Power failure
  - Temperature sensor failure
  - Defrost-time transgression (variable adjustable)
  - Optional: cooling machine monitoring with overheat protection
  
- **Alarm memory** (not deleted) for the last 100 alarm conditions, with the possibility of review on the display and archiving the data via USB or Ethernet. Memory can not be deleted.
  
- **Event memory**
  - In the event log all the operations of the controller are saved, such as:
    - Doorways
    - Parameter changes
    - Cooling equipment function, etc
  - Storage for approximately 4 weeks, with the possibility of review on the display and archiving the data via USB or Ethernet.

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- **Graphical display of the temperature profile in the display**  
Illustration of the actual value and if requested of the product sensor on the display and archiving via USB or Ethernet. View period freely selectable.
- **Network Connection**  
2 Ethernet ports 10/100 Mbps available. This interface can be accessed directly on the log data of the controller to import in the software.
- **NO/NC contact**  
Alarm signal time delayed (adjustable)
- **Language:** English / German, other languages on request
- **Maintenance message:** Notification that maintenance should be carried out.
- **Test facilities** for Alarm limits and battery charge status
- In the housing of the temperature regulator there are all relevant components for using the cabinet. Plug-in connectors of the electrical supply pipes enables a **service friendly exchange**.
- **Optional**
  - Battery Module  
In case of power failure self-contained supply of the temperature controller with a powerful battery. All control functions are saved for about 72 hours.
  - 0..20 mA Output
  - WLAN-Module
  - Interface, RS 485 (galvanically isolated)
  - Software  
This software enables you to check at a glance several cooling units. It was designed to be user friendly and enables you to process your data in an intuitive manner.
  - Alarm system
    - Independent product sensor for reference measurement
    - Product protection against low temperatures. By dropping below the setpoint value, the cooling machine will switched off



**By choosing this controller the freezer will have a height of: 940 mm**

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### 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. Measurement range: -10°C to 40°C  
The unit comes with 100 round charts (day or week)



**By choosing this recorder the freezer will have a height of: 940 mm**



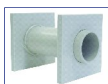
### Door lock including 2 keys

Optional: electronic door lock, via temperature controller TC 2015



### Mains socket / damp room design

Installed inside the cabinet , 230 V, 50 Hz  
ON/OFF by switch on control panel



**Cable port with cover** (approx. 40 mm Ø).

### Cable port with PG-gland

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

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

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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
- 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.