Medical air circulated Refrigerator   TC 104
also in accordance with DIN 58345

External Dimensions:	**B =**	**750 mm**
	D =	**700 mm**
	H =	**2100 mm**
Internal Dimensions:	**B =**	**600 mm**
	D =	**580 mm**
	H =	**1270 mm**
Capacity:		**600 l**
Temperaturerange:		**2°C to 20°C**

Housing (high size)
galvanized sheet steel with high quality white coating. With 4 feet, height adjustable
Optional: of **stainless steel** (Backplane, as well as top and bottom side of the cabinet of galvanised sheet steel)
   Set of 4 castors, 2 with brakes

Interior space
Inner case of galvanized sheet steel with high quality white coating. Cleaning friendly by rounded corners, slippery surface in the interior, meets highest hygiene requirements
Optional: of **stainless steel**

Insulation
high density foamed-in-place polyurethane, with a thickness of 75 mm. CFC-free

Circulaton 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
Three-layer thermally insulating glass door, supplied as standard with right hand hinge, also available with left hand hinge at no extra cost. Grease resistant magnetic seal.
Optional: - **Solid door**
        - with **door lock, or electronic door lock**

Interior fittings
LED-Interior lighting with automatic ON/OFF micro switch
4 pcs. Grating-type shelves (dim.: 530 x 550 mm), white coated (max. 13 shelves possible)

Optional: **Stainless Steel shelves** or
        Stainless Steel drawer compartments, with **3 lengthwise dividers** (max. 13 drawers possible)
        with telescopic-type guides on rollers with stops, Drawer dimensions: 500x480x77 mm (BxDxH)
        Usable width between the lengthwise dividers: 106 mm (lengthwise dividers easily removable)

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Control system located above the door

Touchscreen temperature controller, TC 2015

Working range from 2°C to 20°C
(provided that the ambient temperature is around 4 ° C above the set point)

Temperature accuracy +/- 1,8°C after stabilising (with 50% filling)

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.

- **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.

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- **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**
- <u>Battery Module</u>
  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)
- <u>Software</u>
  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.
- <u>Alarm system</u>
  - Independent product sensor for reference measurement
  - Product protection against low temperatures. By dropping below the setpoint value, the cooling machine will switched off

Refrigerating unit
fully hermetically sealed, forced ventilation, fitted on vibration - absorbing mounts (ambient temperature max. 32°C – 50°C on request), low noise (50 dBa/1m), energy saving compressor with high quality vaporisation system.
Refrigerant: R 404a

Defrost
automatically with thermal and time limit. Condensate evaporation in heated tray. During the defrost period, the temperature inside the cabinet (only the air temperature – not the stored goods) will arise for a short time..

Electrical Data
Power supply	230 V/50 Hz (optional: 60 Hz) /single phase
Power input	400 W
Energy consumption	3,5 KW (24 hours.)
Fuse	16 A
Power cable:	1,5 m with schuko plug

Packing details (paletized)
Dimensions:	approx. 85x98x224 cm
Net weight:	155 kg
Gross weight:	175 kg
Country of Origin:	**European Community**
Customs clearance code:	8418 5090

Medical air circulated Refrigerator **TC 104**
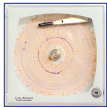## also in accordance with DIN 58345

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

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 ⌀).
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

Dew water collector tank for manual emptying
(i.e. for using this cabinet in operating rooms and clean rooms)

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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
- 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

also in accordance with DIN 58345

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. 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.

also in accordance with DIN 58345

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.