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CryoCube[®] F740hi, F740hiw

Operating manual

Software version 1.1.0.9

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1 Operating instructions

1.1 Using this manual











The operating manual describes the device with the software version shown on the title page. Operating manuals for the current software version can be found at the www.eppendorf.com/manuals webpage. If you require operating manuals for other software versions, please contact the Eppendorf AG.

- ▶ Please read the complete operating manual before initial operation of the device. Observe the instructions for use of the accessories where applicable.
- ▶ The operating manual is part of the product. Store the operating manual at an easily accessible location.
- ▶ Enclose this operating manual when transferring the device to third parties.

1.2 Danger symbols and danger levels

1.2.1 Danger symbols

The safety instructions in this manual have the following danger symbols and danger levels:

	Risk of tipping over		Electric shock
	Highly flammable substances		Explosive substances
	Low temperatures		Biohazard
	Heavy load		Risk of crushing
	Hazard point		Material damage

1.2.2 Danger levels

DANGER	<i>Will</i> lead to severe injuries or death.
WARNING	<i>May</i> lead to severe injuries or death.
CAUTION	May lead to light to moderate injuries.
NOTICE	May lead to material damage.

1.3 Symbols used

Depiction	Meaning
1. 2.	Actions in the specified order
▶	Actions without a specified order
•	List
<i>Text</i>	Display or software texts
i	Additional information

1.4 Version overview

Version	Date	Change
00	April 2017	<ul style="list-style-type: none"> • Created
01	September 2018	<ul style="list-style-type: none"> • Updated to software version 1.1.0 • Completely revised

2 Safety

2.1 Intended use

CryoCube ULT freezers are designed to provide an ultra-low temperature environment for storing scientific research materials. They allow for storage of samples at ultra-low temperatures of -50 °C to -86 °C and at a maximum ambient temperature of 32 °C.

All country-specific safety requirements for operating electrical equipment in laboratories must be observed.

2.2 Warnings for intended use



DANGER! Risk of injury due to tipping of the device

If the device tips over and falls on a person, the person may sustain fatal injuries.

- ▶ Transport the device with a sufficient number of helpers.
 - ▶ Do not transport the device over ramps at an angle > 17 % (10°). Transport the device sideways over ramps.
 - ▶ Only lift the device with a transport aid.
-



WARNING! Risk of injury from climbing onto the device

The device cannot carry the weight of a person. If the device tips over and falls on a person, this person may sustain severe injuries.

Parts of the device can break off.

- ▶ Do not climb onto the device.
 - ▶ Do not pull yourself up on the device or the outer door.
-



WARNING! Damage to health due to infectious liquids and pathogenic germs.

- ▶ When handling infectious liquids and pathogenic germs, observe the national regulations, the biosafety level of your laboratory, the material safety data sheets, and the manufacturer's application notes.
 - ▶ Wear your personal protective equipment.
 - ▶ For comprehensive regulations about handling germs or biological material of risk group II or higher, please refer to the "Laboratory Biosafety Manual" (source: World Health Organization, Laboratory Biosafety Manual, the current edition).
-



WARNING! Risk of explosion

- ▶ Do not operate the device in areas where work with explosive substances is carried out.
- ▶ Do not store explosive or highly reactive substances in this device.
- ▶ Do not use this device to store substances that may generate an explosive atmosphere.

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**WARNING! Lethal voltages inside the device.**

If you touch any parts which are under high voltage you may experience an electric shock. Electric shocks cause injuries to the heart and respiratory paralysis.

- ▶ Ensure that the housing is closed and undamaged.
 - ▶ Do not remove the housing.
 - ▶ Ensure that no liquids can penetrate the device.
- Only authorized service staff may open the device.

**WARNING! Danger due to electric shock**

A damaged or unsuitable mains/power cord can cause an electric shock.

- ▶ If the supplied mains/power cord is defective, replace it with a mains/power cord and a plug of the same type.

**CAUTION! Risk of burns from direct contact with cold surfaces.**

The temperature inside the device is low. Direct contact with the interior or samples can cause skin burns.

- ▶ Wear cold protection gloves when loading and unloading the device.

**NOTICE! Damage to device or malfunctions due to a damaged touch screen.**

- ▶ Do not operate the device.
- ▶ Switch off the device, disconnect the mains/power plug and have the touch screen replaced by a service technician who has been authorized by Eppendorf.

2.2.1 Devices with water cooling

**NOTICE! Damage to device due to blocked water inlet**

If the water inlet of the device is blocked, the heat exchanger and the condenser may become damaged. The device will no longer cool properly. Stored samples may become damaged.

- ▶ Have the water filter checked and cleaned by a technician.

2.2.2 Devices with flammable refrigerant

**WARNING! Risk of fire due to escaping flammable refrigerants (R-170 and R-290)**

Refrigerant may leak out if a refrigeration cycle is faulty. The refrigerants R-170 and R-290 are flammable and can form explosive mixtures with the ambient air.

- ▶ Ensure adequate ventilation of the location.
- ▶ Observe the regulations of the owner.
- ▶ Do not allow the device to be maintained or repaired by anyone except authorized service technicians. Components may only be replaced with original spare parts of the same type.

2.3 User profile

The device and accessories may only be operated by trained and skilled personnel.

Before using the device, read the operating manual carefully and familiarize yourself with the device's mode of operation.

2.4 Personal protective equipment

Personal protective equipment protects your life and your health.

- ▶ Always wear protective clothing, protective gloves, and safety boots.
- ▶ If additional protective equipment is required, this is indicated above the respective instruction.
- ▶ Always wear the personal protective equipment required for the biosafety level and by the laboratory regulations.

2.5 Information on product liability

In the following cases, the designated protection of the device may be affected. Liability for any resulting damage or personal injury is then transferred to the owner:

- The device is not used in accordance with the operating manual.
- The device is used outside of its intended use.
- The device is used with accessories or consumables that are not recommended by Eppendorf.
- The device is maintained or repaired by persons not authorized by Eppendorf AG.
- The user makes unauthorized changes to the device.

2.6 Maintenance and repairs

Eppendorf AG holds training sessions for service technicians. The service technicians learn how to service and repair the device. After completing the training the service technicians receive a certificate and are authorized by Eppendorf.

- ▶ Do not allow the device to be maintained by anyone except service technicians who are authorized by Eppendorf AG.
For more information, please contact your Eppendorf partner or visit www.eppendorf.com.
- ▶ Do not allow the device to be maintained by anyone except service technicians who are accredited according to the national and local laws and safety regulations. Service technicians must hold valid certificates.

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Australia, Queensland: the legal regulations state that service technicians require a valid gas work license for working on the refrigeration cycle.

Eppendorf AG uses high-quality components for the device which are manufactured especially for this purpose. These components ensure the safe function of the device. Eppendorf AG provides original spare parts for the service and repair of the device.

- ▶ Components may only be replaced by original spare parts of the same type.

2.7 Electromagnetic compatibility

2.7.1 Europe

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

2.7.2 U.S.A.

Any modification or changes made to this device, unless explicitly approved by Eppendorf, will invalidate the authorization of this device. Operation of an unauthorized device is prohibited under Section 302 of the Communications Act of 1934, as amended, and Subpart I of Part 2 of Chapter 47 of the Code of Federal Regulations.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the operating manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

2.8 Warning symbols on the device

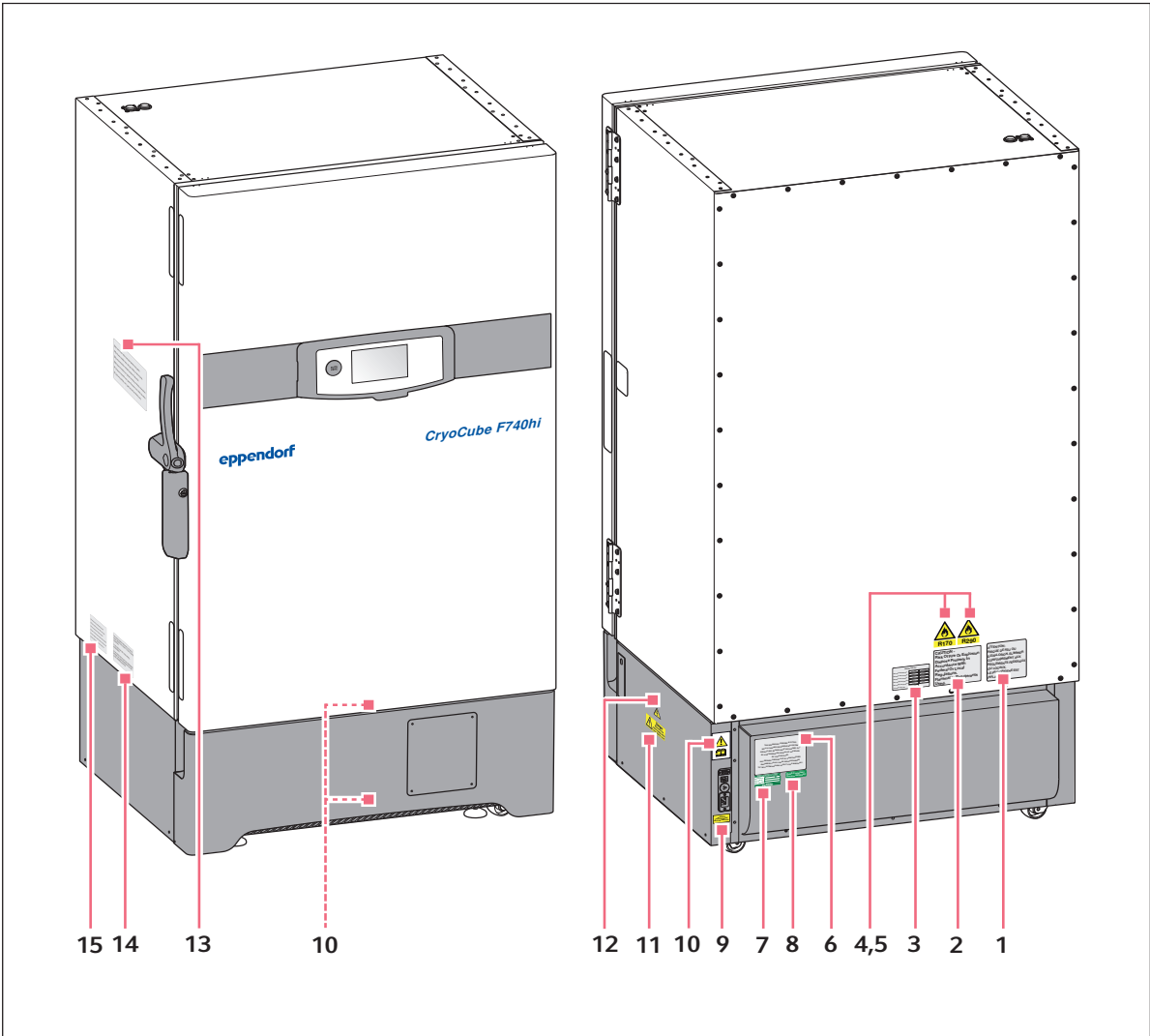









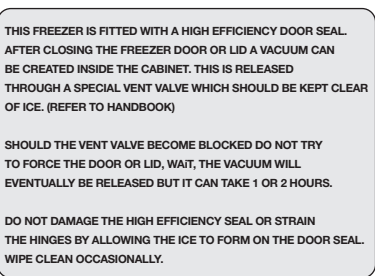
Fig. 2-1: Warning symbols on the outside

	Warning symbol	Meaning
1	<p>ATTENTION- RISQUE DE FEU OU D'EXPLOSION. ELIMINER CONFORMEMENT AUX REGLEMENTS FEDERAUX OU LOCAUX. LE FRIGORIGENE EST INFLAMMABLE</p>	<p>Notice Risk of fire or explosion. Dispose of the device in accordance with federal or local laws and regulations. The device contains flammable refrigerant.</p>

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	Warning symbol	Meaning																		
2	<p>CAUTION - Risk Of Fire Or Explosion Dispose Properly In Accordance With Federal Or Local Regulations. Flammable Refrigerants Used.</p>	<p>Notice Risk of fire or explosion. Dispose of the device in accordance with federal or local laws and regulations. The device contains flammable refrigerant.</p>																		
3	<p>WATER SUPPLY</p> <table border="1"> <tr> <td>Min. Flow Requirement:</td> <td>3.8 L/min</td> <td>1US gal/min</td> </tr> <tr> <td>Maximum Inlet Pressure:</td> <td>10 bar</td> <td>145 psig</td> </tr> <tr> <td>Minimum Inlet Pressure:</td> <td>1 bar</td> <td>14.5 psig</td> </tr> <tr> <td>Max. Supply Temperature:</td> <td>25°C</td> <td>77 °F</td> </tr> <tr> <td>Min. Supply Temperature:</td> <td>7 °C</td> <td>45 °F</td> </tr> <tr> <td>Connection Pipe Siz:</td> <td colspan="2">1/2" BSP</td> </tr> </table>	Min. Flow Requirement:	3.8 L/min	1US gal/min	Maximum Inlet Pressure:	10 bar	145 psig	Minimum Inlet Pressure:	1 bar	14.5 psig	Max. Supply Temperature:	25°C	77 °F	Min. Supply Temperature:	7 °C	45 °F	Connection Pipe Siz:	1/2" BSP		<p>Information on the cooling water supply.</p>
Min. Flow Requirement:	3.8 L/min	1US gal/min																		
Maximum Inlet Pressure:	10 bar	145 psig																		
Minimum Inlet Pressure:	1 bar	14.5 psig																		
Max. Supply Temperature:	25°C	77 °F																		
Min. Supply Temperature:	7 °C	45 °F																		
Connection Pipe Siz:	1/2" BSP																			
4		<p>Danger from flammable refrigerant R-170.</p>																		
5		<p>Danger from flammable refrigerant R-290.</p>																		
6	<p>THIS EPPENDORF FREEZER IS FITTED WITH A CASCADE REFRIGERATION SYSTEM. SERVICE AND REPAIRS MUST BE CARRIED OUT BY A REFRIGERATION SPECIALIST APPROVED BY YOUR SUPPLIER. ANY REPAIRS CARRIED OUT BY UNAUTHORISED ENGINEERS COULD CAUSE SERIOUS DAMAGE TO THE SYSTEM AND MAY AFFECT YOUR WARRANTY.</p>	<p>The device may only be serviced and repaired by a qualified refrigeration specialist who has been authorized by Eppendorf AG. If the device is serviced or repaired by an unauthorized person, liability on the part of Eppendorf AG shall cease immediately.</p>																		
7	<p>ELECTRICAL SAFETY TEST</p> <p>DATE/INITIALS <input type="text"/></p> <p>APPL/REF No. <input type="text"/></p> <p>NEXT TEST DATE <input type="text"/></p> <p>PASSED</p>	<p>The device has passed the electrical safety test.</p>																		

	Warning symbol	Meaning
8		The device complies with the RoHS Directive 2002/95/EC.
9		Only connect the device to a mains/power connection with PE conductor.
10		Notice of a hazard point. Read the operating manual.
11		Risk of electric shock. Disconnect the mains/power cord from the voltage supply before removing the cover.
12		Electric shock
13		The outer door of the device is fitted with a high efficiency seal. After closing the outer door or the lid a negative pressure can be created inside the device. The negative pressure is compensated by the <i>auto vent</i> valve. Keep the <i>auto vent</i> valve free of ice. Should the <i>auto vent</i> valve be blocked, do not try to open the outer door or the lid by force. Wait until pressure compensation has taken place. Pressure compensation may take 1 – 2 hours. The formation of ice in the seal can damage the seal and hinges. To avoid damage, clean the seal to remove ice.

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	Warning symbol	Meaning
14	<p>THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING CONDITIONS:</p> <p>(1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE</p> <p>(2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED, INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRE OPERATION</p>	<p>The device complies with <i>FCC Rules Part 15</i>.</p> <p>The device may be operated under the following conditions:</p> <ul style="list-style-type: none"> • This device may not cause harmful interference. • This device must accept any interference received. This includes interference that may cause undesired operation.
15	<p>[EN] Foam blown with fluorinated greenhouse gases.</p> <p>[FR] Mousse soufflée avec des gaz à effet de serre fluorés.</p> <p>[DE] Schaumisolation enthält fluoriertes Treibmittel.</p> <p>[ES] Espuma fundida con gases fluorados de efecto invernadero.</p> <p>[P1] Espuma soprada com gases fluorados com efeito de estufa.</p> <p>[IT] Schiuma soffiato con i gas fluorurati ad effetto serra.</p>	<p>Foam blown with fluorinated greenhouse gases.</p>

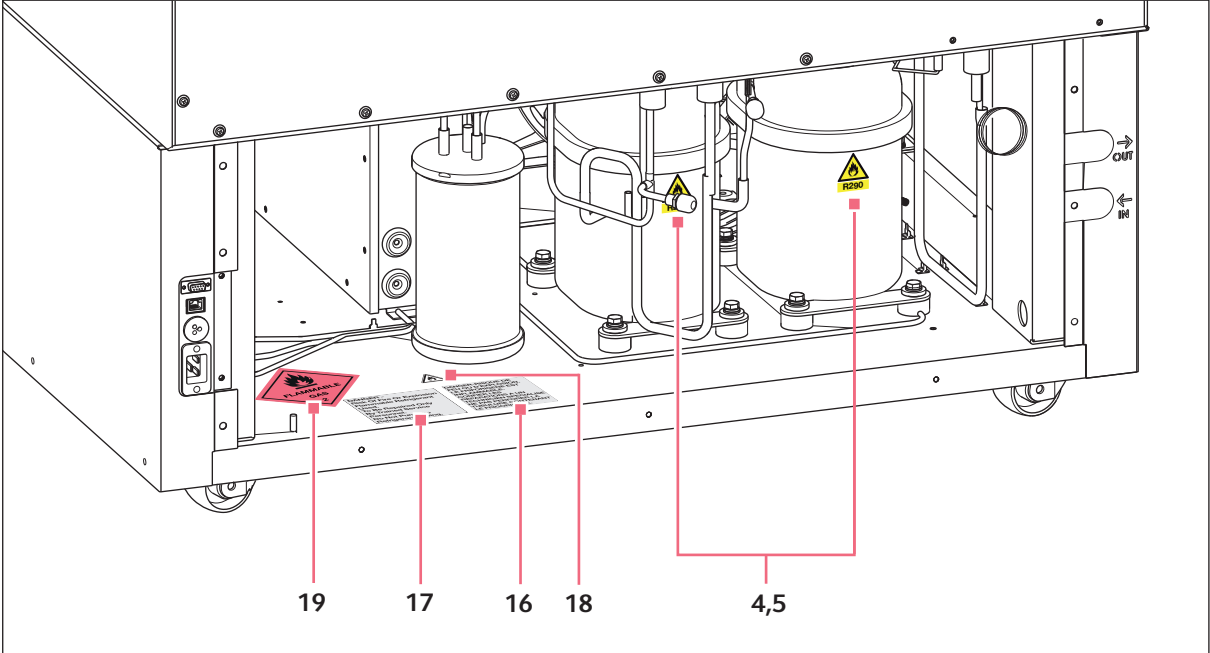




Fig. 2-2: Warning symbols on the rear of the opened device

The warning symbols inside the device can only be accessed by authorized service technicians.

	Warning symbol	Meaning
16	<p>DANGER-RISQUE DE FEU OU D'EXPLOSION. LE FRIGORIGENE EST INFLAMMABLE. CONFIER LES REPARATIONS A UN TECHNICIEN SPECIALISE. NE PAS PERFORER LA TUBULURE CONTENANT LE FRIGORIGENE.</p>	<p>Danger Risk of fire or explosion The device contains flammable refrigerant. Only qualified service technicians are allowed to repair the device. Do not puncture the refrigerant tubing.</p>
17	<p>DANGER - Risk Of Fire Or Explosion Flammable Refrigerant Used. To Be Repaired Only By Trained Service Personnel. Do Not Puncture Refrigerant Tubing.</p>	<p>Danger Risk of fire or explosion The device contains flammable refrigerant. Only qualified service technicians are allowed to repair the device. Do not puncture the refrigerant tubing.</p>

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	Warning symbol	Meaning
18		Danger due to flammable materials
19		Danger due to flammable gas, class 2

3 Product description
3.1 Product overview
3.1.1 Front view

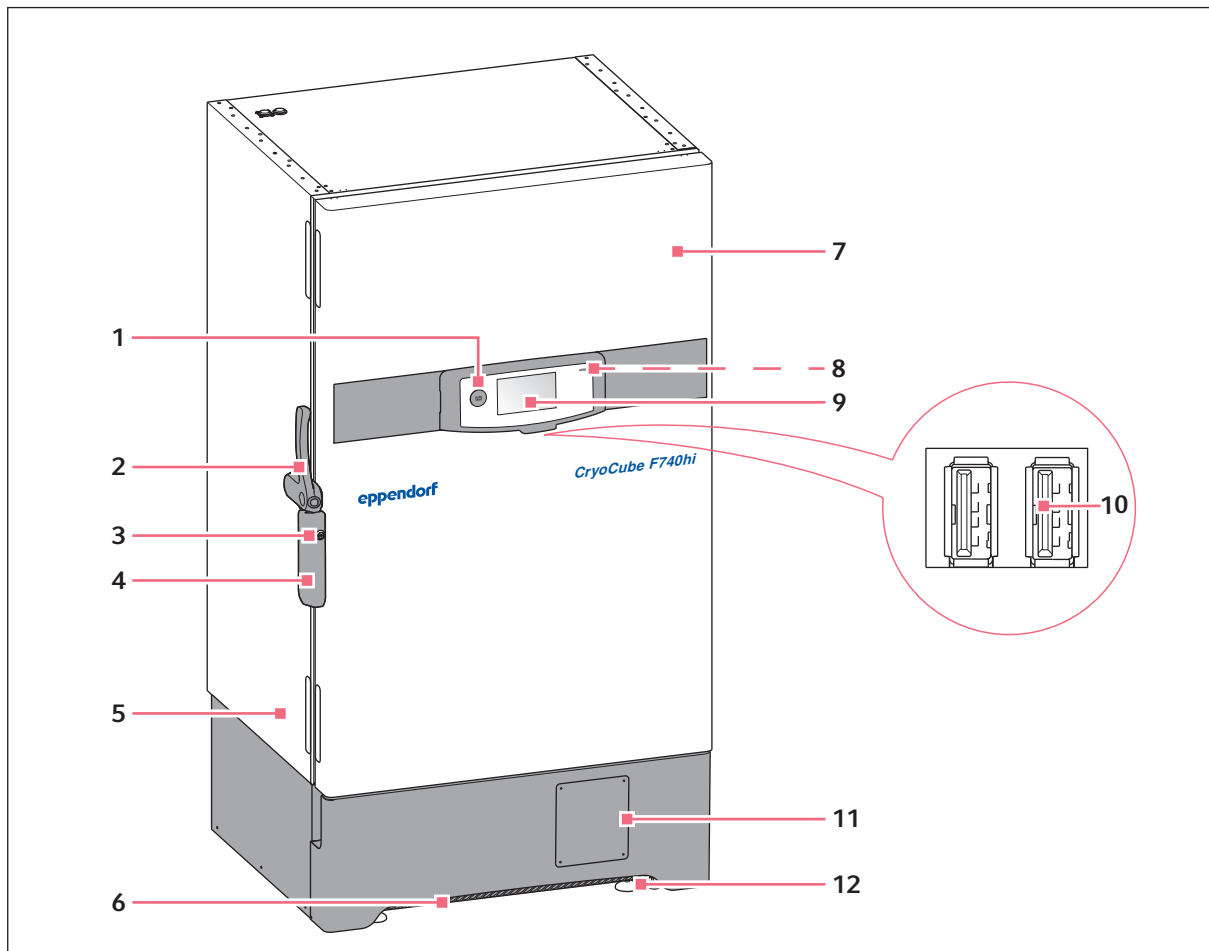


Fig. 3-1: Front view of a model with the door handle mounted on the left side

- | | |
|---|--|
| 1 auto vent valve
Automatic pressure compensation | 7 Outer door |
| 2 Door handle | 8 LED
Flashes in the event of a mains/power outage |
| 3 Mechanical lock
Outer door's emergency release | 9 Touch screen
For device operation |
| 4 Electronic lock | 10 USB ports |
| 5 Name plate | 11 Space for an optional chart recorder |
| 6 Air filter | 12 Leveling feet |

Product description

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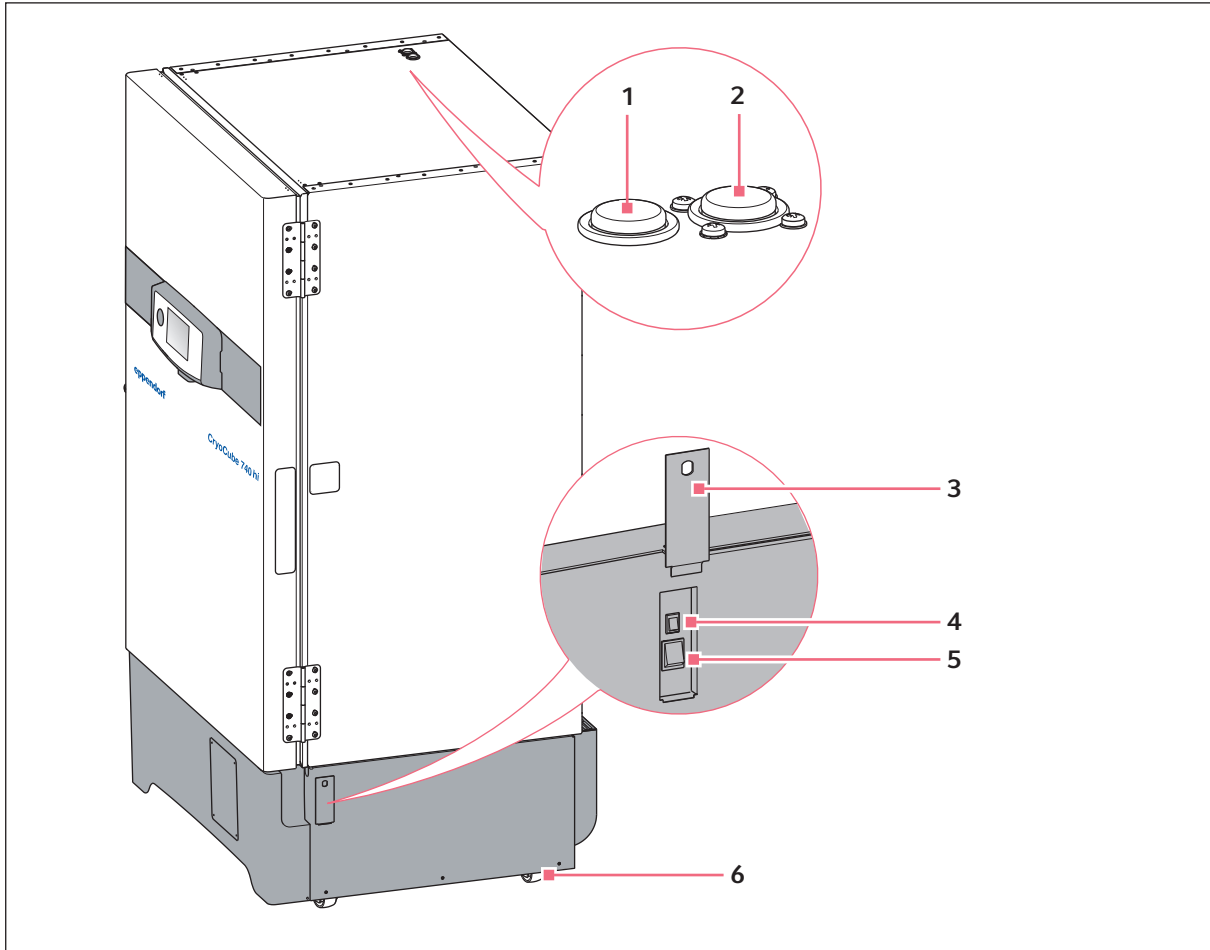
3.1.2 Side view

Fig. 3-2: Side view of a model with the door handle mounted on the left side

1 Access port

For external sensors

2 Access port

For external sensors or an optional back-up system

3 Switch locking plate

Lockable plate cover for the mains/power switch and battery switch

4 Battery switch

For activating the back-up circuit

5 Mains/power switch**6 Heavy-duty castors**

3.1.3 Internal view

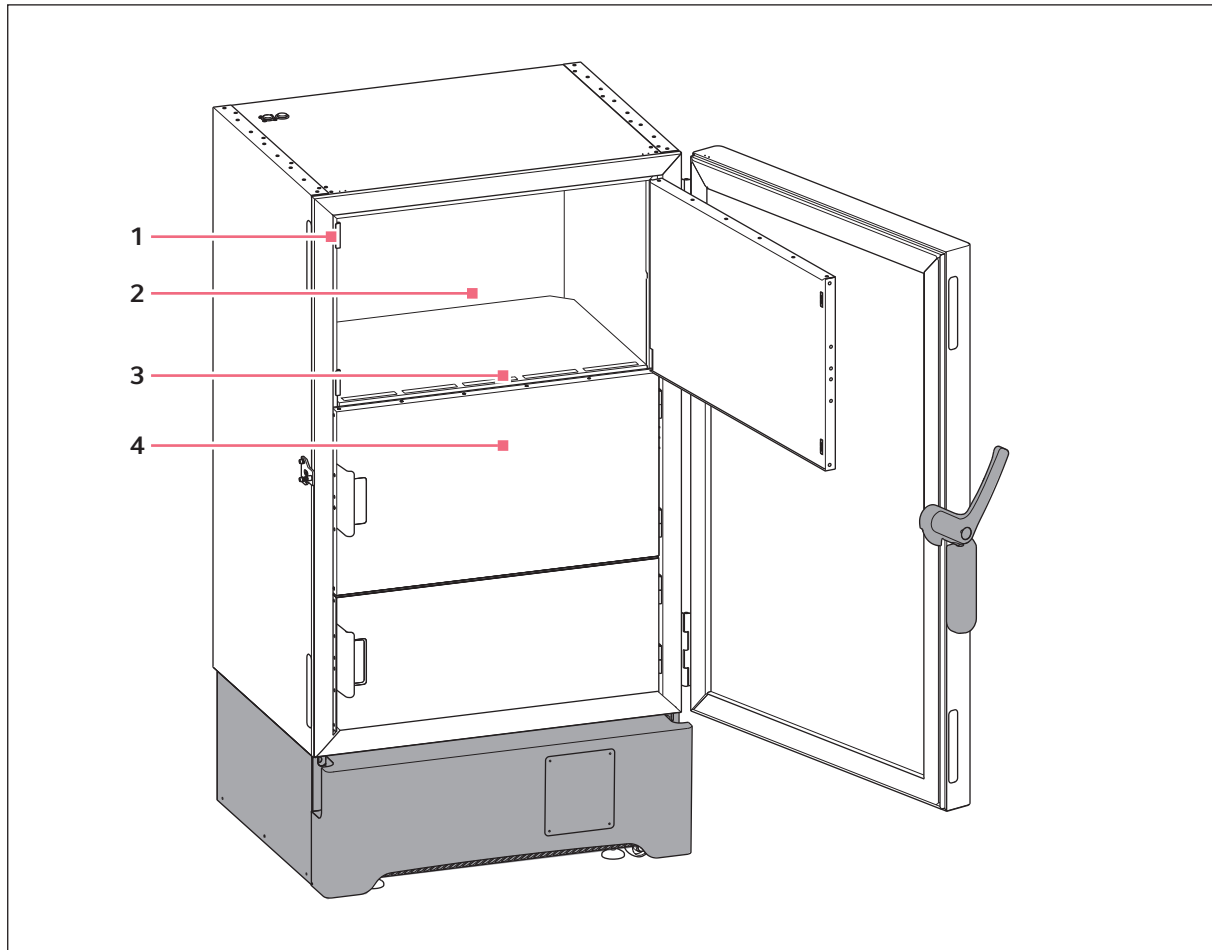


Fig. 3-3: Internal view of a model with three inner doors

1 Inner door's magnetic closure

3 Shelf

2 Inner compartment

4 Inner door

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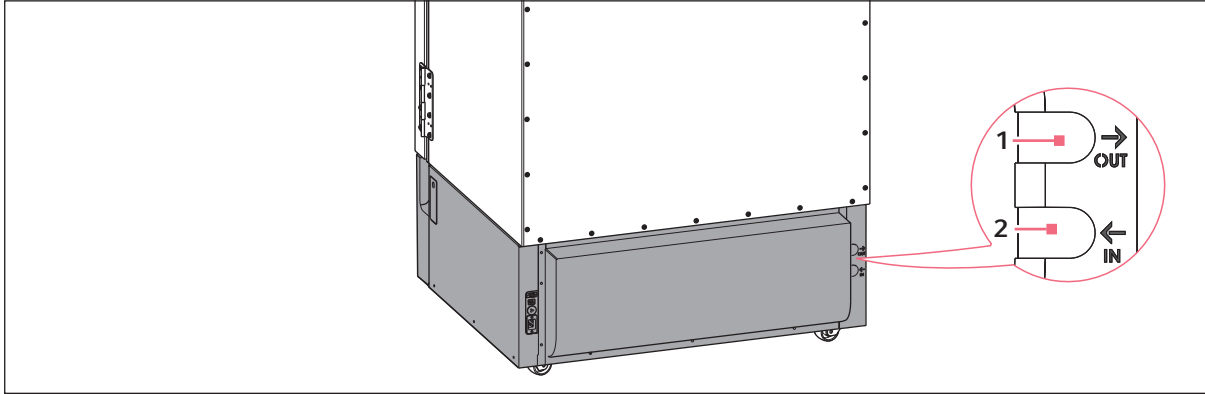
3.1.4 Cooling water supply

Fig. 3-4: Connections for the cooling water supply

1 Water outlet from the device

2 Water inlet to the device

3.1.5 Interfaces

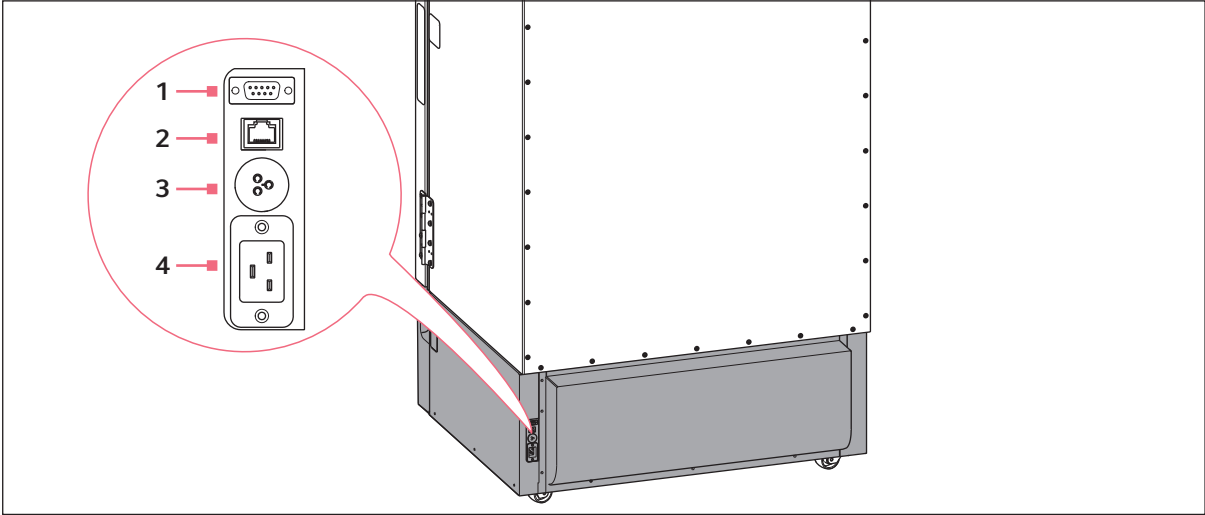


Fig. 3-5: Interfaces

- | | |
|--|---|
| 1 RS-485 serial interface
Connection to an external system | 3 BMS remote alarm interface
Connection to a building management system |
| 2 Ethernet interface
Connection to an external system | 4 Mains/power connection
Connection for the mains/power cord |

Only connect devices to the interface that comply with the IEC 60950 (UL 60590) standards.

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3.2 Features

The CryoCube is a ULT freezer for storing biological samples.

The device has a two-stage cascade refrigeration system with two closed refrigeration cycles. The refrigeration cycles are cooled by air or by cooling water supply.

The device is operated via the touch screen. There are several USB ports below the touch screen.

The device can be integrated into a network and connected to the Eppendorf AG's VisioNize system. The VisioNize system is a central monitoring software. Further information about the VisioNize system can be found on the www.eppendorf.com website.

The device can be connected to a building management system via the BMS remote alarm interface.

The outer door is locked and unlocked via the software. The outer door can be mechanically unlocked with the emergency release key.

The device features automatic pressure compensation. Automatic pressure compensation occurs as soon as the outer door is closed. Afterwards, the outer door can be opened again. Pressure compensation can also be triggered with the *auto vent* valve.

Each compartment is equipped with an inner door with a seal. With the inner doors closed, cold air loss is minimized and ice formation inside the device is reduced.

The devices are equipped with 2 or 4 shelves. The number and position of the shelves cannot be changed.

The device is equipped with a switch locking plate. The mains/power switch and the battery switch are located behind this lockable cover.

An air filter is located below the outer door. The air filter protects the condenser and the components behind it against contamination and dirt.

The heavy-duty castors serve to transport the device safely to its place of installation. Leveling feet ensure the stability and horizontal alignment of the device.

3.3 Models

Name	Door handle	Number of compartments	Cooling
CryoCube F740hi	Left	3	Air cooling
CryoCube F740hi	Left	5	Air cooling
CryoCube F740hiw	Left	3	Water cooling
CryoCube F740hiw	Left	5	Water cooling
CryoCube F740hi	Right	3	Air cooling
CryoCube F740hi	Right	5	Air cooling

3.4 Alarms, warnings and messages

In defined hazard situations, the device issues hazard messages for the alarm and warning danger levels. The danger level indicates the extent of damage that can be caused to the device and to samples.

- An alarm is triggered as soon as a safety-relevant situation occurs. The user must immediately eliminate the cause of the alarm.
- A warning is triggered when a safety-relevant situation can occur. The user must monitor the device.

Optical and acoustic hazard signals have been defined for every hazard message. All hazard signals will disappear when the hazard situation has been remedied. Only the message will remain in the information bar until it is acknowledged.

Hazard messages can be configured (see *Alarms on p. 56*), (see *Device Settings menu item on p. 71*).

The device will issue a message when the time for a recurring task is reached.

3.4.1 Alarms

Alarm: Interior temperature

- The interior temperature exceeds the alarm limit for the minimum or maximum interior temperature.
- The alarm is triggered when the delay time has elapsed. The delay time can be defined.
- The signal tone sounds on the device.
- A red triangle appears on the touch screen in the *Temperature* function area.
- The message *Temperature above alarm limit -XX °C* or *Temperature below alarm limit -XX °C* appears in the touch screen's red information bar.
- The alarm is forwarded to an external system and to a building management system.
- The alarm can be activated and deactivated. If the alarm is deactivated, neither an alarm nor a warning will be issued.

Alarm: Ambient temperature

- The ambient temperature exceeds the alarm limit for the minimum or maximum ambient temperature.
- The alarm is triggered after a delay time of 30 minutes. The delay time cannot be edited.
- The signal tone sounds on the device.
- A red triangle appears on the touch screen in the *Ambient Temperature* function area.
- The message *Ambient temperature above alarm limit XX °C* or *Ambient temperature below alarm limit XX °C* appears in the touch screen's red information bar.
- The alarm is forwarded to an external system.
- The alarm can be activated and deactivated. If the alarm is deactivated, neither an alarm nor a warning will be issued.

Product description

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Alarm: Outer door

- The outer door has been open for longer than defined in the alarm settings.
- The alarm is triggered when the delay time has elapsed. The delay time can be defined.
- The signal tone sounds on the device.
- The message *Door open longer than X:XX min* appears in the touch screen's red information bar.
- The alarm is forwarded to an external system.
- The alarm can be activated and deactivated.

Alarm: Mains/power outage

- The mains/power supply to the device is interrupted. The battery back-up circuit is then switched on and triggers the alarm.
- The signal tone sounds on the device.
- The control panel's indicator light flashes in 10-second intervals.
- The message *Mains/Power Failure* appears in the touch screen's red information bar.
- The interior temperature is displayed on the touch screen.
- The alarm is forwarded to an external system and to a building management system.
- The alarm cannot be deactivated.

Alarm: Battery

- The battery voltage is too low.
- The signal tone sounds on the device.
- The message *Low battery voltage* appears in the touch screen's red information bar.
- The alarm is forwarded to an external system.
- The alarm cannot be deactivated.

Alarm: System error

- The signal tone sounds on the device.
- The cause and solution of the error are displayed on the touch screen.
- The error message is forwarded to an external system.
- The alarm cannot be deactivated.

3.4.2 Warnings

Warning: Interior temperature

- The interior temperature exceeds the alarm limit for the minimum or maximum interior temperature.
- The warning is triggered when the delay time has elapsed. The delay time is the delay time for the "interior temperature" alarm.
- The signal tone sounds on the device.
- A yellow triangle appears on the touch screen in the *Temperature* function area.
- The message *Chamber temperature above warning limit XX °C* or *Chamber temperature below warning limit XX °C* appears in the touch screen's yellow information bar.
- The warning is forwarded to an external system.
- The alarm can be activated and deactivated. If the alarm is deactivated, neither an alarm nor a warning will be issued.

Warning: Ambient temperature

- The ambient temperature exceeds the alarm limit for the minimum or maximum ambient temperature.
- The alarm is triggered after a delay time of 30 minutes. The delay time cannot be edited.
- The signal tone sounds on the device.
- A yellow triangle appears on the touch screen in the *Ambient Temperature* function area.
- The message *Ambient temperature above warning limit XX °C* or *Ambient temperature below warning limit XX °C* appears in the touch screen's yellow information bar.
- The warning is forwarded to an external system.
- The alarm can be activated and deactivated. If the alarm is deactivated, neither alarm nor warning will be issued.

3.4.3 Message

Message: Recurring task

- The defined time for a recurring task has been reached.
- A message appears in the touch screen's yellow information bar.
- The warning is forwarded to VisioNize or to an external system.
- The message can be activated and deactivated.

Product description

CryoCube® F740hi, F740hiw
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3.5 Delivery package**3.5.1 Device and accessories**

Quantity	Description
1	ULT upright freezer
1 or 2	Mains/power cord (number country-specific)
1	Safety clamp for mains/power cord
2	Key for switch locking plate
2	Key for emergency release
2	Anti-slipping pads
1	Plug for connection to the building management system
1	Allen key

3.5.2 Documentation

Quantity	Description
1	Operating manual
1	Unpacking instructions
1	Certificate of conformity

3.6 Accessories

Optional accessories can be ordered separately. Information regarding accessories is available on our website: www.eppendorf.com.

3.6.1 Back-up systems

In the event of a mains/power outage, the battery-powered back-up system will start and cool the interior for a limited period of time. The back-up system is connected through the access port.

The following back-up systems are available:

- CO₂ back-up system for temperatures from -60 °C to -70 °C.
- LN₂ back-up system for temperatures down to -85 °C.

3.6.2 Chart recorder

The chart recorder records the interior temperature on a disk over a period of 7 days. The port for connection of the chart recorder is available in the device.

Pens and disks for chart recorders are available.

3.6.3 Racks

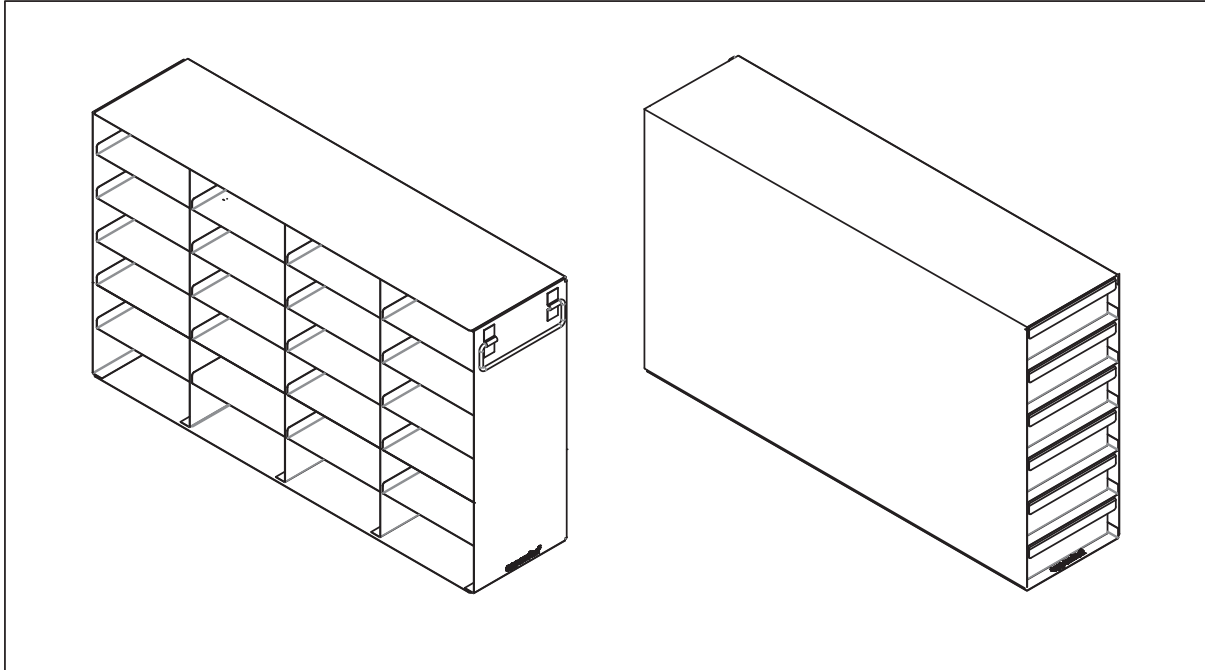


Fig. 3-6: Rack with open sides, rack with drawers

Racks serve to store and sort samples in boxes, microplates and deepwell plates.

Racks are placed on the inner shelves inside the device. The racks are used to store boxes. Stainless steel racks provide space for 136 mm × 136 mm boxes. Aluminum racks can be used to store boxes up to 133 mm × 133 mm.

Racks are available with drawers or with open sides. The design of the racks ensures an even temperature in the entire rack.

Product description

CryoCube® F740hi, F740hiw
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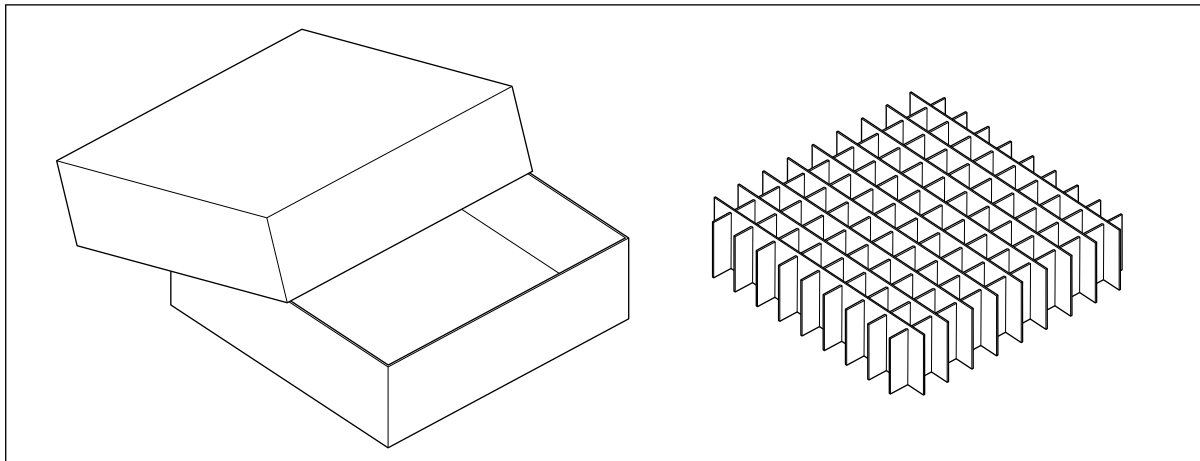
3.6.4 Cardboard boxes and box dividers

Fig. 3-7: Cardboard box and box divider

Cardboard boxes serve to store samples in tubes at temperatures down to -86°C . Cardboard boxes have a waterproof coating.

To sort your samples, you can insert box dividers into the cardboard boxes. Eppendorf AG cardboard boxes and box dividers are compatible with each other.

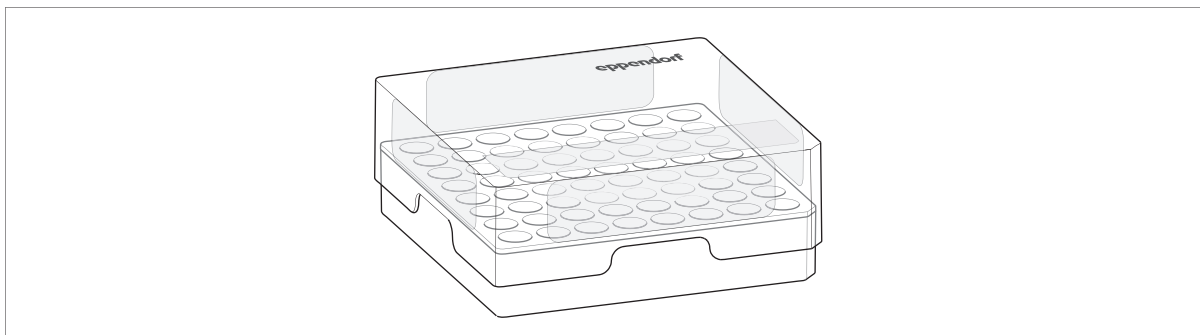
3.6.5 Eppendorf Storage Box

Fig. 3-8: Eppendorf Storage Box

Eppendorf Storage Boxes serve to store samples in tubes at temperatures down to -86°C .

Eppendorf Storage Boxes are made of polypropylene (PP) and are autoclavable.

4 Installation

4.1 Selecting the location

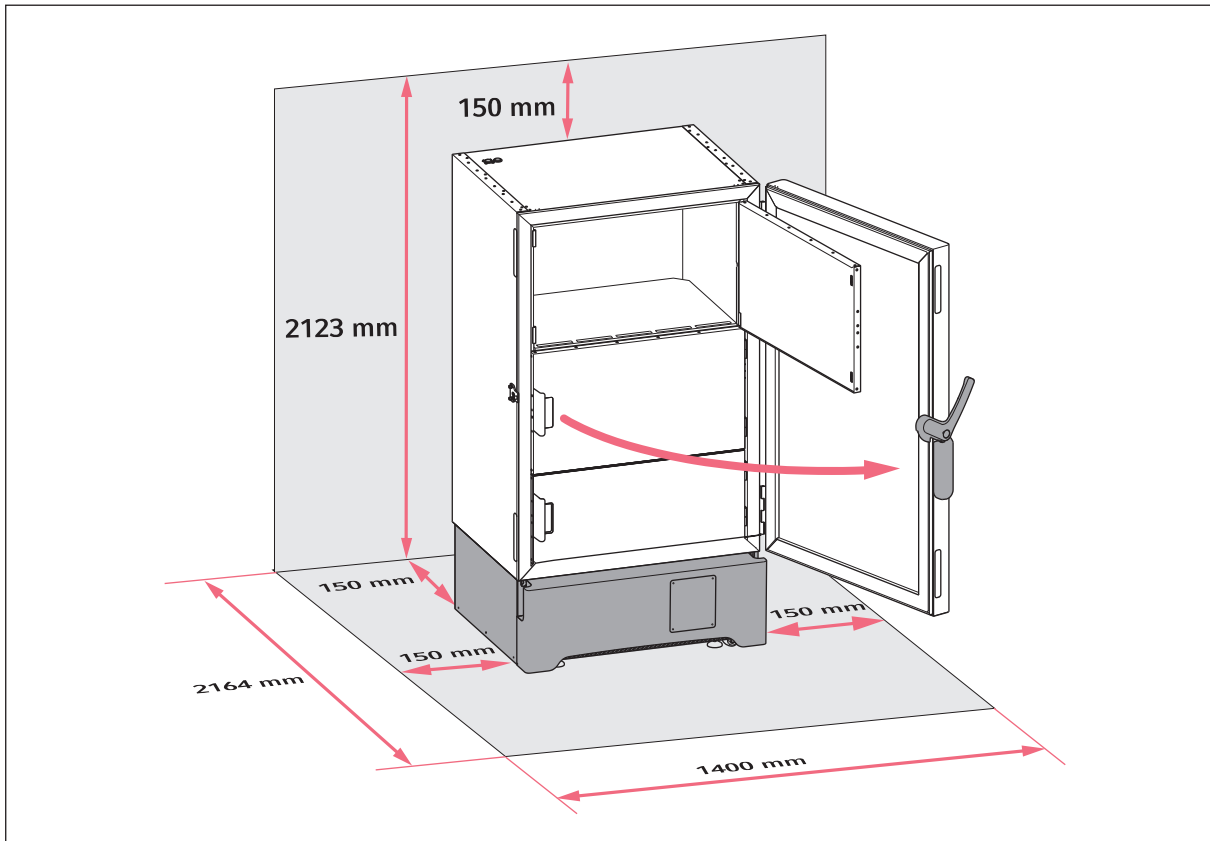


Fig. 4-1: Footprint

Information on ambient conditions, dimensions and weights can be found in the technical data.

Location in general

- The ambient conditions match the specifications set out in the Technical data chapter.
- The location is well ventilated or air-conditioned.
- The location is not next to heat sources.
- The location is protected against sparks and open fire.
- The floor space corresponds to the technical data.
- The floor is level, vibration-free and designed for the weight of the device.

Electrical connection

- Mains/power connection in accordance with the name plate
- The mains/power switch of the device and the disconnecting device of the power system circuit (e.g., residual current circuit breaker) are accessible during operation.

Cooling water supply

- The building connection, cooling water and accessories match the specifications set out in the Technical data chapter.

Installation

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Air volume for devices with refrigerant R-290 or R-170

The CryoCube F740hi and CryoCube F740hiw contain the flammable refrigerants R-290 and R-170. Refrigerant may leak out through a leak in the refrigeration cycle. If the ambient air contains a certain concentration of the refrigerant, the oxygen in the air and the refrigerant will form a flammable gas-air mixture. You can prevent this from happening by ensuring the following

- Sufficient air volume.
- Controlled ventilation and venting of the location.
- The refrigeration cycles of the device contain less than 0.15 kg of refrigerant. Access to and use of the room in which the device is located is not restricted according to EN 378.



Contact your safety officer for information on further requirements when installing the device.

4.2 Preparing installation**4.2.1 Unpacking the device**

1. Check the packaging for damage.
2. Unpack the device in accordance with the unpacking instructions.

4.2.2 Checking the delivery

1. Check the delivery for completeness.
2. Check the device and accessories for transport damage.
3. Do not commission the device if the packing or the device is damaged. Contact Eppendorf AG customer service or your Eppendorf partner.

4.2.3 Transporting the device to the location

Personal protective equipment

- Protective clothing, safety shoes

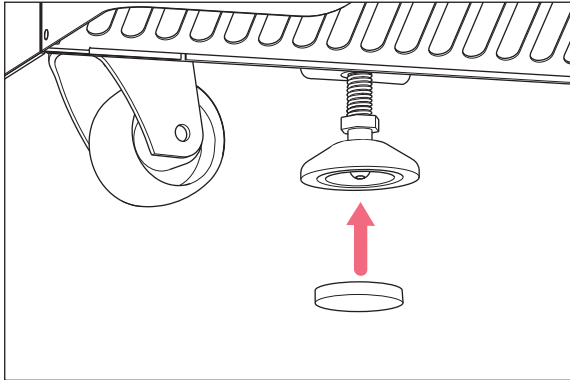
Prerequisites

- The location meets the requirements.
- ▶ Transport the device to the location (see *Transport on p. 95*).

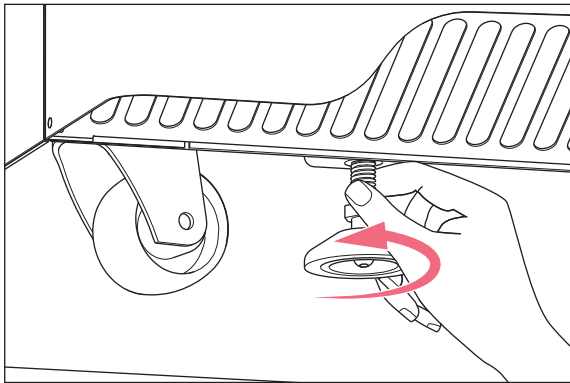
4.2.4 Installing the device

Prerequisites

- The device is in its intended position.



1. Attach anti-slipping pads to the underside of the leveling feet.



2. Rotate the leveling feet down.

3. Remove the adhesive tape from the air intake grille.

4.3 Connecting the device to the voltage supply



WARNING! Danger due to incorrect voltage supply.

- ▶ Only connect the device to voltage sources which correspond with the electrical requirements on the name plate.
- ▶ Only use earth/grounded sockets with a protective earth (PE) conductor.
- ▶ Only use the mains/power cord supplied.

Prerequisites

- Mains/power connection in accordance with the name plate

1. If several mains/power cords are included, select the mains/power cord according to the mains/power supply voltage.
2. Connect the mains/power cord at the rear of the device.
3. Fasten the safety clamp.

If the device is moved, the mains/power cord cannot be pulled out of the device.

Installation

CryoCube® F740hi, F740hiw
English (EN)

4.4 Connecting the device to the cooling water supply

4.4.1 Functional description

The cooling water absorbs the heat of the refrigerant at the condenser. This lowers the temperature of the refrigerant in the condenser. How much the refrigerant is cooled by is determined by the input temperature and volume flow of the cooling water.

The cooling water's input temperature can be measured at the water inlet. The volume flow is regulated via the water regulation valve.

The water regulation valve's factory settings assume a cooling water input temperature of approx. 20 °C and an ambient temperature of 21 °C – 23 °C. The valve regulates the volume flow so that the refrigerant leaves the condenser with a temperature of 25 °C. These settings allow for the greatest energy efficiency for the device.

4.4.2 Connecting to a cooling water supply without a water cooler

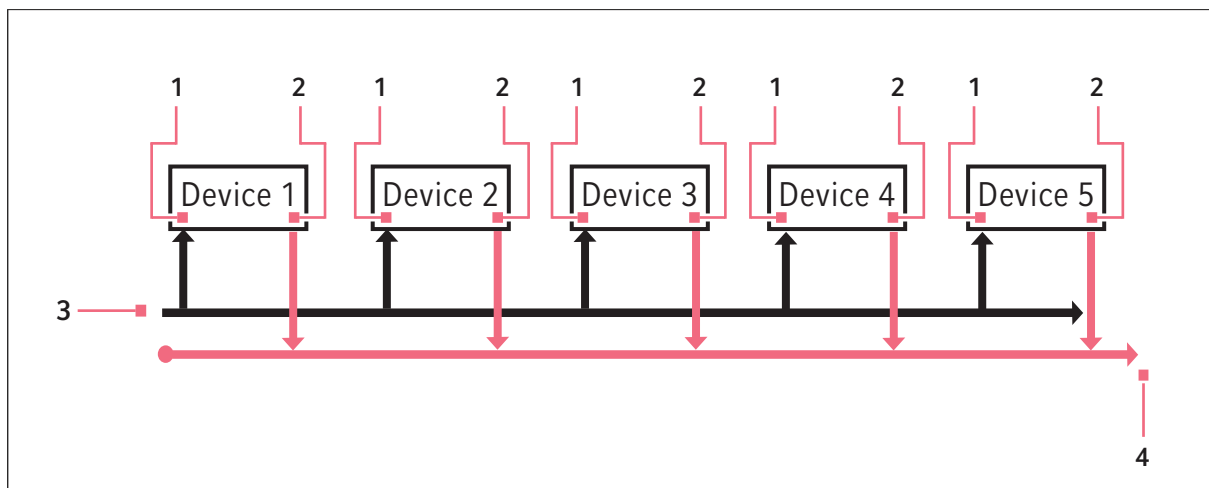


Fig. 4-2: Connection principle

1 Water inlet to the device

2 Water outlet from the device

3 Water inlet to the cooling water supply

4 Water outlet from the cooling water supply

4.4.3 Connecting to a cooling water supply with a water cooler

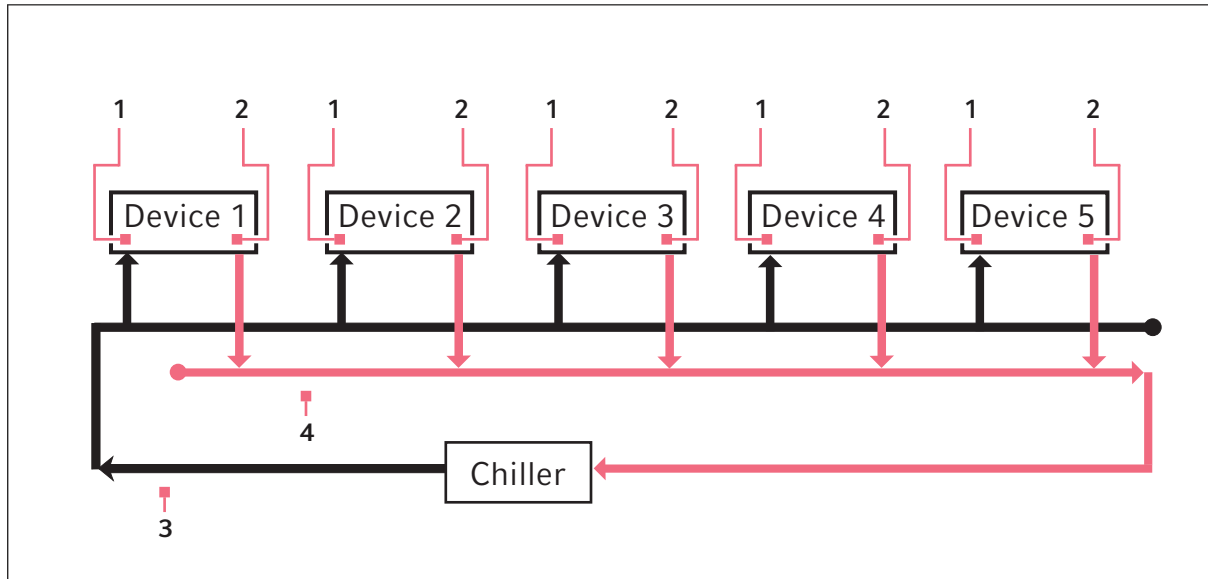


Fig. 4-3: Connection principle

- | | |
|--------------------------------|--|
| 1 Water inlet to the device | 3 Water inlet to the cooling water supply |
| 2 Water outlet from the device | 4 Water outlet from the cooling water supply |



NOTICE! Damage due to too high cooling water temperature

Cooling water coming from a ULT freezer is hot. This water cannot be used to cool other devices.

- ▶ Connect several ULT freezers to one cooling water supply in parallel.

If the device is connected to a cooling water supply with a water cooler, a technician must check the cooling water pressure. The technician must adjust the water regulation valve.

Installation

CryoCube® F740hi, F740hiw
English (EN)

4.4.4 Connecting the device

Accessories

- Cooling water hose
- Mounting material for the cooling water hose
- Water filter (if necessary)
- Stop valve (if necessary)
- Pressure regulator

Requirements

- The building connection and cooling water match the specifications set out in the Technical data chapter.
- The water regulation valve has been adjusted by a technician, if necessary.

Specialized knowledge and skills are required to work on the laboratory's water supply. Only qualified persons are allowed to work on the water supply. National and local safety regulations and legal provisions must be observed.

The owner is responsible for connecting the device to the water supply. The device must be connected according to local standards and regulations.

4.5 Connecting the device to external systems

4.5.1 Remote alarm interface

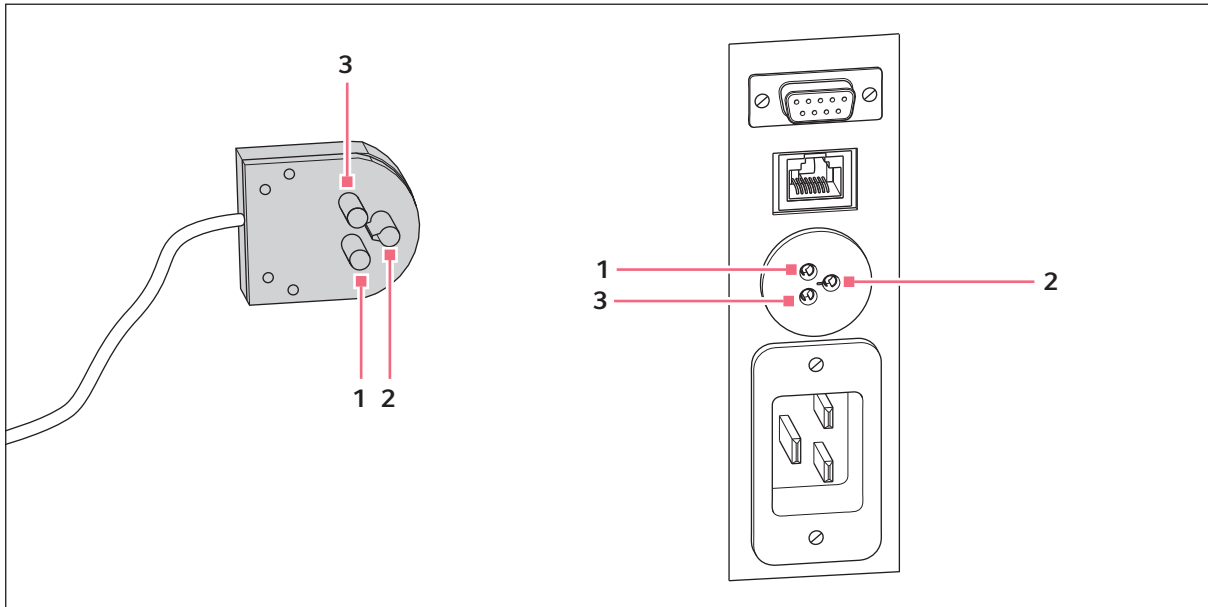


Fig. 4-4: Plug and remote alarm interface

1 Pin 1 and socket 1

3 Pin 3 and socket 3

2 Pin 2 and socket 2

You can connect the device to a building management system via the remote alarm interface.

The following alarms are forwarded to the building management system:

- Alarm in the case of a mains/power outage
- Alarm that the temperature inside the device is too high
- Alarm that the temperature inside the device is too low

The plug is included in the delivery package. Connections must have double or reinforced insulation as described in DIN EN 61010-1.

Installation

CryoCube® F740hi, F740hiw
English (EN)

4.5.2 RS-485 interface

You can connect the device to external monitoring systems via the RS-485 interface.

The RS-485 interface can be used to read out various parameters, such as the interior temperature. You can forward all alarms to an external system.

Connections must have double or reinforced insulation as described in DIN EN 61010-1.

4.5.3 Ethernet interface

You can connect the device to a local network or external monitoring systems, e.g., a laboratory management system, via the Ethernet interface.

The Ethernet interface can be used to read out various parameters, such as the interior temperature. You can forward all alarms to an external system.

Connections must have double or reinforced insulation as described in DIN EN 61010-1.

4.6 Turning on the device**WARNING! Electric shock due to damage to the device or mains/power cord.**

- ▶ Only switch on the device if the device and mains/power cord are undamaged.
- ▶ Only operate devices which have been installed or repaired properly.
- ▶ In case of danger, disconnect the device from the mains/power supply voltage. Disconnect the mains/power plug from the device or the earth/grounded socket. Use the isolating device intended for this purpose (e.g. the emergency switch in the laboratory).

**NOTICE! Damage to electronic components due to condensation.**

Condensate may form in the device when it has been transported from a cool environment to a warmer environment.

- ▶ After installing the device, wait for at least 6 h. Only then connect the device to the mains/power line.
-

4.6.1 Enabling the back-up circuit

The back-up circuit is battery-powered. In the event of a mains/power outage, the battery will supply power to the control panel and the alarm for 72 hours.

Tools and auxiliary equipment

- Key for the switch locking plate

Prerequisites

- The device has been installed and connected according to the operating manual.
- The device has been acclimatized for at least 6 h.

1. Unlock the switch locking plate and remove the cover.
2. Switch on the battery switch.

The back-up circuit is enabled.

- An alarm is triggered in the event of a mains/power outage.
- In the event of a mains/power outage, power will still be supplied to the control panel.
- The software settings are saved in the event of a mains/power outage.
- The battery is charged with mains power. The battery is fully charged after approx. 24 hours.

3. Fit the cover and lock it.

4.6.2 Switching the device on at the mains/power switch

Tools and auxiliary equipment

- Key for the switch locking plate

Prerequisites

- The device has been installed and connected according to the operating manual.
- The device has been acclimatized for at least 6 h.
- Devices with cooling water supply: The water inlet is open.

1. Unlock the switch locking plate and remove the cover.
2. Switch on the mains/power switch.
 - The display shows the software version number.
 - The compressor starts running after a short time delay.

3. Fit the cover and lock it.

4.7 Basic device settings

For the initial operation of the device, set the following values. Further settings are described in the *Menu* chapter.

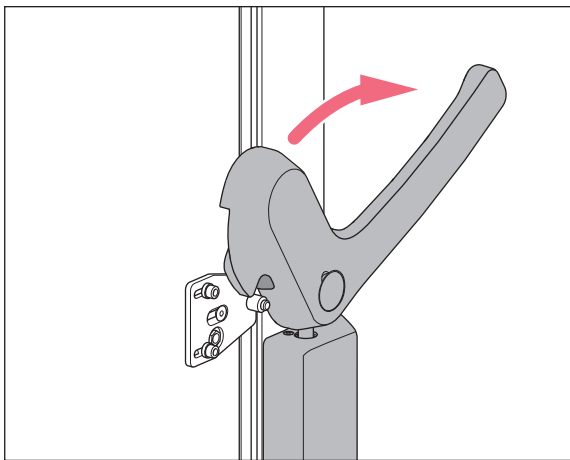
1. Set the interior set temperature (see p. 51).
2. Set the temperature offset (Fig. 7-5 on p. 72).
3. Activate the signal tone (Fig. 7-5 on p. 71).
4. Activate the hazard messages. Set the alarm limits and the warning limits (see p. 56).
5. Set a delay time for the alarm (Fig. 7-5 on p. 72).
6. To regulate and document access to the device, you can enable the user management (see p. 77).

5 Operation

5.1 Opening the outer door

Prerequisites

- The mechanical lock (emergency release) is unlocked.
- Pressure compensation has finished.



1. If user administration is activated, tap the *Unlock door* button.
2. Pull the door handle forward and down. The door handle releases the peg. The outer door is unlocked.
3. To open the outer door, pull the door handle forward.

5.2 Loading the device



NOTICE! Longer pull-down time because the device is loaded too early

If you load the device during the cooling phase, the pull-down time will be longer. The pull-down time specified in the technical data cannot be achieved.

The pull-down time is the time needed for the device to cool the interior from the ambient temperature to the set temperature.

- ▶ Allow the device to cool down from ambient temperature to the set temperature.
- ▶ Place the samples in the device after the device has reached the set temperature.



CAUTION! Risk of head injury due to open inner door

There is a risk of hitting your head against the upper inner doors when they are open.

- ▶ Only open one inner door at a time.
- ▶ Immediately close the inner door after completing your work.



The interior temperature of the device increases when loading it:

- Outer and inner doors are open.
 - The sample temperature differs from the interior temperature.
- ▶ To minimize the temperature increase in the interior, load the device step by step.

Operation

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Prerequisites

- Racks and accessories have been placed in the compartments.
- Device, racks and accessories have reached the set temperature.

1. Open the outer door.
2. Open the inner door of the compartment in which you want to place the samples.
3. Place the samples in the device.
Information on the maximum carrying capacity of the inner shelves can be found in the technical data.
4. Close the inner door.
5. Close the outer door.

5.3 Close the outer door.



CAUTION! Risk of crushing your fingers when closing the outer door

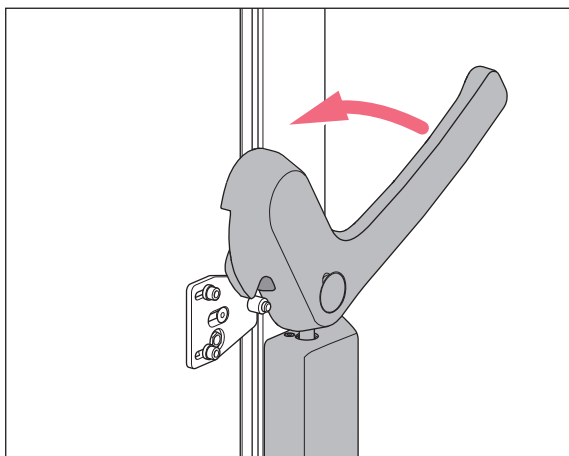
- ▶ Do not place your fingers between the device and the outer door.
- ▶ Do not touch the peg and the covers of the door lock when closing the outer door.



NOTICE! Damage to the door handle due to incorrect closing of the outer door.

Closing the outer door while the door handle is in the upright position may damage the door handle and the peg.

1. Pull the door handle down first.
2. Then close the outer door.



1. Pull the door handle forward and down.
2. Close the outer door.
3. To lock the outer door, push the door handle up. The door handle covers the peg. The outer door is closed.
Automatic pressure compensation takes place as soon as the outer door is closed.

5.4 Pressure compensation

If you leave the outer door open for a while, the temperature in the interior will increase. After closing the outer door, the air in the interior will cool down and the atmospheric pressure will decrease. Negative pressure may occur in the device. If negative pressure occurs, the outer door can no longer be opened.

Pressure compensation takes place automatically to reestablish ambient pressure in the device. Pressure compensation takes 1 to 2 minutes. Pressure compensation starts as soon as the outer door is closed.

- ▶ To speed up pressure compensation, press the *auto vent* valve.

5.5 Switching off the device



WARNING! Electric shock due to damage to the device or mains/power cord.

- ▶ Only switch on the device if the device and mains/power cord are undamaged.
- ▶ Only operate devices which have been installed or repaired properly.
- ▶ In case of danger, disconnect the device from the mains/power supply voltage. Disconnect the mains/power plug from the device or the earth/grounded socket. Use the isolating device intended for this purpose (e.g. the emergency switch in the laboratory).

5.5.1 Disabling the back-up circuit

Tools and auxiliary equipment

- Key for the switch locking plate

1. Unlock the switch locking plate and remove the cover.
2. Switch off the battery switch.

The back-up circuit is disabled.

- No alarm is triggered in the event of a mains/power outage.
- During a mains/power outage, there will be no power supply to the control panel.
- The battery is not charged.

5.5.2 Disconnecting the device from the voltage supply

Tools and auxiliary equipment

- Key for the switch locking plate

1. Unlock the switch locking plate and remove the cover.
2. Switch off the mains/power switch.

5.5.3 Disconnecting the device from the cooling water supply

- ▶ Close the water inlet.

Operation

CryoCube® F740hi, F740hiw



English (EN)

6 Operating control overview











6.1 Intuitive operating concept

Eppendorf offers a cross-product operating concept which supports swift familiarization with different Eppendorf products. For different Eppendorf products, the basic operating controls are compatible with each other by using an intuitive touch user interface.

6.2 Operating the user interface

















-  The touch screen is designed to be operated with your fingers only without the need for tools. You can wear laboratory gloves made of nitrile or latex. Alternatively, you can also use a stylus, for example, when thick gloves need to be worn in the laboratory.
-  If liquid comes into contact with the touch screen, the functions displayed on the touch screen may be triggered.
 - ▶ Do not drop any liquids onto the touch screen.
 - ▶ Do not spill any liquids onto the touch screen.

6.3 Symbols

Symbol	Description
	Enter data.
	Select filters. If a filter is active, the symbol will be highlighted in blue.
	Reset the parameters to the factory settings.
	Close the window.
	Outer door
	Ambient temperature
	Device's interior temperature
	The offset is activated. Open the <i>Offset</i> area.
	Open the user administration. Log in as a user.
	Open the <i>Alarms</i> area. Activate hazard messages. Check alarm limits and warning limits.

Operating control overview

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Symbol	Description
	The signal tone is deactivated.
	Open the <i>Events</i> area.
	Alarm message
	Warning message
	Notification
	Call up unacknowledged messages. The number displayed is the number of unacknowledged messages.
	Acknowledge the current message in the information bar.
	Acknowledge all messages in the information bar.
	The message has not been acknowledged.
	The message has been acknowledged.
	Open the <i>Charts</i> area.
	Select the time span to be shown in the chart. The number displayed is the selected time span.
	Open the <i>Export</i> area. Export data.
	The function is active.
	The function is not active.
	Display the last used parameters.

6.4 Home screen overview

6.4.1 Home screen

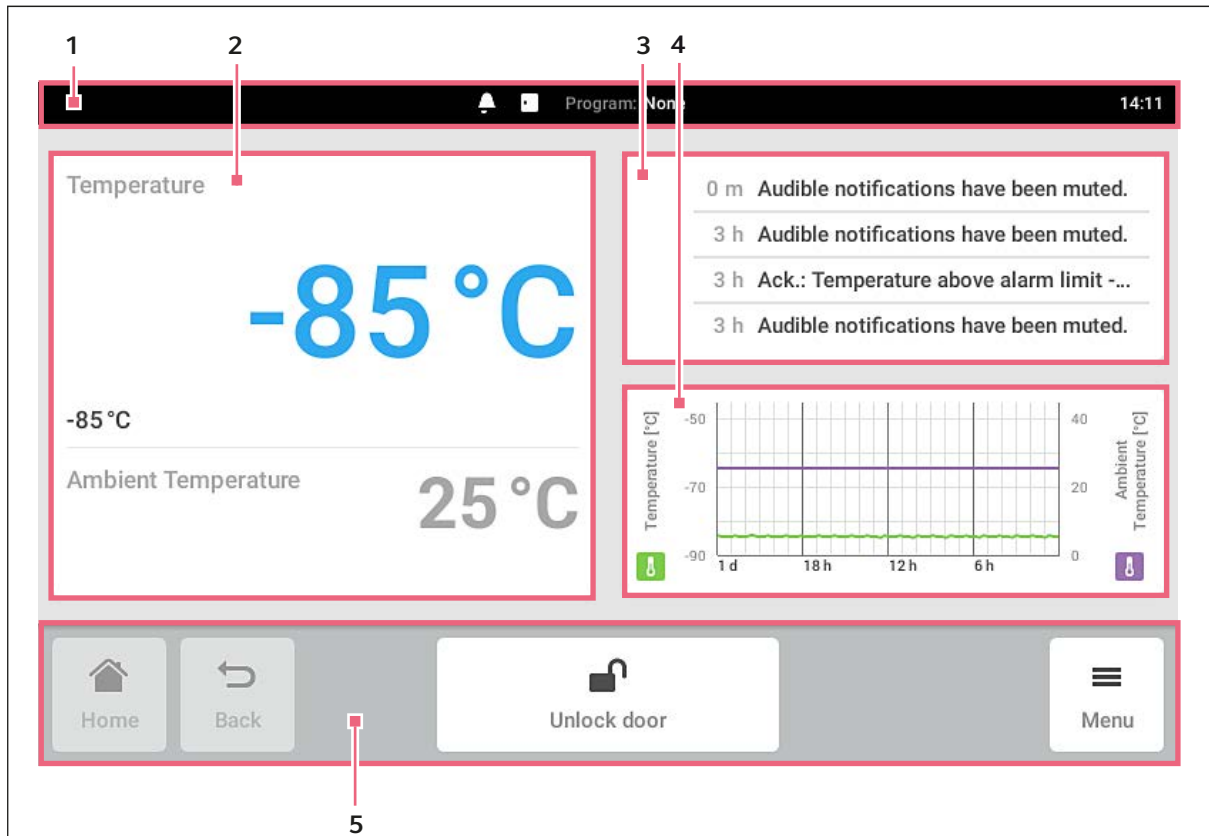


Fig. 6-1: Home screen

1 Status bar

Information about the operator, time, device status

Display and editing of messages

2 Function area

Display of the interior's set temperature and actual temperature

Display of the ambient temperature

3 Events

Log

4 Chart

Chart with interior temperature and ambient temperature

5 Toolbar

Buttons for navigation and operation of the device

6.4.2 Function area

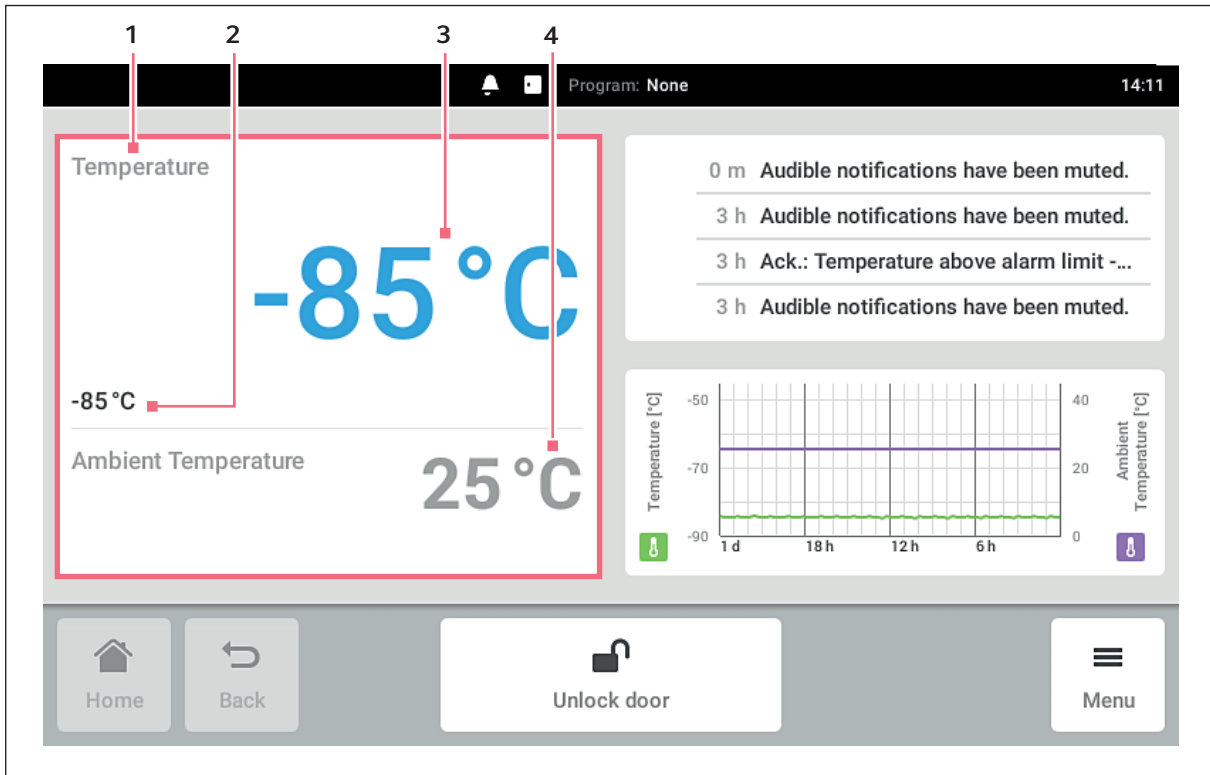


Fig. 6-2: Function area

- | | |
|---|--|
| <p>1 Name of the function</p> <p>2 Set value of the function
An editable set value of a function is displayed in small black numbers.</p> | <p>3 Actual value of the function
The function is monitored and can be edited.
The actual value is displayed in large blue numbers.</p> <p>4 Measured value of a function
The function is monitored and cannot be edited.
The actual value is displayed in large gray numbers.</p> |
|---|--|

6.4.3 Toolbar

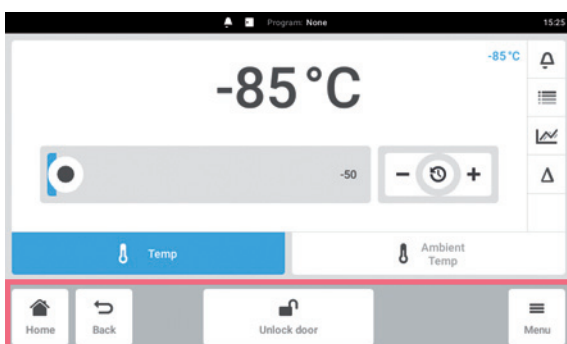


Fig. 6-3: Toolbar

- ▶ Tap the *Home* button.
The home screen appears.
- ▶ Tap the *Back* button.
The previous window appears.
- ▶ Tap the *Menu* button.
The menu appears. With the menu items, functions such as *Settings*, *Alarms* or *Event Log* can be opened.

6.5 Function control

6.5.1 Selecting the function



- ▶ Tap the function in the function area.
The window for setting the set value appears.

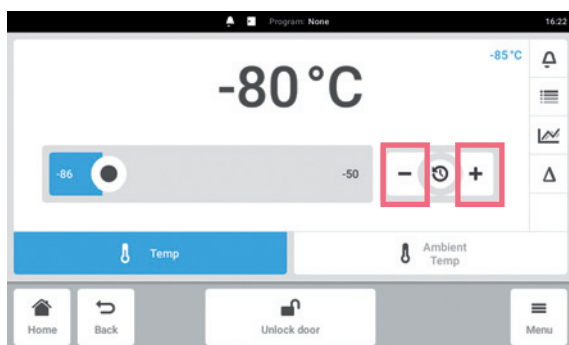
6.5.2 Setting the set value

Setting the set value with the slider



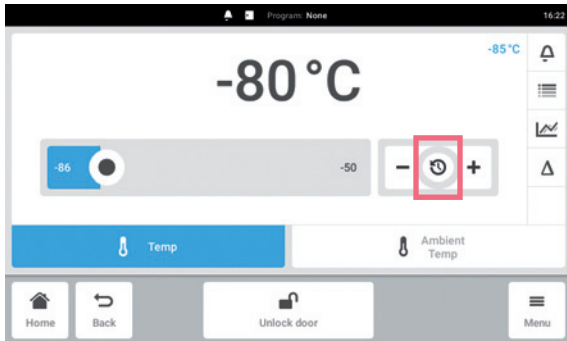
- ▶ Tap the slider and drag it to the right or to the left.
The set value changes.

Changing the set value incrementally with the fine adjustment



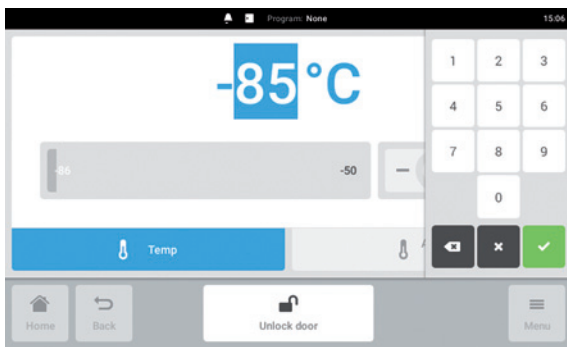
- ▶ Tap the + button.
The set value is incrementally increased.
- ▶ Tap the - button.
The set value is incrementally decreased.

Selecting the last used set value



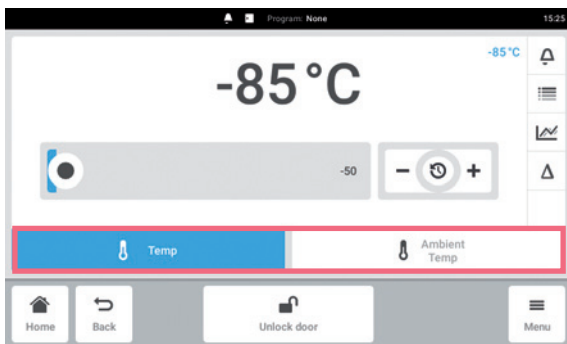
1. Tap into the center of the fine adjustment.
A list with the last used set values is displayed.
2. Select the set value.

Entering the set value with the number pad



1. Tap the set value.
The number pad appears.
2. Enter the new set value.
3. Confirm your entry.
The entry is completed. The number pad disappears.

6.5.3 Switching between functions



- ▶ To switch to another function, tap the symbol of the function.
The active function is highlighted in blue.

6.6 Editing warnings and alarms

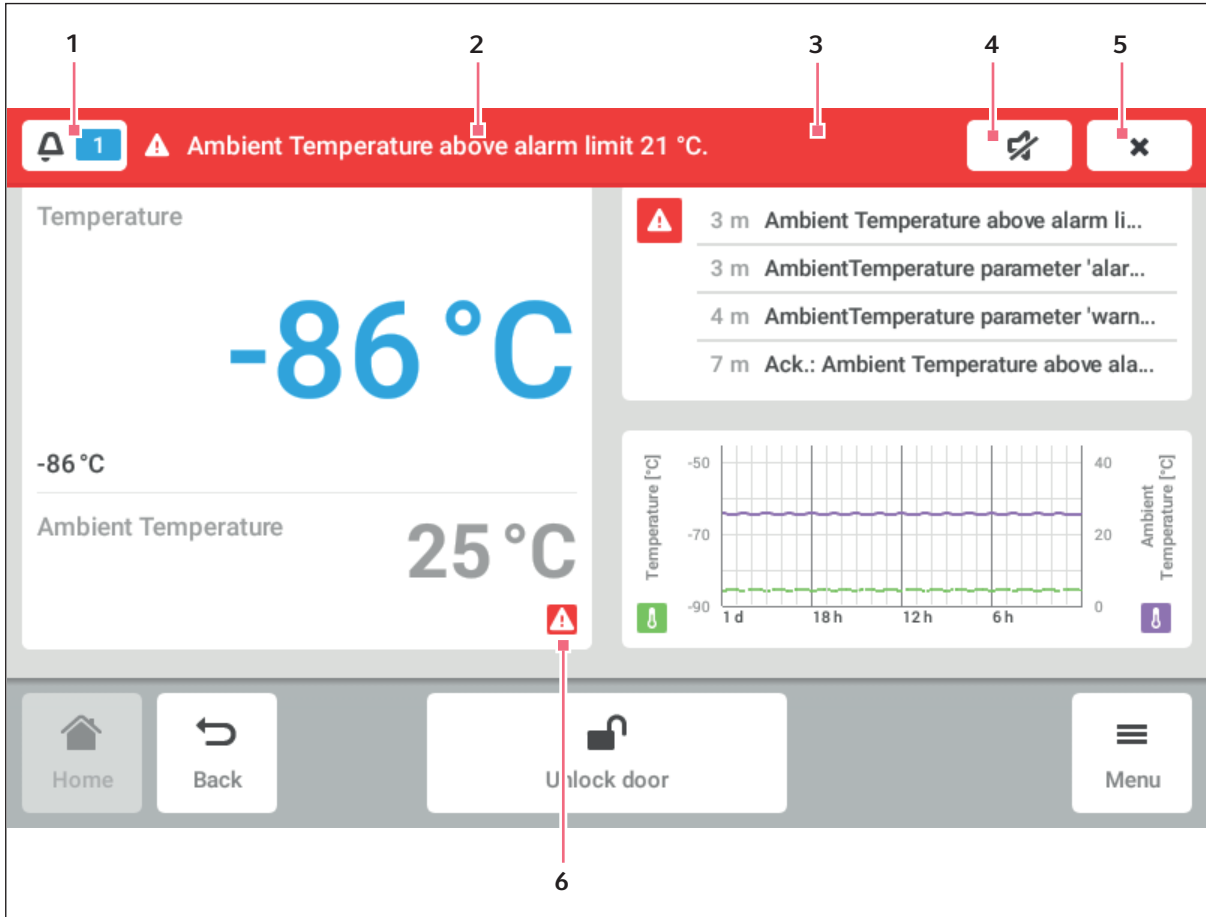


Fig. 6-4: Home screen with alarm

- | | |
|---|---|
| <p>1 Number of unacknowledged messages</p> <p>2 Message
Last unacknowledged message</p> <p>3 Information bar
The color of the information bar shows the danger level.
Red = alarm, yellow = warning</p> <p>4 Deactivate the signal tone
If the hazardous situation is still not remedied after 5 minutes, the signal tone will sound again.</p> | <p>5 Acknowledge the current message
The current message will be removed from the information bar when it has been acknowledged. When all messages have been acknowledged, the information bar will disappear. The status bar will then appear.</p> <p>6 Triangle
The triangle appears in the function area in which a hazard situation is present.
The triangle's color indicates the danger level.
Red = alarm, yellow = warning
If the hazardous situation is remedied, the triangle will disappear.</p> |
|---|---|

Operating control overview

CryoCube® F740hi, F740hiw
English (EN)

All hazard signals will disappear when the hazard situation is remedied. Only the message will remain in the information bar until it is acknowledged.

- ▶ To call up all messages that have not yet been acknowledged, tap the symbol (1) on the left side.
The log displays all messages that have not been acknowledged. The *acknowledgement status > not acknowledged* filter is active.
- ▶ To call up the displayed message, tap the message (2) itself.
- ▶ To deactivate the signal tone, tap the loudspeaker symbol (3).
- ▶ To acknowledge the displayed message, tap the check symbol (4).
The message will be removed from the information bar.

7 The Menu area

The Menu area contains all of the software settings.

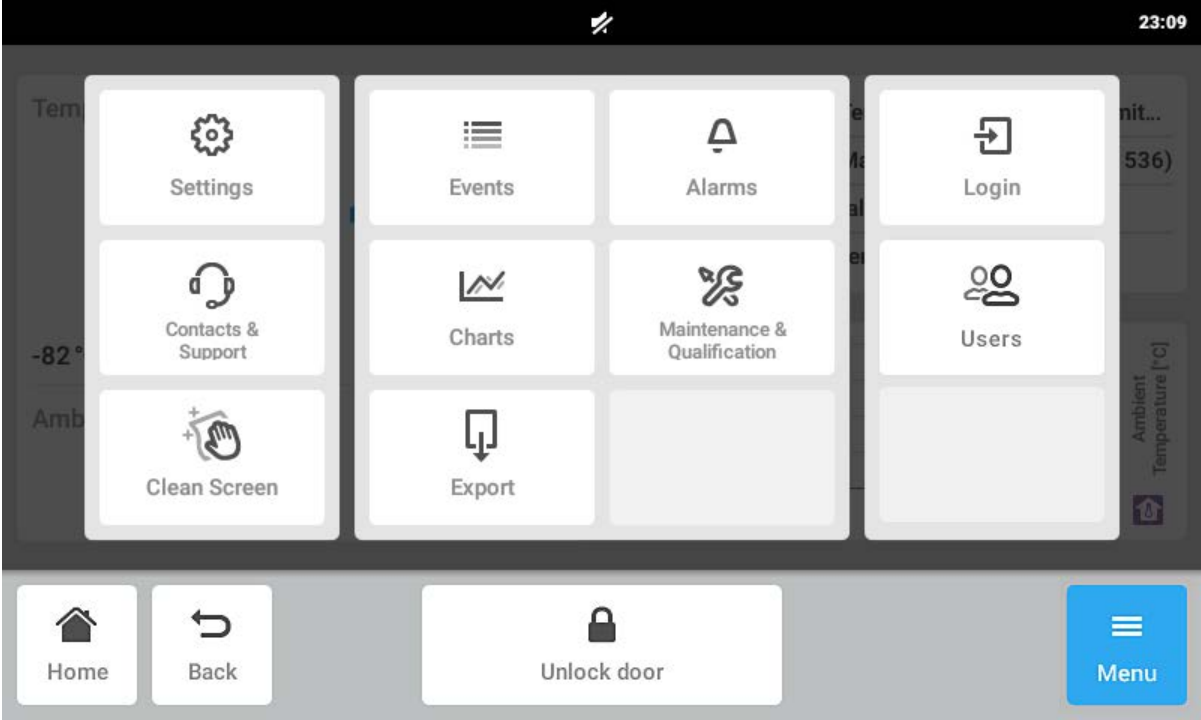


Fig. 7-1: Menu items

The Menu area

CryoCube® F740hi, F740hiw
English (EN)

7.1 Alarms

Hazard messages can be activated in this area. Alarm limits as well as warning limits can be defined.

The following hazard messages can be configured:

- *Temperature*: Interior temperature
- *Ambient Temperature*: Ambient temperature
- *Door*: Outer door

The mains/power outage, battery and system error hazard messages are always active and not configurable.

7.1.1 Configuring the *Temperature* and *Ambient Temperature*

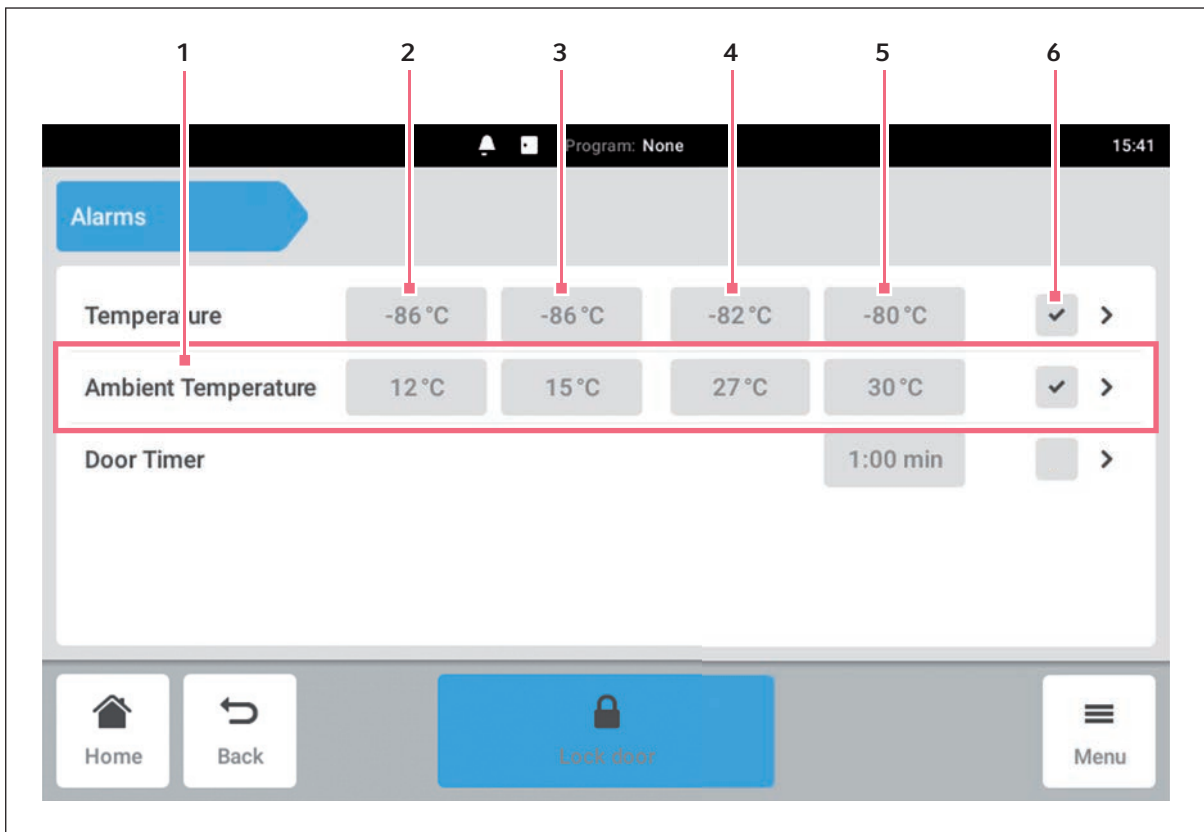


Fig. 7-2: *Alarms* window

- | | |
|--|--|
| 1 Overview of a hazard message | 4 Warning limit for the maximum temperature |
| 2 Alarm limit for the minimum temperature | 5 Alarm limit for the maximum temperature |
| 3 Warning limit for the minimum temperature | 6 Hazard message is activated or deactivated. |

1. Tap *Menu* > *Alarms*.
2. Tap *Temperature* or *Ambient Temperature*.
An overview of the hazard message appears.

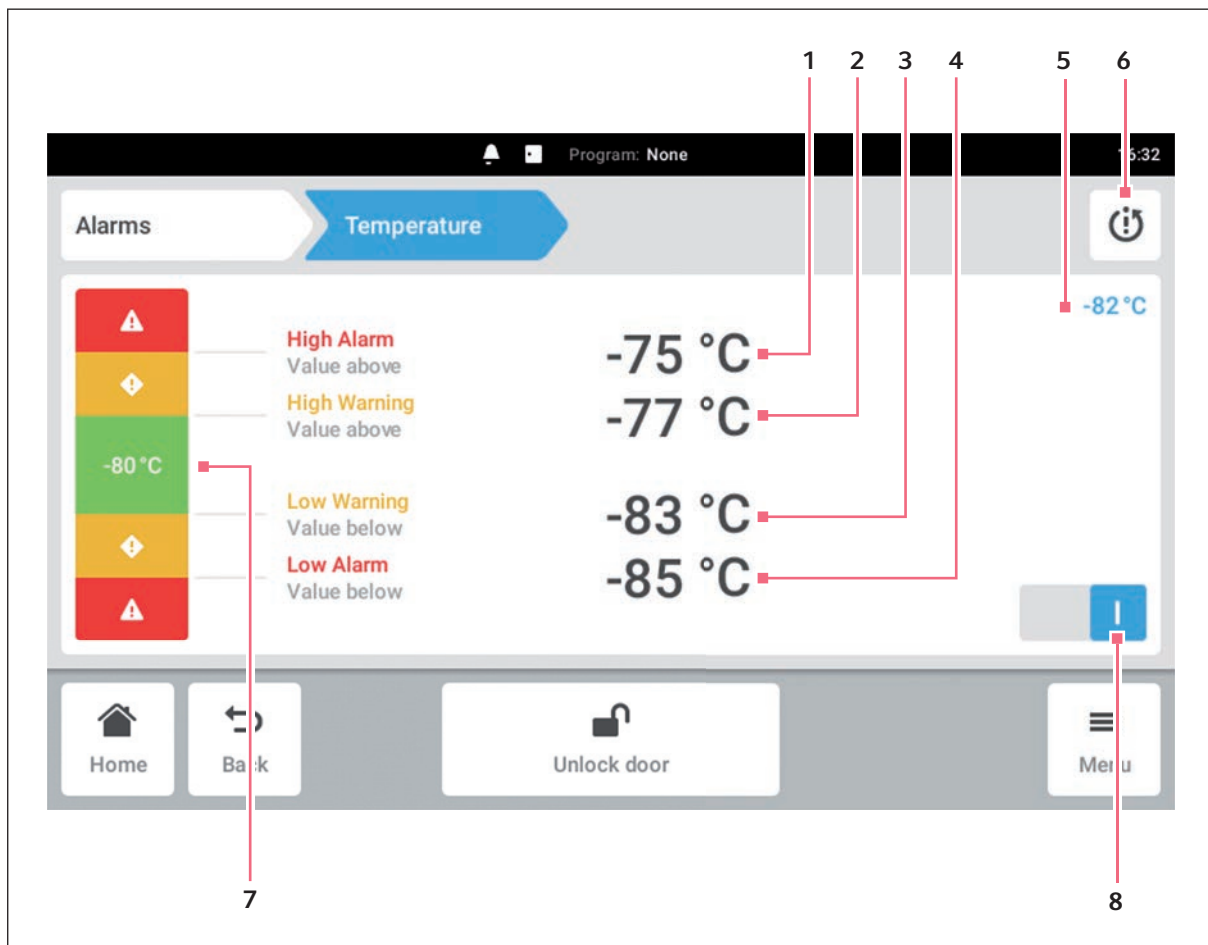


Fig. 7-3: Overview of the *Temperature* hazard message

- | | |
|--|---|
| 1 Alarm limit for the maximum temperature | 5 Interior actual temperature |
| 2 Warning limit for the maximum temperature | 6 Factory settings symbol
Reset values to factory settings. |
| 3 Warning limit for the minimum temperature | 7 Interior set temperature |
| 4 Alarm limit for the minimum temperature | 8 Activate or deactivate the hazard message. |

3. Activate the hazard message with the *OI* switch.
4. Define the alarm limits and warning limits. Tap the appropriate field to do this.
5. Enter and confirm the new value.

If the current value exceeds the warning limit, a warning will be triggered.
 If the current value exceeds the alarm limit, an alarm will be triggered.

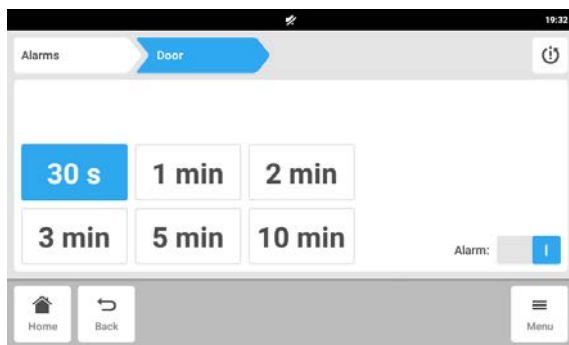
The Menu area

CryoCube® F740hi, F740hiw
English (EN)



In the event of a hazard message, the exceeded value will be highlighted in red in the *Alarms* window.

7.1.2 Configuring *Door*



1. Tap *Menu > Alarms > Door* .
2. Activate the alarm with the *OI* switch.
3. Select the time delay after which an alarm is triggered.

7.2 Charts

Data is displayed in chart form in this area.

The chart has 2 different y-axes, each with a different scale. This allows it to show 2 functions. A function has the same color as the scale it has been assigned. The time is shown on the x-axis.

The following functions are displayed:

- Temperature in the interior
- Ambient temperature



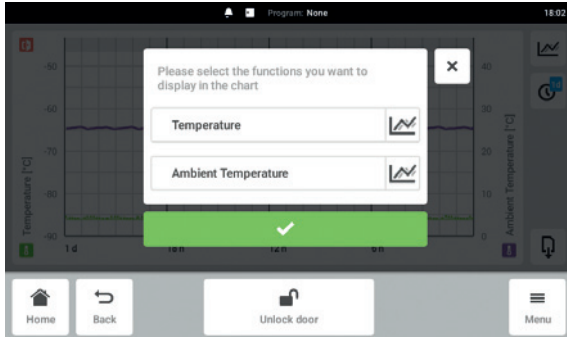
Fig. 7-4: Chart

- | | |
|---|--|
| <p>1 Function symbol
 Select the function to be shown in the chart.</p> <p>2 Time span symbol
 Select the time span to be shown in the chart.</p> | <p>3 Name of the function shown.</p> <p>4 Export button
 Exports the data.</p> |
|---|--|

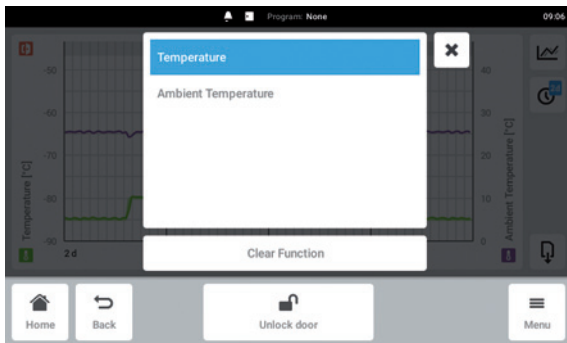
The Menu area

CryoCube® F740hi, F740hiw
English (EN)

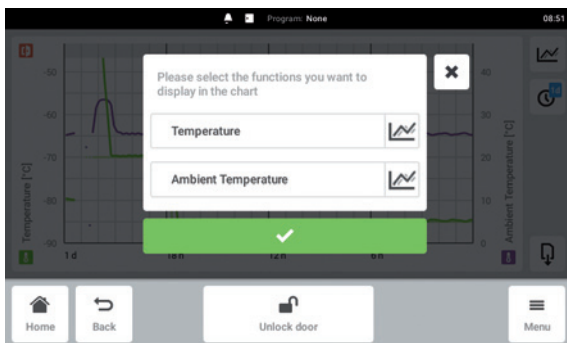
7.2.1 Selecting functions



- ▶ Tap *Menu > Charts*.
- ▶ Tap the Function button.
- ▶ To select the functions for the left y-axis, tap the upper line.
- ▶ To select the functions for the right y-axis, tap the lower line.
A window with the available functions appears.

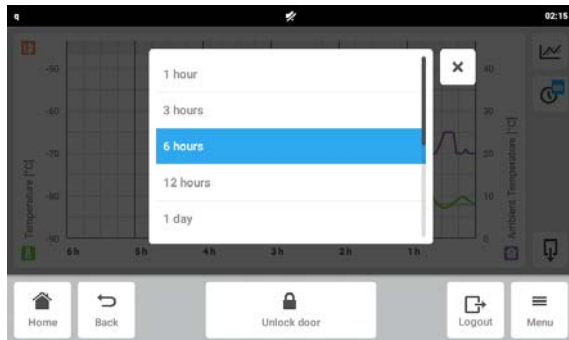


- ▶ Select the function.
The function appears in the tapped line.



- ▶ Confirm your selection.
The function is displayed in the selected y-axis.

7.2.2 Selecting the time span



1. Tap *Menu > Charts*.
2. Tap the time span symbol
3. Select the time span.
The time span appears on the x-axis.

7.2.3 Displaying the chart's measured values



1. Tap *Menu > Charts*.
2. To display numerical measured values, select a defined time.
3. Tap the corresponding point in the chart.
The measured values of all functions are displayed.

7.2.4 Exporting charts

1. Tap *Menu > Charts*.
2. Tap *Export* (see *Export* on p. 64).

The Menu area

CryoCube® F740hi, F740hiw
English (EN)

7.3 Events

This area lists the device's messages. You can filter, edit and export messages.

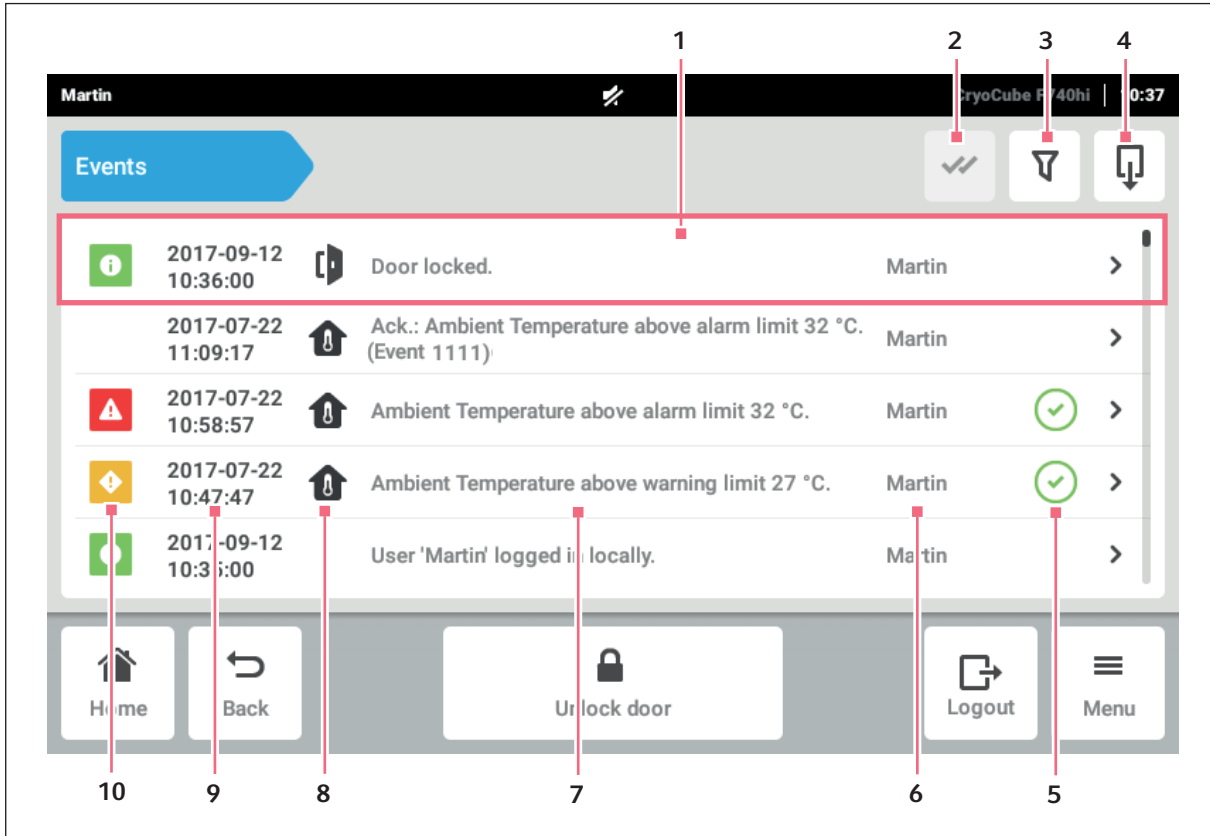
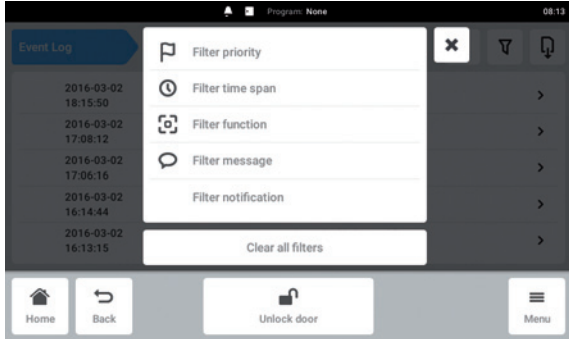


Fig. 7-5: Events window

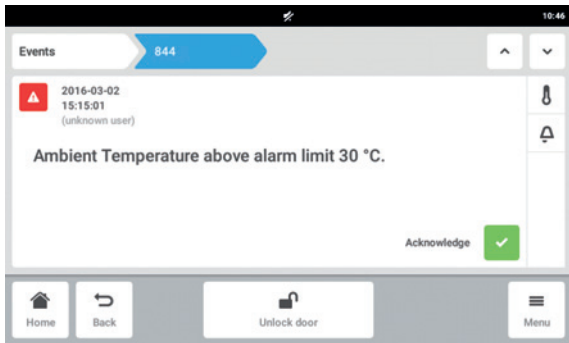
- | | |
|--|---|
| 1 Overview of a message | 6 User that was logged in during this time. |
| 2 Acknowledge all alarms in the information bar. | 7 Message text |
| 3 Call up filters.
If a filter is active, the symbol will be highlighted in blue. | 8 Symbol for exceeded threshold |
| 4 Export Events. | 9 Date and time of the message |
| 5 Acknowledgement status
The message has been acknowledged or must still be acknowledged. | 10 Message status |

7.3.1 Filtering Events



- ▶ Tap *Menu > Events*.
- ▶ Tap the Filter button.
- ▶ Select filters.
 If a filter is enabled, a checkmark appears next to the filter.
 In the *Events* window, the filter symbol is highlighted in blue.
- ▶ To disable all the filters, tap *Clear all filters*.

7.3.2 EventsEdit



1. To edit a message, tap the line with the message.

The following parameters are displayed:

- Message number
- Status
- Date and time
- User that was logged in at the time of the message.
- Message text
- Button to acknowledge the message
- Symbols to call up corresponding parameters

2. To acknowledge a message, tap *Acknowledge*.
 The button's appearance will change.
3. To check the parameters of the message, tap the symbols to the right.

7.3.3 Exporting Events.

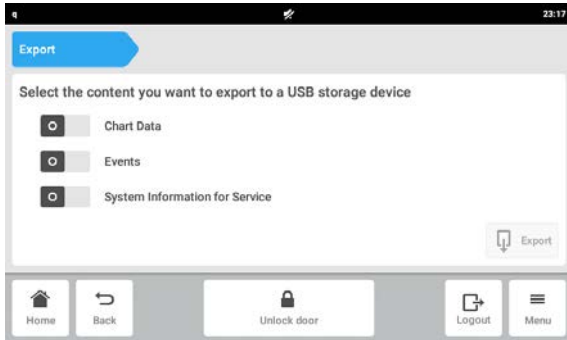
- ▶ Tap *Menu > Events*.
- ▶ Tap *Export* (see *Export* on p. 64).

The Menu area

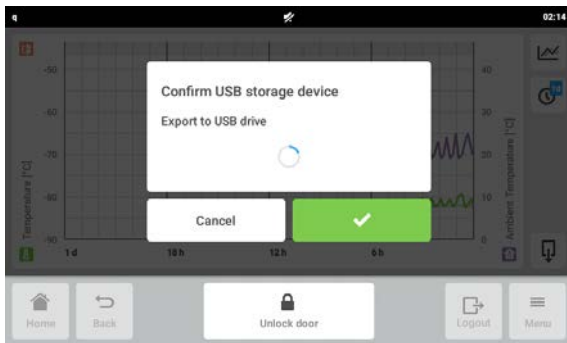
CryoCube® F740hi, F740hiw
English (EN)

7.4 Export

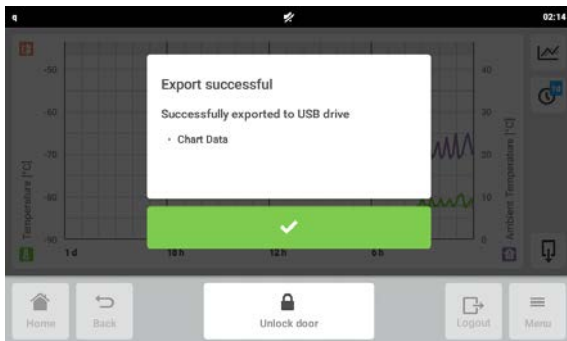
You can export charts, logs and data for service to a USB storage medium.



1. Connect a USB storage medium.
2. Tap *Menu* > *Export*.
3. Use the sliders to select data for export.
Data shown in gray cannot be exported.
4. Tap *Export*.



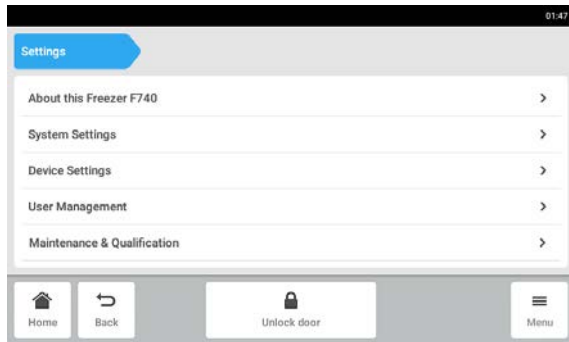
5. Confirm the connected USB storage medium.



6. Confirm the export.
7. Remove the USB storage medium.

7.5 Settings

This area provides you with information about the device. You can configure system and device settings and activate the user administration.

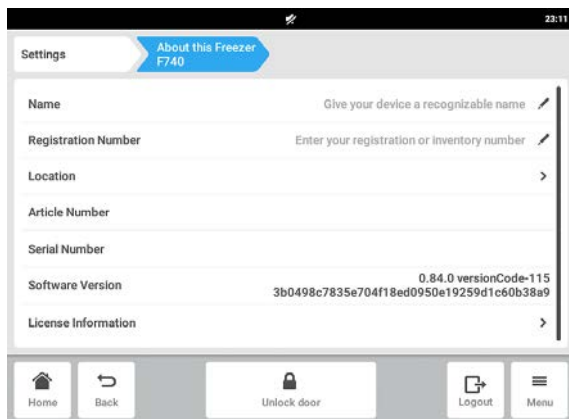


▶ Tap *Menu > Settings*.

The following parameters are available:

- *About this Freezer F740*: View or enter device information. View software licenses.
- *System Settings*: Configure the date, time and network.
- *Device Settings*: Configure hazard messages, the touch screen and the offset.
- *User Management*: Set up the user administration (see *User administration on p. 77*).
- *Maintenance & Qualification*: Define and edit recurring tasks.

7.5.1 About this Freezer F740 menu item



▶ Tap *Menu > Settings > About this Freezer F740*.

The following parameters are available:

- *Name*: Enter the device name.
- *Registration Number*: Enter the inventory number of the device.
- *Location*: Enter the location of the device.
- *Article Number*: View the article number of the model.
- *Serial number*: View the serial number of the device. The serial number is also located on the name plate.
- *Software Version*: View the user software version.
- *License Information*: View information on software licenses.

The Menu area

CryoCube® F740hi, F740hiw
English (EN)

Location - Entering the location of the device

The screenshot shows the 'Location' settings screen. The top navigation bar includes 'Settings', 'About this Freezer F740', and 'Location'. The main content area contains the following fields:

- Position: Position inside the room (e.g. bench or aisle number)
- Room: Room number or name
- Building: Building number or name
- Site: Site within the company
- Organization: Organization name
- Street 1: Street 1
- Street 2: Street 2
- Postcode: Postcode/ZIP
- City: Town/City
- State: State/Province
- Country: Country

The bottom navigation bar includes: Home, Back, Unlock door, Logout, and Menu.

- ▶ Tap *Menu > Settings > About this Freezer F740 > Location*.
- ▶ Enter information about the location of the device.

7.5.2 System Settings menu item

The screenshot shows the 'System Settings' screen. The top navigation bar includes 'Settings' and 'System Settings'. The main content area contains the following items:

- Date & Time
- Network

The bottom navigation bar includes: Home, Back, Unlock door, and Menu.

- ▶ Tap *Menu > Settings > System Settings*.
- The following parameters are available:
 - *Date & Time*: Enter date and time.
 - *Network*: Set the parameters for network operation.

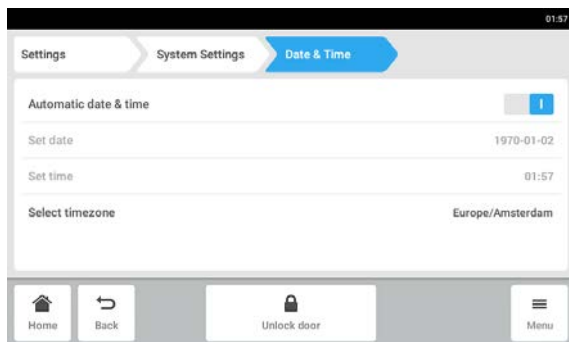
Date & Time – Setting the date and time automatically

Prerequisites

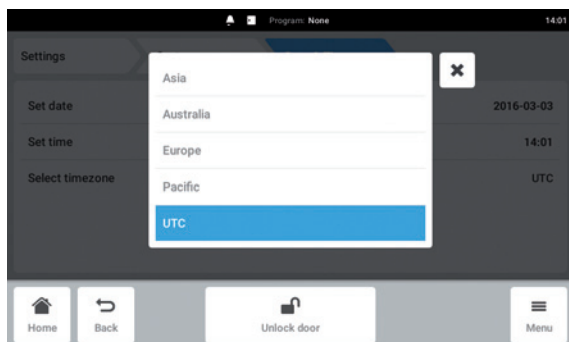
- The device is connected to the network.
- A time server is available.
- On devices that are monitored via the VisioNize core software, the current local time and the current date must be set.



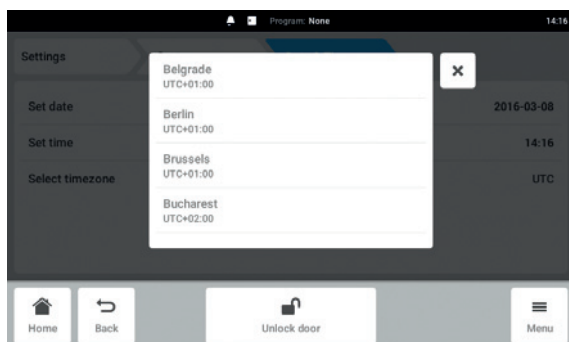
Changing the date, time or time zone may temporarily affect the appearance of the chart. The log may be incorrectly sorted.



- ▶ Tap *Menu > Settings > System Settings > Date & Time*.
- ▶ Activate the *Automatic date & time* switch.
- ▶ Tap *Select timezone*.



- ▶ Select the continent.
 UTC = Coordinated Universal Time
 (Coordinated universal time)



- ▶ Select the time zone.

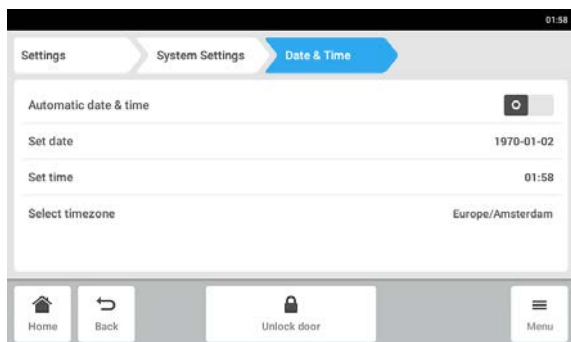
The Menu area

CryoCube® F740hi, F740hiw
English (EN)

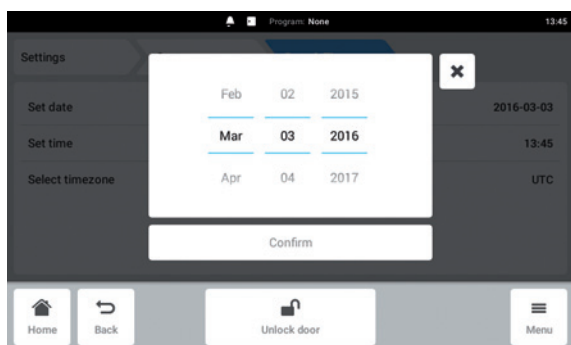
Date & Time – Setting the date and time manually



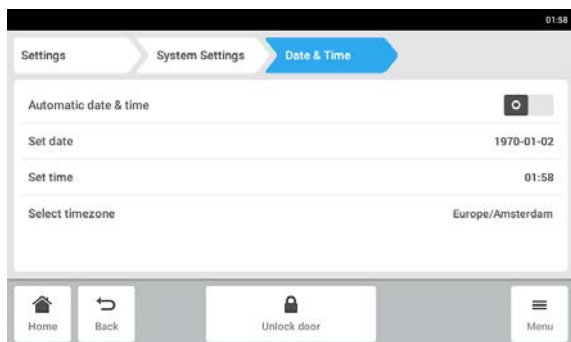
Changing the date, time or time zone may temporarily affect the appearance of the chart. The log may be incorrectly sorted.



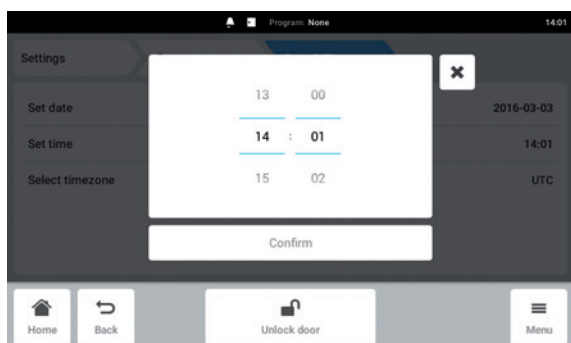
- ▶ Tap *Menu* > *Settings* > *System Settings* > *Date & Time*.
- ▶ Deactivate the *Automatic date & time* switch. The *Set date* and *Set time* parameters will become active.
- ▶ Tap *Set date*.



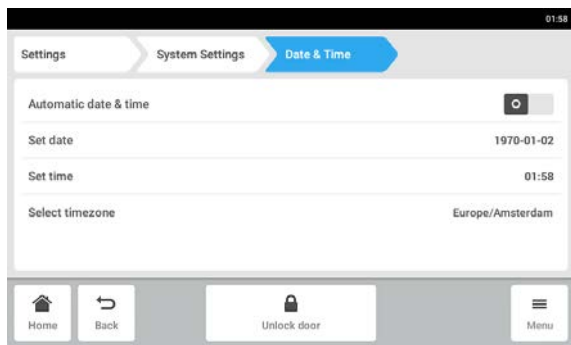
- ▶ Set the current date.
- ▶ Tap *Confirm*.



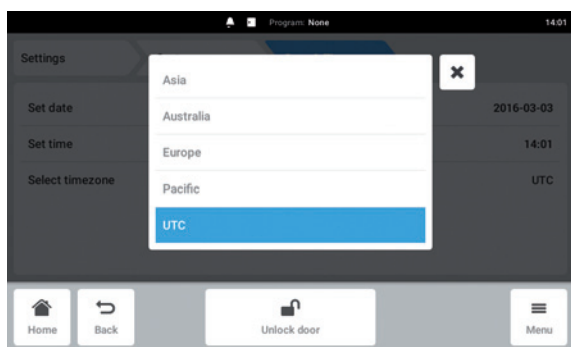
- ▶ Tap *Set time*.



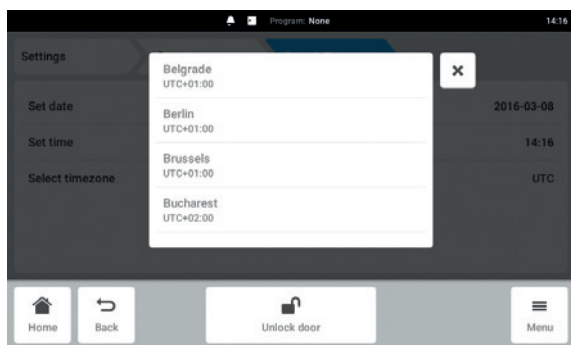
- ▶ Set the time.
- ▶ Tap *Confirm*.



▶ Tap *Select timezone*.



▶ Select the continent.
UTC = Coordinated Universal Time
(Coordinated universal time)

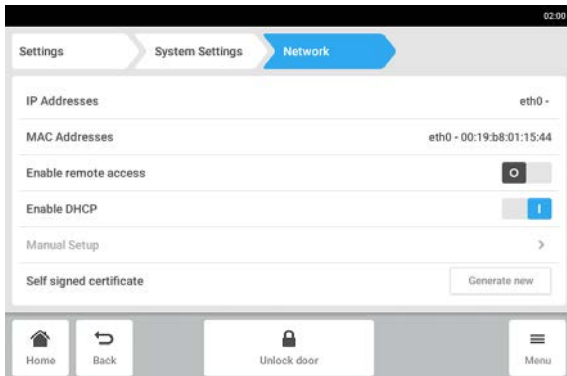


▶ Select the time zone.

The Menu area

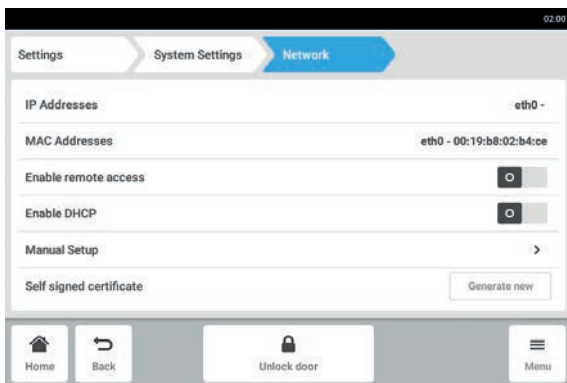
CryoCube® F740hi, F740hiw
English (EN)

Network – Network operation settings



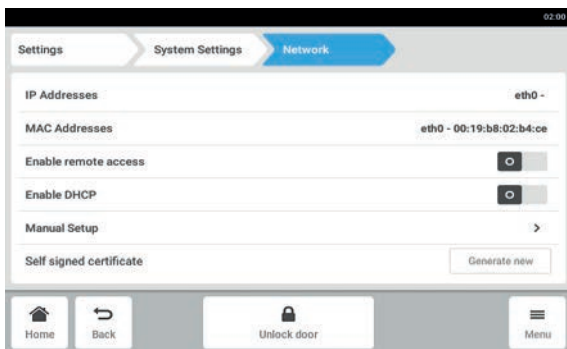
- ▶ Tap *Menu* > *Settings* > *System Settings* > *Network*.
The following parameters are available:
 - *IP Addresses*: Current IP address of the device
 - *MAC Addresses*: Address by which the device can be uniquely identified in the network.
 - *Enable remote access*: The device allows communication with external software.
 - *Enable DHCP*: The device uses an IP address assigned to it by a DHCP server.
 - *Manual Setup*: Configure the network manually.
 - *Self signed certificate*: Certificate with which the device identifies itself in the network.

Network – Configuring the network automatically

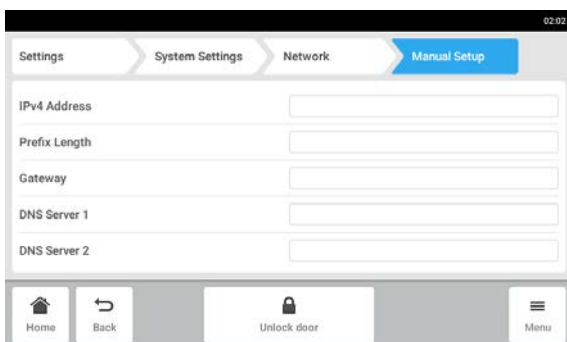


- ▶ Tap *Menu* > *Settings* > *System Settings* > *Network*.
- ▶ Activate the *Enable remote access* switch.
The device will automatically connect to the network.

Network – Configuring the network manually

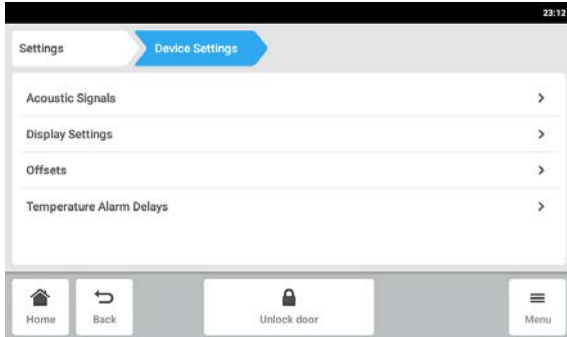


- ▶ Tap *Menu* > *Settings* > *System Settings* > *Network*.
- ▶ Deactivate the *Enable DHCP* switch.
The *Manual Setup* parameter will become active.
- ▶ Tap *Manual Setup*.



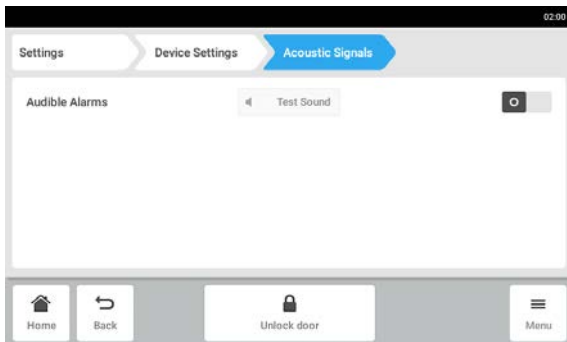
- ▶ Enter and confirm parameters.

7.5.3 Device Settings menu item



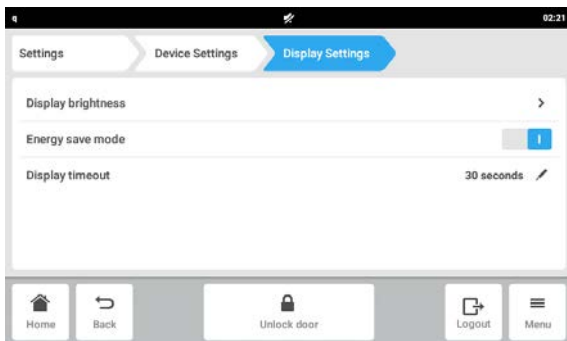
- ▶ Tap *Menu > Settings > Device Settings*.
 The following parameters are available:
 - *Acoustic Signals*: Configure the signal tone.
 - *Display Settings*: Configure the touch screen.
 - *Offset*: Enter the offset for the interior set temperature.
 - *Temperature Alarm Delays*: Enter which systems the hazard message is forwarded to.

Acoustic Signals – Configuring the signal tone



- ▶ Tap *Menu > Settings > Device Settings > Acoustic Signals*.
- ▶ To switch on the signal tone, activate the *O I* switch.
- ▶ To test the signal tone, tap *Test Sound*.

Display Settings – Configuring the touch screen

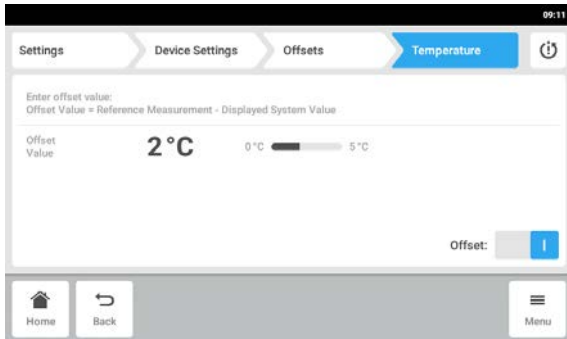


- ▶ Tap *Menu > Settings > Device Settings > Display Settings*.
- ▶ Tap *Display brightness*.
- ▶ Configure the touch screen's brightness.
- ▶ Activate the *O I* switch.
 The *Display timeout* parameter will become active.
 Activating the *Display timeout* function saves energy. The touch screen's service life will be extended.
- ▶ Tap *Display timeout*.
- ▶ Select the time after which the display will be dimmed.

The Menu area

CryoCube® F740hi, F740hiw
English (EN)

Offset – Entering the offset for the interior set temperature

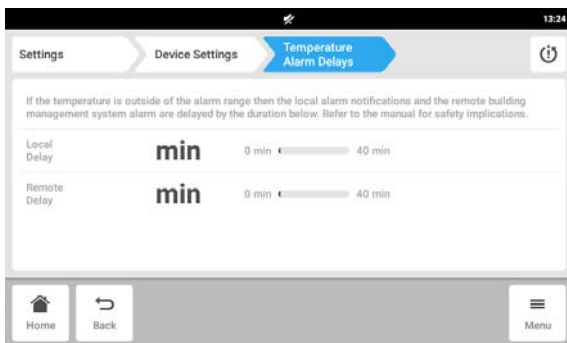


- ▶ Tap *Menu* > *Settings* > *Device Settings* > *Offset*. You can define an offset for the interior set temperature within the range of 0 °C to -5 °C. The offset is added to the set temperature. The temperature cannot fall below -86 °C.
- ▶ Tap *Temperature*.
- ▶ Activate the *Offset* switch.
- ▶ Tap *Offset Value*.
- ▶ Enter and confirm the offset.

Temperature Alarm Delays – Entering the delay time for the "interior temperature"



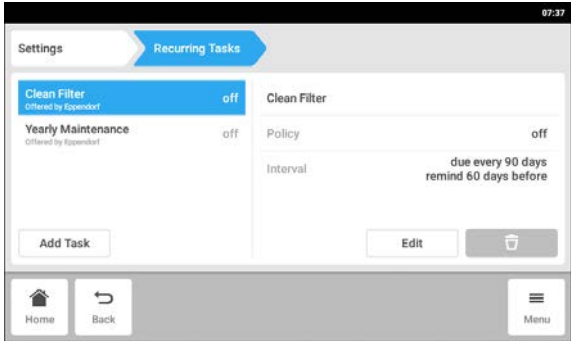
Example: You open the outer door for a longer time to load the device. The temperature inside the device increases. The alarm limit is exceeded. If you have defined a delay time, the alarm will not be triggered immediately. It will only be triggered if the interior temperature still exceeds the alarm limit after the delay time has elapsed.



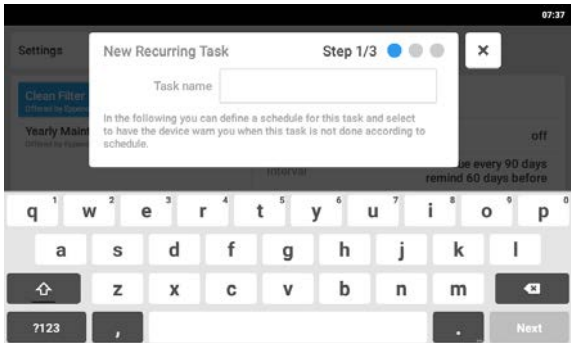
- ▶ Tap *Menu* > *Settings* > *Device Settings* > *Temperature Alarm Delays*.
- ▶ Tap *Local Delay*.
- ▶ Enter the time after which the device triggers the local hazard message. The factory setting is 30 min.
- ▶ Tap *Remote Delay*.
- ▶ Enter the time after which the device sends the hazard message to a building management system or an external system. The factory setting is 30 min.

7.5.4 Maintenance & Qualification menu item

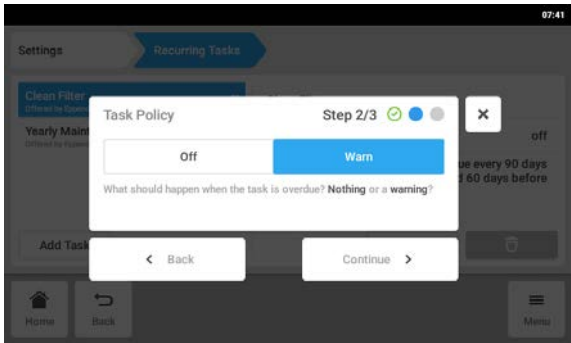
Recurring Tasks – Defining and editing recurring tasks



- 1. Tap *Settings* > *Maintenance & Qualification*.
- 2. Tap *Add Task*.



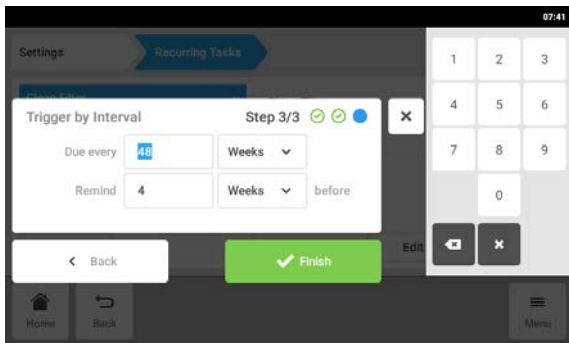
- 3. Enter the name of the task.
- 4. Tap *Next*.



- 5. Activate the warning.
- 6. Tap *Continue*.

The Menu area

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7. Enter the time after which the device triggers the warning.
8. Tap *Finish*.
The task has been saved.
9. To edit a defined task, mark the task and tap *Edit*.
Edit the task as described from step 5 onward.

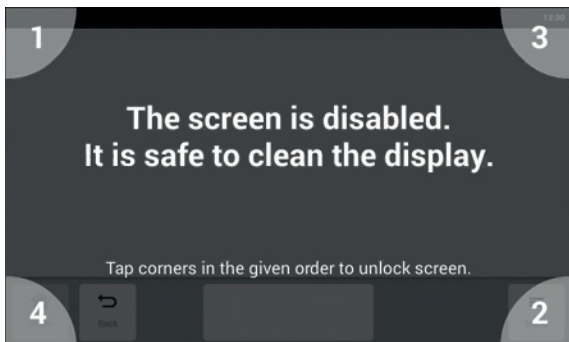
The following tasks have been defined by the Eppendorf AG. These tasks can be edited, but not deleted.

- *Clean Filter*: Cleaning of the air filter
- *Yearly Maintenance*: Yearly maintenance of the device by an authorized service technician

7.6 Clean Screen

The touch screen can be locked to clean the touch screen.

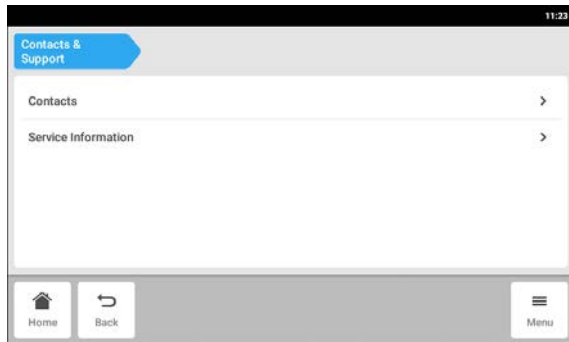
Locking and unlocking the touch screen



1. Tap *Menu > Clean Screen*.
The touch screen is locked.
2. To unlock the touch screen, tap the numbered corners in their numerical sequence.
The touch screen is unlocked. The previous screen is displayed.

7.7 Contact and Support

Information on your Eppendorf partner can be entered in this area. can receive information on contacting the authorized service.

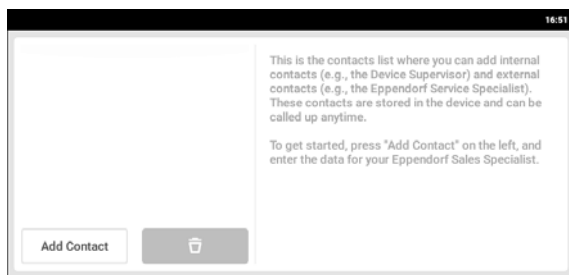


▶ Tap *Menu* > *Contact & Support*.

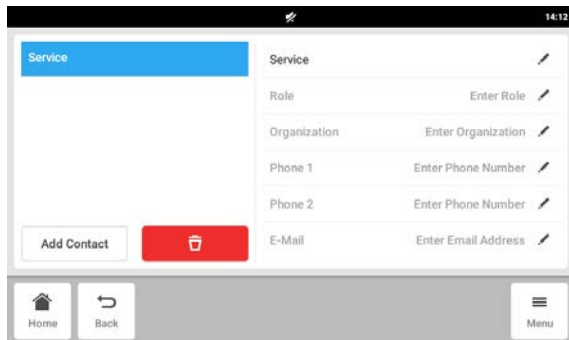
The following parameters are available:

- *Contacts*: Enter the addresses of the Eppendorf partners
- *Service Information*: Information on contacting the authorized service

Contacts menu item – Entering contact partners



1. Tap *Menu* > *Contact & Support*.
2. Tap *Add Contact*.
3. Enter and confirm the name of the Eppendorf partner.



4. Enter the contact information of the Eppendorf partner.
5. To delete an entry, tap the recycle bin symbol.

The Menu area

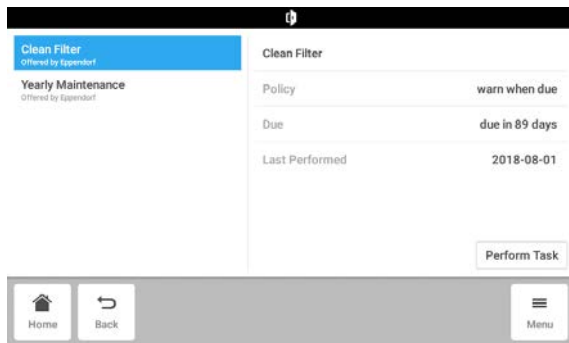
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7.8 Maintenance & Qualification

Performing recurring tasks

Prerequisites

- The task has been defined.



1. Tap *Menu* > *Maintenance & Qualification*.
2. Mark the task.

The touch screen will display the current settings:

- *Policy*: Warning activated or deactivated
- *Due*: Target date for the task
- *Last Performed*: Last time the task was performed

3. Tap *Perform Task*.
The task is described.
4. Confirm that the task has been performed.
The *Last Performed* field will display the current date.

8 User administration

8.1 User groups

The user administration can be used to manage access to the device. 3 user roles are available.

Tasks	Administrator	User	Restricted User
Open the outer door.	×	×	×
Edit settings.	×	-	-
Acknowledge alarms.	×	×	-
Acknowledge warnings.	×	×	×
Manage user accounts.	All	Own	Own
Set up the user administration.	×	-	-

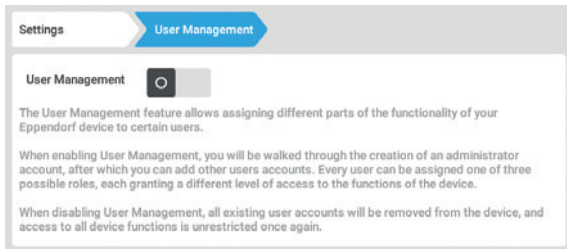
If user administration is not active, all users have the same rights as an administrator.

8.2 User administration

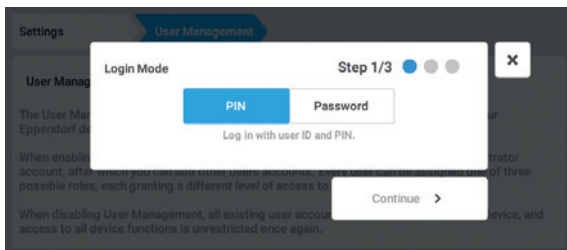
8.2.1 Setting up the user administration

Prerequisites

- The device is ready for operation.
- The home screen appears on the touch screen.



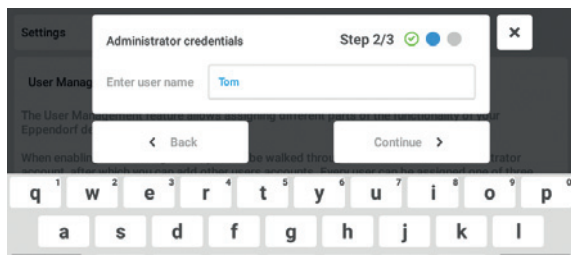
1. Tap *Menu* > *Settings* > *User Management*.
2. To activate the user administration, slide the *User Management* switch to the *I* position. The *Login mode* window will appear.



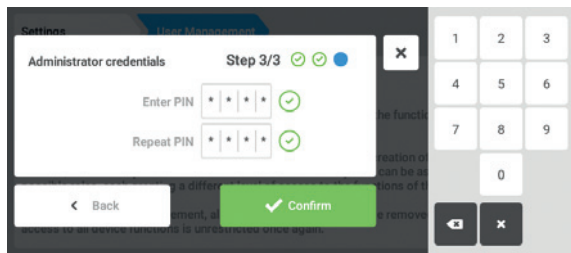
3. Select whether the users log in with a password or PIN.
4. Tap *Continue*.

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5. Enter the user name for the administrator in the *Enter User Name* field.
6. Tap *Continue*.

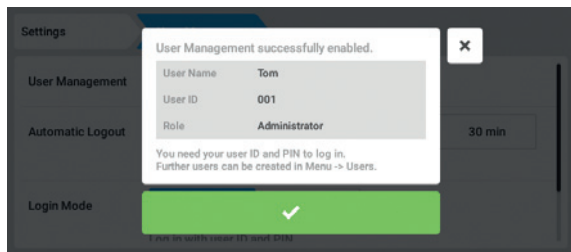


7. Enter the PIN or password in the *Enter password/PIN* field. Confirm the entry via the *Repeat password/PIN* field.
8. Tap *Confirm*.

The *User Management successfully enabled* window appears.

The user administration is activated.

The user account for the administrator has been created.

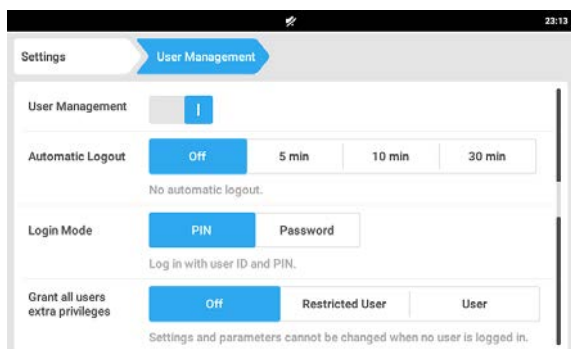


9. Confirm the message.
The *User management* window will appear.
It is now possible to edit the user administration.

8.2.2 Editing the user administration

Prerequisites

- The device is ready for operation.
- The home screen appears on the touch screen.
- You are logged in as an administrator.



1. Tap *Menu > Settings > User Management*.
2. Define the settings for the user administration.
 - *User Management*: Activate or deactivate the user administration.
 - *Automatic Logout*: Time for the touch screen to be idle before a user is automatically logged out.
 - *Login Mode*: Select whether the users log in with a password or PIN.
 - *Grant all users extra privileges*: When this function is active, all users of the device have the same *Restricted user/User* rights. Even users not registered in the user administration can use the device with the rights that have been set.

8.2.3 Deactivating the user administration



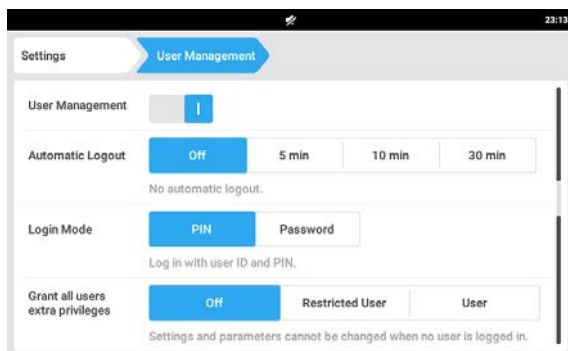
NOTICE! Data loss when the user administration is deactivated

Deactivating the user administration deletes all user accounts.

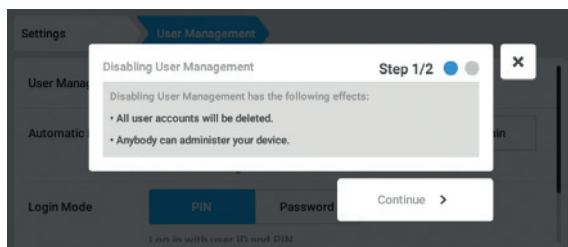
- ▶ Check whether deactivation of the user administration is necessary.
- ▶ Inform all users that the user administration has been deactivated.

Prerequisites

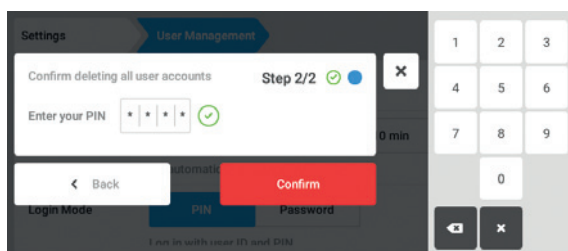
- The device is ready for operation.
- The home screen appears on the touch screen.
- You are logged in as an administrator.



1. Tap *Menu* > *Settings* > *User Management*.
2. To deactivate the user administration, slide the *User Management* switch to the *0* position. The *Disabling User Management* window will appear.



3. Tap *Continue*. The *Confirm deleting all user accounts* window will appear.



4. Enter the *Password/PIN*.
5. Tap *Confirm*. The user administration is deactivated. All user accounts are deleted.

8.3 Editing user accounts as administrator



NOTICE! Data loss due to loss of the administrator password.

The administrator can only change his password or PIN with his access data. If the administrator's access data is lost, no changes can be made to the user administration and system settings.

In this case, the device will have to be reset to the factory settings by an authorized service technician. All user accounts and any data and settings stored on the device will be deleted.

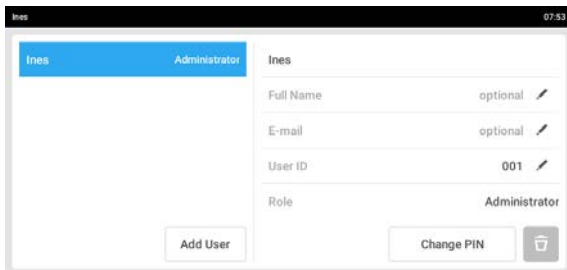
- ▶ Create a second user account with administrator rights.
- ▶ Keep the administrator password secure.

8.3.1 Creating a user account

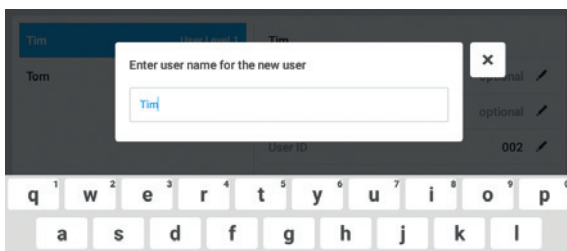
999 user accounts can be created.

Prerequisites

- The device is ready for operation.
- The user administration is activated.
- The home screen appears on the touch screen.
- You are logged in as an administrator.



1. Tap *Menu > Users*.
The overview of user accounts will appear.
2. Tap *Add User*.
The *Enter User Name for the new user* field will appear.

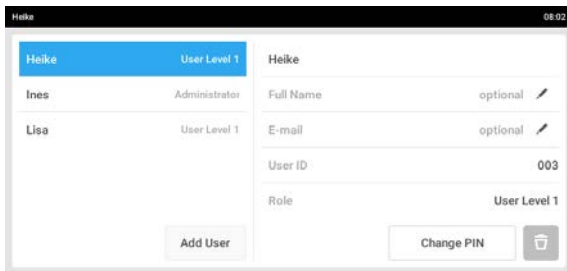


3. Enter the name of the user in the field.
4. Confirm the entry.
The *Credentials for user* window will appear.
The user account has been created. The user data will appear in the window.
The user is assigned to the *Restricted user* user group.

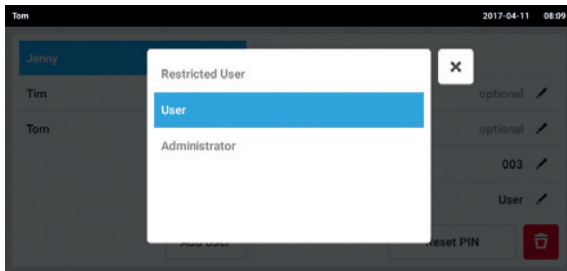
8.3.2 Editing user accounts

Prerequisites

- The device is ready for operation.
- The user administration is activated.
- The user account has been created.
- The home screen appears on the touch screen.
- You are logged in as an administrator.



1. Tap *Menu > Users*.
The overview of user accounts will appear.
2. Mark the user account.
3. Enter the user's name in the *Full Name* field.
4. Enter the user's e-mail address in the *E-mail* field.
5. To change the user ID, tap *User-ID*.
Three suggestions for a new user ID will appear.
Alternately, you can select a user ID from a list of available user IDs.
6. To change the user group, tap *Role*.
A window with the user groups will appear.
7. Select the user group.
The selected parameters are stored and will appear in the user account.



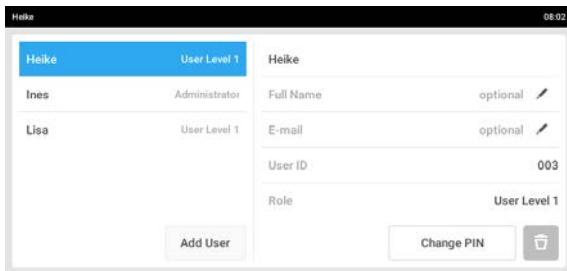
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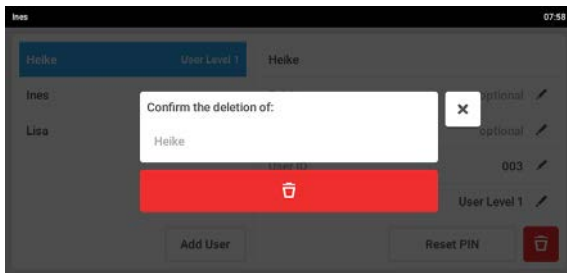
8.3.3 Deleting a user account

Prerequisites

- The device is ready for operation.
- The user administration is activated.
- The user account has been created.
- The home screen appears on the touch screen.
- You are logged in as an administrator.



1. Tap *Menu > Users*.
The overview of user accounts will appear.
2. Mark the user account to be deleted.
3. Tap the *Recycle bin* symbol.
The *Confirm the deletion of* window will appear.



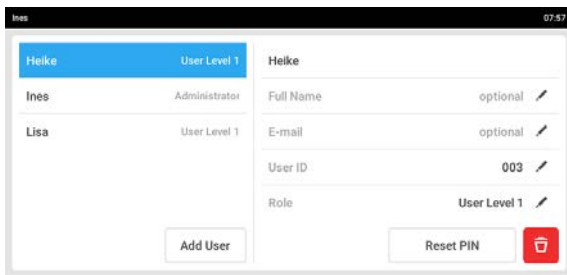
4. Confirm that you want to delete the user account.
The user account is then deleted.
The last user account of the Administrator user group cannot be deleted.

8.3.4 Changing the password/PIN of a user account

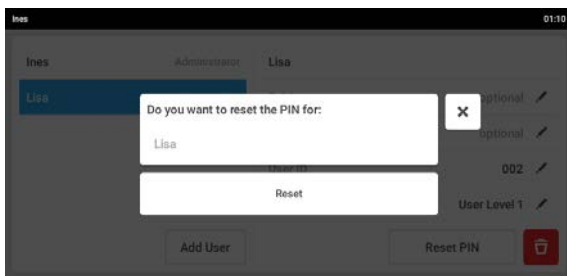
If a user has forgotten his password/PIN, the administrator can generate a new password.

Prerequisites

- The device is ready for operation.
- The user administration is activated.
- The user account has been created.
- The home screen appears on the touch screen.
- A USB stick is connected to the control panel (optional).
- You are logged in as an administrator.



1. Tap *Menu > Users*.
The overview of user accounts will appear.
2. Mark the user account.
3. Tap *Reset password/PIN*.
The *Do you want to reset the password/PIN for XXX* window will appear.

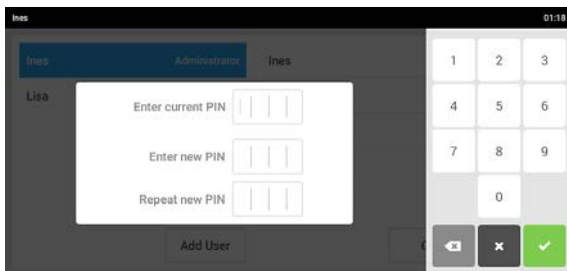


4. Tap *Reset*.
The *New Credentials* window will appear.
The new password/PIN is created automatically

8.3.5 Changing the password/PIN of the administrator

Prerequisites

- The device is ready for operation.
- The user administration is activated.
- The home screen appears on the touch screen.
- You are logged in as an administrator.



1. Tap *Menu > Users*.
The overview of user accounts will appear.
2. Highlight the user account of the administrator.
3. Tap *Change password/PIN*.
4. Enter the current password/PIN.
5. Enter and confirm the new password/PIN.
6. Confirm the entry with the green checkmark.
The message *Password/PIN successfully changed* will appear.
The password/PIN of the administrator has been changed.

User administration

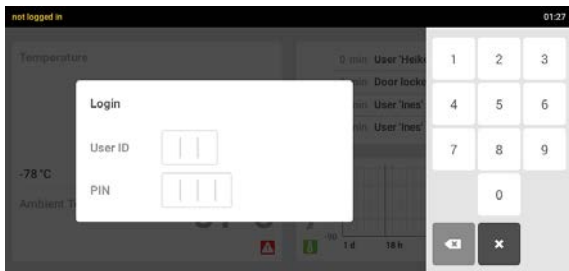
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8.4 Using your own user account

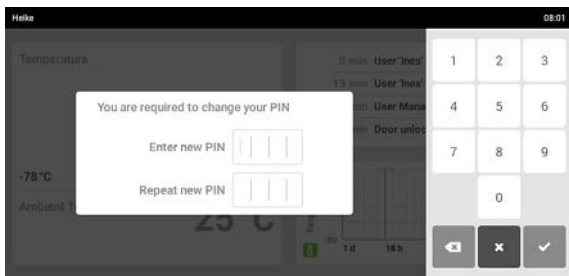
8.4.1 Logging in as a user.

Prerequisites

- The device is ready for operation.
- The user administration is activated.
- The user accounts have been created.
- The home screen appears on the touch screen.



1. Tap *Login*.
The *Login* window will appear.
2. Enter the user ID in the *Username/User-ID* field.
3. Enter the password/PIN in the *Password/PIN* field.
If the user ID and the password/PIN has been entered correctly, the user will be logged in.
The home screen will appear on the touch screen.

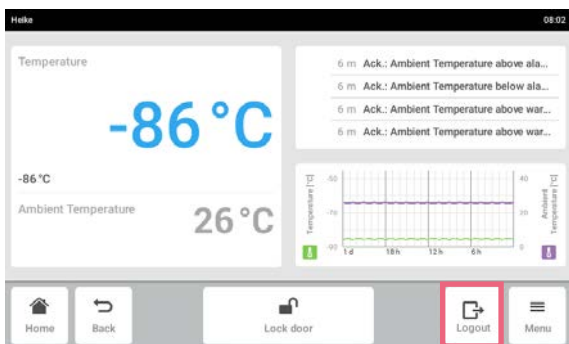


4. If a user is logging in for the first time, the *You are required to change your password/PIN* window will appear.
5. Enter the new PIN in the *Enter new password/PIN* field.
6. Repeat the new PIN in the *Repeat new password/PIN* field to confirm.
The user will be logged in.
The home screen will appear on the touch screen.

8.4.2 Logging off as a user

Prerequisites

- The device is ready for operation.
- The user administration is activated.
- The user accounts have been created.
- You are logged in as user.



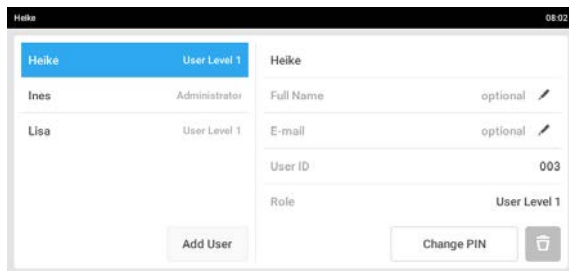
- ▶ Tap *Logout*.
The user will be logged off from the device.

8.4.3 Managing your own user account

Users in the *User* and *Restricted User* user groups can edit the *Full Name*, *E-mail* and *Password/PIN* fields.

Prerequisites

- The device is ready for operation.
- The user administration is activated.
- The home screen appears on the touch screen.
- You are logged in as user.



1. Tap *Menü > Users*.
2. Mark the user account.
3. Edit the user's name in the *Full Name* field.
4. Edit the user's e-mail address in the *E-mail* field.
5. To change the password/PIN, tap *Change Password/PIN*.
6. Enter the current password/PIN in the *Enter current password/PIN* field.
7. Enter the new password/PIN in the *Enter new password/PIN* and *Repeat new password/PIN* fields.
8. Confirm the entry.
If the entries differ, an error message will appear.
If the entries match, the *Password/PIN successfully changed* message will appear.
The new password will then be active.

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9 Maintenance

9.1 Service schedule

Service	Service cycle
Defrost the device.	As required
Clean the interior and exterior of the device.	As required
Clean the seals.	Once a month
Clean the air filter and the air intake grille.	Every 3 months under normal ambient conditions. Clean more frequently if the surroundings are very dusty or dirty.

9.2 Defrosting the device



CAUTION! Risk of slipping due to melt water

Puddles may form on the laboratory floor when defrosting the device.

- ▶ Clean up the melt water immediately.



NOTICE! Damage to device due to scraping off ice.

Removing ice with a sharp object may damage the device.

- ▶ Wait until the ice has thawed by itself.

Tools and auxiliary equipment

- Personal protective equipment: Cold protection gloves, protective goggles, dust protection mask
- Material for absorbing the melt water
- "Defrosting device" notice sign

Prerequisites

- The samples have been transferred to another ULT freezer.
- The device is switched off and disconnected from the mains/power line (see p. 45).

1. Put up the notice sign.
2. Open the outer and inner doors.
3. Wait until the ice has thawed.
4. Absorb the melt water.
5. Dry the interior of the device.

9.3 Cleaning and decontamination

**DANGER! Electric shock.**

- ▶ Switch off the device and disconnect the mains/power plug before commencing any service or cleaning operations.
-

**NOTICE! Damage from the use of aggressive chemicals.**

- ▶ Do not use any aggressive chemicals on the device or its accessories, such as strong and weak bases, strong acids, acetone, formaldehyde, halogenated hydrocarbons or phenol.
 - ▶ If the device has been contaminated by aggressive chemicals, clean it immediately using a mild cleaning agent.
-

9.3.1 Cleaning the device

Tools and auxiliary equipment

- Water
- Mild cleaning agent
- Soft, lint-free cloth

Prerequisites

- For cleaning the interior: The device is switched off and disconnected from the mains/power line.
- The device is defrosted.

1. If required, lift the inner shelf upwards out of the device.
2. Moisten the lint-free cloth with water and cleaning agent.
3. Clean the surfaces.

9.3.2 Cleaning and disinfecting the touch screen

Tools and auxiliary equipment

- Laboratory cleaner
- Lint-free cloth
- Disinfectant: Ethanol 70%, sodium hypochlorite solution 1%, Dismozon pur, Hexaquart S, Biozid ZF or another suitable disinfectant

1. Lock the touch screen.
2. Moisten the lint-free cloth with laboratory cleaner or disinfectant.
3. Wipe the touch screen with the cloth.
4. Unlock the locked touch screen.

9.3.3 Cleaning the seals

Tools and auxiliary equipment

- Dry soft lint-free cloth

1. Wipe the seal with a soft, lint-free cloth.
2. Wipe the contact surface on which the seal is seated with a soft, lint-free cloth.

9.3.4 Cleaning the air filter and the air intake grille



NOTICE! Refrigeration failure due to blocked air filter

If the air filter is blocked, the refrigerant will not be liquefied. This will damage the compressor.

- ▶ Regularly ensure that the air flow into the device is not obstructed.

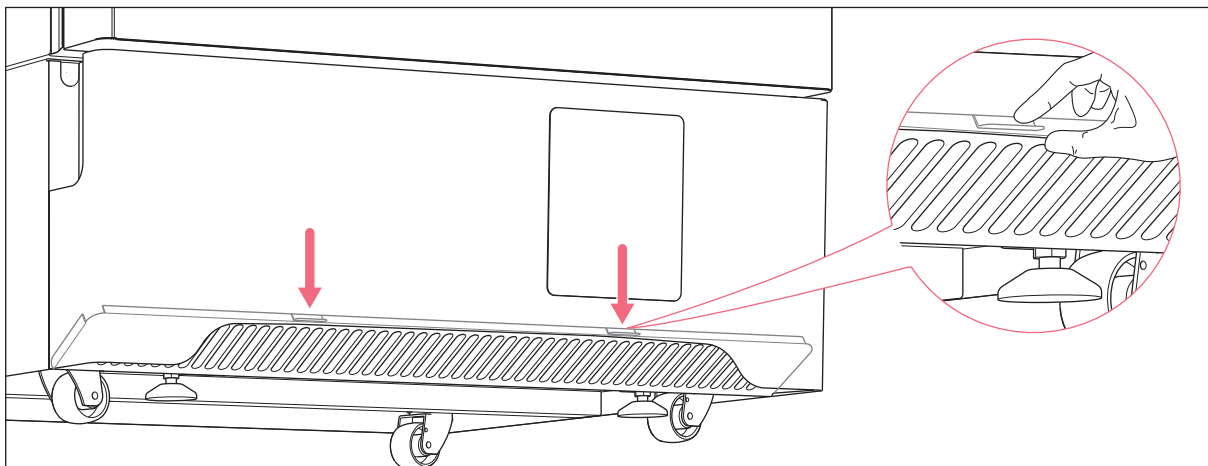


Fig. 9-1: Folding down the air intake grille

An airflow from the surroundings flows through the air filter to the condenser. The airflow carries the heat away from the condenser.

The air filter protects the condenser and the components behind it against contamination and dirt. If the air filter is dirty, not enough air will reach the condenser. The condenser will overheat and the refrigeration system may fail.

Tools and auxiliary equipment

- Vacuum cleaner
- Warm water

1. Place your fingers into the recesses on the air intake grille. Press the air intake grille downwards.
The air intake grille folds down.
2. Remove the air filter.
3. Clean the air intake grille with the vacuum cleaner.

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4. Alternatively, clean the air intake grille with a soft brush.
5. Remove the coarse dirt from the air filter by vacuuming or tapping it.
6. Clean the air filter with warm water.
7. Let the air filter dry.
8. Insert the air filter.
9. Press the air intake grille upwards and close it.

9.3.5 Decontaminating the interior and the inner shelves

The interior and the inner shelves are made of stainless steel.

Tools and auxiliary equipment

- Decontamination agent consisting of 70 % isopropyl alcohol and 30 % distilled water
- Soft, lint-free cloth

Prerequisites

- The device is switched off and disconnected from the mains/power line.
- The device is defrosted.

1. Lift the inner shelf upwards out of the device.
2. Moisten the lint-free cloth with decontamination agent.
3. Clean the surfaces using the lint-free cloth.
The surfaces are dampened with a decontamination agent.
4. Allow the decontamination agent to take effect.
5. Wipe off the decontamination agent with deionized water.
6. Allow the surfaces to dry.

9.4 Fuses

Fuses may only be replaced by authorized service technicians. Users must not replace the fuses.

9.5 Checking the alarm in the case of a mains/power outage

Prerequisites

- The back-up circuit is activated.
- ▶ Switch off the device using the mains/power switch.
The *Mains/power failure* message is displayed on the touch screen.
The interior temperature is displayed on the touch screen.
The control panel's indicator light flashes in 10-second intervals.
The signal tone sounds on the device.
The alarm is forwarded to an external system and to a building management system.

10 Troubleshooting

10.1 General errors

If you cannot remedy an error with the recommended measures, please contact your local Eppendorf partner. The address can be found on the Internet at www.eppendorf.com.

10.1.1 Outer door

Problem	Cause	Solution
The outer door cannot be opened.	<ul style="list-style-type: none"> The door handle is locked. 	<ul style="list-style-type: none"> ▶ Unlock the door handle.
The outer door cannot be opened.	<ul style="list-style-type: none"> The vent tube is blocked. The negative pressure in the interior is preventing the outer door from being opened. 	<ul style="list-style-type: none"> ▶ Wait until pressure compensation has taken place. Balancing the pressure takes 1 to 2 hours. ▶ After opening the outer door, remove the ice from the vent tube.
The outer door cannot be opened.	<ul style="list-style-type: none"> The touch screen is not responding. 	<ul style="list-style-type: none"> ▶ Open the outer door via the emergency release (see <i>Emergency release on p. 93</i>).

10.1.2 Cooling water supply

Problem	Cause	Solution
The device is not in operation.	<ul style="list-style-type: none"> The water inlet and outlet connections are reversed. 	<ul style="list-style-type: none"> ▶ Connect the water inlet and outlet properly.

10.1.3 Software error messages

Problem	Cause	Solution
<i>Cabinet temperature sensor failure. Refrigeration system shut down. Call service.</i>	<ul style="list-style-type: none"> The temperature sensor that measures the interior temperature is not working properly. 	<ul style="list-style-type: none"> ▶ Contact your local Eppendorf partner.
<i>Heat exchanger temperature sensor failure. Refrigeration system shut down. Call service.</i>	<ul style="list-style-type: none"> The temperature probe on the heat exchanger is not working properly. 	
<i>Condenser temperature sensor failure. Refrigeration system shut down. Call service.</i>	<ul style="list-style-type: none"> The temperature probe on the condenser is not working properly. 	

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Problem	Cause	Solution
<i>Ambient temperature sensor failure. Call service.</i>	<ul style="list-style-type: none"> • The temperature probe for the ambient temperature is not working properly. 	
<i>Fan failure. Refrigeration system shut down. Call service.</i>	<ul style="list-style-type: none"> • The fan is not working properly. 	
<i>First stage overpressure. Refrigeration system shut down. Call service.</i>	<ul style="list-style-type: none"> • The pressure of the refrigerant in the first stage refrigeration cycle is too high. 	
<i>Second stage overpressure. Refrigeration system shut down. Call service.</i>	<ul style="list-style-type: none"> • The pressure of the refrigerant in the second stage refrigeration system is too high. 	
<i>Battery voltage low. Set battery switch to "I" to charge.</i>	<ul style="list-style-type: none"> • The battery's charge status is low. 	<ul style="list-style-type: none"> ▶ Switch on the battery switch.
<i>Mains/power failure. Check power supply to the device.</i>	<ul style="list-style-type: none"> • Mains/power failure • The battery is only supplying the display with power. 	<ul style="list-style-type: none"> ▶ Check to see if the mains/power cord is connected properly. ▶ Check to see if the device is switched on at the mains/power switch. ▶ Contact your local Eppendorf partner.
<i>First stage compressor failure. Refrigeration system shut down. Call service.</i>	<ul style="list-style-type: none"> • The first-stage refrigeration cycle's compressor is faulty. 	<ul style="list-style-type: none"> ▶ Contact your local Eppendorf partner.
<i>Second stage compressor failure. Refrigeration system shut down. Call service.</i>	<ul style="list-style-type: none"> • The second-stage refrigeration cycle's compressor is faulty. 	<ul style="list-style-type: none"> ▶ Contact your local Eppendorf partner.
<i>Starting first stage compressor failed.</i>	<ul style="list-style-type: none"> • The first-stage refrigeration cycle's compressor is not starting. 	<ul style="list-style-type: none"> ▶ Contact your local Eppendorf partner if the device's interior temperature rises.
<i>Starting second stage compressor failed.</i>	<ul style="list-style-type: none"> • The second-stage refrigeration cycle's compressor is not starting. 	

10.2 Emergency release

If the outer door does not open, you can release the electronic lock manually. To this end, use the emergency release key included in the delivery package.

1. Insert the emergency release key in the mechanical lock on the outer door.
2. Open the lock.
3. Open the outer door using the handle.

10.3 Mains/power outage

During a mains/power outage, no mains/power supply is supplied to the device. The device will trigger the "Mains/power outage" alarm (see p. 27). The "Mains/power outage" alarm signals will end when the device is once again supplied with power.

During longer mains/power outages, the interior temperature of the device may rise to a level outside of the alarm limits and warning limits. When the device is once again supplied with power, the "Interior temperature" hazard message will be triggered.

10.4 Heating up of the interior

When the doors of the device are open, warm ambient air will enter the device. The temperature inside the device will increase.

If the interior temperature is outside of the alarm limits or warning limits, the device will trigger the "Temperature" and "Door" hazard messages (see p. 27). To avoid the inside of the device heating up, only open the outer door and the inner doors briefly.

Troubleshooting

CryoCube® F740hi, F740hiw
English (EN)

11 Transport, storage and disposal

11.1 Decommissioning

Tools and auxiliary equipment

- Adhesive tape

Prerequisites

- Racks and samples have been transferred to another ULT freezer.

1. Secure the air intake grille with adhesive tape.
2. Disable the back-up circuit (see p. 45).
3. Disconnect the device from the voltage supply (see p. 45).
4. Remove the safety clamp of the mains/power cord. Remove the mains/power cord from the device.
5. Devices with cooling water supply: Close the water inlet. Drain cooling water from the device.
6. Defrost the device (see p. 87).
7. Decontaminate the device (see p. 90).

11.2 Transport



DANGER! Risk of injury due to tipping of the device

If the device tips over and falls on a person, the person may sustain fatal injuries.

- ▶ Transport the device with a sufficient number of helpers.
- ▶ Do not transport the device over ramps at an angle > 17% (10°). Transport the device sideways over ramps.
- ▶ Only lift the device with a transport aid.



CAUTION! Risk of foot injury due to little ground clearance

Feet can easily get trapped under the device.

- ▶ Wear safety shoes with steel toes.



NOTICE! Damage to device due to lifting the device without the original pallet

Lifting the device without the original pallet will damage the base of the device.

1. Place the device on the original pallet.
2. Secure the device.
3. Use a transport aid to lift the device.



NOTICE! Damage to the compressors and the refrigeration cycle due to tilting of the device

Tilting the device or transporting it in a horizontal position will damage the compressors and the refrigeration cycle. Refrigerant and oil may leak out.

- ▶ Transport the device in an upright position.
- ▶ After setting up the device, wait for 6 h before switching it on.

Transport, storage and disposal

CryoCube® F740hi, F740hiw
English (EN)

**NOTICE! Damage due to exposing the compressors to shocks**

Shocks may dislodge the compressors from the brackets.

- ▶ Move the device with due caution and care.
- ▶ Do not knock the device into anything.
- ▶ Protect the device from shocks.

**NOTICE! Damage to electronic components due to condensation.**

Condensate may form in the device when it has been transported from a cool environment to a warmer environment.

- ▶ After installing the device, wait for at least 6 h. Only then connect the device to the mains/power line.

**NOTICE! Damage to the door handle due to too high loads**

Pulling or pushing the device on the door handle during transport may damage the door handle.

- ▶ Grip the device at the housing to pull or push it.

**NOTICE! Transport damage to the control panel**

The control panel protrudes from the door. The control panel may get damaged during transport.

- ▶ Only transport the device with the transport protection attached to the control panel.
-

11.2.1 Preparing the device for transport

Tools and auxiliary equipment

- Open-end wrench
- Adhesive tape

Prerequisites

- Racks and samples have been transferred to another ULT freezer.

1. Secure the air intake grille with adhesive tape.
2. Disable the back-up circuit (see p. 45).
3. Disconnect the device from the voltage supply (see p. 45).
4. Remove the safety clamp of the mains/power cord. Remove the mains/power cord from the device.
5. Devices with cooling water supply: Close the water inlet.
6. Use the open-end wrench to turn the leveling feet upward (Fig. 4-1 on p. 35).

11.2.2 Transporting the device

Personal protective equipment

- Protective clothing, safety shoes

Tools and auxiliary equipment

- Transport aid
- Original pallet

General transport

1. Transport the device in an upright position.
2. Grip the device at the housing and wheel it to its new location.
Do not grip the device at the door handle.

Lifting the device

3. Place the device on the original pallet and secure it.
4. Lift the device with a transport aid.

Sloping surfaces

5. Transport the device sideways over ramps.
6. Do not transport the device over ramps at an angle > 17 % (10°).

Narrow passageways

7. Open the door of the device 180°.
8. Push the device, with one side panel to the front, through the passageway.

If the passageway is too narrow for the device, housing parts may have to be disassembled. Contact your local Eppendorf partner for more information.

Outside of buildings

9. Transport the device with a transport aid.

The heavy-duty castors are not suitable for transport outside of buildings.



If you need help to transport the device, contact the authorized service.

Transport, storage and disposal

CryoCube® F740hi, F740hiw
English (EN)

11.3 Shipping

11.3.1 Shipping regulations

ULT freezers have the UN number 3358 (Refrigerating machines containing flammable, non-toxic, liquid gas) and are subject to the relevant regulations. ULT freezers containing less than 100 g of flammable refrigerant are exempt from these regulations.

The ULT freezers contain more than 100 g of flammable refrigerant. These devices must not be transported by air freight.

11.3.2 Shipping the device

**WARNING! Risk of personal injury due to contamination.**

People may get contaminated if you store or ship a contaminated device.

- ▶ Clean and decontaminate the device before shipping or storage.

**NOTICE! Risk of damage due to incorrect packaging.**

Eppendorf AG is not liable for any damage caused by improper packaging.

- ▶ Only store and transport the device in its original packaging.
 - ▶ If you do not have the original packaging, request original packaging from Eppendorf AG.
-

Prerequisites

- The device has been taken out of operation (see p. 95).
- The device has been cleaned and decontaminated.
- The original packaging is available.

1. Download the "Decontamination declaration for product returns" from www.eppendorf.com.
2. Complete the decontamination declaration.
3. Pack the device.
4. Put the decontamination declaration into the packaging.
5. Ship the device according to the shipping regulations.



For service and repairs, send the device to Eppendorf AG or to an authorized service partner.

11.4 Disposal

If the product needs to be disposed of, the relevant legal regulations must be observed.

Information on the disposal of electrical and electronic devices in the European Community:

Within the European Community, the disposal of electrical devices is regulated by national regulations based on EU Directive 2012/19/EU pertaining to waste electrical and electronic equipment (WEEE).

According to these regulations, any devices supplied after August 13, 2005, in the business-to-business sphere, to which this product is assigned, may no longer be disposed of in municipal or domestic waste. To document this, they have been marked with the following marking:



Do not dispose of batteries together with domestic waste. Dispose of batteries in accordance with local, legal regulations.

Because disposal regulations may differ from one country to another within the EU, please contact your supplier if necessary.

Transport, storage and disposal

CryoCube® F740hi, F740hiw

English (EN)

12 Technical data

12.1 Power supply

Mains/power supply voltage	100 V – 230 V ±10 %		
Mains/power frequency	50 Hz - 60 Hz		
Current consumption	100 V – 230 V (50 Hz); 15 A – 6 A 100 V – 220 V (60 Hz); 12 A – 6 A		
Power consumption The device is empty. The interior temperature is -80 °C. The ambient temperature is 20 °C.	CryoCube F740hi	(100 V) (120 V) (208 V) (230 V)	11.6 kWh/day 11.6 kWh/day 10.5 kWh/day 10.5 kWh/day
	CryoCube F740hiw	(100 V) (120 V) (208 V) (230 V)	11.7 kWh/day 11.7 kWh/day 10.6 kWh/day 10.6 kWh/day
Electromagnetic compatibility (EMC)	The device meets the following requirements: <ul style="list-style-type: none"> • IEC/EN 61326-1 • EN 55011 (CISPR 11) • FCC Part 15 – Class A 		
Overvoltage category	II		
Degree of pollution	2		

12.2 Ambient conditions

12.2.1 Operation

Environment	For indoor use only
Ambient temperature	15 °C – 32 °C
Relative humidity	Maximum 80 %, non-condensing
Atmospheric pressure	80 kPa – 106 kPa

12.2.2 Transport

	Air temperature	Relative humidity	Atmospheric pressure
General transport	-20 °C – 35 °C	10 % – 91 %	30 kPa – 106 kPa

These devices may not be transported by air freight.

12.2.3 Storage

	Air temperature	Relative humidity	Atmospheric pressure
In transport packaging	-20 °C – 35 °C	10 % – 91 %	70 kPa – 106 kPa
Without transport packaging	-20 °C – 35 °C	10 % – 91 %	70 kPa – 106 kPa

Technical data

CryoCube® F740hi, F740hiw
English (EN)

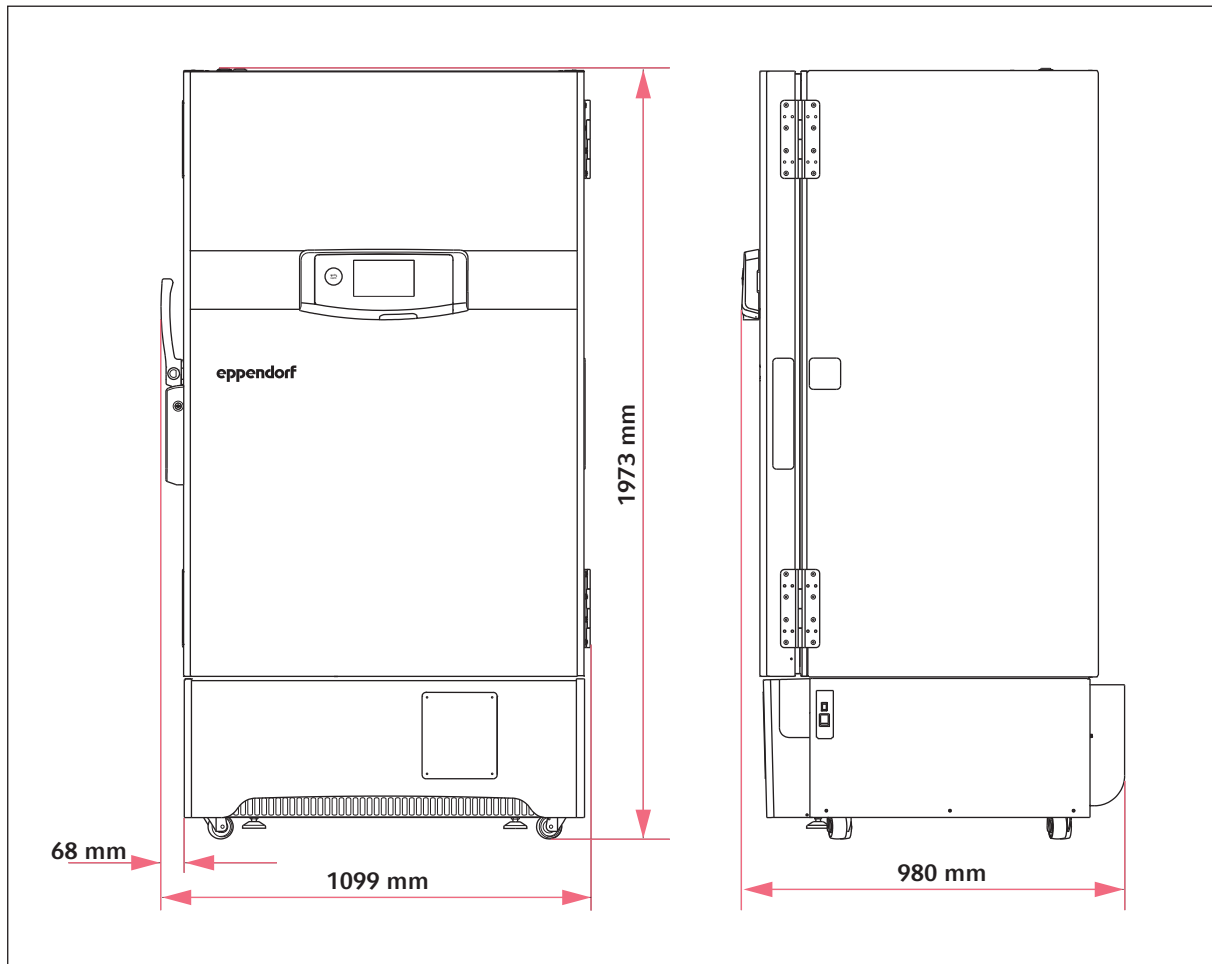
12.3 Dimensions**12.3.1 External dimensions**

Fig. 12-1: External dimensions

12.3.2 Internal dimensions

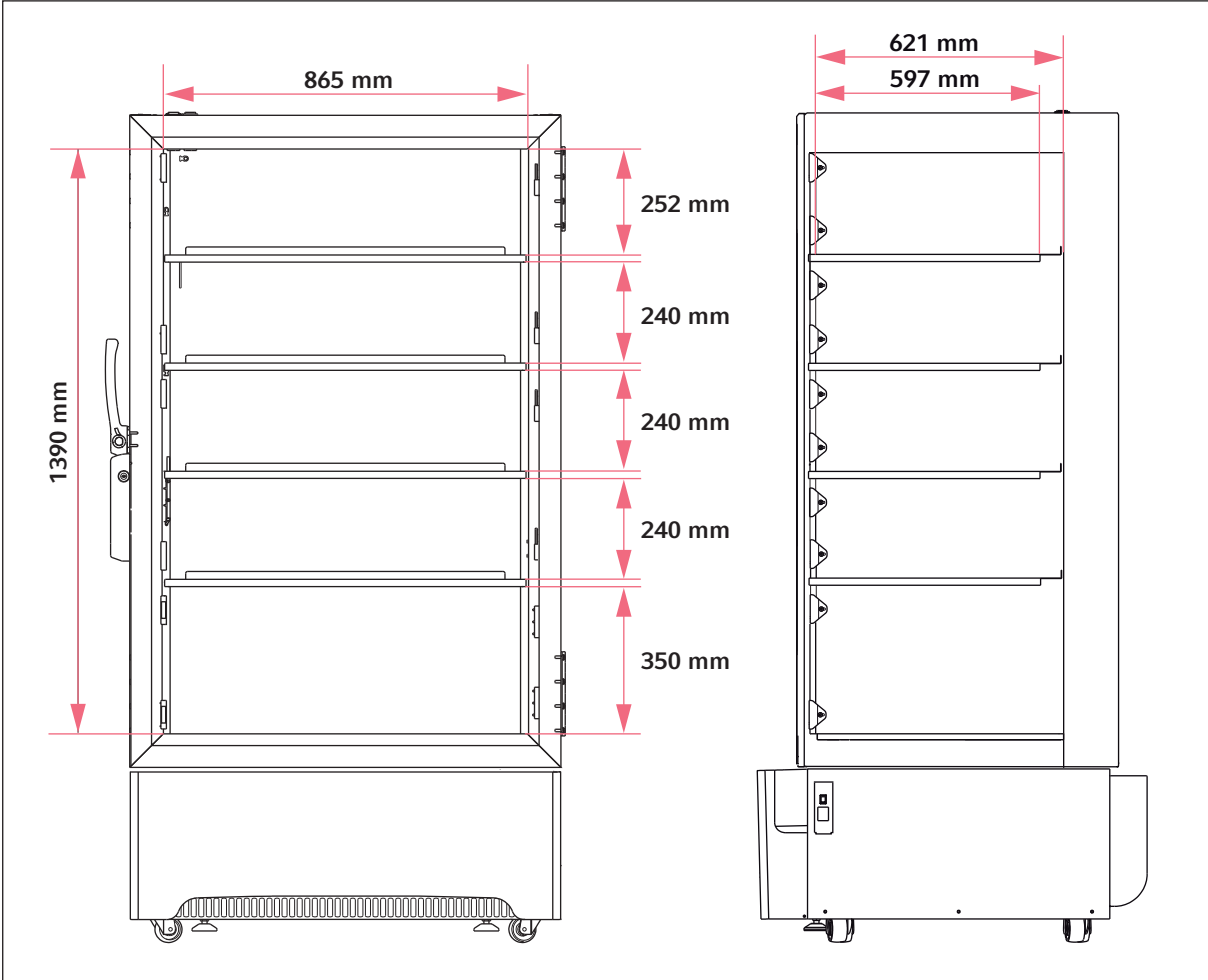


Fig. 12-2: Internal dimensions for devices with 5 inner compartments

Technical data

CryoCube® F740hi, F740hiw
English (EN)

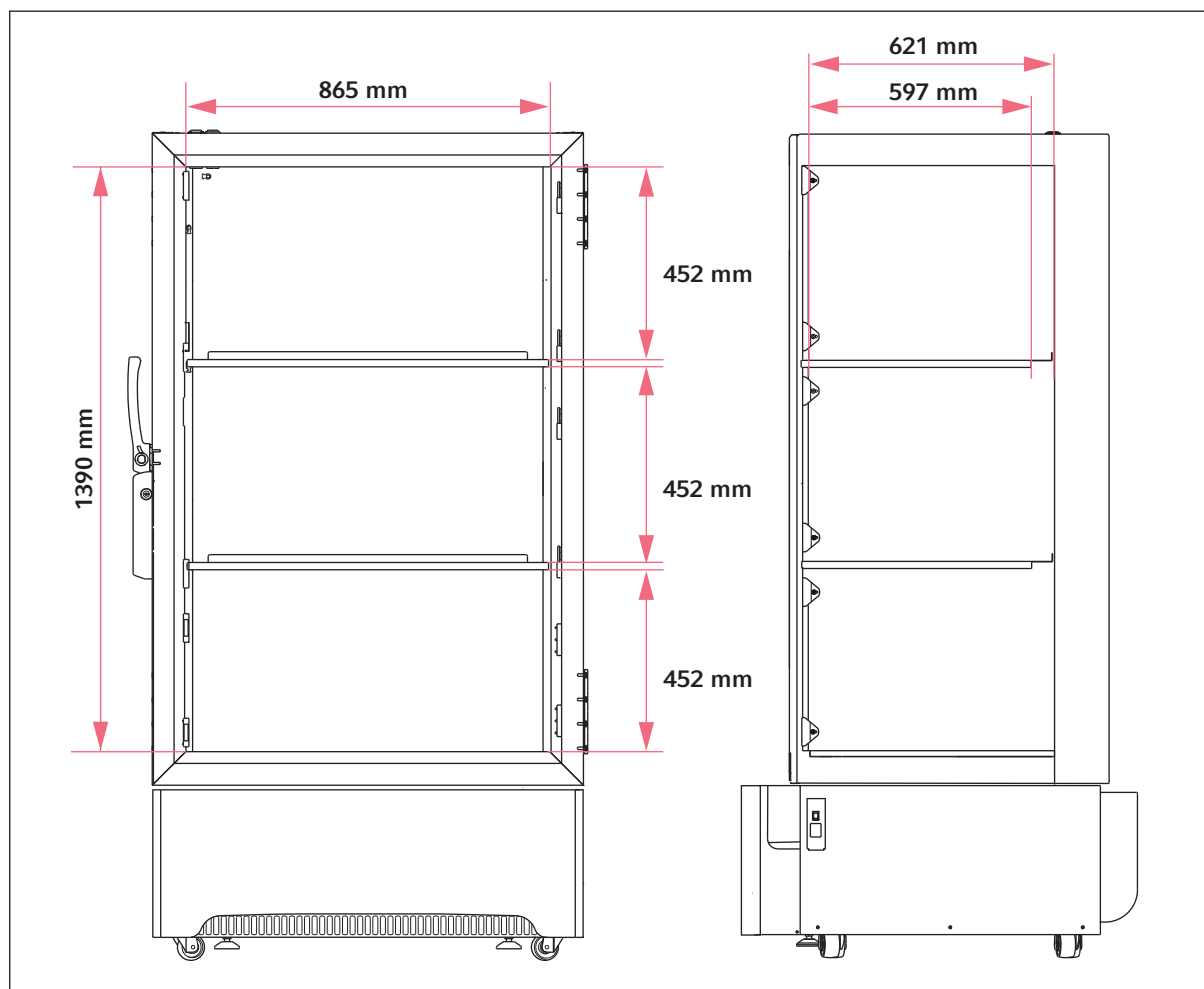


Fig. 12-3: Internal dimensions for devices with 3 inner compartments

12.3.3 Packing dimensions

Width	1200 mm
Depth	1045 mm
Height	2225 mm

12.4 Weight

Device	Model with 3 compartments	Model with 5 compartments
CryoCube F740hi	331 kg	344 kg
CryoCube F740hiw	320 kg	328 kg

Packaged device	Model with 3 compartments	Model with 5 compartments
CryoCube F740hi	382 kg	395 kg
CryoCube F740hiw	369 kg	377 kg

12.5 Noise level

CryoCube F740i	41.3 dB (A)
CryoCube F740iw	41.3 dB (A)
CryoCube F740	47.8 dB (A)
CryoCube F740hi	41.3 dB (A)
CryoCube F740hiw	41.3 dB (A)

12.6 Interfaces

USB	
Ethernet	
BMS	Remote alarm
Serial interface	RS-485

Only connect devices that comply with the IEC 60950 (UL 60590) standards to the interfaces.

12.7 Cooling water supply

12.7.1 Device connection

Connection for water inlet and water outlet	Whitworth pipe thread 15 mm × 12.7 mm (1/2" BSP) acc. to DIN 2999
---	--

12.7.2 Building connection

Pressure at the water inlet	100 kPa – 1000 kPa
Pressure difference between water inlet and outlet	50 Pa
Nominal volume for the dimensioning of the cooling water supply	3.8 L/min

12.7.3 Cooling water

Temperature at the water inlet	7 °C – 25 °C
Cooling water quality	Clean Free of particles that could clog the valves and the temperature sensors

12.7.4 Cooling water hose

Pressure resistance	1000 kPa
Temperature resistance	25 °C
	To avoid algae growth, use oxygen-tight hoses.

Technical data

CryoCube® F740hi, F740hiw
English (EN)

12.7.5 Water filter

If well water is used, mount the water filter in front of the device's water inlet.

Mesh size	0.25 mm (60 mesh)
-----------	-------------------

12.8 Temperature control**12.8.1 Temperature range**

Setting range	-50 °C to -86 °C
---------------	------------------

12.8.2 Times for cooling and heating the interior

Cooling from 22 °C to -80 °C	CryoCube F740hi	4 h 10 min
	CryoCube F740hiw	4 h 10 min
Heating from -80 °C to 0 °C The device is 2/3 full.	CryoCube F740hi	45 h
	CryoCube F740hiw	45 h

12.8.3 Cooling of the refrigeration cycle

CryoCube F740hi	Air cooling
CryoCube F740hiw	Water cooling

12.8.4 Refrigerant

Device	Refrigeration cycle 1	Refrigeration cycle 2
CryoCube F740hi	R-290 (96 g)	R-170 (106 g)
CryoCube F740hiw	R-290 (96 g)	R-170 (106 g)

Refrigerant	Components
R-170	Ethane
R-290	Propane

12.9 Additional specifications

12.9.1 Capacity and carrying capacity

Capacity	740 L
Carrying capacity per inner shelf	150 kg
Carrying capacity per device	420 kg

12.9.2 Materials

Outer door insulation	Vacuum insulation panels Polyurethane foam
Device insulation	Vacuum insulation panels Polyurethane foam
Interior	Stainless steel (304 2B)

Technical data

CryoCube® F740hi, F740hiw
English (EN)

13 Ordering information

13.1 Accessories

13.1.1 Back-up systems

Order no. (International)	Description
	CO2 back-up system
F652999005	100 V/50 Hz - 60 Hz
U9043-0002	120 V - 220 V/60 Hz
U9043-0004	230 V/ 50 Hz
	LN2 back-up system
F652999006	100 V/50 Hz - 60 Hz
U9044-0002	120 V - 220 V/60 Hz
U9044-0004	230 V/ 50 Hz

13.1.2 Chart recorder

Order no. (International)	Description
	Chart recorder type 2
	Connection to mains/power supply in the ULT freezer
F652999001	100 V/120 V, 50 Hz – 60 Hz
F652999002	208 V – 230 V, 50 Hz – 60 Hz
	Discs for chart recorder type 2
	-100 °C – 0 °C
F625999003	60 pieces

Ordering information

CryoCube® F740hi, F740hiw
English (EN)

13.1.3 Racks

Order no. (International)	Description
	Rack with drawers for devices with 3 compartments, material stainless steel
6001 072.210	depth 563 mm, width 140 mm, height 449 mm, drawer height 53 mm
6001 072.910	depth 563 mm, width 140 mm, height 412 mm, drawer height 64 mm
6001 072.310	depth 563 mm, width 140 mm, height 414 mm, drawer height 76 mm
6001 072.410	depth 563 mm, width 140 mm, height 431 mm, drawer height 102 mm
6001 072.510	depth 563 mm, width 140 mm, height 414 mm, drawer height 127 mm
	Rack with drawers for compartments 1 - 4 for devices with 5 compartments, material stainless steel
6001 022.210	depth 563 mm, width 140 mm, height 231 mm drawer height 53 mm
6001 022.910	depth 563 mm, width 140 mm, height 204 mm drawer height 64 mm
6001 022.310	depth 563 mm, width 140 mm, height 166 mm drawer height 76 mm
6001 022.410	depth 563 mm, width 140 mm, height 216 mm drawer height 102 mm
	Rack with drawers for compartment 5 for devices with 5 compartments, material stainless steel
6001 082.210	depth 563 mm, width 140 mm, height 346 mm drawer height 53 mm
6001 082.910	depth 563 mm, width 140 mm, height 344 mm drawer height 64 mm
6001 082.310	depth 563 mm, width 140 mm, height 331 mm drawer height 76 mm
6001 082.410	depth 563 mm, width 140 mm, height 324 mm drawer height 102 mm
6001 082.510	depth 563 mm, width 140 mm, height 276 mm drawer height 127 mm
	Rack with side access for devices with 3 compartments, material stainless steel
6001 071.210	depth 569 mm, width 139 mm, height 444 mm drawer height 53 mm
6001 071.910	depth 569 mm, width 139 mm, height 406 mm drawer height 64 mm
6001 071.310	depth 569 mm, width 139 mm, height 412 mm drawer height 76 mm
6001 071.410	depth 569 mm, width 139 mm, height 444 mm drawer height 102 mm
6001 071.510	depth 569 mm, width 139 mm, height 414 mm drawer height 127 mm
6001 071.110	depth 549 mm, width 139 mm, height 444 mm, with compartments for deepwell plates
	Rack with side access for compartments 1 - 4 for devices with 5 compartments, material stainless steel
6001 021.210	depth 569 mm, width 139 mm, height 230 mm drawer height 53 mm
6001 021.910	depth 569 mm, width 139 mm, height 205 mm drawer height 64 mm
6001 021.310	depth 569 mm, width 139 mm, height 167 mm drawer height 76 mm
6001 021.410	depth 569 mm, width 139 mm, height 230 mm drawer height 102 mm
6001 021.110	depth 549 mm, width 139 mm, height 224 mm, with compartments for deepwell plates
	Rack with side access for compartment 5 for devices with 5 compartments, material stainless steel
6001 081.210	depth 569 mm, width 139 mm, height 343 mm drawer height 53 mm
6001 081.910	depth 569 mm, width 139 mm, height 339 mm drawer height 64 mm
6001 081.310	depth 569 mm, width 139 mm, height 330 mm drawer height 76 mm
6001 081.410	depth 569 mm, width 139 mm, height 343 mm drawer height 102 mm
6001 081.510	depth 569 mm, width 139 mm, height 227 mm drawer height 122 mm
6001 081.110	depth 569 mm, width 139 mm, height 343 mm, with compartments for deepwell plates

13.1.4 Cardboard boxes and box dividers

Order no. (International)	Description
B50-SQ B75-SQ B95-SQ	Cardboard box width 133 mm, depth 133 mm, height 50 mm width 133 mm, depth 133 mm, height 75 mm width 133 mm, depth 133 mm, height 100 mm
D49 D64 D81 D100	Box divider for 7 × 7 vessels, maximum vessel diameter 17.4 mm for 8 × 8 vessels, maximum vessel diameter 15 mm for 9 × 9 vessels, maximum vessel diameter 13 mm for 10 × 10 vessels, maximum vessel diameter 11.8 mm

13.1.5 Eppendorf Storage Boxes

Order no. (International)	Description
0030 140.508	Eppendorf Storage Box 10 × 10, 2 inch height 52.8 mm, for 100 cryogenic tubes with internal thread 3 pieces
0030 140.516	Eppendorf Storage Box 9 × 9, 2 inch height 52.8 mm, for 81 screw cap (cryogenic) tubes 1 mL - 2 mL 3 pieces
0030 140.524	Eppendorf Storage Box 8 × 8, 2 inch height 52.8 mm, for 64 micro test tubes 1 mL - 2 mL 3 pieces
0030 140.532	Eppendorf Storage Box 8 × 8, 2.5 inch height 63.5 mm, for 25 micro test tubes 5 mL 4 pieces
0030 140.540	Eppendorf Storage Box 9 × 9, 3 inch height 76.2 mm, for 81 screw cap (cryogenic) tubes 3 mL 2 pieces
0030 140.567	Eppendorf Storage Box 9 × 9, 4 inch height 101.6 mm, for 81 screw cap (cryogenic) tubes 4 mL - 5 mL 2 pieces
0030 140.583	Eppendorf Storage Box 5 × 5, 5 inch height 127 mm, for 25 conical tubes 15 mL 2 pieces
0030 140.591	Eppendorf Storage Box 3 × 3, 5 inch height 127 mm, for 9 conical tubes 50 mL and 4 conical tubes 15 mL 2 pieces
0030 140.613	Eppendorf Storage Box 5 × 5, 3 inch height 76.2 mm, for 25 screw cap tubes 5 mL 2 pieces

Ordering information

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13.1.6 VisioNize system

Further information about the Eppendorf VisioNize system can be found on the www.eppendorf.com webpage. Contact your local Eppendorf partner for more information.

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Declaration of Conformity

The product named below fulfills the requirements of directives and standards listed. In the case of unauthorized modifications to the product or an unintended use this declaration becomes invalid. This declaration of conformity is issued under the sole responsibility of the manufacturer.

Product name:

CryoCube® F740i, CryoCube® F740iw, CryoCube® F740hi, CryoCube® F740hiw

including accessories

F740310011
F740320011
F740310111

F740310021
F740320021
F740310131

F740310031
F740320031
F740320111

F740310041
F740320041
F740320131

Product type:

Ultra- low temperature freezer

“i” designates model with touch user interface, in general

“i” designates model with refrigerant hydrofluorocarbon, air- cooled

“iw” designates model with refrigerant hydrofluorocarbon, water- cooled

“hi” designates model with refrigerant hydrocarbon, air- cooled

“hiw” designates model with refrigerant hydrocarbon, water- cooled

Relevant directives / standards:

2014/35/EU: EN 61010- 1

UL 61010- 1 (except F740hiw), CAN/CSA C22.2 No. 61010- 1 (except F740hiw)

2014/30/EU: EN 61326- 1

47 CFR FCC part 15

2011/65/EU: EN 50581

2014/68/EU: EN 378- 2 (partial)

Hamburg, October 04, 2017



Dr. Wilhelm Plüster
Management Board



Dr. Thomas Uschkureit
Portfolio Management

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