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CellXpert® C170i

Operating manual

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1 Operating instructions











1.1 Using this manual

- ▶ Read this operating manual thoroughly before using the device for the first time. Also observe the instructions for use of the accessories.
- ▶ This operating manual is part of the product. It must always be kept easily accessible.
- ▶ Enclose this operating manual when transferring the device to third parties.
- ▶ You will find the current version of the operating manual for all available languages on our website at www.eppendorf.com/manuals.

1.2 Danger symbols and danger levels

The safety instructions of this operating manual indicate the following danger symbols and danger levels:

1.2.1 Danger symbols

	Hazard point		Hot surface
	Electric shock		Material damage
	Explosion		Heavy load
	Inhalation		Danger of cuts
	Biohazard		Magnetic fields

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

2 Safety

2.1 Intended use

The CellXpert C170i CO₂ incubator is designed to and serve to provide a stable and homogeneous atmosphere required for cell culture by controlling temperature, carbon dioxide, and optionally oxygen for cultivating samples and cells from biological laboratories. It is intended exclusively for use indoors and for operation by qualified staff for research purposes only.



CAUTION! Lack of safety due to incorrect accessories or spare parts

- ▶ Accessories and spare parts that are not recommended by Eppendorf compromise the safety, functions, and precision of the device. Eppendorf cannot be held liable or accept any liability for damage resulting from the use of non-recommended accessories and spare parts.
- ▶ Only use accessories and original spare parts recommended by Eppendorf.

2.2 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.



CAUTION! Risk of personal injury or damage to equipment due to misappliance of equipment

- ▶ The equipment must be operated as described in this manual. If operational guidelines are not followed, equipment damage and personal injury can occur.
- ▶ Do not use the equipment in a hazardous atmosphere or with hazardous materials for which the equipment was not designed.
- ▶ Eppendorf is not responsible for any damage to the equipment that may result from the use of an accessory not manufactured by Eppendorf.

2.3 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.

2.4 Application limits

2.4.1 Description of ATEX Guideline 94/9EC



DANGER! Explosion hazard

- ▶ Do not operate the device in areas where work is completed with explosive substances.
- ▶ Do not use this device to process any explosive or highly reactive substances.
- ▶ Do not use this device to process any substances which could create an explosive atmosphere.



DANGER! Explosion hazard

- ▶ Use gases in this equipment only within the range between their lower explosion limit (LEL) and their upper explosion limit (UEL).
- ▶ If your process requires or produces gases, be sure to verify their LEL and UEL concentration range (available online or ask your gas supplier).



CAUTION! Lack of safety due to incorrect use of materials

- ▶ Do not use this device to process any flammable materials, or use materials where the transfer of mechanical energy to glass apparatus could lead to breakage.

Due to its design and the ambient conditions in its interior, the device is not suitable for use in potentially explosive atmospheres.

The device may only be used in a safe environment, e.g., the open atmosphere of a ventilated lab.

The use of substances which may contribute to a potentially explosive atmosphere is not permitted.

The final decision regarding the risks associated with using these types of substances is the user's responsibility.

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 Warnings for intended use

Before using the device, read the operating manual and observe the following general safety instructions.

2.6.1 Personal injury and damage to device



DANGER! Unconsciousness and death by elevated levels of CO₂

Elevated levels of CO₂ may be found in the operating area of the CO₂ incubator.

- ▶ Wear personal protective equipment.
- ▶ If the laboratory is not properly ventilated, use a CO₂/O₂ alarm system.
- ▶ Check the tube connection system with a leakage test.
- ▶ Read the *Information on performing a risk assessment for the operation of incubators with CO₂ and N₂* from Eppendorf AG.



WARNING! Lack of safety due to incorrect gas installation or insufficient ventilation

- ▶ Only trained personnel may install and connect the gas tubing.



WARNING! Risk of suffocation

- ▶ Observe the national guidelines on handling gases and on the equipment and operation of laboratories.
- ▶ Prevent a too high concentration of CO₂ in breathing air while working in the laboratory.
- ▶ Prevent a displacement of O₂ in breathing air due to working with N₂.



WARNING! Risk of personal injury

Burns due to hot surface.

- ▶ Do not touch the equipment during the high-temperature disinfection cycle.
- ▶ Do not open the doors during the cycle.
- ▶ Do not open the doors after a system crash or a mains/power outage during the high-temperature disinfection.



WARNING! Risk of personal injury

Scalding due to hot water.

- ▶ Remove water from the water tray before starting the high-temperature disinfection cycle.



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.
- ▶ Consult the "Laboratory Biosafety Manual" (source: World Health Organization, Laboratory Biosafety Manual, in its respectively current valid version).

Safety

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**WARNING! Damage to health due to toxic, radioactive or aggressive chemicals.**

- ▶ Wear your personal protective equipment.
- ▶ Observe the national regulations for handling these substances.
- ▶ Observe the material safety data sheets and manufacturer's application notes.

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

- ▶ Only switch on the device if the device and the 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).

**WARNING! Danger due to strong magnetic field**

Magnetic fields may affect pacemakers and defibrillators. Pacemakers may be reset.

- ▶ Keep a distance of at least 20 cm from the magnet.

**WARNING! Risk of personal injury**

- ▶ Do not open the device!
- ▶ Do not operate a broken device! (E.g. if the exterior is damaged)
- ▶ Do not modify the device!

**WARNING! Risk of personal injury and equipment damage**

The incubator or incubators may topple, if they are not fixed with a safety latch.

- ▶ Each incubator or stack of two incubators on a stacking stand must be fixed to the wall with a safety latch.

**CAUTION! Risk of personal injury**

- ▶ At least 4 people are required to safely lift the incubator.
- ▶ The incubator has a high center of gravity. Make sure that it does not topple over when it is moved.

**CAUTION! Risk of personal injury**

- ▶ Observe the safety standards of your lab.
- ▶ Use your personal protective equipment.

**CAUTION! Risk of personal injury**

- ▶ Before closing the glass door, make sure that the shelves are properly installed inside the chamber. Slamming the glass door against the shelf could cause broken glass and injury.



NOTICE! Material damage from incorrect connections.

- ▶ Only electrical connections may be made to devices described in the operating manual.
- ▶ Other connections are permitted only with the agreement of Eppendorf AG.
- ▶ Only connect devices that meet the safety requirements defined in IEC 60950-1.



NOTICE! Damage to the incubator

Lifting the incubator by the door will cause permanent damage to the incubator.

- ▶ Lift the incubator only by the lifting handles.
- ▶ Never lift the incubator by its door.



NOTICE! Damage to door latch and hinge

- ▶ Do not lean on the door.
- ▶ Do not put any items on the door.



NOTICE! Risk of material damage

- ▶ Never put any liquid material on the top of the incubator. Spilled liquid could cause a short circuit. This will cause permanent damage to the incubator.



NOTICE! Risk of material damage

- ▶ To avoid possible damage to the CO₂ sensor due to condensation, never leave water in the water tray while the incubator is switched off, or when a high-temperature disinfection cycle is initiated.



NOTICE! Risk of material damage

The gas tubing and in-line gas filter will burst or crack due to high pressure.

- ▶ Incoming CO₂ and N₂ gas pressure must not exceed 0.15 MPa (1.5 bar, 21.8 psi).



NOTICE! Risk of material damage

- ▶ Remove the RH sensor before using high-temperature disinfection.



NOTICE! Risk of material damage

- ▶ The instrument or equipment, and its external connections, to be used inside the chamber should be specified as suitable for use in a humid environment, and at 37 °C. If in doubt, consult with the manufacturer of the equipment.
- ▶ Always ensure that the connections are properly and securely made.
- ▶ Instruments transfer heat into the chamber. Do not allow too much heat to be transferred into the chamber. Too much heat will affect the temperature control or activate the temperature limiter; this could cause the loss of sample.



NOTICE! Risk of material damage

- ▶ Do not modify the device; this could cause the loss of sample.



NOTICE! Damage due to overheating

- ▶ Do not place the device close to sources of heat (e.g., radiator, drying cabinet).
- ▶ Do not expose the device to direct sunlight.
- ▶ Ensure that all sides of the device are in an adequate distance from the wall and adjacent devices to guarantee unobstructed air circulation.



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.







The mains/power switch and the cutting unit of the mains/power line must be easily accessible during operation (e.g., residual current circuit breaker).



If high-temperature settings are used, be aware of heated parts, when touching the incubator or coming into contact with interior parts.

2.7 Warning signs on the device

Symbol	Meaning	Location
	Hazard point ▶ Observe the operating manual	On the name plate at the rear of the device
	Risk of burns from hot surfaces	Top left and right on the door panel, visible when outer door is opened
	Read the operating manual	Right side, next to the mains/power switch
	Warning Strong magnetic fields produced by the magnets used for door locking	Top left and top right on the front panel, visible when outer door is opened. Right side next to the door closing magnets (left side when door hinge is on the right side).

2.8 Name plate

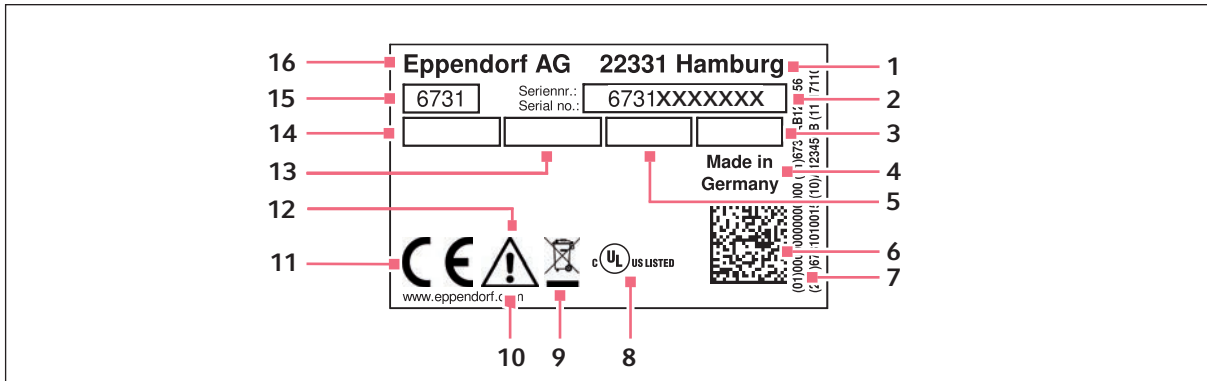


Fig. 2-1: Name plate

1	Manufacturer address
2	Serial number
3	Power consumption
4	Place of origin
5	Current consumption
6	Data matrix code
7	Content of the data matrix code
8	UL certification mark
9	Waste Electrical and Electronic Equipment Directive
10	Manufacturer web address
11	CE certification mark
12	Caution: Hazard point Read the manual which refers to the hazard points.
13	Frequency
14	Voltage
15	Device number
16	Manufacturer

3 Product description
3.1 Product overview
3.1.1 CellXpert C170i

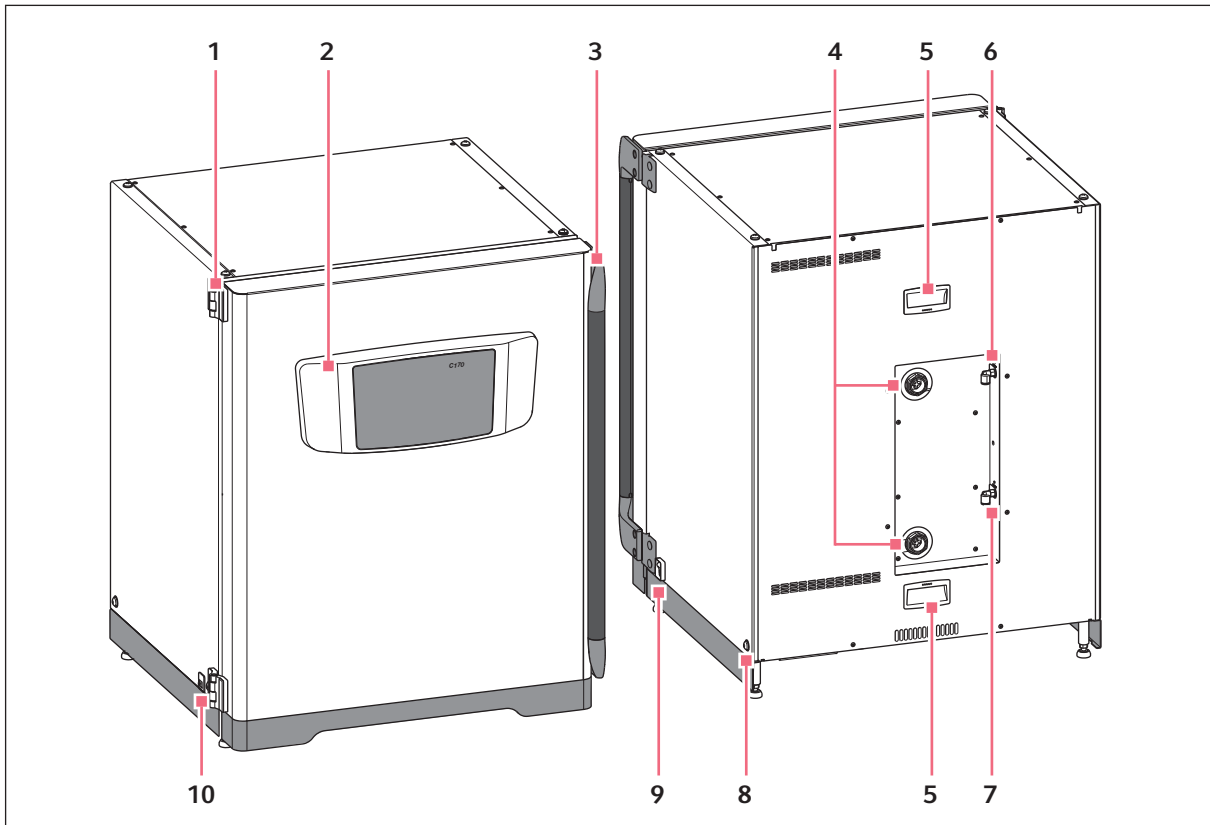


Fig. 3-1: CellXpert C170i: Front and rear view

- | | |
|---|--|
| 1 Door hinge | 6 CO₂ gas connection |
| 2 Control panel | 7 N₂ gas connection
(option) |
| 3 Door handle | 8 Hole for installing the lifting handle
(4) |
| 4 Access ports | 9 Mains/power switch |
| 5 Molded recesses
(only for service technician) | 10 Service interface |

Product description

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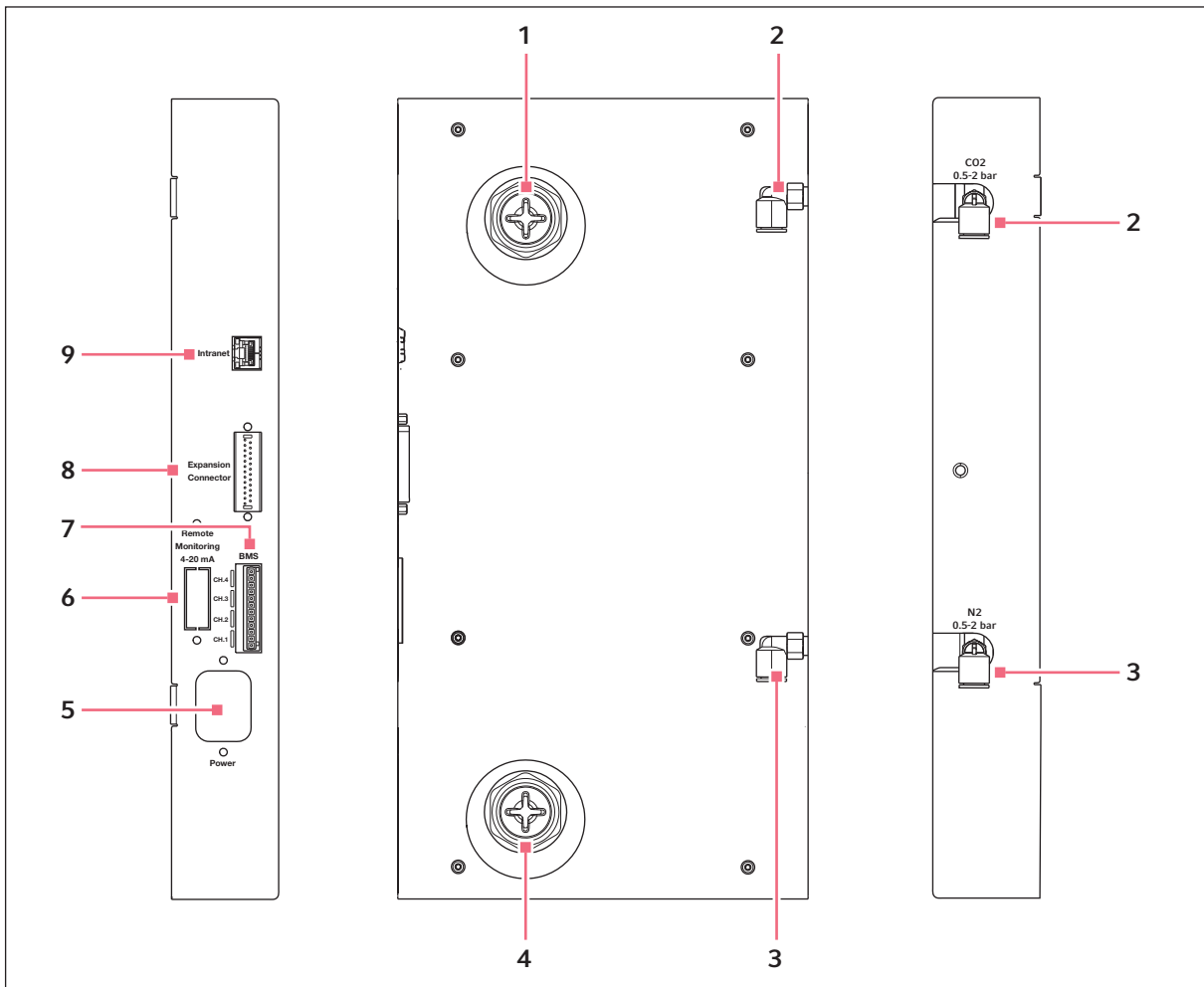


Fig. 3-2: CellXpert C170i: Connections at the rear of the device

- | | |
|---|---|
| <p>1 Upper access port</p> <p>2 CO₂ tube connector</p> <p>3 N₂ tube connector (option)</p> <p>4 Lower access port</p> <p>5 Mains/power cord socket</p> | <p>6 Connection for remote monitoring (4–20 mA interface) (option)</p> <p>7 Connection for Building Management System (BMS) 4 channels</p> <p>8 Expansion connector (option)</p> <p>9 Connection for intranet</p> |
|---|---|

3.1.2 Inside the chamber

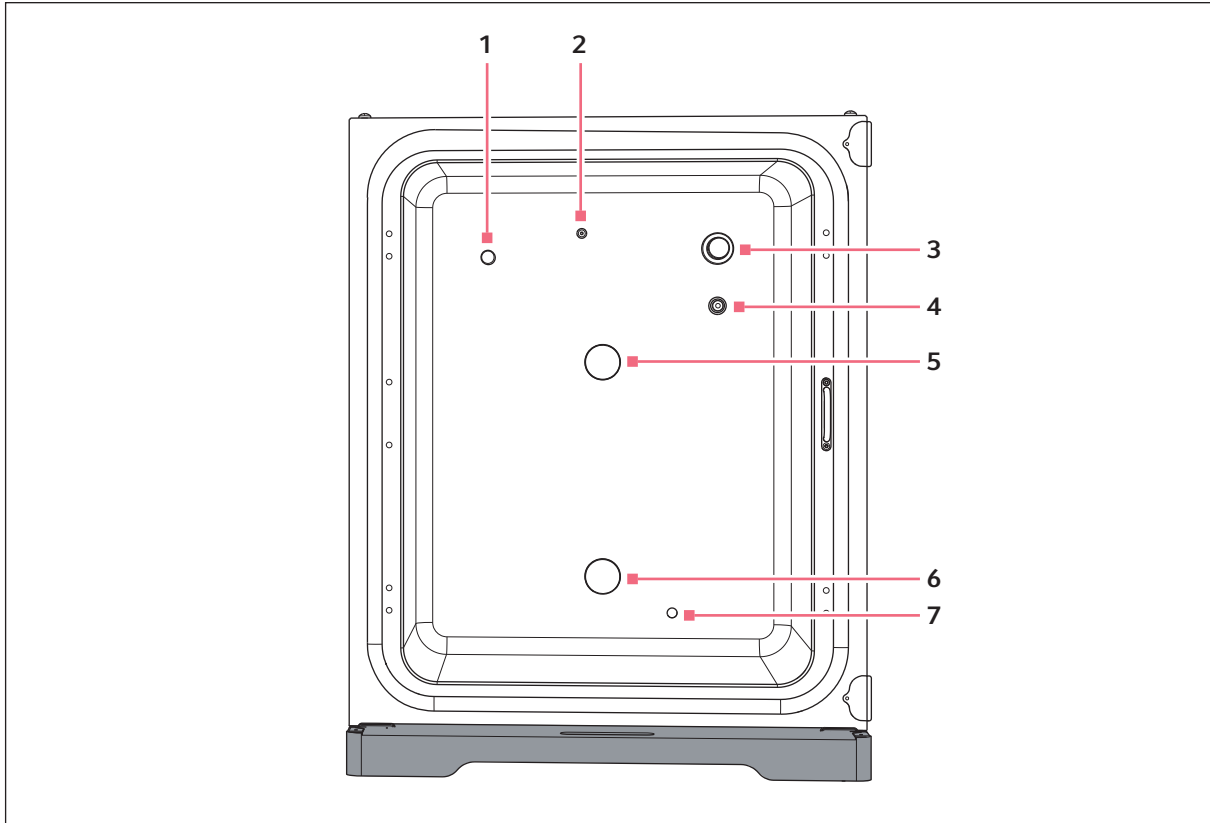


Fig. 3-3: CellXpert C170i: Inside the chamber

- | | |
|---|---|
| 1 Humidity sensor
(option) | 5 Upper access port |
| 2 Combined inlet for N₂ gas (option) and for CO₂ gas | 6 Lower access port |
| 3 CO₂ sensor | 7 Water level sensor
(option) |
| 4 O₂ sensor
(option) | |

3.1.3 Inner doors

There are three options available for the inner doors:

- Non-segmented inner door
- Inner door with 4 door segments
- Inner door with 8 door segments

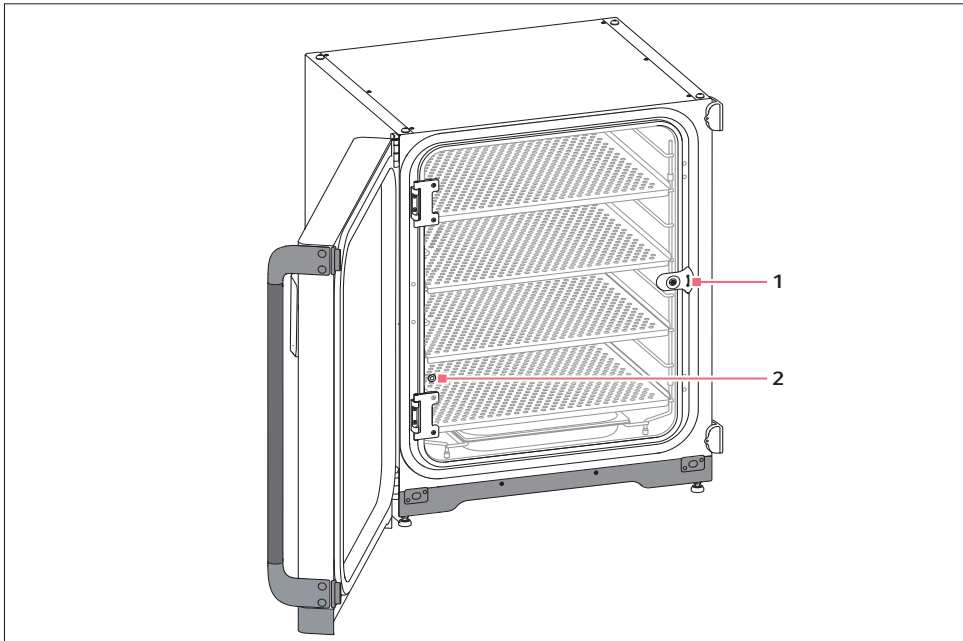


Fig. 3-4: Non-segmented inner door

1 Inner door latch

2 Sample port

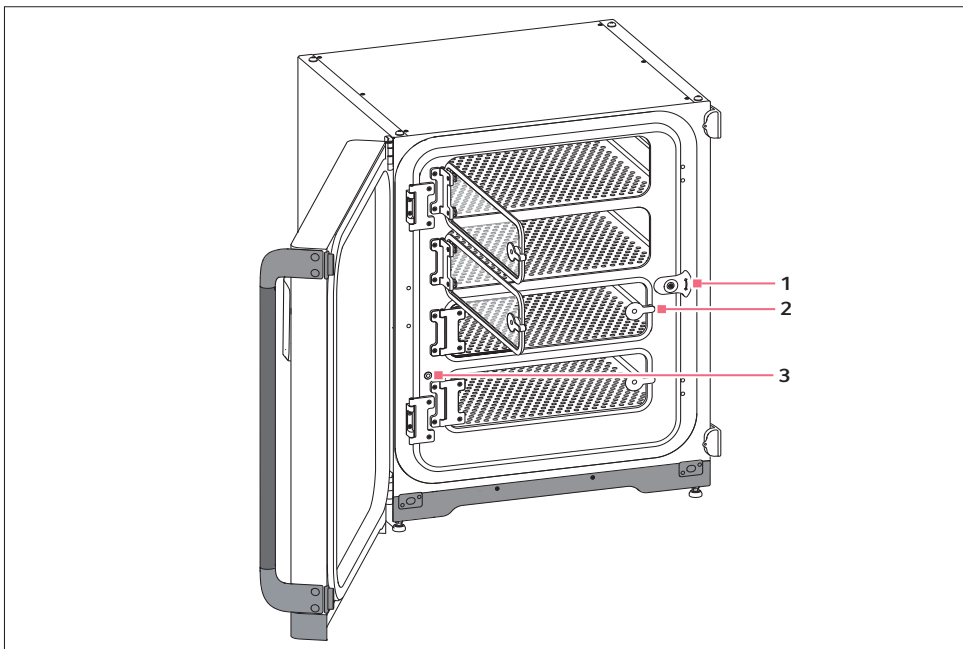


Fig. 3-5: Inner door with 4 door segments

1 Inner door latch
2 Door segment handle

3 Sample port

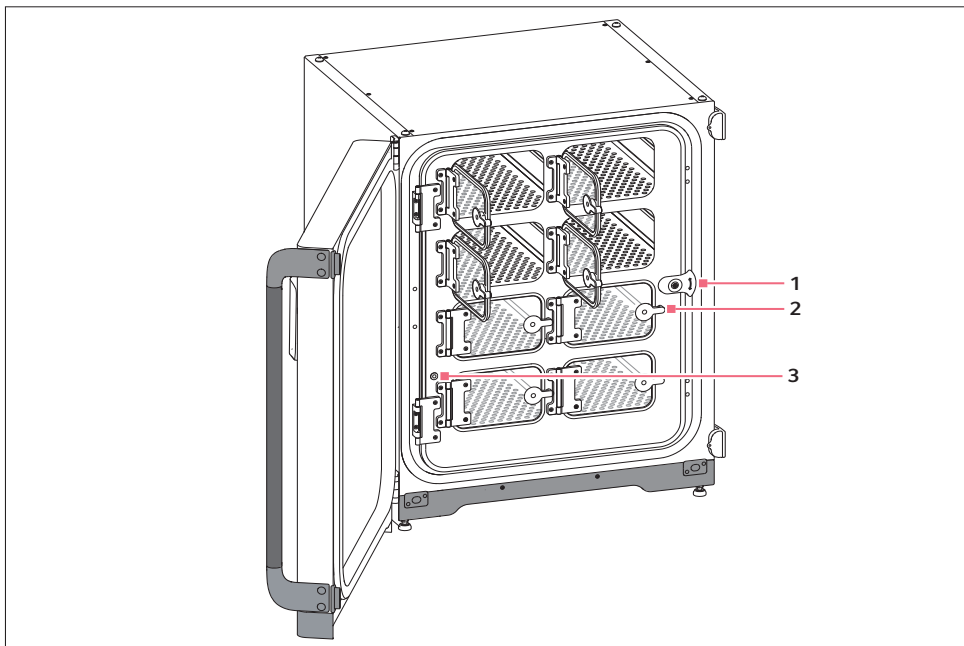


Fig. 3-6: Inner door with 8 door segments

1 Inner door latch

2 Door segment handle

3 Sample port

Product description

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3.2 Delivery package

- ▶ Check the delivery for completeness.
- ▶ Inspect all items for damage that may have occurred during delivery.
- ▶ To safely transport and store the device, keep the transport box and packing material.

Report any damage to the carrier and to your local Eppendorf sales order department immediately.

Quantity	Description	Notes
1	Device	Provided
1	Operating manual	Provided
1	Information on performing a risk assessment for the operation of incubators with CO ₂ and N ₂	Provided
4	Non-tip perforated shelf	Installed
1	Shelf rack	Installed
1	Water tray	Installed
2	Plug for access port	Installed
1 (O ₂ option)	O ₂ sensor	Installed
1	Water level sensor (water level option)	Installed
1	Mains/power cord	Packed in box inside outer carton
1 (2 for O ₂ option)	10 mm (0.4 in) outer diameter tubing with 6.5 mm (0.2 in) inner diameter with in-line gas filter Length: 3 m	Packed in accessory kit
4	Lifting handle	Packed in accessory kit
3	Spare shelf rack foot	Packed in accessory kit
3	Spare shelf rack spacer	Packed in accessory kit
4	Silicone foot	Packed in accessory kit
1	Safety fastening kit	Packed in accessory kit
1	BMS plug	Packed in accessory kit
2	Open-end wrench for adjusting the feet (8 mm and 13 mm)	Packed in accessory kit
4	Non-slipping cap for adjustable feet	Packed in accessory kit

4 Installation

4.1 Utilities requirements

The following utilities requirements are needed for operation:

Utility	Requirement
Electricity	Use an earthed/grounded mains/power supply which corresponds to the electrical prerequisites on the name plate. The mains/power supply has to be equipped with a residual current circuit breaker.
Mechanical	Use the safety fastening kit for fixing the incubator or 2 stacked incubators to the wall.
CO ₂ gas	Cylinder with 100 % CO ₂ vapor withdrawal, together with a two-stage regulator for pressure control between 0.05 MPa and 0.15 MPa (7.2–21.8 psi, 0.5–1.5 bar)
For O ₂ option: N ₂ gas	Cylinder with 100 % N ₂ vapor withdrawal, together with a two-stage regulator for pressure control between 0.05 MPa and 0.15 MPa (7.2–21.8 psi, 0.5–1.5 bar)



Keep the packaging and the transport securing device for later transport or storage.

4.2 Selecting the location



CAUTION! Lack of safety due to humid storage and transport conditions

- ▶ Evaluate the device for condensation, when received and unpacked for installation.
- ▶ If condensation due to storage and transport in humid conditions has occurred, allow the device to dry out for 12 hours in an environment of 18–28 °C and 20–80 % relative humidity. Only with a drying-out process is the device able to meet safety requirements.



NOTICE! Damage due to overheating

- ▶ Do not place the device close to sources of heat (e.g., radiator, drying cabinet).
- ▶ Do not expose the device to direct sunlight.
- ▶ Ensure that all sides of the device are in an adequate distance from the wall and adjacent devices to guarantee unobstructed air circulation.



The mains/power switch and the cutting unit of the mains/power line must be easily accessible during operation (e.g., residual current circuit breaker).



The main gas valve must be easily accessible during operation.



Do not place the incubator directly on the floor as it will aspirate dust.

Installation

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The CellXpert C170i fits on the workbench, under a workbench or it can be double-stacked to save space. Select a level surface capable of withstanding the operating weight of the incubator. The actual operating weight depends on both the options installed, and the material stored in the incubator.

Minimum floor space required

- Width: 81 cm (31.9 in)
- Depth: 60 cm (23.6 in)
- Height: 95 cm (37.4 in)

Optimal distance

- 15 cm (6 in) at the door hinge side (opening of 90°)
- 10 cm (4 in) at the opposite side for mounting the lifting handles

The correct location features

- a minimum ventilation clearance of 5 cm (2 in) to the left and to the right
- a minimum ventilation clearance of 5 cm (2 in) upward
- a minimum ventilation clearance of 3 cm (1.2 in) at the rear side
- a minimum clearance of 5 cm (2 in) on the right side to use the mains/power switch
- protection from direct sunlight
- protection from vibrations
- a clear distance to heat sources, e.g., heaters, autoclaves, or drier compartments
- a clear distance to airflow of heating, air-conditioning ducts, or other drafts
- a clear distance to cold sources, e.g., ultra-low temperature freezers
- an even, stable ground to avoid the device falling down

The electrical connections feature

- a matching of the mains/power connection with the specifications on the name plate
- access to the cutting unit of the power system circuit (to unplug the mains/power cord) during operation

Unplug the device to completely disconnect it from the power source. Install the device in a way that allows easy access to the mains/power plug in case of emergency.

4.3 Positioning the incubator



WARNING! Danger due to strong magnetic field

Magnetic fields may affect pacemakers and defibrillators. Pacemakers may be reset.

- ▶ Keep a distance of at least 20 cm from the magnet.



CAUTION! Risk of injury from lifting and carrying heavy loads

- ▶ At least 4 people are required to safely lift the incubator.
- ▶ Use a transport aid for transporting the incubator.



CAUTION! Risk of personal injury

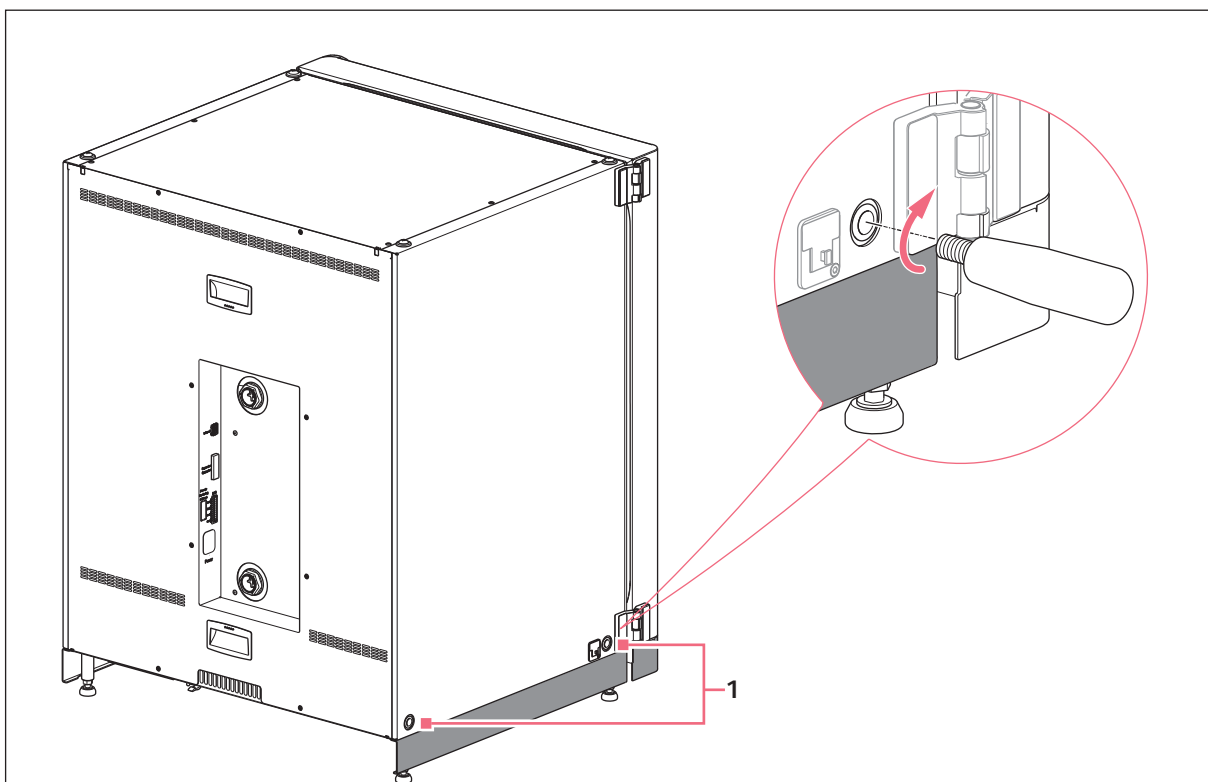
- ▶ The incubator has a high center of gravity. Make sure that it does not topple over when it is moved.



NOTICE! Damage to the incubator

Lifting the incubator by the door will cause permanent damage to the incubator.

- ▶ Lift the incubator only by the lifting handles.
- ▶ Never lift the incubator by its door.



1 Holes for lifting handles

1. Install the 4 lifting handles into the tapped holes.
2. Carefully move the incubator to the operational location using the lifting handles.
3. Check to ensure that the door cable is not pinched and may be moved.

For non-slip application use the supplied non-slipping caps:

1. Lift the incubator on one side with the lifting handles.
2. Place one non-slipping cap under each of the 2 incubator feet.
3. Repeat the procedure on the other side of the incubator.
4. Remove the lifting handles and store them for further use.
5. Install the cover caps into the tapped holes on both sides of the incubator.

4.4 Initial setup

4.4.1 Leveling the incubator

Prerequisites

A spirit level with the ends facing to the left and to the right is placed on one shelf.



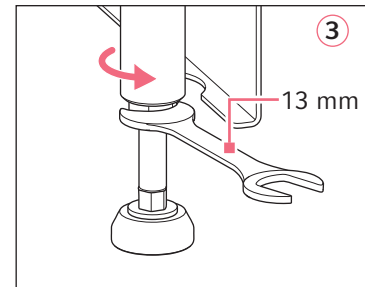
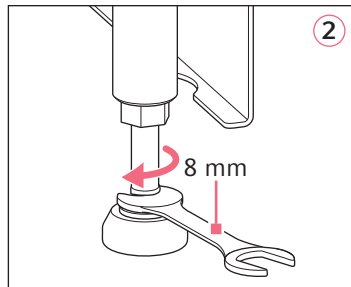
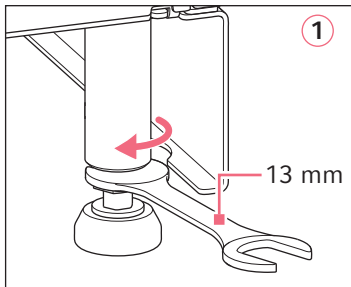
Do not place the spirit level on the housing.



NOTICE! Risk of material damage

Due to an unlevelled device, it is possible that not all cells are covered with the medium. This could cause the loss of sample.

► Level the device by adjusting its feet.



1. Loosen the lock nut with the supplied wrench of 13 mm.
2. Adjust the leveling feet with the wrench of 8 mm until the incubator is level and stable.
3. Turn the spirit level so that the ends face forward and rearward.
4. Level the incubator by adjusting the height of the feet.
5. Place the spirit level on other shelves. Adjust the height of the feet if necessary.
6. Lock the leveling feet by tightening the locking nuts on each foot with the wrench of 13 mm.

4.4.2 Fixing the incubator

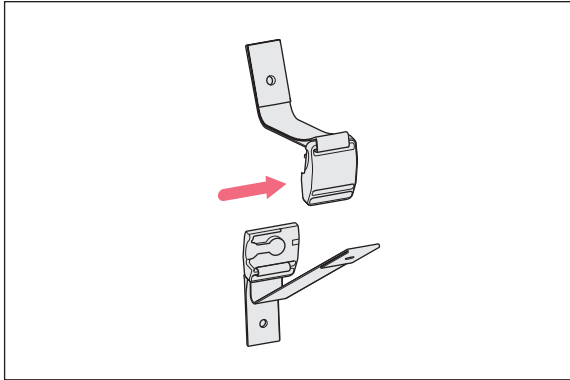


WARNING! Risk of personal injury and equipment damage

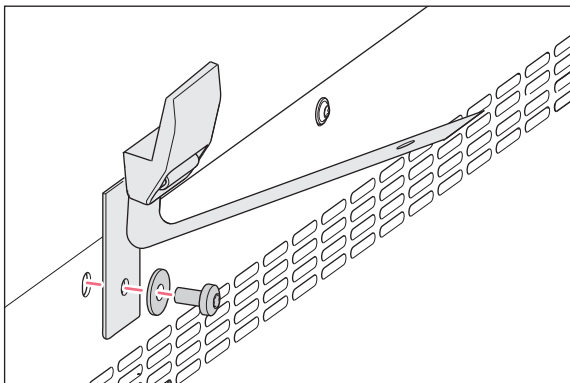
If the incubator is not fixed with a safety latch, it may topple.

► Each incubator or stack of two incubators on a stacking stand must be fixed to the wall with a safety latch.

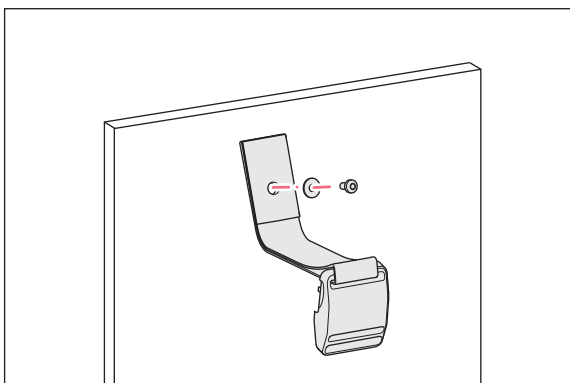
1. Disconnect the upper and the lower part of the magnetic safety latch by pushing them aside from each other.



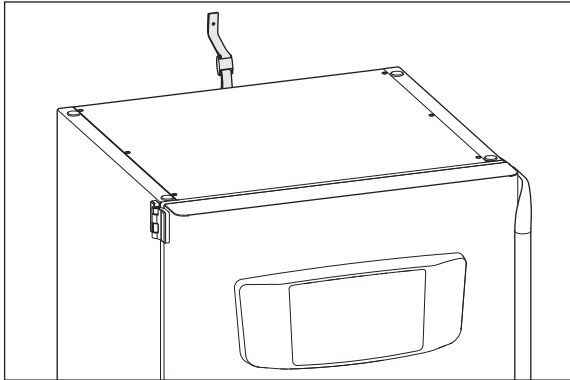
2. To attach the lower part of the safety latch to the top side of the incubator, use the spare part screw M4x8, Torx 20, and a washer.



3. Attach the other part of the safety latch and a washer to the wall. The screw must have a pullout strength of at least 250 N (25 kg).



4. Click the two parts of the magnetic safety latch together.



5. Fasten the belt. Do not fasten too tightly.

4.5 Making connections

4.5.1 Electrical connection



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.
- ▶ Use the supplied mains/power cord only.



WARNING! High voltage

- ▶ Always make sure that this equipment is properly earthed/grounded.



Do not use a multiple socket extension cord.

- ▶ Make sure that the voltage requirements match the information on the name plate.
- ▶ Incubators with 100 V – 127 V: Connect only 1 device to 1 fuse.
- ▶ Incubators with 220 V – 240 V: Connect up to 2 devices to 1 fuse.
- ▶ Use the mains/power cord supplied to connect the incubator to the correct mains/power supply voltage.

4.5.2 Gas connection



DANGER! Unconsciousness and death by elevated levels of CO₂

Elevated levels of CO₂ may be found in the operating area of the CO₂ incubator.

- ▶ Wear personal protective equipment.
- ▶ If the laboratory is not properly ventilated, use a CO₂/O₂ alarm system.
- ▶ Check the tube connection system with a leakage test.
- ▶ Read the *Information on performing a risk assessment for the operation of incubators with CO₂ and N₂* from Eppendorf AG.



WARNING! Lack of safety due to incorrect gas installation or insufficient ventilation

- ▶ Only trained personnel may install and connect the gas tubing.



WARNING! Risk of suffocation

- ▶ Observe the national guidelines on handling gases and on the equipment and operation of laboratories.
- ▶ Prevent a too high concentration of CO₂ in breathing air while working in the laboratory.
- ▶ Prevent a displacement of O₂ in breathing air due to working with N₂.



NOTICE! Risk of material damage

The gas tubing and in-line gas filter will burst or crack due to high pressure.

- ▶ Incoming CO₂ and N₂ gas pressure must not exceed 0.15 MPa (1.5 bar, 21.8 psi).



The main gas valve must be easily accessible during operation.



Do not bend the gas tubing.

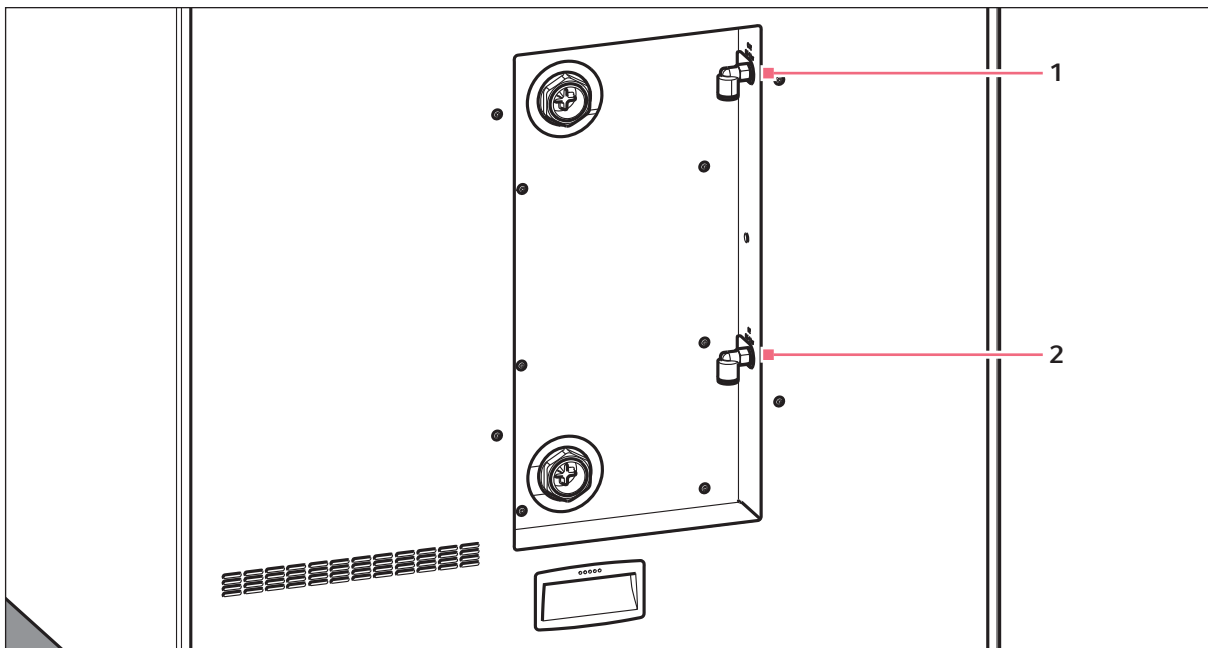


Fig. 4-1: Connections for CO₂ and N₂ at the rear of CellXpert C170i

1 CO₂ tube connector

2 N₂ tube connector (option)

Installation

CellXpert® C170i
English (EN)

1. Attach the longer part of the supplied gas tubing with the in-line gas filter to the pressure regulator outlet. Ensure that the gas supply is connected to the *INLET* side of the in-line gas filter. Attach the shorter part of the supplied gas tubing to the CO₂ tube connector at the rear of the incubator. Push the gas tubing into the tube connector until it stops. Check if the gas tubing is fixed by lightly pulling on it. It must not move. Secure the connected end at the pressure regulator.
2. For O₂ option: Attach the longer part of the supplied gas tubing with the in-line gas filter to the pressure regulator outlet. Ensure that the gas supply is connected to the *INLET* side of the in-line gas filter. Attach the shorter part of the supplied gas tubing to the O₂ tube connector at the rear of the incubator. Push the gas tubing into the tube connector until it stops. Check if the gas tubing is fixed by lightly pulling on it. It must not move. Secure the connected end at the pressure regulator.
3. A large-size cylinder of CO₂ with vapor withdrawal (and optional a large-size cylinder of N₂ with vapor withdrawal) is required to supply the incubator. The cylinder controls primary gas pressure. Fitting a two-stage CO₂ (and optional N₂) pressure regulator is recommended.
4. Check the pressure settings of the CO₂ and the N₂ connections.



A default pressure setting for CO₂ of 0.1 MPa (14.5 psi, 1 bar) or in the range of 0.05–0.15 MPa (7.2–21.8 psi, 0.5–1.5 bar) is recommended.

O₂ option: A default pressure setting for N₂ of 0.1 MPa (14.5 psi, 1 bar) or in the range of 0.05–0.15 MPa (7.2–21.8 psi, 0.5–1.5 bar) is recommended.

5. To disconnect the gas tubing, switch off the gas pressure and press down the small ring of the tube connector and pull out the gas tubing.

4.5.3 Relative humidity sensor (option)

Plug in the humidity sensor to the connector at the rear left side in the chamber. Position the sensor with the orientation point at the top. The humidity sensor can be connected or disconnected without the device being switched off.

Check if the sensor is plugged in correctly. A single sound signalizes if a newly plugged in humidity sensor is detected or if the sensor has been disconnected.

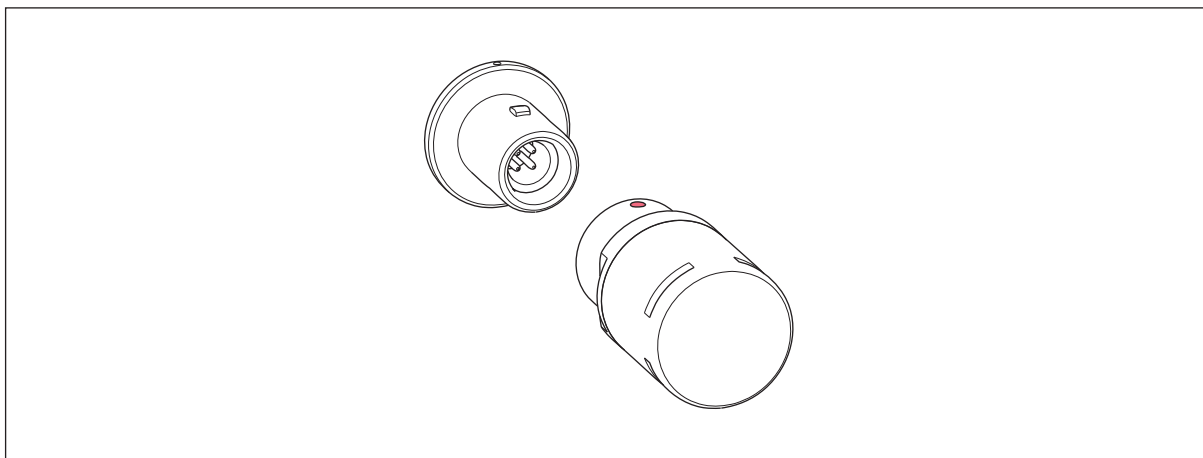


Fig. 4-2: Humidity sensor and connector

4.5.4 O₂ sensor (option)



Never disconnect the O₂ sensor.

If the incubator is provided with the O₂ option, the O₂ sensor already is mounted. The sensor is individually calibrated for each incubator. Do not use O₂ sensors from other devices. If an O₂ sensor is defective, contact the authorized service.

4.5.5 Ethernet connection



Only connect devices that meet the safety requirements defined in IEC 60950-1.

The device is equipped with an Ethernet interface. The interface allows you to connect the device to an external monitoring system, e.g., a building management system or a laboratory management system. The interface provides data about the current status and the identity of the device. Contact your local Eppendorf partner for more technical information. Connections must have a double or reinforced insulation according to DIN EN 61010-1.

Use CAT 5 STP with shielded RJ45 connectors as network cable. The cable must be connected to a grounded RJ45 jack.

4.6 BMS relay contact alarm



Only connect devices that meet the safety requirements defined in IEC 60950-1.

The connection to the BMS (Building Management System) allows the centralized monitoring of the device. Alarm sources are programmable with the user interface.

The system is activated by alarm conditions, as for example:

- over-temperature
- under-temperature
- errors and warnings
- CO₂ high
- CO₂ low
- power failure

The power failure alarm cannot be switched off. If mains/power supply voltage fails or the device is being switched off, all relays switch to alarm: Common and normally open contacts are connected.

The system is connected via a 12-pin connector at the rear of the incubator. The matching plug is provided.

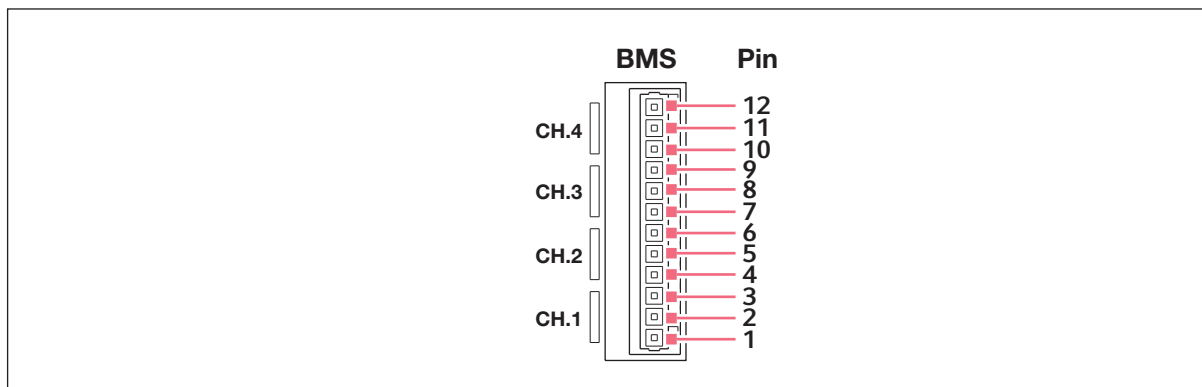


Fig. 4-3: BMS connector

Pin	Designation
1	Channel 1 common
2	Channel 1 normally closed
3	Channel 1 normally open
4	Channel 2 common
5	Channel 2 normally closed
6	Channel 2 normally open
7	Channel 3 common
8	Channel 3 normally closed
9	Channel 3 normally open
10	Channel 4 common
11	Channel 4 normally closed
12	Channel 4 normally open



The relays must not be operated at more than 2 A and 30 V DC/AC.

Default settings are:

Channel 1 (relay 1)	Temperature alarm
Channel 2 (relay 2)	CO ₂ alarm
Channel 3 (relay 3)	O ₂ alarm (OFF, if option is not available)
Channel 4 (relay 4)	Water level alarm (OFF, if option is not available)

The alarm sources for the channels can be programmed at the user interface.

4.6.1 Incubator operating with and without alarm

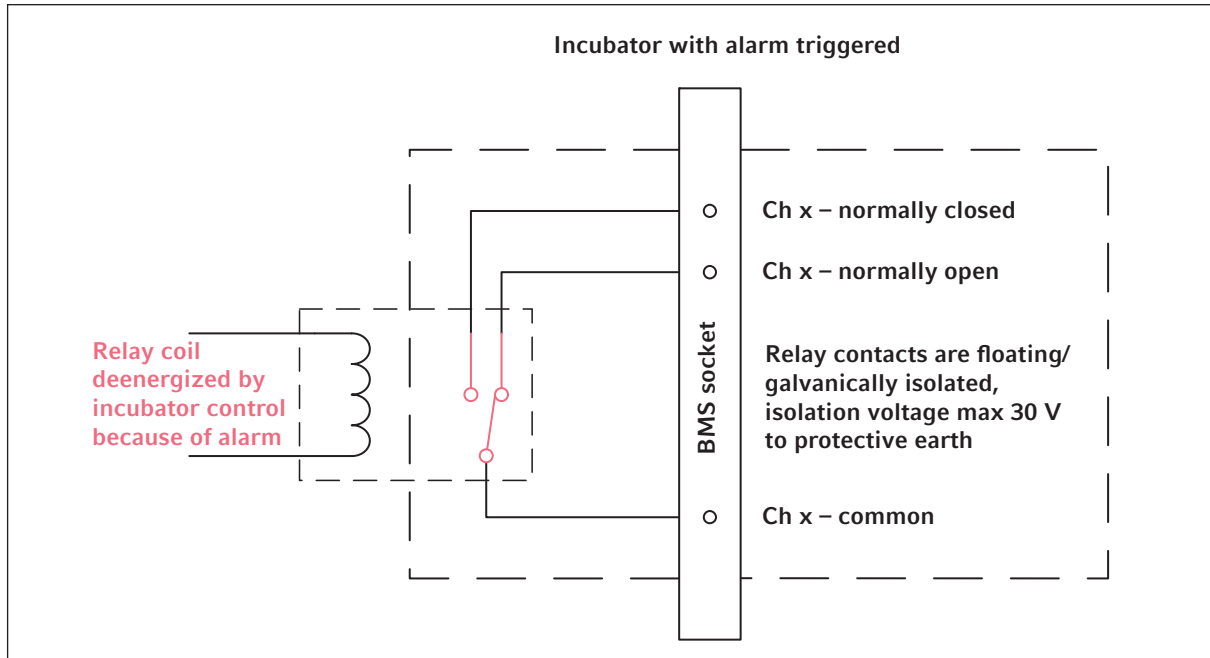


Fig. 4-4: Incubator operating with alarm

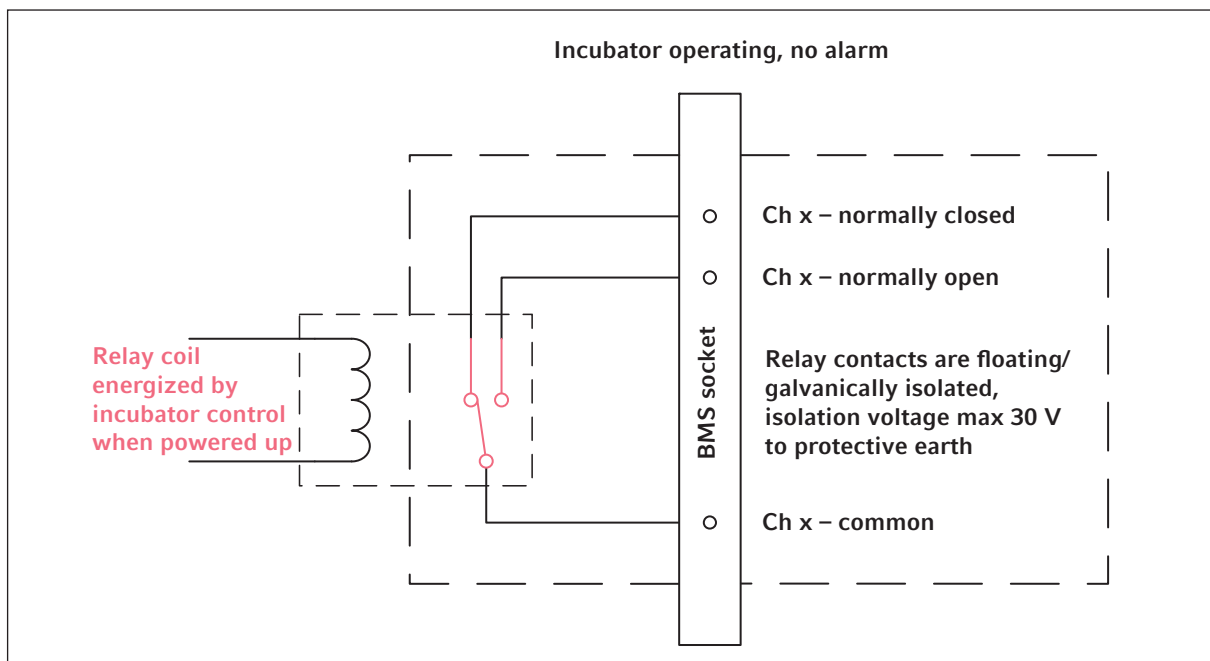


Fig. 4-5: Incubator operating without alarm

5 Operation

5.1 Preparing for operation



DANGER! Unconsciousness and death by elevated levels of CO₂

Elevated levels of CO₂ may be found in the operating area of the CO₂ incubator.

- ▶ Wear personal protective equipment.
- ▶ If the laboratory is not properly ventilated, use a CO₂/O₂ alarm system.
- ▶ Check the tube connection system with a leakage test.
- ▶ Read the *Information on performing a risk assessment for the operation of incubators with CO₂ and N₂* from Eppendorf AG.



NOTICE! Damage to electronic components due to condensation

Condensate can form in the device after it has been moved from a cool environment to a warmer environment.

- ▶ After installing the device, wait for at least 12 hours. Only then connect the device to the mains/power supply.



NOTICE! Risk of material damage

The gas tubing and in-line gas filter will burst or crack due to high pressure.

- ▶ Incoming CO₂ and N₂ gas pressure must not exceed 0.15 MPa (1.5 bar, 21.8 psi).



After switching on the incubator, sensors have to initialize. It may take a few minutes until values are displayed.

1. Using the mains/power cord provided, connect the incubator to an earthed/grounded mains/power supply.
2. Turn on the CO₂ gas supply with the pressure regulator. Set the gas pressure to 0.1 MPa (1 bar, 14.5 psi). For O₂ option: Turn on the N₂ gas supply with the pressure regulator. Set the gas pressure to 0.1 MPa (1 bar, 14.5 psi).



The CO₂ gas pressure range is adjustable between 0.05 MPa (flow pressure; 0.5 bar; 7.2 psi) and 0.15 MPa (pressure at rest; 1.5 bar; 21.8 psi). The N₂ gas pressure range is adjustable between 0.05 MPa (flow pressure; 0.5 bar; 7.2 psi) and 0.15 MPa (pressure at rest; 1.5 bar; 21.8 psi).

Open the stop valve completely to ensure an adequate volume flow.

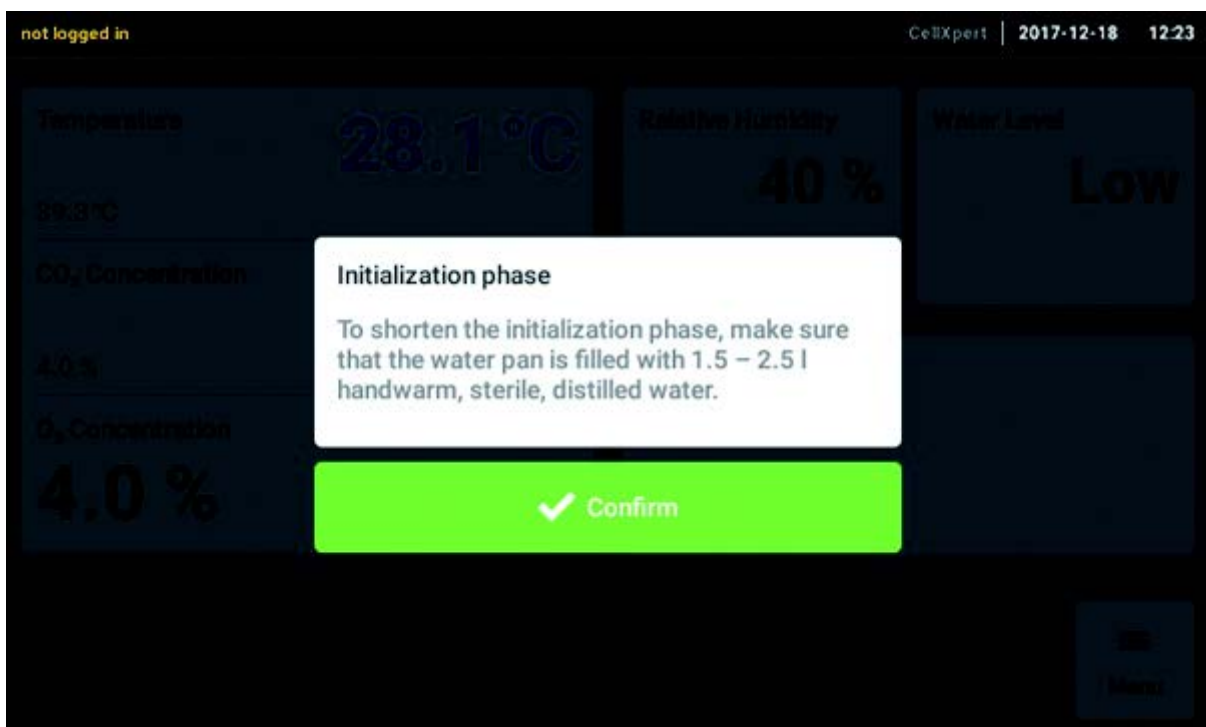
Ensure that the gas pressure and the volumetric gas flow rate are sufficient, especially if more than one device is connected to the CO₂ gas source.

3. The chamber setpoints are pre-programmed at 37 °C and 5 % CO₂.



- The CO₂ sensor needs 30 minutes for initialization after the switch-on of the device. No process value is displayed during the initialization phase.
- The O₂ sensor (option) needs 10 minutes for initialization after the switch-on of the device. No process value is displayed during the initialization phase.
- If power is interrupted to the incubator long enough for the temperature to drop below the setpoint, the CO₂ valve is deactivated until the temperature setpoint is achieved again. (The deactivation serves to avoid spurious CO₂ readings while the incubator is below its temperature setpoint).

4. Switch on the incubator using the on-off switch at the right side of the device. Leave the incubator on until the set chamber temperature and CO₂ concentration have been reached.



The display illuminates immediately.

5. To allow conditions to stabilize, leave the incubator running for at least 2 hours (preferably overnight).



- CO₂ sensors are calibrated at the factory to control accurately at 5 % CO₂ and 37 °C. Changing the temperature or the CO₂ setpoint leads to deviations in accuracy.

5.2 Functions and limitations

5.2.1 Temperature management

The temperature is adjustable from 22 °C to 50 °C. Incubators are meant to operate with 4 °C above ambient temperature at minimum. If the setpoint is below 4 °C above ambient temperature, the incubator tries to adjust the temperature. It is possible that a sensor error occurs after a certain period. Restart the incubator and adjust another setpoint.

Avoid condensation and reduce the temperature setpoint by:

- cooling down the incubator as fast as possible by opening the doors
- emptying and refilling the water tray with water with a maximum temperature of the new setpoint

5.2.2 CO₂

The CO₂ concentration is adjustable from 0.1 % to 20 %. It is possible to deactivate the gas control and to operate with temperature control only.

If you want to reduce the setpoint for the CO₂ concentration during the operation, let CO₂ escape by opening the outer and the inner door.

The sensors have to reinitialize after a switch-on of the device or after a high temperature disinfection took place. The status *Initializing Sensor* is described in the function areas. It is not possible to adjust a setpoint during this period.

5.2.3 O₂ (option)

The O₂ concentration is adjustable from 0.1 % to 20 % via N₂ connection. It is possible to deactivate the gas control.

If the O₂ sensor is temporarily not needed, deactivate the O₂ sensor. Tap the *Settings > Device Settings > Home Screen Configuration* menu items.

If you want to increase the setpoint for the O₂ concentration during the operation, let O₂ stream into the incubator by opening the outer and the inner door.

It is not possible to adjust a high CO₂ concentration together with a high O₂ concentration. If setpoints have been chosen beyond physical opportunities, an alarm message may occur.

5.2.4 Relative humidity (option)

The humidity sensor detects the relative humidity in the incubator.

5.2.5 Water level (option)

The incubator triggers an alarm when the water level falls below a certain value.

5.2.6 Feature for maintenance

The CellXpert C170i features the option of activating an automatic reminder for common tasks (see *Recurring tasks on p. 71*).

5.3 Opening and closing doors



WARNING! Danger due to strong magnetic field

Magnetic fields may affect pacemakers and defibrillators. Pacemakers may be reset.

- ▶ Keep a distance of at least 20 cm from the magnet.



CAUTION! Cuts due to broken glass

A damaged glass door leads to cuts on the hands.

- ▶ Remove the broken glass with a suitable tool.



CAUTION! Risk of personal injury

- ▶ Before closing the glass door, be sure that the shelves are properly installed inside the chamber. Slamming the glass door against the shelf could cause broken glass and potential injury.

5.3.1 Opening the inner and the outer door

1. To open the outer door, pull the door handle.

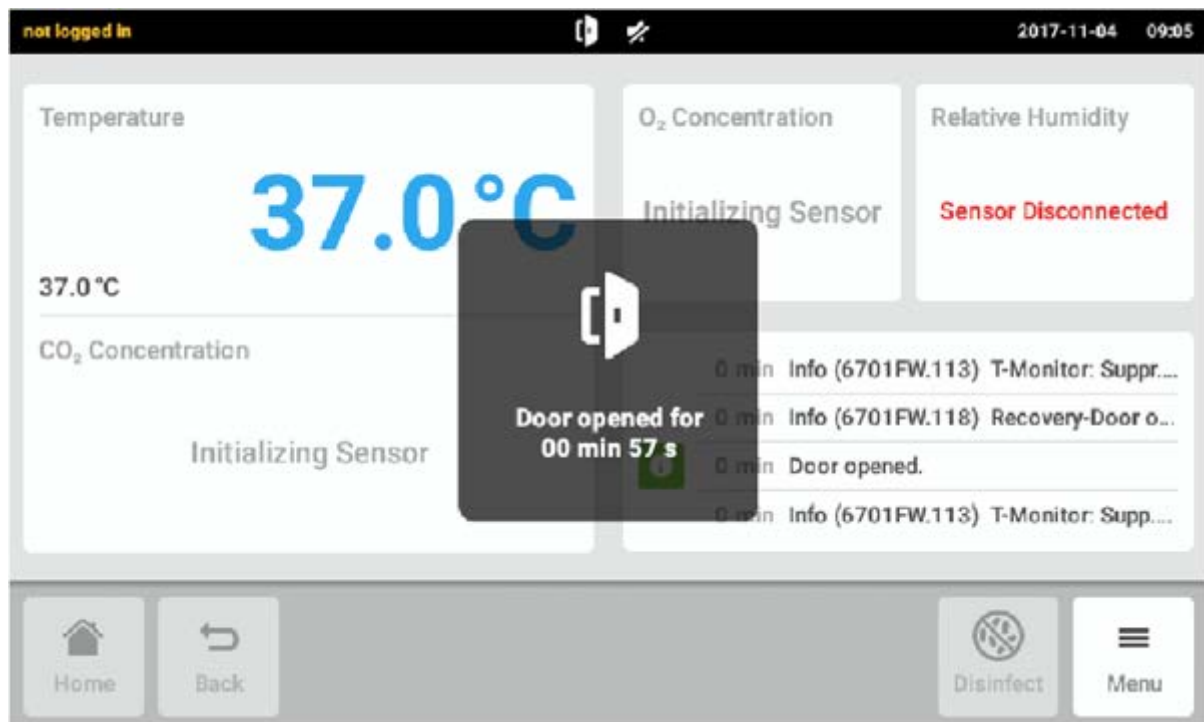


Fig. 5-1: Hint on the touch screen

When the outer door is opened, a hint is displayed on the touch screen.

2. Turn the inner door latch 90° to the top. To open the inner door, pull on the inner door latch.

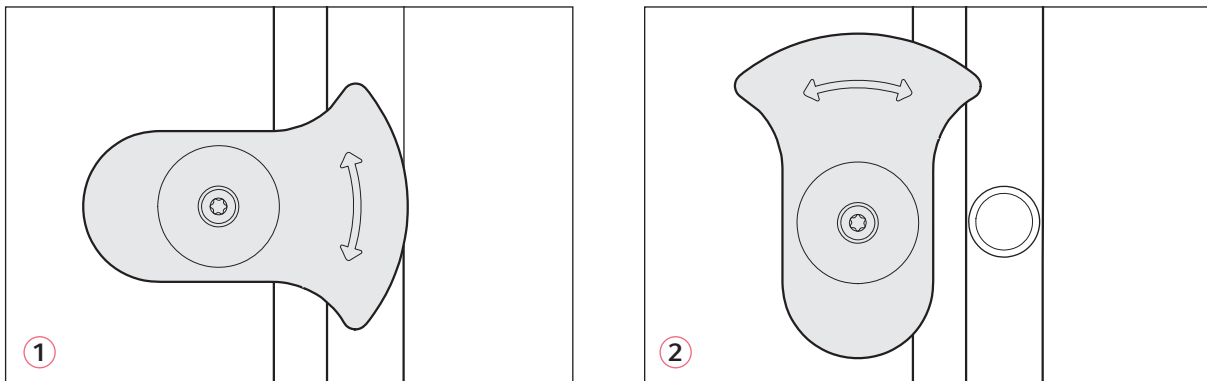


Fig. 5-2: Inner door latch with magnet

1 Inner door latch closed

2 Inner door latch opened

5.3.2 Closing the inner and the outer door

1. Close the inner door and turn the inner door latch 90° to the side until it is fixed by the magnet.



The inner door is not correctly closed until the inner door latch is oriented horizontally. An incorrectly closed door could cause condensation.

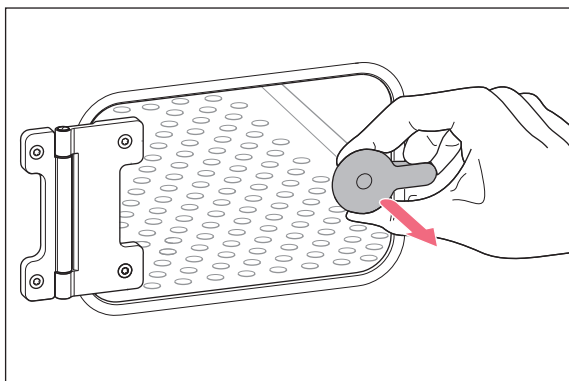
2. Close the outer door until it is fixed by the magnets.

5.3.3 Opening and closing door segments (option)

Prerequisites:

- A 4 or 8-segmented inner door is installed.
- The outer door is open.

1. To open the door segment, pull the door segment handle.



2. Close the door segment.

The handle is fixed by the magnet.

5.4 Using the water tray



NOTICE! Risk of material damage

- ▶ To avoid possible damage to the CO₂ sensor, never leave water in the water tray while the incubator is switched off, or when a high-temperature disinfection cycle is initiated.



NOTICE! Risk of material damage due to spilled water

Spilled water could cause corrosion.

- ▶ To avoid possible damage to the device, observe the maximum capacity of the water tray.
 - ▶ Do not move the device when the water tray is filled.
-



- Always leave the water tray in place.
- Use warm, distilled, sterile water only in the water tray. The usage of any other types of water including deionized water may cause corrosion inside the incubator.

1. Fill the water tray with 1.5–2.5 liters of warm, distilled, sterile water.
2. The usage of any biocide in the water tray is not recommended. To reduce the possibility of contamination, empty the tray every 7–14 days, clean it with a solution of 70 % isopropyl alcohol and 30 % distilled water, and then refill it with 1.5–2.5 liters of warm distilled, sterile water.



The humidity level within the chamber is not adjustable. The chamber reaches between 85 % and 95 % relative humidity at 37 °C (depending on ambient humidity) with the water tray.

5.5 Using the access ports

It is possible to insert components, e.g., sensors, into the chamber via the access ports.

Prerequisites

- The component, e.g., sensor, with wire is placed in the chamber.
 - Both of the access ports are closed with the blind plugs.
 - Make sure that the component is not bigger than the inner diameter of 25 mm (0.98 in) of the access port.
1. Remove one of the blind plugs.
 2. Pull the component wire through the open access port.
 3. For optimal gas tightness, make a cut into the cover of the blind plug. Wrap the component wire around the plug.

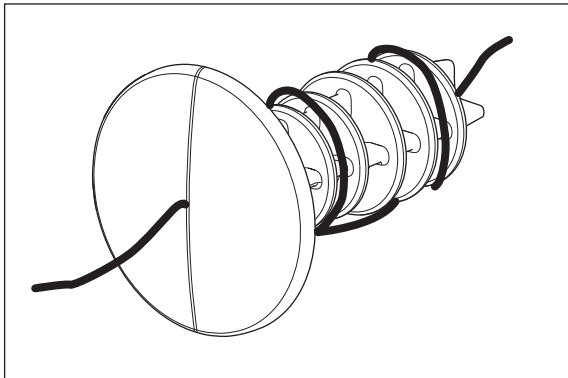


Fig. 5-3: Wire wrapped around the blind plug

4. Refit the blind plug. Make sure that the plug is securely fixed and flush with the rear panel.
5. Put the end of the wire on the top of the incubator.



Make sure that the access port is cleaned and dried before reinstallation of the plug.

5.6 Safety shutdown



NOTICE! Risk of material damage

The gas tubing and in-line gas filter will burst or crack due to high pressure.

- ▶ Incoming CO₂ and N₂ gas pressure must not exceed 0.15 MPa (1.5 bar, 21.8 psi).

5.6.1 Temperature

The CellXpert C170i features a shutdown at 10 K over the setpoint of one heat circuit or 5 K below the setpoint according to standard **DIN 12880** (temperature limiter class 1).

- Restart the device.
- If the error occurs again, contact Eppendorf Service.

5.6.2 Gas

The inlet gas valve switches off above 2 bar.

5.7 Switching off the device

















1. Switch off the device.
2. Disconnect the power cord.
3. Switch off the gas pressure.
4. Disconnect the pressure tube.
5. Empty the water tray.
6. Clean the device.
7. Let the incubator dry with opened doors.
8. Let the incubator cool down.

6 Overview of operating controls

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 Symbols

Symbol	Description
	Status: Function active
	Status: Function inactive
	Door open
	Active error
	Active alarm
	Warning
	Notice
	Open alarm setting
	Open event log
	Open chart
	Chart duration
	Close
	Filter
	Export data
	Change function position
	Default alarm setting

Overview of operating controls

CellXpert® C170i
English (EN)

Symbol	Description
	Fine increment adjustment
	Display recently used values

6.3 Home screen overview

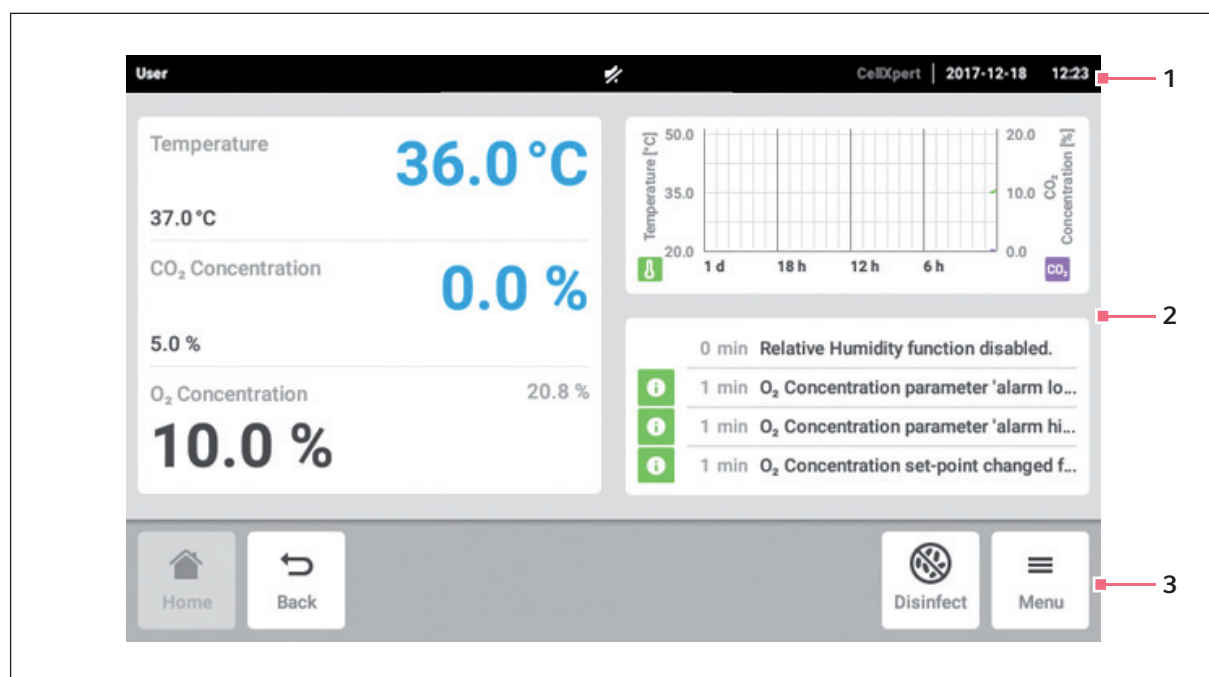


Fig. 6-1: Home screen

1 Status bar

Information on user logged in, date, time, device status, device name

3 Toolbar

Buttons for navigation and operation of the device

2 Function area

Standard functions of the device

6.3.1 Status bar

- Define the device name in *Menu > Settings > About this CellXpert C170i*.
- Log in as a user via *User Management*.
- Define time and date in *Menu > Settings > System Settings > Date & Time*.

If there is an active alarm, the exceeded alarm limit is highlighted in red.

6.3.2 Function area

Primary functions are displayed on the left. Additional functions and options are displayed on the right.

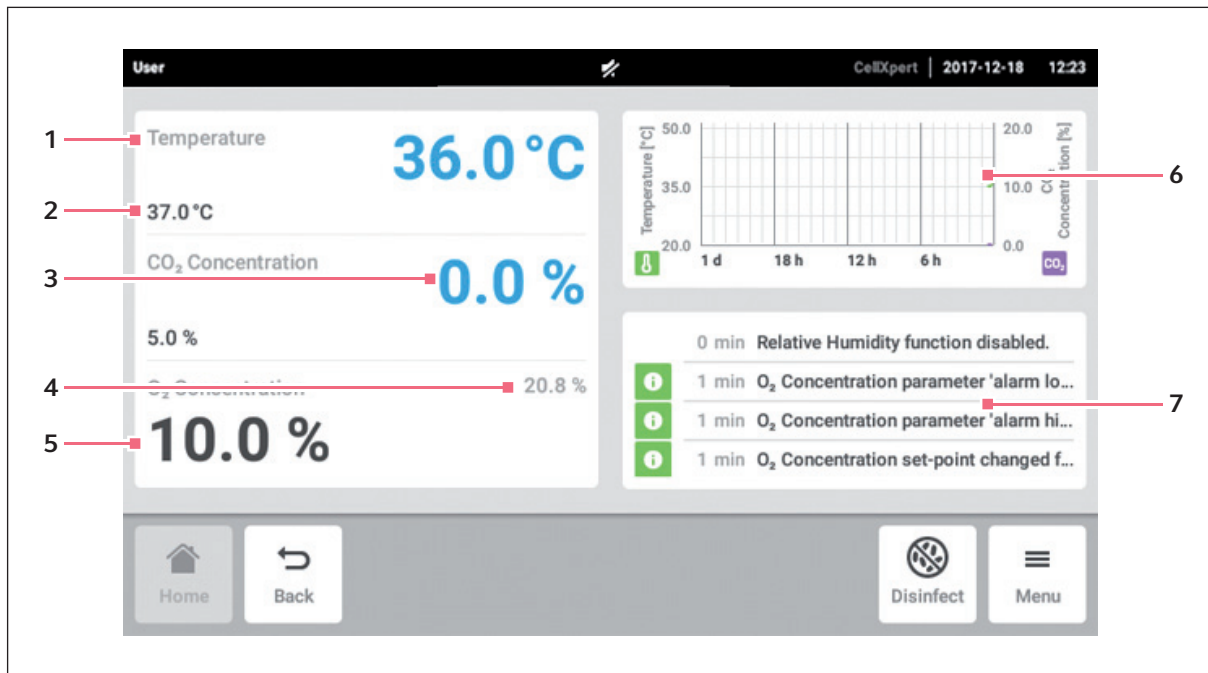
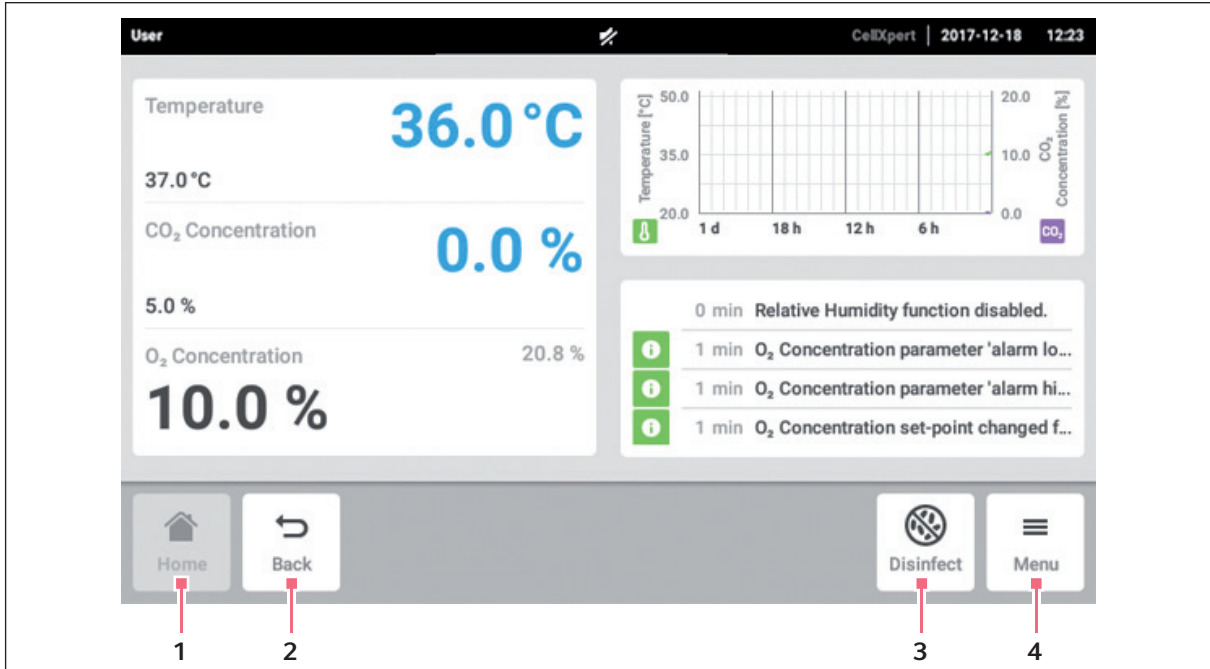


Fig. 6-2: Function area

- | | |
|---|--|
| <ul style="list-style-type: none"> 1 Name of the function 2 Setpoint of a controlled function
displayed in small black characters 3 Actual value of a controlled function
displayed in large blue characters 4 Actual value of a non-controlled function
displayed in small grey characters | <ul style="list-style-type: none"> 5 Setpoint of a non-controlled function
displayed in large black characters 6 Chart
preview of the two most important functions 7 Event log
preview of the notifications and messages |
|---|--|

6.3.3 Toolbar

**1 Home**

Tap the *Home* button to show the home screen.

2 Back

Tap the *Back* button to go the previous window.

3 Menu

Tap the *Menu* button to open functions such as Settings, Alarms, or Events.

4 Disinfect

Tap the *Disinfect* button to start the high-temperature disinfection program (see *High-temperature disinfection (HTD)* on p. 98).

6.4 Information bar

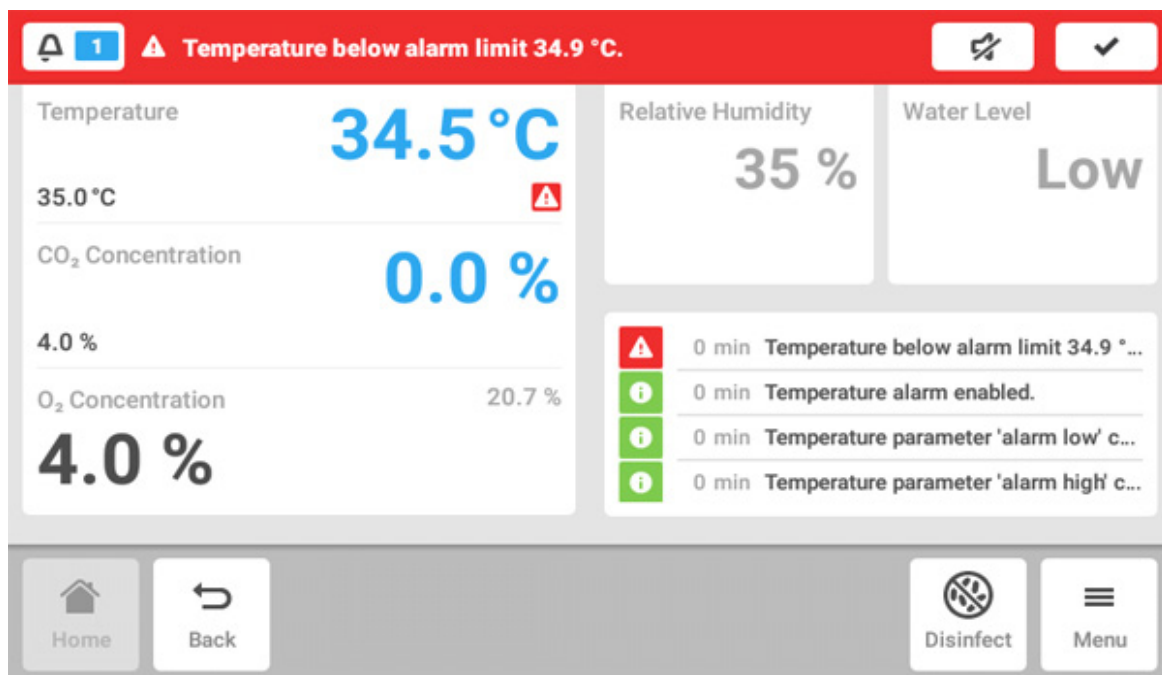
If messages are present, the information bar appears instead of the status bar. The information bar displays warning, alarm, and error messages.



Fig. 6-3: Information bar

- | | |
|--|---|
| <p>1 Number of unacknowledged messages</p> <p>2 Current messages
Red information bar: Unacknowledged alarm or error messages
Yellow information bar: Unacknowledged warning messages</p> | <p>3 Mute the audible alarm
Temporarily disables the audible alarm</p> <p>4 Acknowledge the current message
When the current message has been acknowledged, it is deleted from the information bar.
When all messages have been acknowledged, the information bar disappears.</p> |
|--|---|

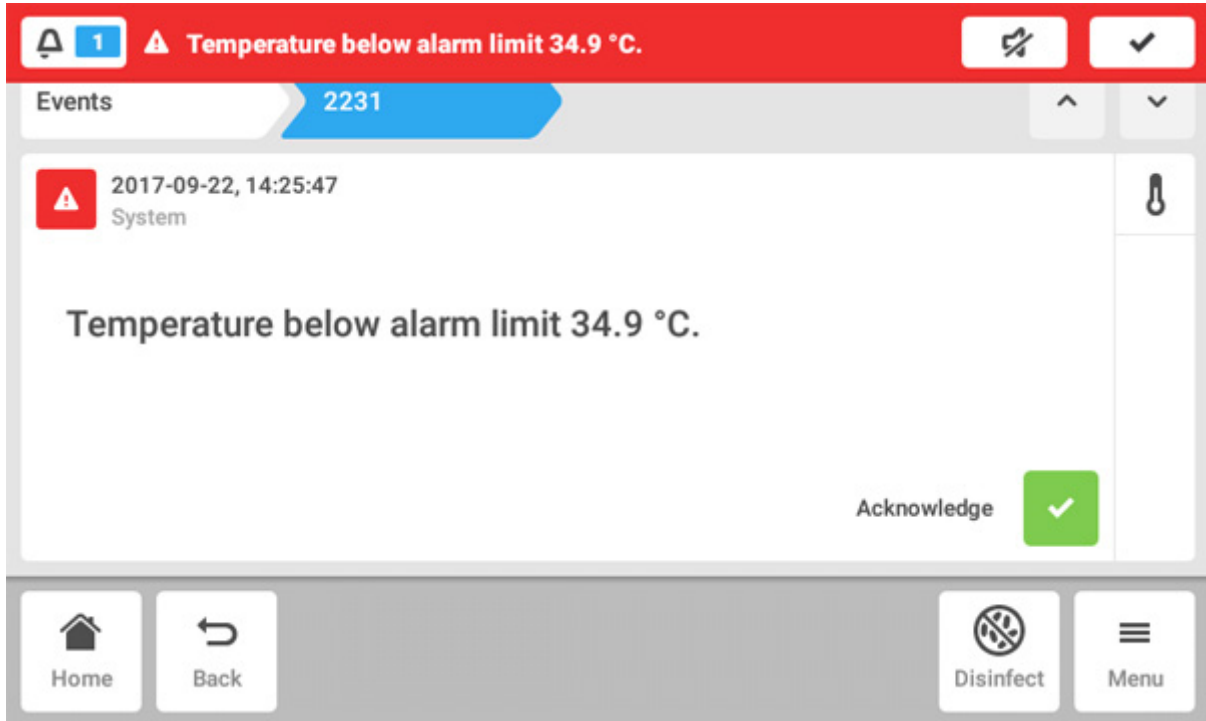
6.4.1 Editing the information bar



- To display the log of all unacknowledged messages, tap the number next to the bell symbol.
- To disable the audible alarm temporarily, tap the mute symbol.
- To confirm the current message, tap the checkmark symbol.

The alarm symbol is displayed until values are within the alarm limits.



6.4.2 Editing the message



- To call up the current message, tap the information bar. The message appears in the *Event log*.
- To acknowledge the message, tap the *Acknowledge* button.
- To change the alarm limits, tap the *Alarm* (bell symbol) symbol.
- To change the setpoint of the function, tap the button above the *Alarm* symbol.

7 Starting the application

7.1 Operating the user interface

-  The touch screen is designed to be operated with your fingers only without the need for tools. Laboratory gloves made of nitrile or latex can be worn. Alternatively, a stylus can be used, 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.

7.2 Selecting functions



Tap the *Temperature* function in the function area. The parameter settings are displayed.

Starting the application

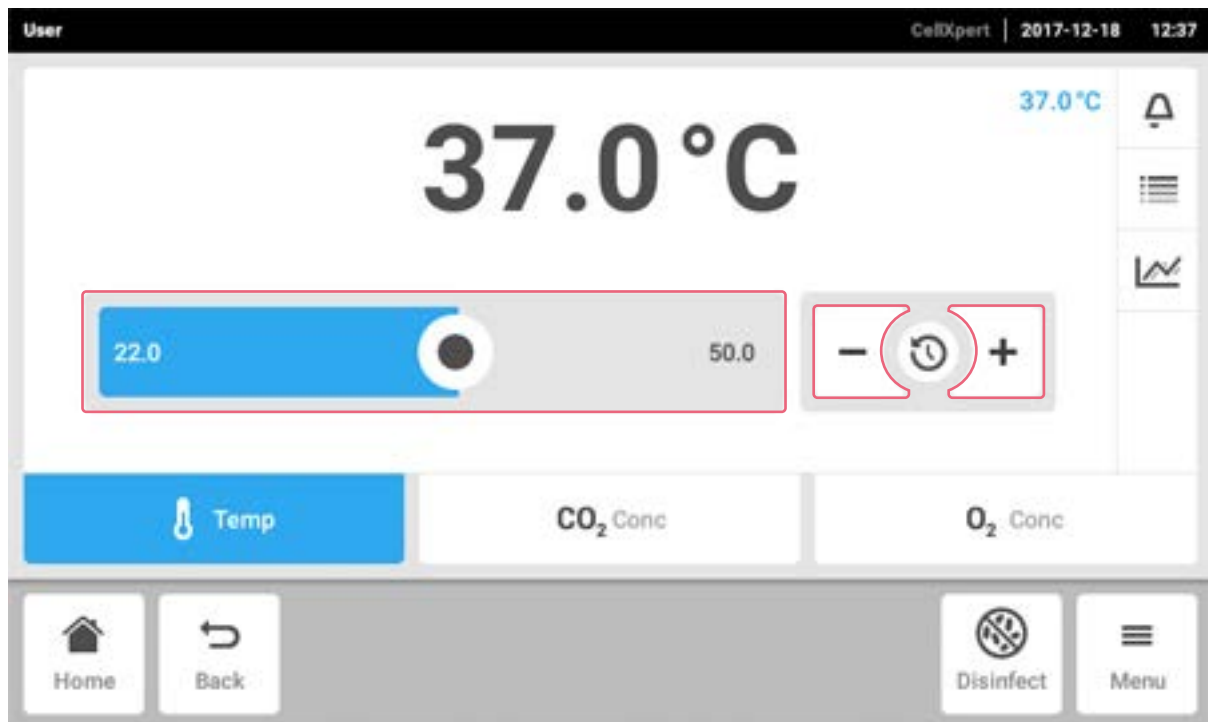
CellXpert® C170i
English (EN)

7.3 Setting the values



The setpoints can be adjusted with the slider or with the number pad.

7.3.1 Setting a value with the slider



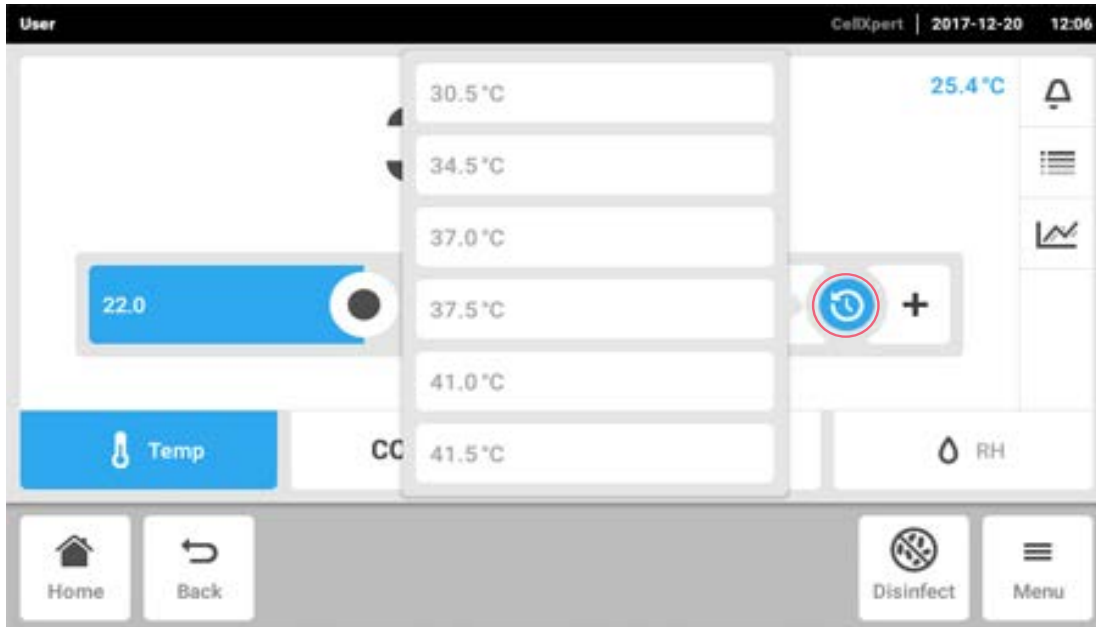
Tap the slider and drag it to the right or to the left.

The setpoint changes.

7.3.2 Changing a value incrementally with the fine adjustment

- Tap the + button. The setpoint is incrementally increased.
- Tap the - button. The setpoint is incrementally decreased.

7.3.3 Selecting the last used value



1. Tap into the center of the fine adjustment. A list with the last used setpoints is displayed.
2. Select the setpoint from the list.

7.3.4 Setting a value with the number pad

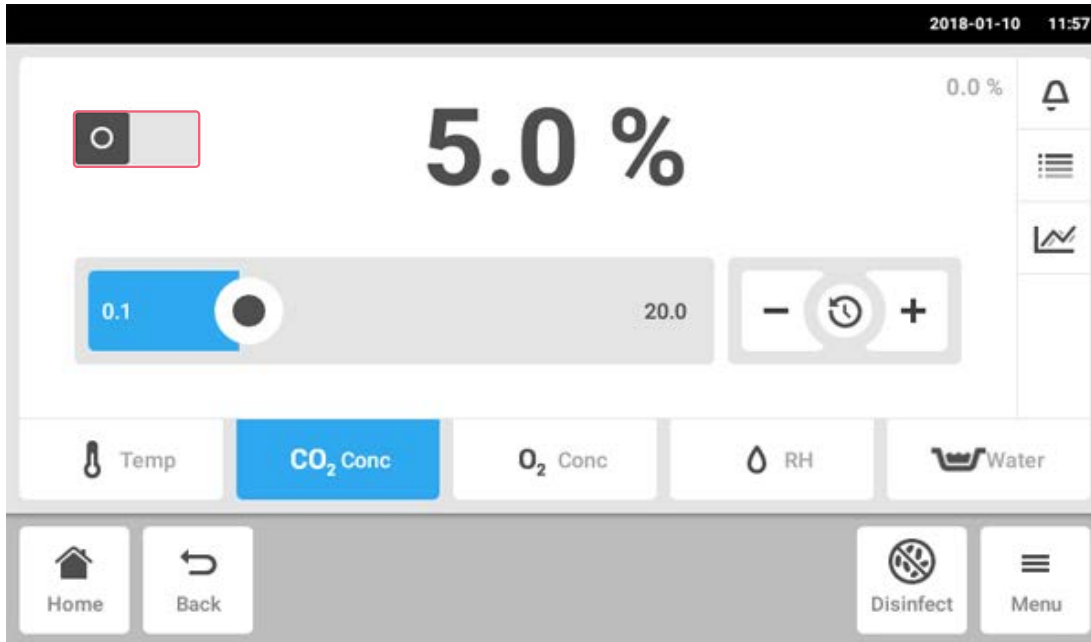


1. Tap the displayed setpoint. The number pad appears.
2. Enter the new setpoint.
3. Confirm your entry. The number pad disappears.

Starting the application

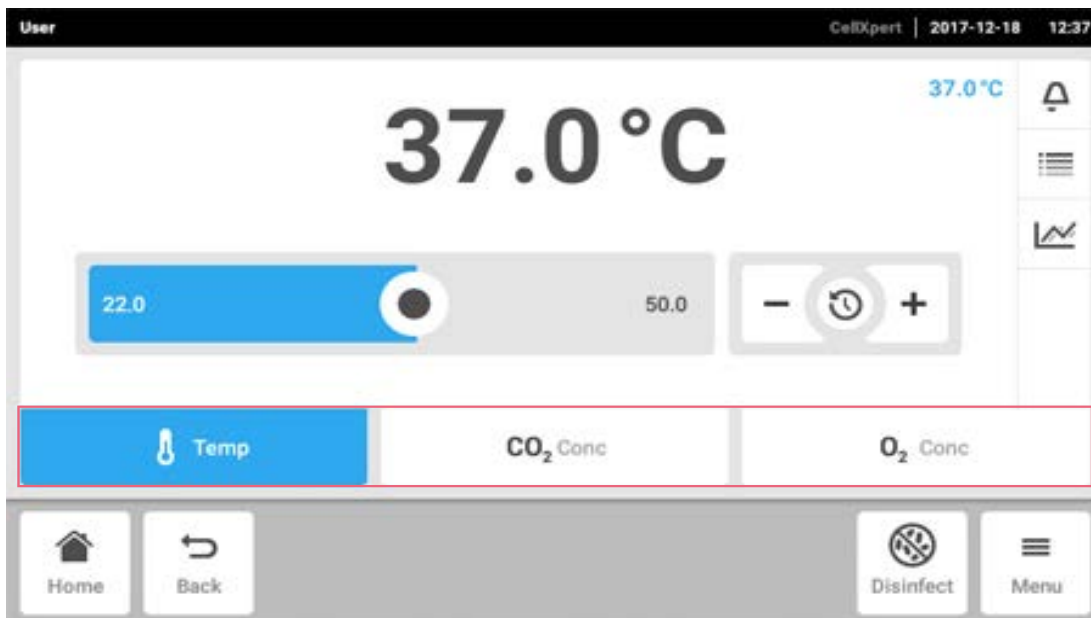
CellXpert® C170i
English (EN)

7.3.5 Activate or deactivate the gas control



- To activate or to deactivate the CO₂ control tap the status button.
- To activate or to deactivate the O₂ control (option) tap the status button.

7.4 Switching between the functions



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

8 Menu area

The *Menu* area contains all of the software settings.

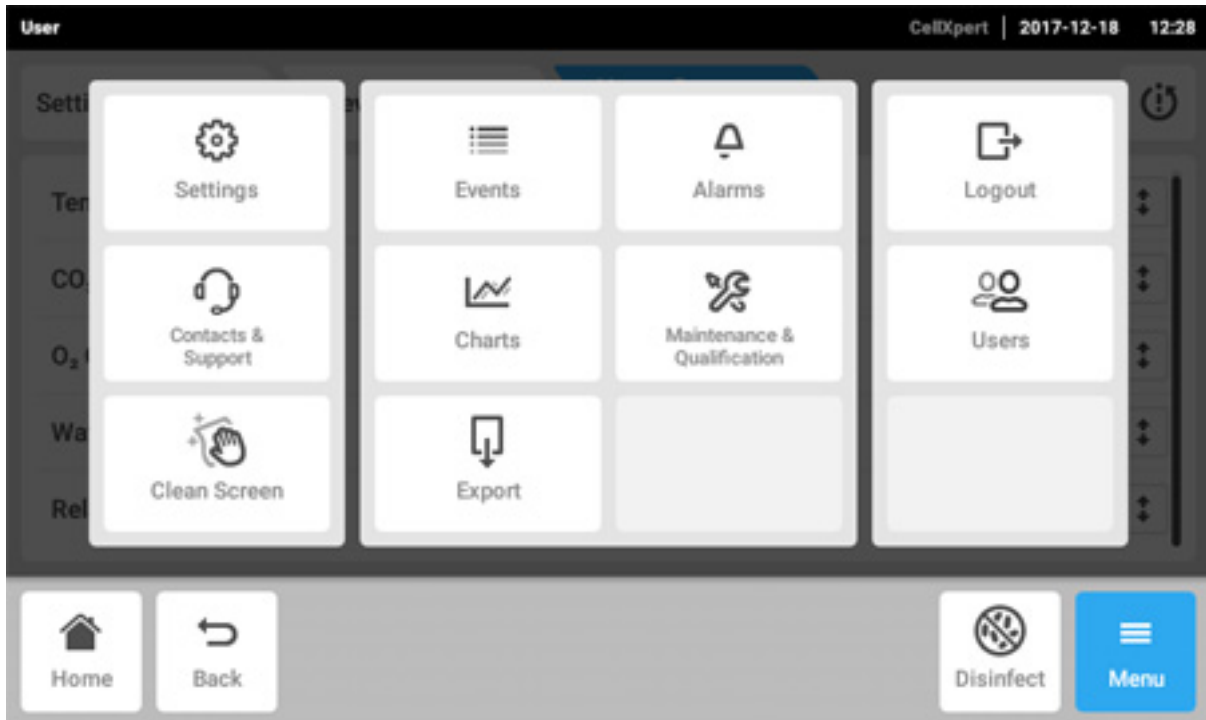


Fig. 8-1: The *Menu* screen

Settings

- Information on the device and licenses
- Device, maintenance and system settings
- Activate user management

Contacts & Support

- Information on local contact persons

Clean Screen

- Activate and deactivate the touch screen
- Clean the touch screen

Events

- Event log with messages and alarms

Charts

- View functions in a diagram

Export

- Export charts, logs and data

Alarms

- Activate alarms and set alarm limits

Maintenance & Qualification

- Perform recurring tasks

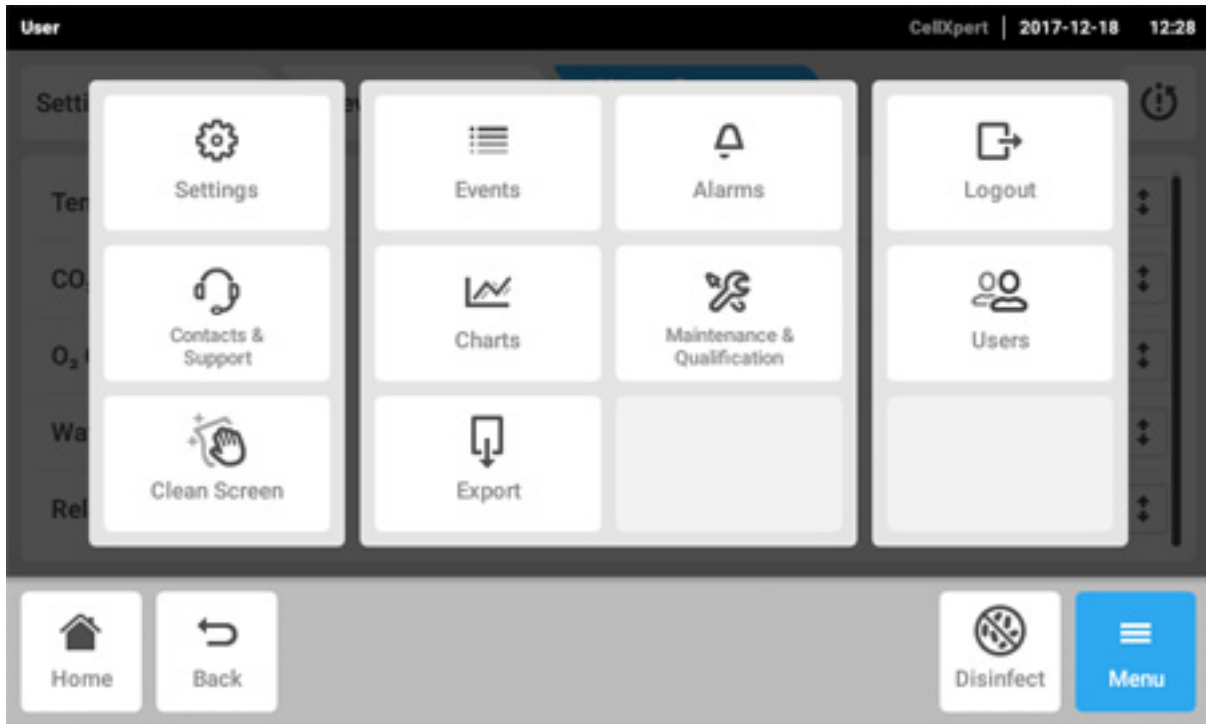
Login/Logout

- User management

Users

- User profile settings

8.1 Selecting the menu



Tap the *Menu* button. The menu items available for the device are displayed.

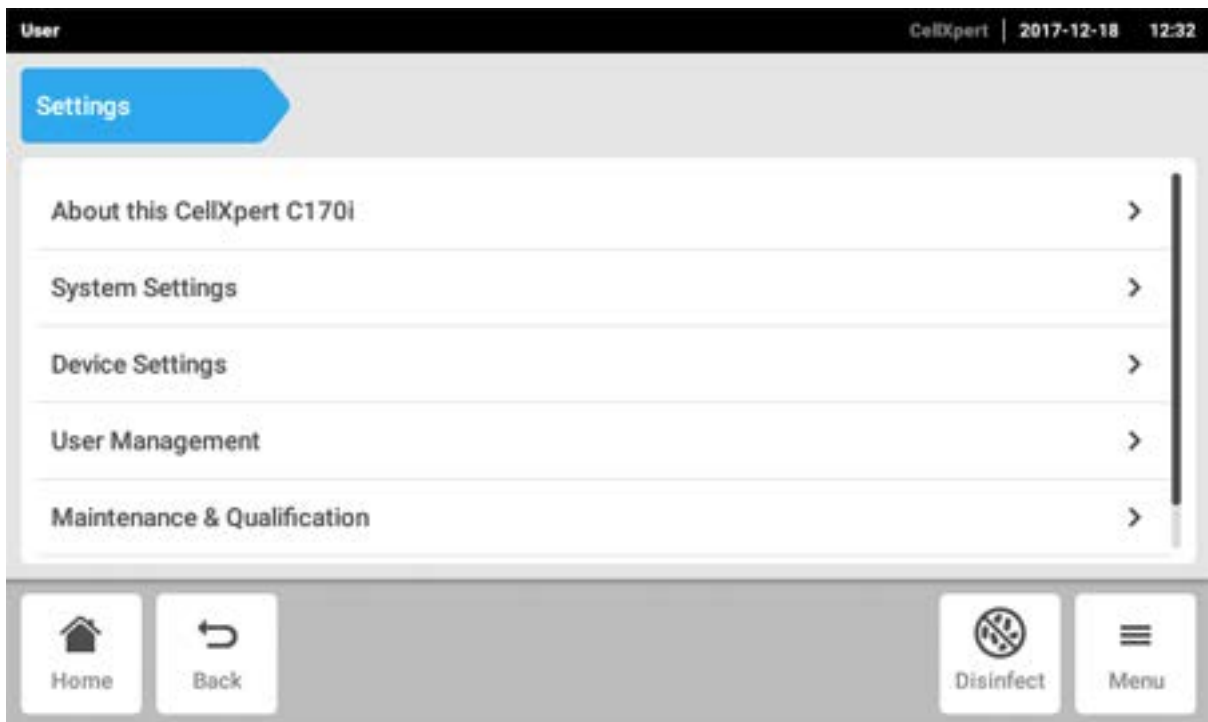
Select a menu item.

8.2 Settings

This area provides you with information on the device. You can adjust device settings and enable the user management.

- Tap the *Menu > Settings* menu items.

The following settings are available:



About this CellXpert C170i

View information on the device and licenses

System Settings

Configure date, time, and network

Device Settings

Configure sounds, relays, and display

User Management

Create user management

Maintenance & Qualification

Configure recurring tasks

8.2.1 The *About this CellXpert C170i* menu item

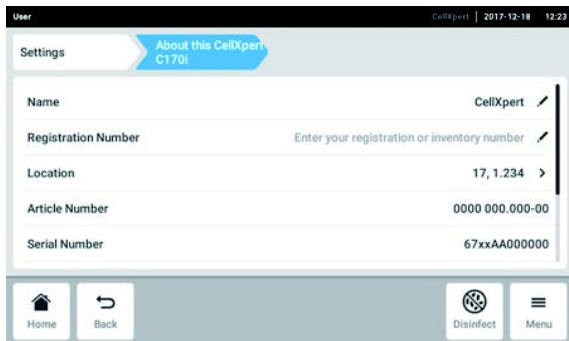


Fig. 8-2: Available fields

Name

The administrator can enter the device name.

Registration Number

The administrator can enter the inventory number of the device.

Location

The administrator can enter the location of the device.

Article Number

The article number of the model.

Serial number

The serial number of the device, see the name plate.

Software Version

User software version

Hardware Configuration

View information on optional extensions.

License Information

View information on licenses.

- ▶ Tap the *Menu > Settings > About this CellXpert C170i* menu items.

8.2.2 The *System Settings* menu item

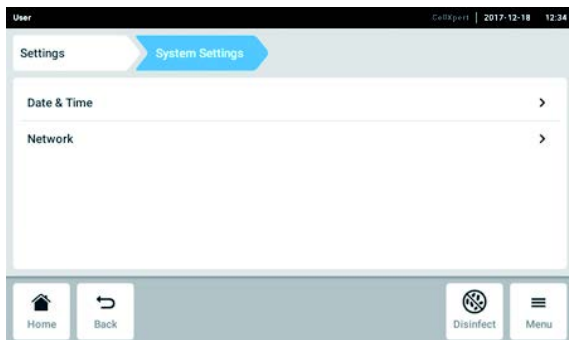


Fig. 8-3: Available settings

Date & Time

Set the date, time, and time zone.

Network

Set the parameters for network operation.

- ▶ Tap the *Menu > Settings > System Settings* menu items.

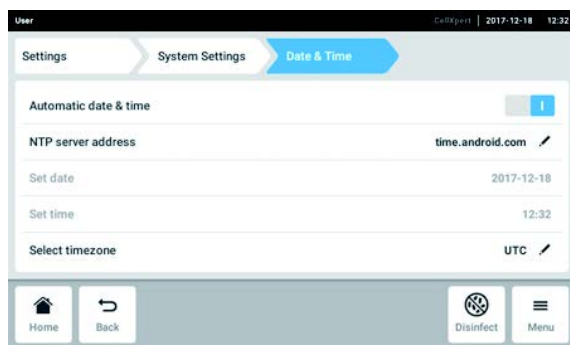
8.2.2.1 Date & Time – Setting the date and time automatically

Prerequisites

- The device is connected to the network.
- A time server is available.
- The current local time and the current date must be set on devices controlled by the VisioNize core software.



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



1. Tap the *Menu > Settings > System Settings > Date & Time* menu items.
2. Switch on the *Automatic date & time* switch.
3. Tap the *Select timezone* menu item.
4. Select the continent.
5. Select the time zone.
6. Close the selection.
The *Date & Time* menu appears.

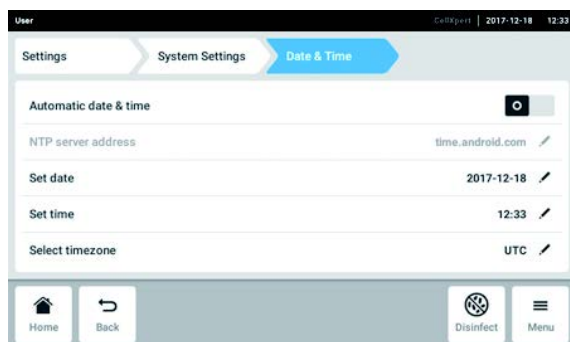
8.2.2.2 Date & Time – Setting the date and time manually

Prerequisites

- The current local time and the current date must be set on devices controlled by the VisioNize core software.



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



1. Tap the *Menu > Settings > System Settings > Date & Time* menu items.
2. Switch off the *Automatic date & time* switch.
The *Set date* and *Set time* menu items become active.
3. Tap the *Set date* menu item.
4. Set the current date.
5. Tap the *Confirm* button.
The date is saved.
The *Date & Time* menu appears.
6. Tap the *Set time* menu item.
7. Set the time.
8. Tap the *Confirm* button.
The time is saved.
The *Date & Time* menu appears.
9. Tap the *Select timezone* menu item.
10. Select the continent.
11. Select the time zone.
12. Close the selection.
The *Date & Time* menu appears.

8.2.2.3 Network

An Internet connection is not needed for the operation. The operator is responsible for the data security when connecting the device with the Internet.

Only a network administrator is allowed to connect the device with an internal network or the Internet.

Check the settings for the internal network or the Internet before connecting the device.



Fig. 8-4: Available settings

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

Allow device communication with external software

Enable DHCP

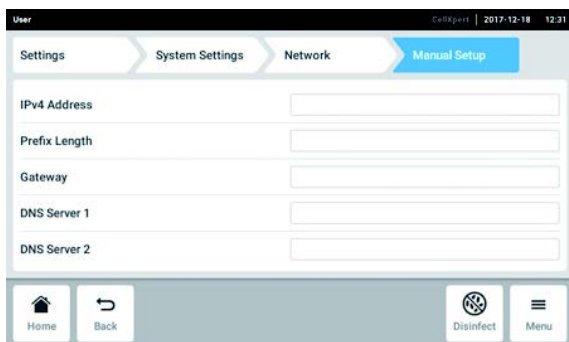
The device uses an IP address that was assigned by a DHCP server

Manual Setup

Enter the network settings manually. Active when the *Enable DHCP* switch is switched off

Self Signed Certificate

Generates an own certificate



1. Tap the *Menu > Settings > System Settings > Network > Manual Setup* menu items.
2. Deactivate *Enable DHCP* with the switch. The *Manual Setup* button appears.
3. Tap the *Manual Setup* button.
4. Enter and confirm your entry.
5. Tap the *Back* button. The data is saved. The window for the network settings appears.

8.2.3 The *Device Settings* menu item

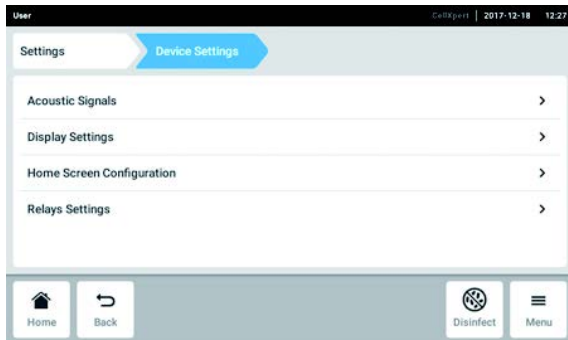


Fig. 8-5: Available settings

Acoustic Signals

Settings for the audible alarm and the volume

Display Settings

Settings for the brightness of the display

Home Screen Configuration

Configuration of the home screen

Relays Settings

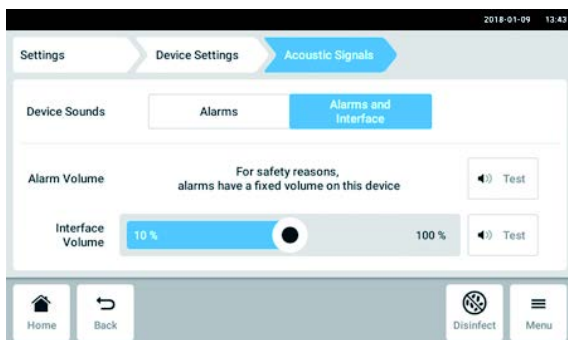
Configuration of the BMS relay contact alarm

1. Tap the *Menu > Settings > Device Settings* menu items.

8.2.3.1 *Acoustic Signals* – Setting the audible alarm



Due to safety reasons, it is not possible to totally disable the alarm signals.



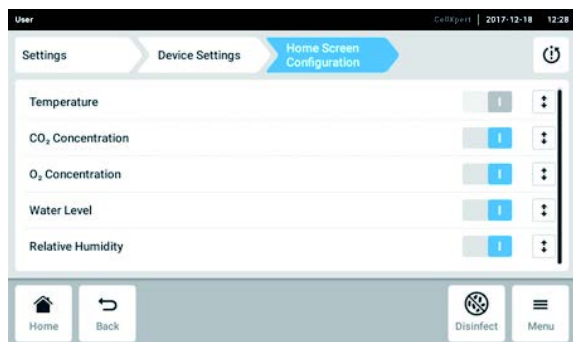
1. Tap the *Menu > Settings > Device Settings > Acoustic Signals* menu items.
2. To activate the interface signals incl. door alarm, tap the *Alarms and Interface* button.
3. To change the volume of the interface signals, swipe the slider.
4. To check the volume of the alarms or interface signals, tap the respective *Test* button.
5. To activate only the alarm signals (all notifications from the information bar like errors, alarms, and warnings), tap the *Alarms* button.

8.2.3.2 Display settings – Setting the touch screen



1. Tap the *Menu > Settings > Device Settings > Display Settings* menu items. The slider for *Display Brightness* is displayed.
2. To change the brightness of the display, swipe the slider.

8.2.3.3 Home Screen Configuration – Configuring the home screen



1. Tap the *Menu > Settings > Device Settings > Home Screen Configuration* menu items. You can specify which functions appear on the home screen. You can set the order of the functions on the home screen. You can choose the following functions:
 - *Temperature*
 - *CO₂ Concentration*
 - *O₂ Concentration* (option)
 - *Water Level* (option)
 - *Relative Humidity* (option)
2. For a function to appear on the home screen, activate the switch.
3. Set the order of the functions on the home screen using the arrow keys. On the home screen, the functions appear in the same order as in the list.
 - If 2 areas are not occupied on the home screen, the event log appears on the home screen.
 - If 4 areas are not occupied on the home screen, the event log and chart appears on the home screen.



If the O₂ sensor is temporarily not needed, deactivate the switch. After activating the switch, the sensor needs some time to reinitialize.

8.2.3.4 Relay settings – Configuring the BMS relay contact alarm

You can choose events for the 4 relays of the device. A signal is transmitted to the respective relay if a chosen event occurs. The relays can be connected to a BMS.

1. Select the relay you want to edit.
2. Tap on the black pen of the relay.
 An overlay appears with events to select for each relay:

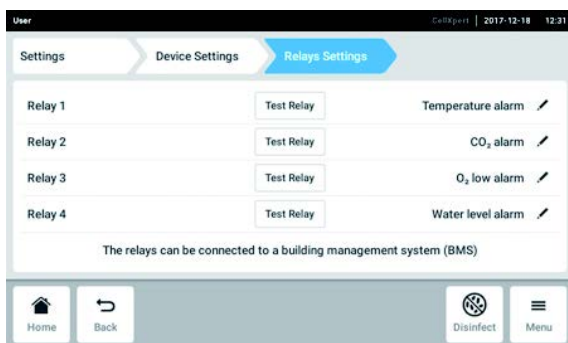
- Temperature alarm
- Temperature high alarm
- Temperature low alarm
- CO₂ alarm
- CO₂ high alarm
- CO₂ low alarm
- O₂ alarm (option)
- O₂ high alarm (option)
- O₂ low alarm (option)
- Humidity alarm (option)
- Water level alarm (option)
- Warnings
- Error
- Any alarm/Warning/Error
- Off

3. Select an event.



The selected relay transmits a signal if there is an event happening.

8.2.3.5 Relay settings – Test Relay



1. Tap the *Menu > Settings > Device Settings > Relay Settings* menu items.
2. Tap the *Test Relay* button.
 The relay is active for 15 seconds to check the correct connection to the BMS.

8.3 Alarms

Alarms can be triggered for several conditions.

- Door alarm: triggers if the outer door has been open for too long.
- Temperature alarm: triggers if the temperature in the interior exceeds the alarm limits.
- CO₂ alarm: triggers if the CO₂ concentration in the interior exceeds the alarm limits.
- O₂ alarm (option): triggers if the O₂ concentration in the interior exceeds the alarm limits.
- Relative humidity alarm (option): triggers if the humidity in the interior exceeds the alarm limits.
- Water level alarm (option): triggers if the filling level of the water is below a defined level.

An alarm message appears in the information bar if a value is out of a specified range of setpoints. The alarm is active until the value is within the set alarm limit again. The alarm system is paused for a defined time span so that no unnecessary alarm messages are triggered after:

- switching on the incubator
- changing a setpoint
- closing the outer door

8.3.1 Calling up the alarm overview

- Tap the *Menu > Alarms* menu items.



Fig. 8-6: Overview with device alarms, warning limits and alarm limits

1 Lower alarm limit
 2 Upper alarm limit

3 Alarm activated (temperature)
 4 Alarm not activated (CO₂)

If there is an active alarm, the exceeded alarm limit is highlighted in red.



8.3.2 Setting alarms and alarm limits



When delivered the factory set alarm limits are:

- Temperature: ± 0.5 K
- CO₂ and O₂: ± 0.5 %
- RH: 80 %
- Door: 30 s
- Water level: on

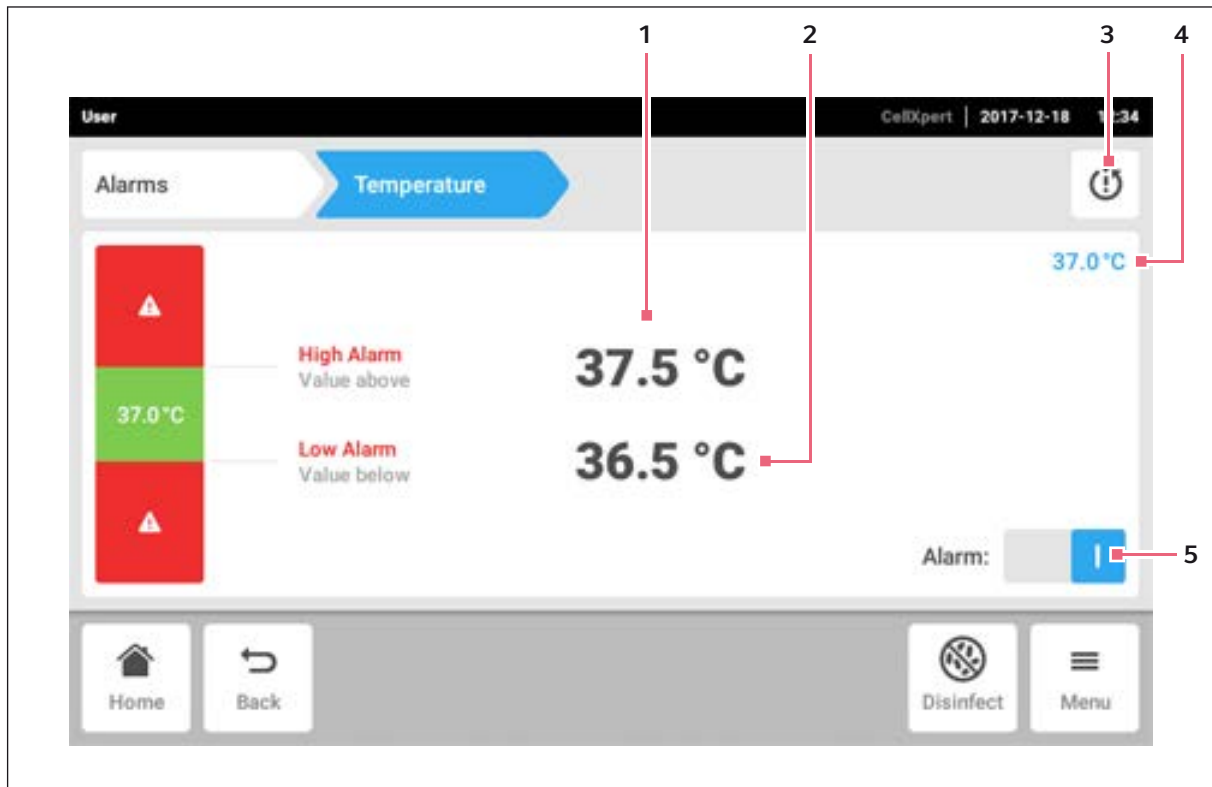


You can set the alarm limits closer to the setpoint. Alarm messages may occur more frequently then.



If you change a setpoint, the alarm limits change relatively.

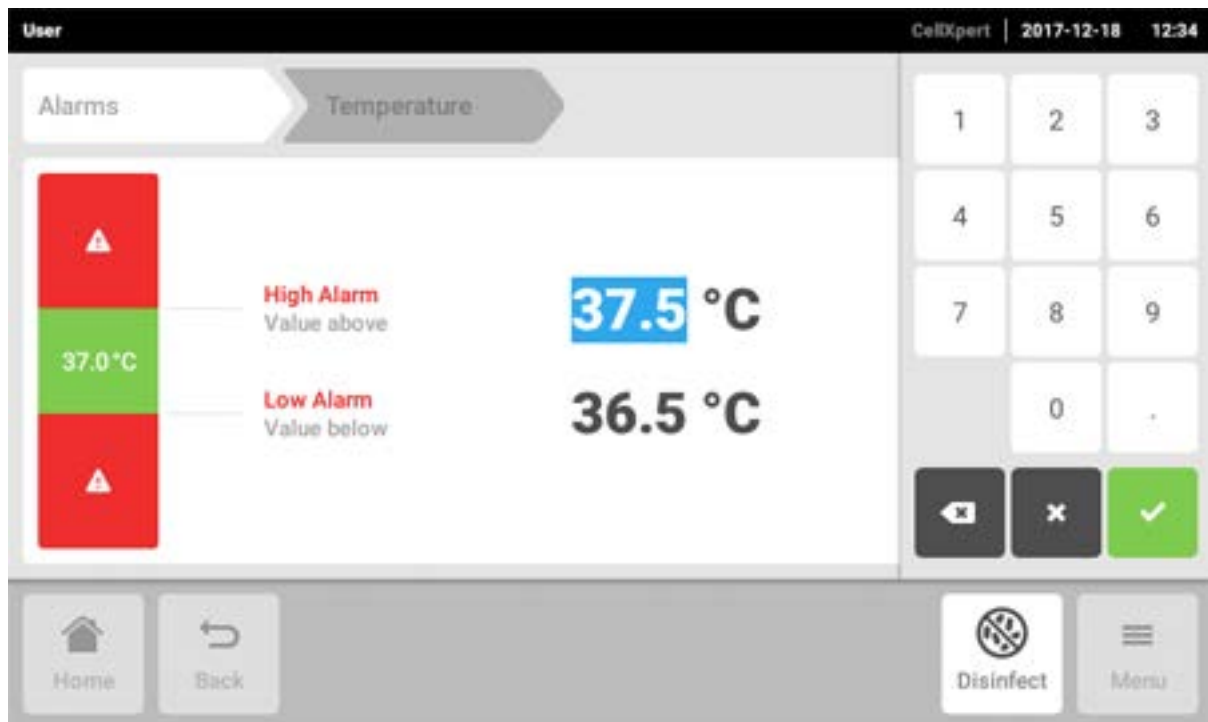
1. Tap the *Menu > Alarms* menu items.
2. To call up an alarm, tap the corresponding line.



- | | |
|---|--------------------------------|
| 1 High alarm | 4 Actual value |
| 2 Low alarm | 5 Activate or deactivate alarm |
| 3 Sets the alarm limits around the setpoint in line with factory settings | |

The window for the alarm settings appears.

- To change an alarm limit, tap the alarm limit.



The number pad appears.

4. Enter the new alarm limit.
5. Confirm your entry.

The entered alarm limit appears on the display.

8.4 Events

This area contains messages and alarms with the corresponding time and, if applicable, the user. You can filter and export *Events*.

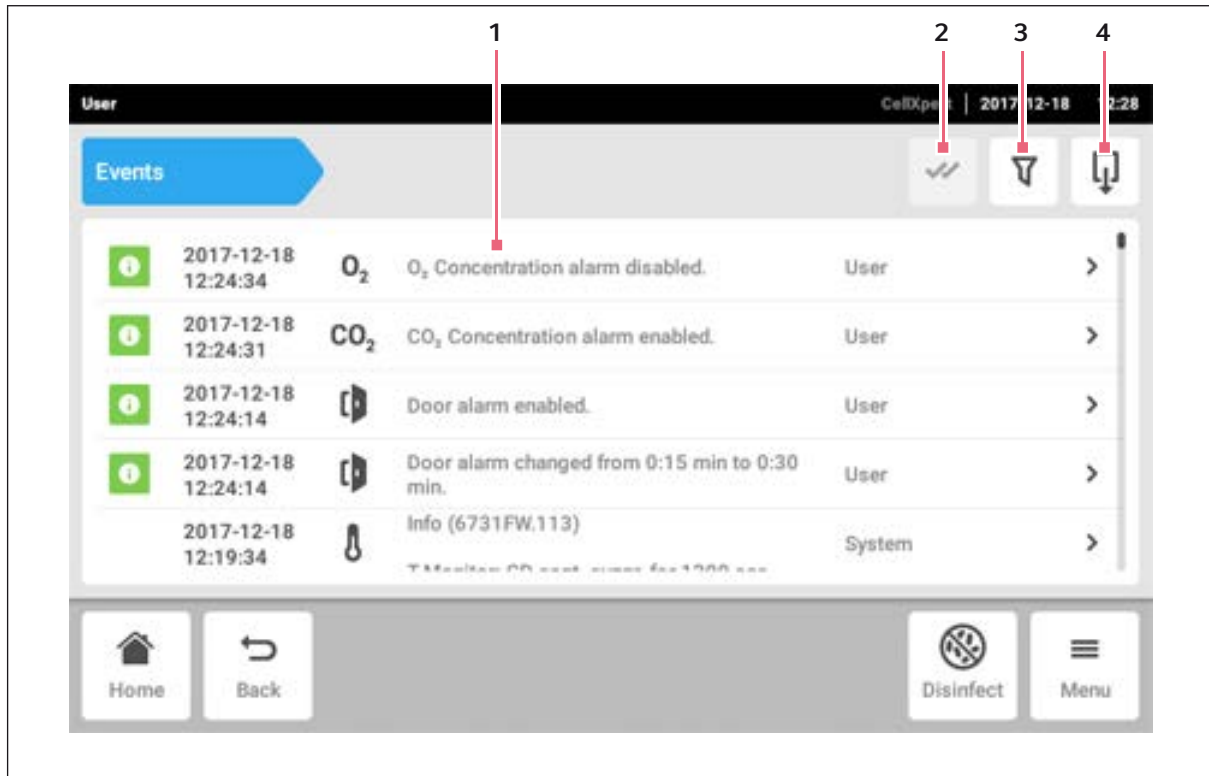


Fig. 8-7: The *Event log* screen

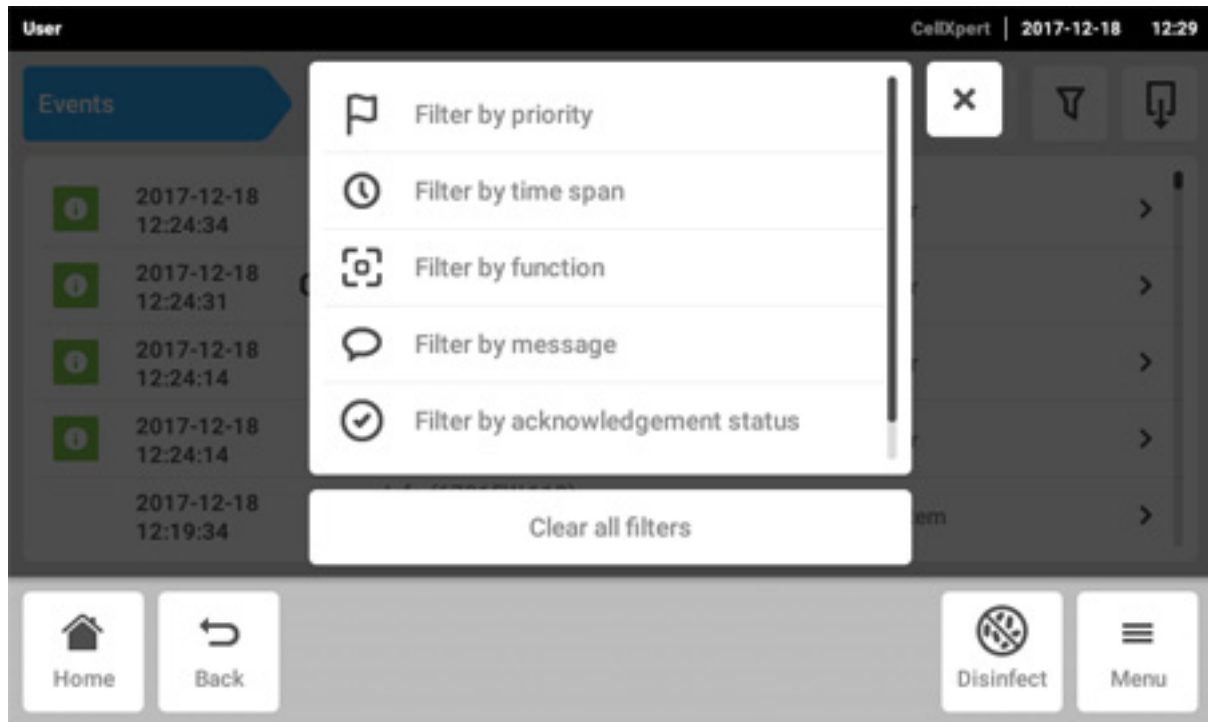
- | | |
|--|--|
| <p>1 List with all notifications and messages</p> <p>2 Confirm all notifications</p> | <p>3 Filter options: This button is highlighted in blue if messages are filtered.</p> <p>4 Export list with messages to a USB storage medium</p> |
|--|--|

Up to 100000 notifications and messages can be saved. The oldest entries are overwritten if there are more than 100000 entries.

8.4.1 Retrieving events

1. Tap the *Menu > Events* menu items.

8.4.2 Filtering events




1. Tap the *Filter* button
2. Select the filter. If a filter is enabled, a checkmark appears next to the filter. The *Filter* symbol is highlighted in blue.
3. To disable all filters, tap the *Clear all filters* button.

8.4.3 Calling up more information

1. Select a message or notification from the event list.
A window with further information appears.
2. To navigate to messages or notifications, use the arrow keys.

8.4.4 Exporting events

 Currently filtered event logs are exported.

1. Plug in a USB storage medium.
2. To export *Events* as a list, tap the *Export* button.
3. To finish the procedure, acknowledge the notification.

8.5 Charts

The chart shows 2 functions on 2 y-axes. The time is shown on the x-axis.



The data of the last 7 days is stored uncompressed. Data older than 7 days up to 6 months is stored compressed. The compression of the data may affect the appearance of the chart.



Fig. 8-8: Chart screen

1 Select the function

The chart displays the values of the selected function.

2 Select the time span

3 Name of the function of the displayed values

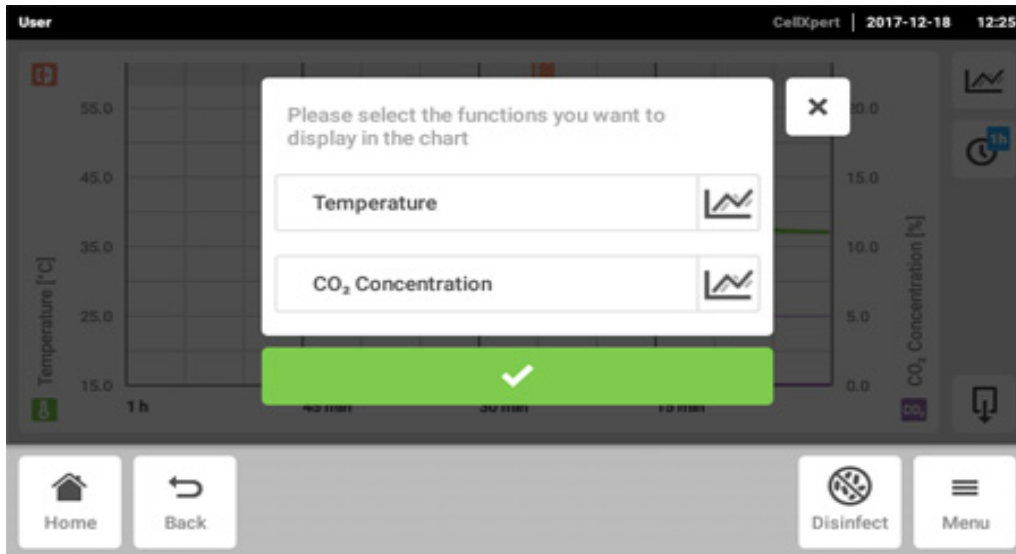
4 Export chart data to a USB storage medium

8.5.1 Opening the chart

1. Tap the *Menu > Charts* menu items.

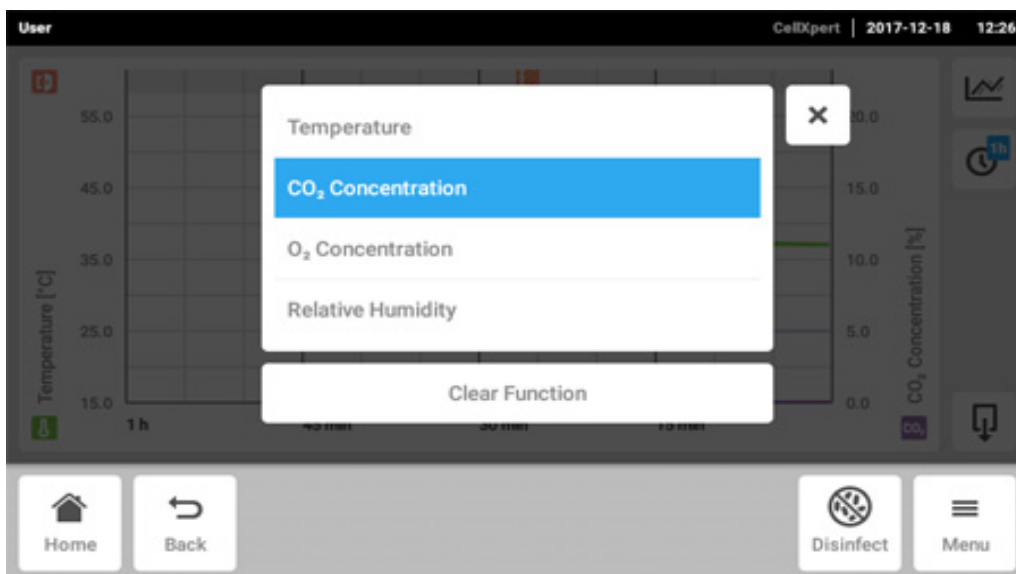
8.5.2 Selecting functions

1. To select which function is shown, tap the correspondent button.



A window with 2 lines appears.

2. To select the function for the left y-axis, tap the upper line.
3. To select the function for the right y-axis, tap the lower line.



A window with the available functions appears.

4. Select the function.
 The function appears in the tapped line.
5. Confirm your selection.
 The functions appear in the chart.

8.5.3 Selecting the time span

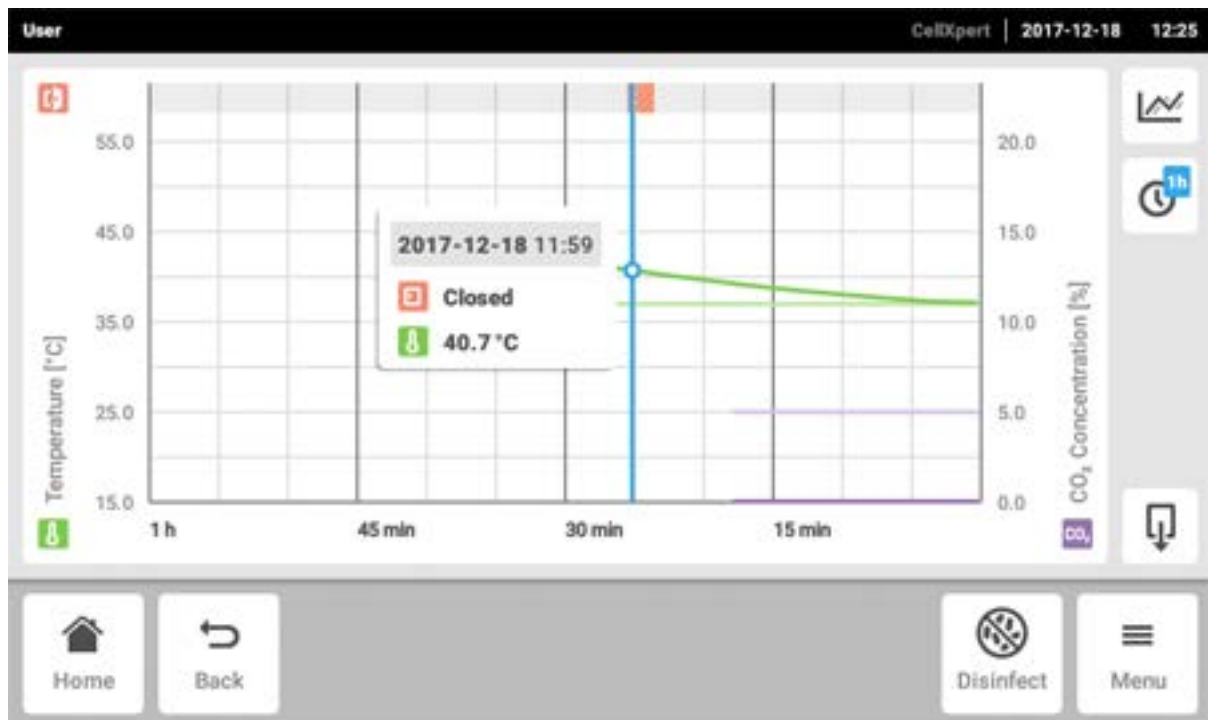
1. To select the time span, tap the correspondent button.
2. Select the time span.

The time span appears on the x-axis.

The program measures the data of a function every 15 seconds. If you select a large time span, the resolution of the displayed data is adjusted.

8.5.4 Displaying values from the chart

1. To display numerical values from the chart, select a defined time.
2. Tap the corresponding point in the chart. The functions appear in a separate window.

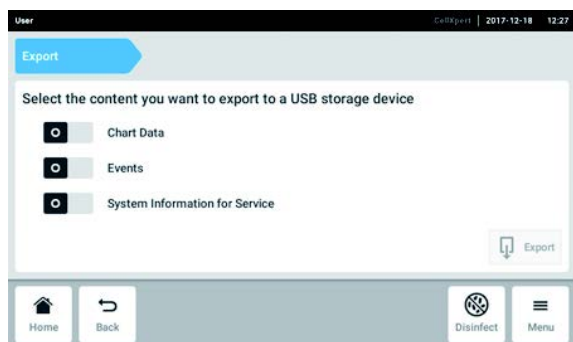


8.5.5 Exporting the chart

1. To export the data from the chart, tap the *Export* button.
 The currently selected time span and the currently selected parameters are exported.

8.6 Export

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



1. Connect a USB storage medium.
2. Tap the *Menu > Export* menu items.
A list for the export appears.
3. Select which data to export.
Data shown in gray will not be exported.
4. Tap the *Export* button.
The data is stored. The notice *Export successful* appears if the export is finished.
5. Confirm the export.
6. Remove the USB storage medium.

8.7 Recurring tasks

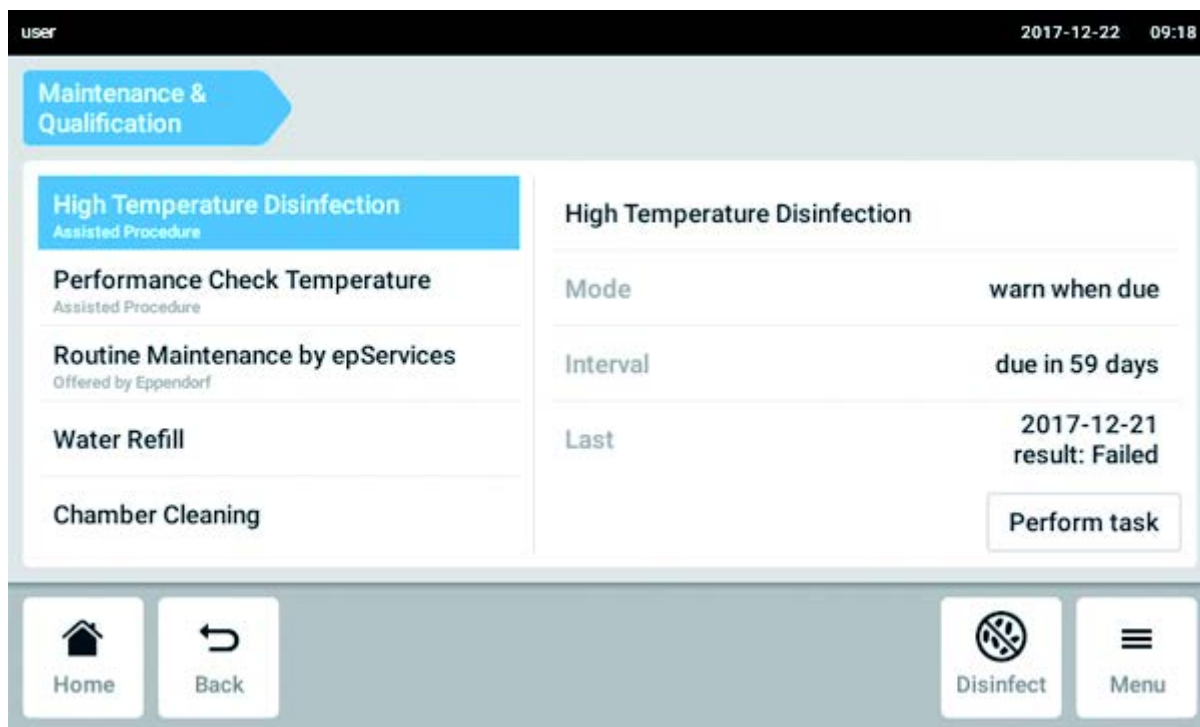
The CellXpert C170i features the option of activating an automatic reminder for common tasks. Eppendorf provides a set of predefined tasks with the delivery of the incubator. The user can edit existing tasks or define new tasks.

8.7.1 Predefined tasks

Task name	Description
Routine maintenance by epServices	Tasks offered by Eppendorf: If you want maintenance to be executed regularly, contact your local Eppendorf partner.
High-temperature disinfection	Tasks assisted by the operation of the incubator.
Performance check	
Chamber cleaning	Tasks executed manually and independently from the operation software.
Water refill	

8.7.2 Perform a recurring task

1. Tap the *Menu > Maintenance & Qualification* menu items.



A list with predefined tasks is displayed.

2. Select a task.
3. Tap the *Perform task* button.

If you select the *High Temperature Disinfection* task, a software-guided procedure starts.

If you select the *Performance Check* tasks, a software-guided procedure starts.

If you select other tasks, you can confirm the execution of the tasks.

Only an authorized service technician can execute tasks offered by Eppendorf.

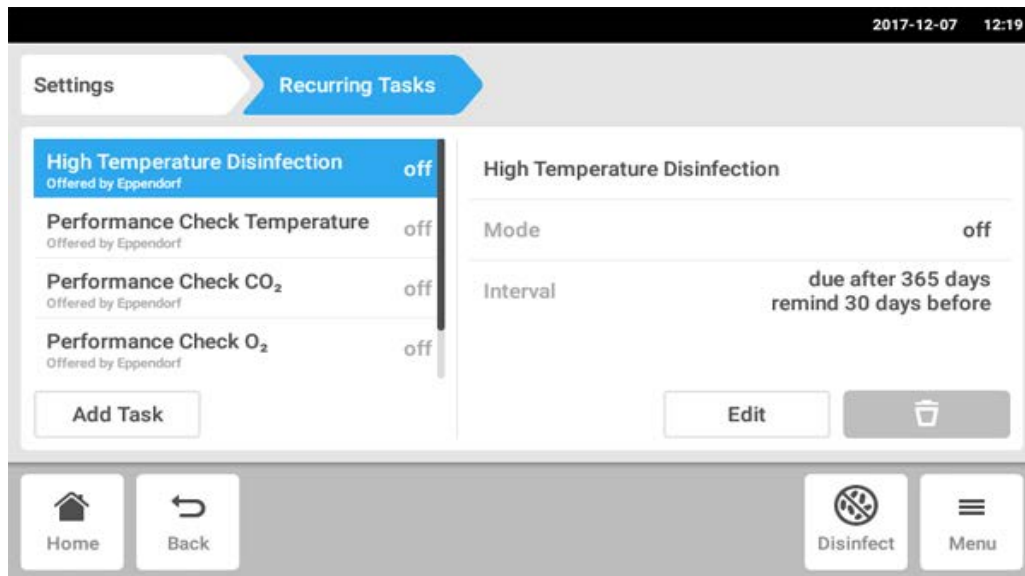
The entry of the last execution of a task is updated, when this task is executed again.

A warning gives the user a hint, that a task has to be executed. To define an interval for the warning, see *Edit a recurring task*.

8.7.3 Edit a recurring task

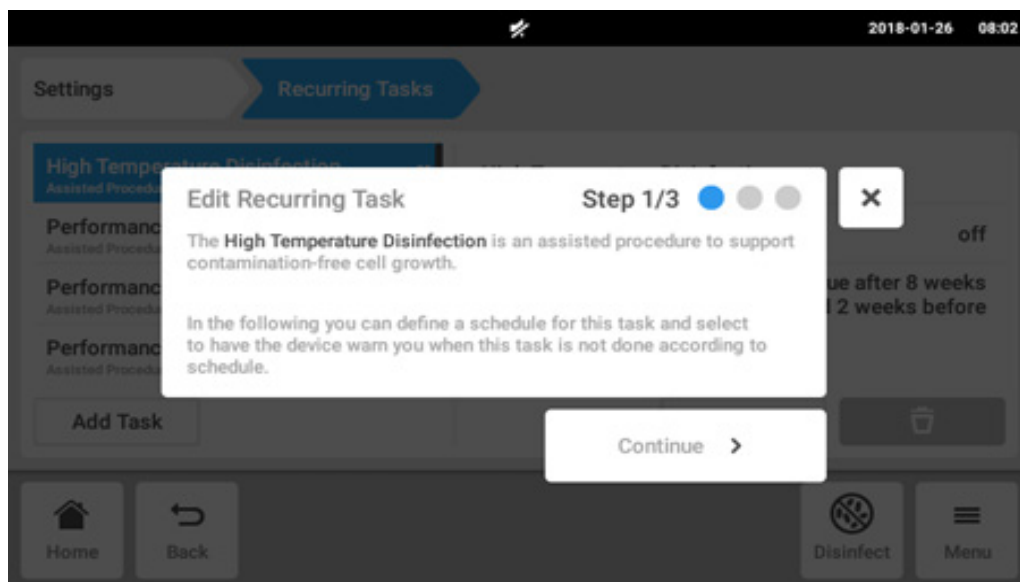
You can edit an existing task.

1. Tap the *Menu > Settings > Recurring Tasks* menu items.



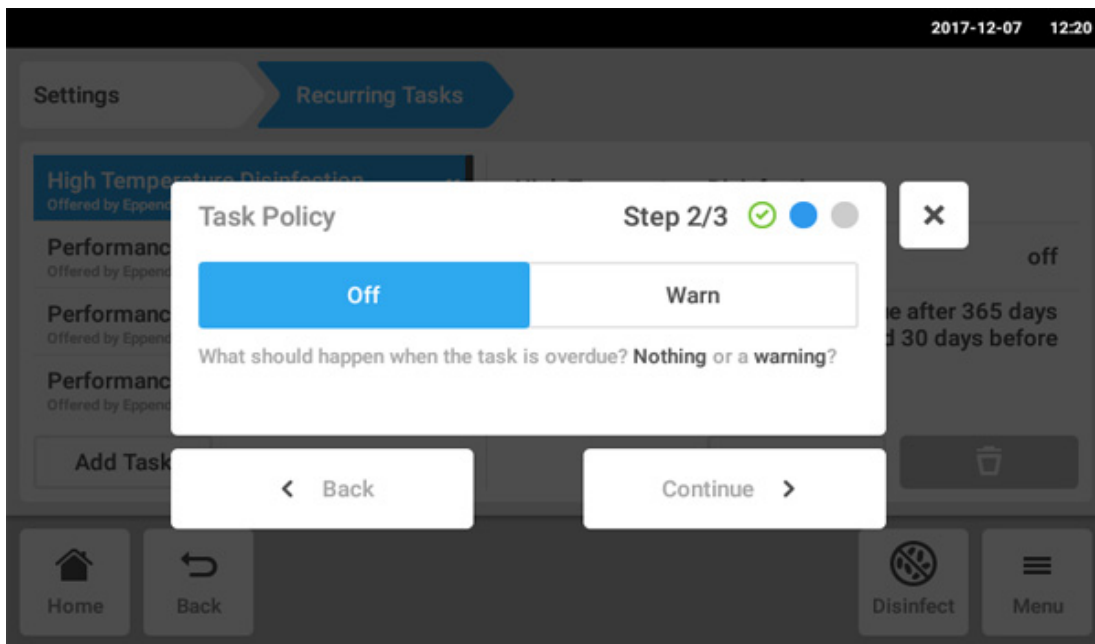
A list with predefined tasks is displayed.

2. Select a task.
3. Tap the *Edit* button.

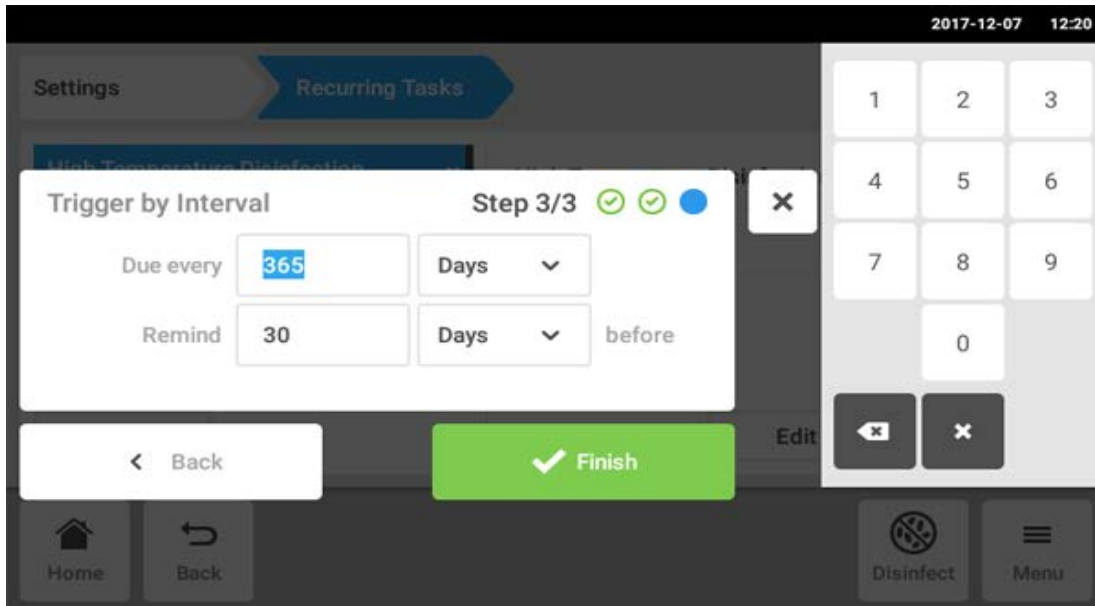


A wizard window appears that explains the task.

4. Tap the *Continue* button.



5. Select to have the incubator warn you when the task is overdue. When selecting *Off*, you can still define an interval without a warning.
6. Tap the *Continue* button.

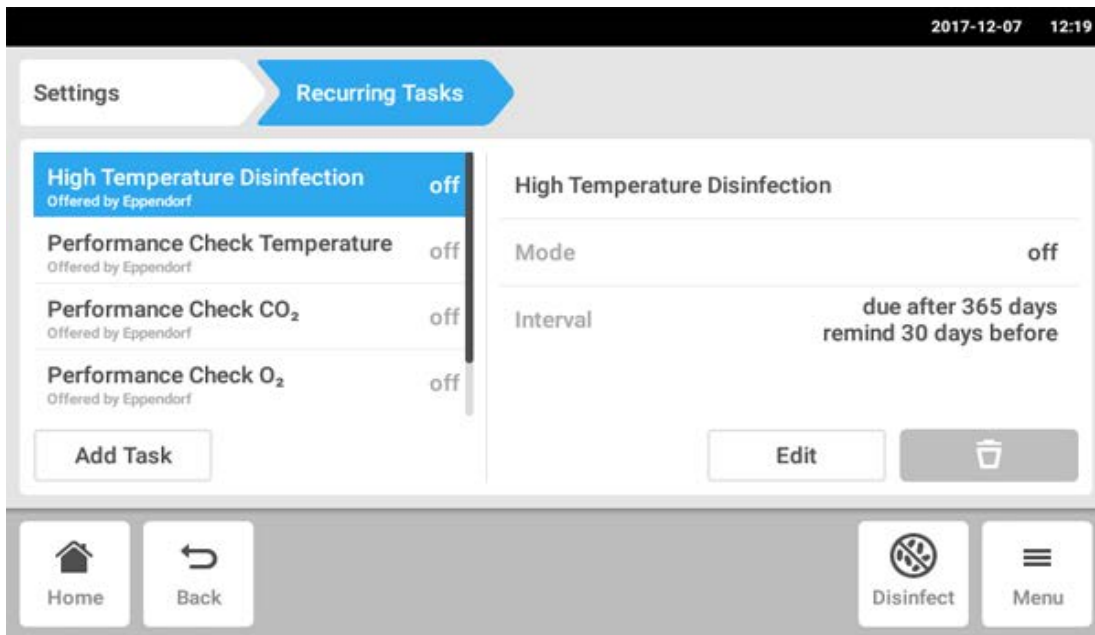


7. Define the interval: yearly, monthly, weekly, or daily. Additionally you can set a reminder.
8. Tap the *Finish* button.

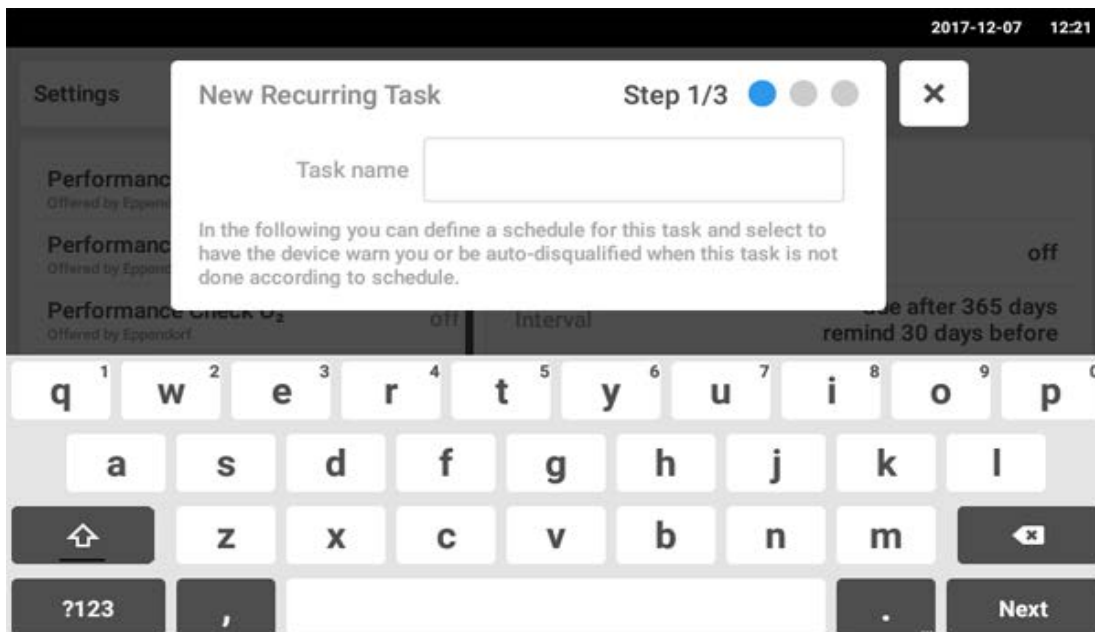
8.7.4 Define a new recurring task

To set a customized reminder, you can define a new task. Tasks that have been defined by yourself are deletable.

1. Tap the *Add Task* button.

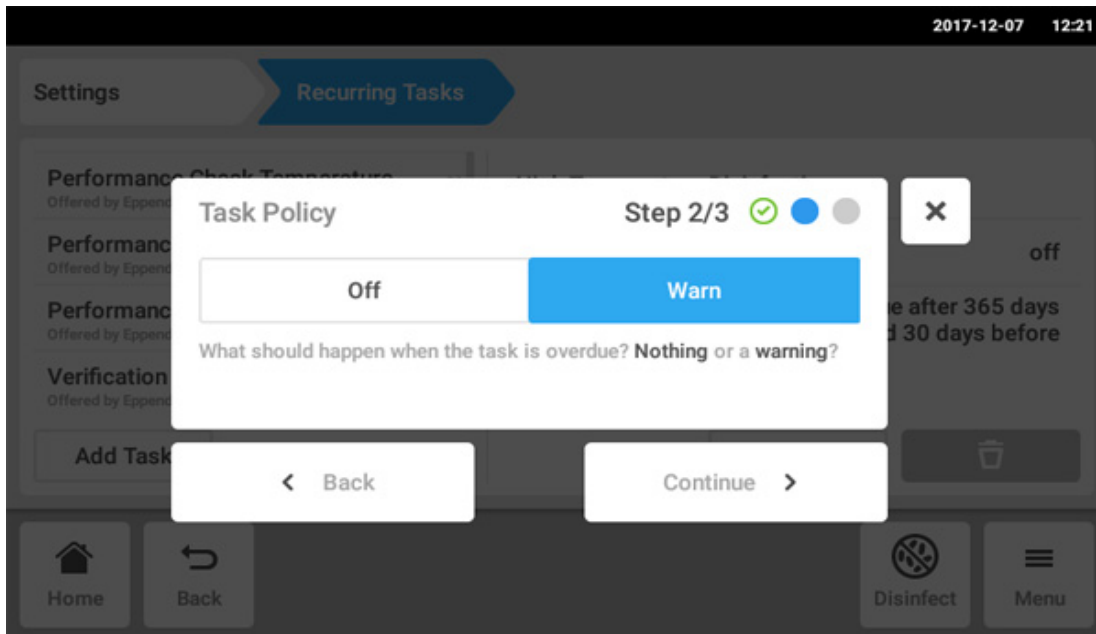


A wizard window appears.

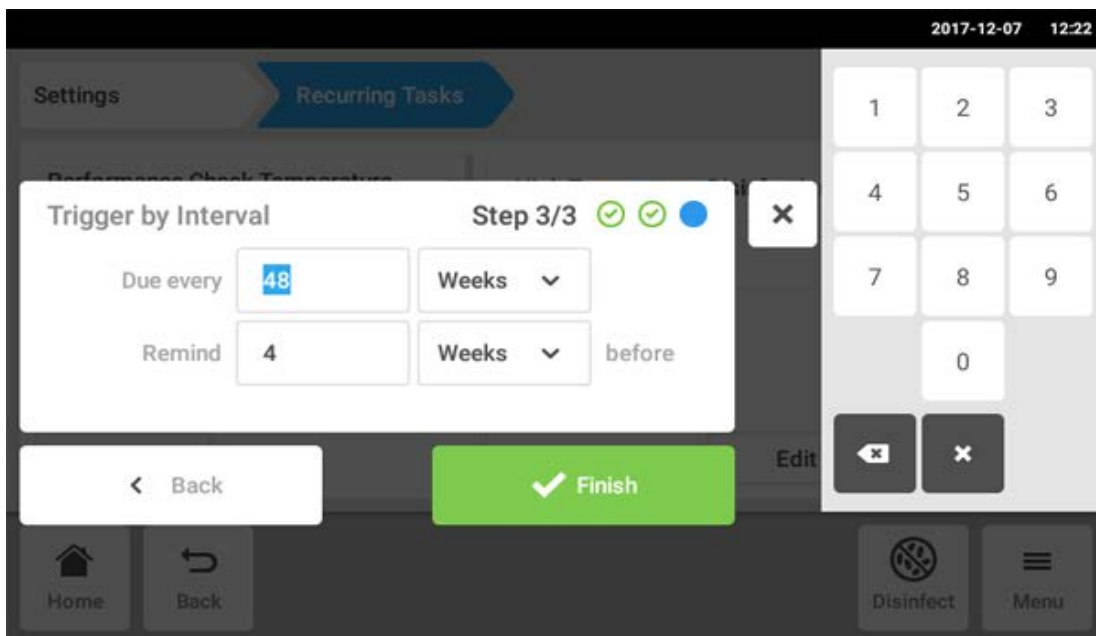


2. Enter the task name

3. Tap the *Next* button.



4. Select to have the incubator warn you when the task is overdue. When selecting *Off*, you can still define an interval without a warning.
5. Tap the *Continue* button.



6. Define the interval: yearly, monthly, weekly, or daily. Additionally you can set a reminder.
7. Tap the *Finish* button.

9 User administration

9.1 The user administration concept

The user administration can be used to organize access to the incubator. There are three user roles:

- Administrator
- User with standard rights
- User with restricted rights

9.1.1 User roles for working with user administration

Administrator (role with extra rights)

- Configuring the incubator
- Access to user administration

User with standard rights

- A normal user can operate the incubator without restrictions.

User with restricted rights

- A user with restricted rights can operate the incubator with certain restrictions, i.e. acknowledge notifications and view settings.

Logged out user

- A logged out user can view all relevant information.

9.1.2 Working without user administration

Without user administration, all users have the same rights as an administrator.

9.1.3 User rights

Tasks	User with restricted rights	User with standard rights	Administrator/user (rights without user administration)
Change parameters		x	x
Change alarm limits			x
Change settings			x
Change relay settings			x
Change alarm volume		x	x
Change home screen configuration		x	x
Change own PIN/ password	x	x	x
Change user name			x

Tasks	User with restricted rights	User with standard rights	Administrator/user (rights without user administration)
Change user rights			x
Acknowledge alarm		x	x
Acknowledge error			x
Acknowledge warnings	x	x	x
Start high-temperature disinfection		x	x
Start performance check			x
Start relay test function			x
Export event log	x	x	x
Export charts	x	x	x
Login/logout	x	x	x
View administrator settings	x	x	x
View user settings	x	x	x
View device information	x	x	x
Configure network settings			x
Create user account			x
Reset user password			x
Delete user account			x

9.2 Establishing the user management



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 will be possible in the user management and system settings.

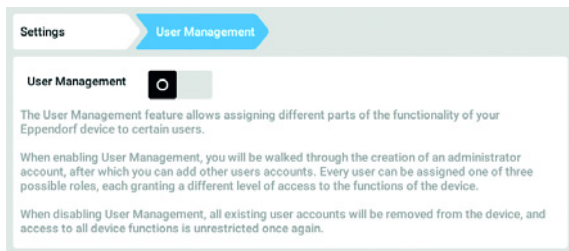
In this case, the device will have to be reset to the factory settings by an authorized service technician. All the user accounts and the data and settings stored on the device will be deleted.

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

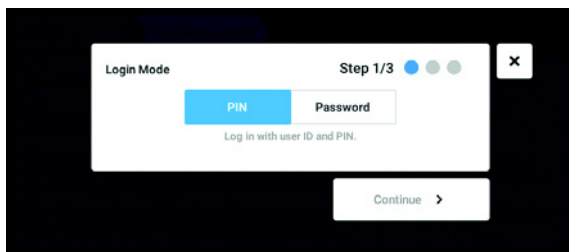
9.2.1 Creating an administrator

Prerequisites

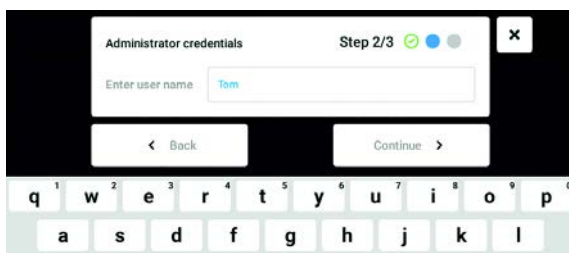
- The incubator is ready to operate.
- The home screen is active.



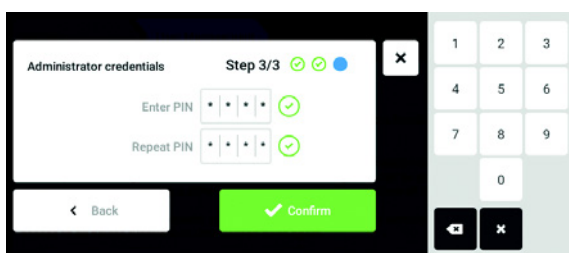
1. Tap the *Menu* button and navigate to the *Settings > User Management* menu item.
2. To activate the user administration, slide the *User Management* switch to the *I* position. The *Login mode* window appears.



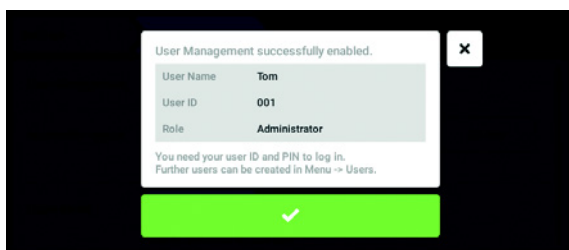
3. Define the login mode for all users.
4. Continue the process with *Continue*. The *Administrator credentials* window appears.



5. Enter the user name for the first administrator in the *Enter User Name* field.
6. Continue the process with *Continue*. The *Administrator credentials* window appears.



7. Enter PIN or password in the *Enter PIN/Password* field. Confirm the entry in the *Repeat PIN/Password* field.
8. Continue the process with *Continue*. The *User Management successfully enabled* window appears. The user administration is activated. The user account for the first administrator is created.

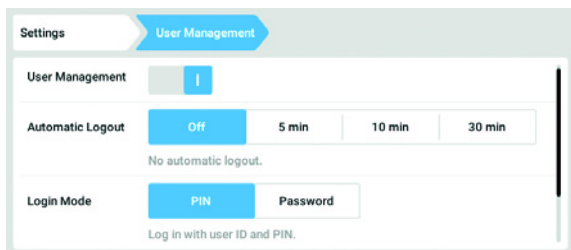


9. Confirm the message. The *User Management* window appears. It is now possible to edit the user administration.

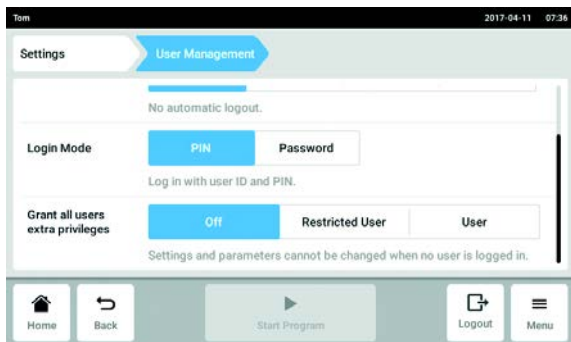
9.2.2 Editing the user administration

Prerequisites

- The incubator is ready to operate.
- The administrator is logged in.
- The home screen is active.



1. Tap the *Menu* button and navigate to the *Settings* > *User Management* menu item.



2. Define the settings for the user administration.

- *User Management*: Switch the user administration on and off.
- *Automatic Logout*: Define the time after which a user is automatically logged out if the touch screen is not used.
- *Login Mode*: Define the login mode for all users.
- *Grant all users extra privileges*: Restricted rights (*Restricted User*) or standard rights (*User*) are active for all users.



When the *Grant all users extra privileges* option is activated, a login is not necessary. Also, users who are not recorded in the user administration can operate the device with these rights (*Restricted User / User*).

9.2.3 Deactivating the user administration



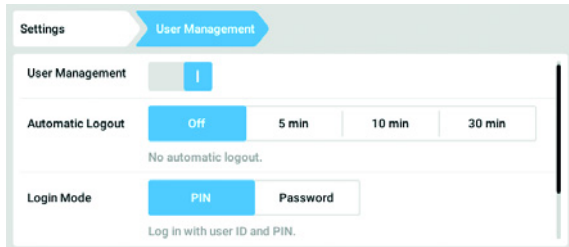
NOTICE! Data loss in case of deactivation of the user administration

Deactivating the user administration deletes all user accounts.

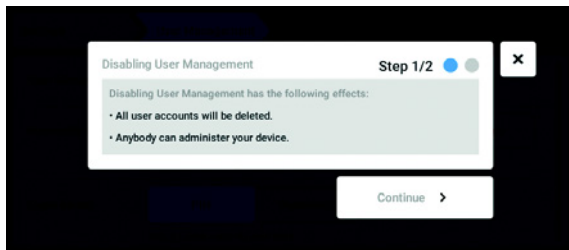
- ▶ Check whether deactivation of the user administration is required.
- ▶ Inform all users that the user accounts have been deleted.

Prerequisites

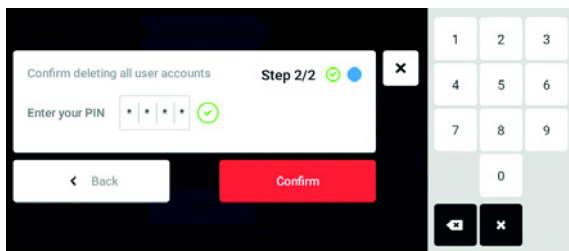
- The incubator is ready to operate.
- The administrator is logged in.
- The home screen is active.



1. Tap the *Menu* button and navigate to the *Settings* > *User Management* menu item.
2. To deactivate the user administration, slide the *User Management* switch to the 0 position. The *Disabling User Management* window appears.



3. Continue the process with *Continue*. The *Confirm deleting all user accounts* window appears.



4. Enter the PIN/password.
5. Complete the process with *Confirm*. The user administration is deactivated. All user accounts are deleted.

9.3 User login

Prerequisites

The user administration is set up, and you can login as a user or administrator.

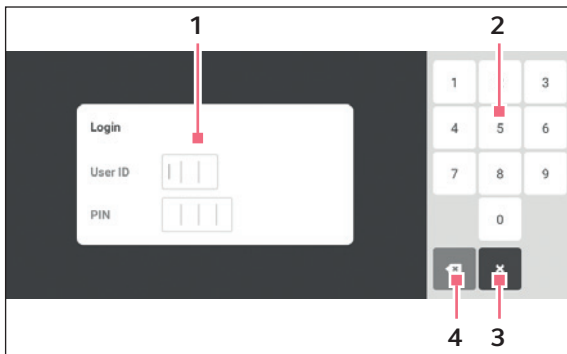


Fig. 9-1: The *Login* screen

- | | |
|---------------------|--|
| 1 Edit box | 3 Abort login |
| 2 Number pad | 4 Delete the entry step by step |

Logging in as a user

1. Tap the *Menu > Login* menu items.
2. Enter your user ID/user name and your PIN/password.

If the correct PIN or password was entered, the user is automatically logged in.

Logging out as a user

1. Tap the *Menu > Logout* menu items.

9.4 Editing user accounts as an administrator



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

The administrator password protects the device software from unwanted access.

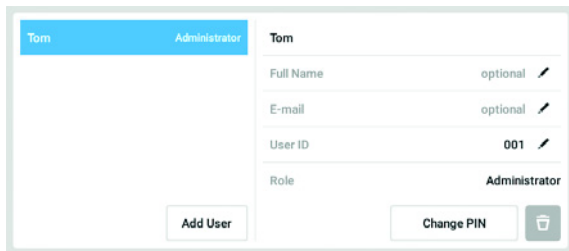
- ▶ Make a note of the administrator password.
- ▶ Keep the administrator password at a secure location.
- ▶ Only provide the administrator password to individuals who work with the system configuration.
- ▶ Please contact Eppendorf AG if you have any problems with the administrator password.

9.4.1 Creating a user account

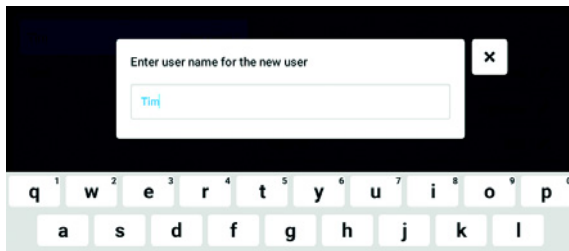
i You can create 999 user accounts.

Prerequisites

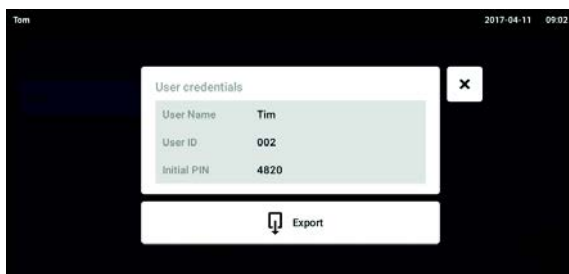
- The administrator is logged in.



1. Tap the *Menu* button and navigate to the *User* menu item.
The list with the user accounts is displayed.
2. Tap the *Add User* button.
The *Enter User Name for the new user* field appears.



3. Enter the user name.
4. Confirm your entry.
The *User credentials* window appears.
The user account is created. The user data appears in the window.
The user is assigned to the user group *Restricted User*.



5. **Optional export of user data:** Connect a USB storage medium and tap the *Export* button.
6. Confirm the export.
The user data is exported to the USB storage medium in a TXT file.
7. If the export is successful, the *Export successful* window appears.
To complete the process, confirm the message.

9.4.2 Editing user accounts

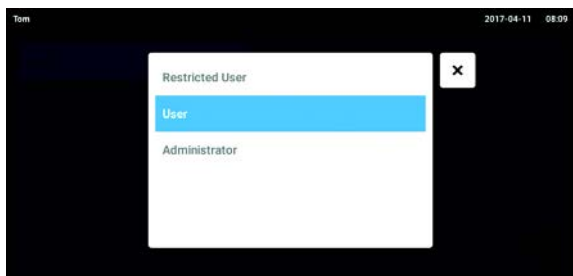
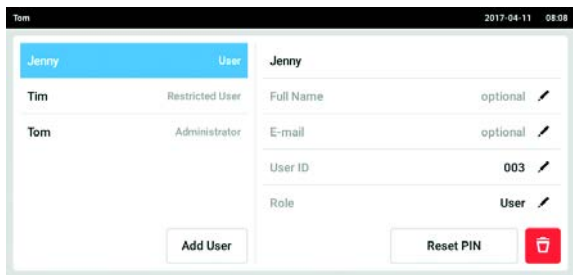
i Users with restricted user rights or standard rights can only edit their own *Full Name* and *E-mail* entries. Users can always change their own PIN or password. Administrators can assign a new user ID to a user account and change the rights.

Prerequisites

- The administrator is logged in.

User administration

CellXpert® C170i
English (EN)



1. Tap the *Menu* button and navigate to the *User* menu item.
The list with the user accounts appears. Entries that can be edited are indicated by a black pen.
2. Select the user account.
3. Optional: Enter the full name.
4. Optional: Enter the e-mail address.
5. To change the user ID, tap *User-ID*.
6. Select the new user ID.

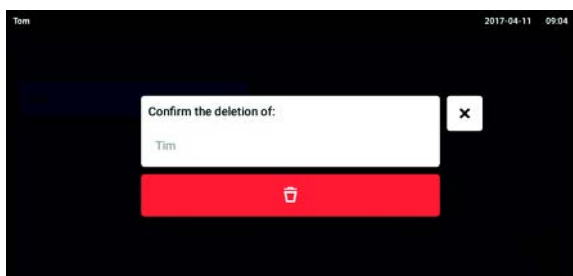
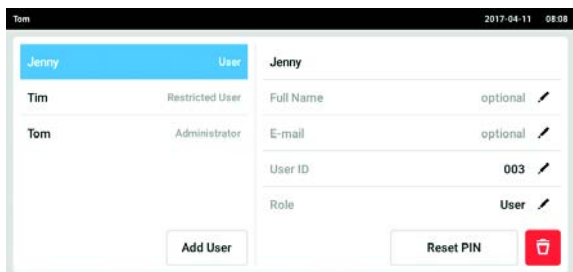
7. To change the user group and the corresponding rights, tap *Role*.
The list with the available user groups appears.
8. Assign a user group to the user.
 - Restricted User
 - User
 - Administrator

The selected parameters are stored and appear in the user account.

9.4.3 Deleting a user account

Prerequisites

- The administrator is logged in.



1. Tap the *Menu* button and navigate to the *User* menu item.
The list with the user accounts appears.
2. Select the user account to be deleted.
3. Tap the *Recycle bin* symbol.
The *Confirm the deletion of:* window appears.

4. Confirm that you want to delete the user account.
The user account is deleted.

9.4.4 Resetting the password/PIN for a user account

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



The administrator can only change their password or PIN with their current access data. If the administrator's access data is lost, changes are no longer possible in the user administration. In this case, the device must be reset to the factory settings by an authorized service technician. All user accounts and the programs, log files, and logs stored on the device will be deleted.

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

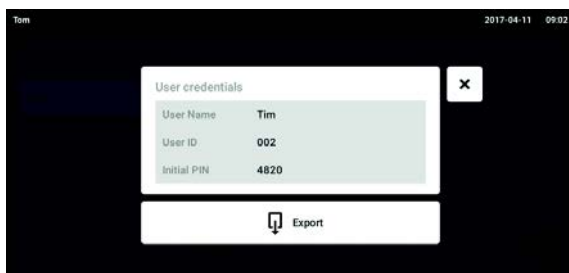
Prerequisites

- The administrator is logged in.



1. Tap the *Menu* button and navigate to the *User* menu item.
The list with the user accounts appears.
2. Select the user account.
3. Tap the *Reset Password/PIN* button.
The *Do you want to reset the Password/PIN for:* window appears.

4. Confirm the process with *Reset*.
The *New Credentials* window appears.
The new password/PIN is created automatically.



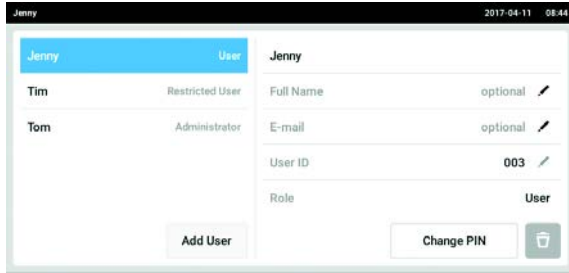
5. To export the user data, connect the USB storage medium and tap the *Export* button.
6. Confirm the export.
The user data is exported to the USB storage medium in a TXT file.
7. If the export is successful, the *Export successful* window appears.
To complete the process, confirm the message.

9.5 Administrating your own user account

Users can only edit their own *Full Name* and *E-mail* entries. Users can always change their own PIN or password.

Prerequisites

- The user is logged in.



1. Tap the *Menu* button and navigate to the *User* menu item.
The list with the user accounts appears. Entries indicated by a black pen can be edited.
2. Select the user account.
3. Optional: Enter the full name.
4. Optional: Enter the e-mail address.
5. To change the password/PIN, tap the *Change Password/PIN* button.
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 your entry.
The message *Password/PIN successfully changed* appears.
The new password or the new PIN is active.

10 Maintenance

10.1 Routine maintenance

10.1.1 General



WARNING! Risk of injury to personnel or damage to equipment!

- ▶ Do not move 2 stacked incubators for maintenance or cleaning.



WARNING! Risk of injury to personnel or damage to equipment!

- ▶ While moving the incubator, ensure that the door is closed.
- ▶ Two trained persons are needed for moving an incubator.
- ▶ Risk of the device falling due to its high center of gravity.



WARNING! Risk of injury to personnel or damage to equipment

- ▶ While cleaning or disinfecting/decontaminating the chamber, take care not to break small sensors/other parts or destroy your protective gloves by wiping with too much force.
-

To ensure that chamber conditions remain stable, minimize the length of time that the door is open. When you open the door, wipe off any condensation that may have formed at the inner seal to avoid condensation build-up.

10.1.2 Daily checks

1. Check if the temperature level and the CO₂ level are within the specification.
2. Check the reserve pressure in the CO₂ cylinder (normally 725 psi (50 bar) when full). The design of the incubator ensures low consumption of CO₂. If there is a significant drop at the cylinder pressure, it means that the cylinder is almost empty and should be replaced. Make sure that there are no leaks at any of the connections. Checking the pressure and the connections helps to increase the lifetime of the CO₂ supply and to avoid accidentally running out of CO₂.
3. Clean any spills in the chamber immediately.
4. Routinely check the screen for any alarms or events that may have occurred.

10.1.3 Weekly checks

Clean and refill the water tray with an appropriate amount of warm, distilled, sterile water. The use of warm water ensures a rapid return to optimum chamber conditions.

10.1.4 Monthly checks

Clean the exterior and interior of the device.

10.1.5 Yearly checks

Let the sensors be maintained by a qualified service technician.

Exchange the in-line gas filter.

10.2 Performance check



The performance check cannot replace a verification by Eppendorf Service.



Consider the accuracy and the measuring principle of the measuring instrument. Check the accuracy of the measuring instrument, if there is a discrepancy between the measured values and the displayed values. Exact limits are not definable for the values as they depend on the measuring method.

If the measurement is reliable and the measuring instruments are suitable:

- Export the measuring result
- Contact your local Eppendorf partner

The performance check is used to check the accuracy of temperature and gas concentration with an external measuring instrument. A programmable interval reminds you of the need to run a performance check.

During a performance check the values, that were set by the user and that are not to be checked, do not have to be modified. The device has default settings. Only the value you want to check will be switched to its default setting.

Default settings

- Temperature: 37 °C
- CO₂: 5 %
- O₂: 10 %



If your samples tolerate the default setting of a value to be checked, they may remain in the device. If not, take the samples out of the device.

Performance check for temperature

- If your cells are growable at 37 °C, samples may remain in the device during the performance check. If not, take the samples out of the device.

Performance check for CO₂

- If your cells are growable at 5 % CO₂, samples may remain in the device during the performance check. If not, take the samples out of the device.

Performance check for O₂

- If your cells are growable at 10 % O₂, samples may remain in the device during the performance check. If not, take the samples out of the device.

Prerequisites

- External measuring instruments are available.
- The incubator is ready to operate.
- The home screen is displayed on the touch screen.
- If using a user administration, the administrator has to be logged in.

1. Tap the button *Menu* on the control panel.
2. Tap the button *Maintenance & Qualification*.
3. Tap *Performance check temperature*, *Performance check CO₂* or *Performance check O₂*.

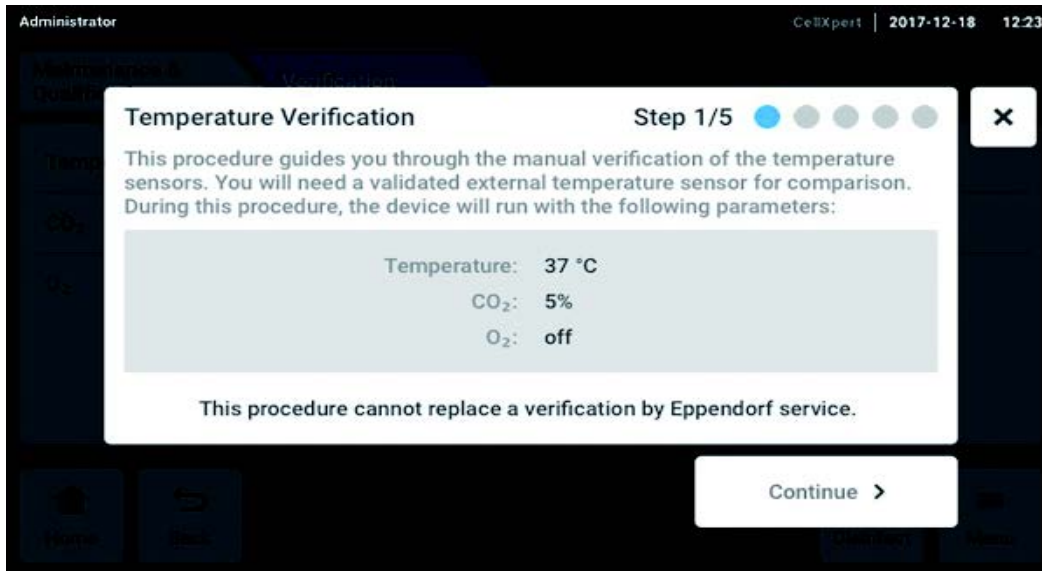


Fig. 10-1: The guided procedure starts

4. Tap the button *Continue*.



Use a calibrated measuring instrument. Consider the specification of the measuring instrument, particularly the operating conditions, and measurement accuracy.

5. Specify the external measuring instrument by entering its name. Enter the last calibration date of the measuring instrument.

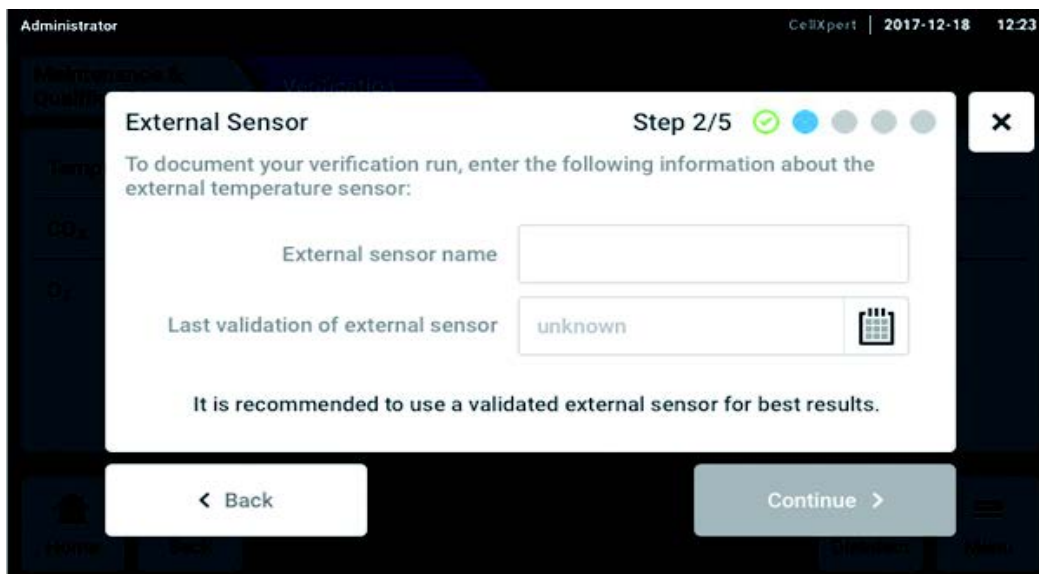


Fig. 10-2: Documentation of the verification run

For temperature

i To preserve the door seals, use the access port to bring the cable into the chamber.

1. Open the outer and the inner door.
2. Place the measuring instrument at the middle of the second shelf from the top.
3. Close the inner and outer door.



Fig. 10-3: Placement of the external temperature sensor

For CO₂ and O₂

i Use a thin, but solid tubing with a maximum diameter of 6 mm. Take care that the tubing does not become damaged.

1. Open the outer door.
2. Conduct the tubing through the sample port.
3. Close the outer door.

i If the displayed value at the analyzer is too low (CO₂) or too high (O₂), the analyzer cannot draw the sample correctly. The displayed values from the analyzer and the incubator display differ.

Solution

- Pull out the blind plug at the rear of the incubator.
- Repeat the measurement.
- Refit the blind plug after drawing the sample.

▶ Tap the button *Start Verification*.

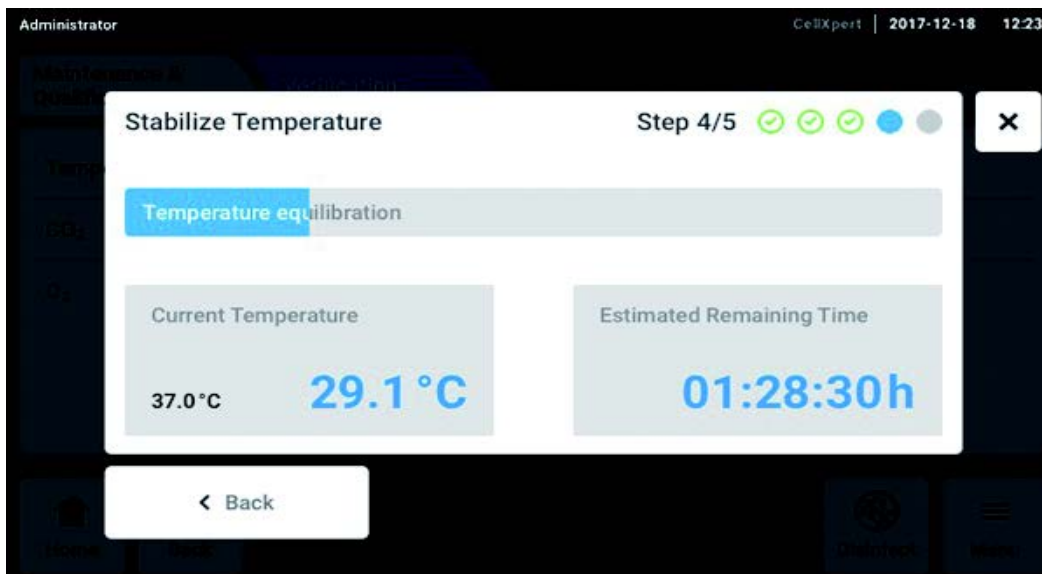


Fig. 10-4: Depending on the performance check, temperature or gas concentration are equilibrated. The remaining run time is displayed.

- ▶ Enter the detected value of temperature or gas concentration at the touch screen.

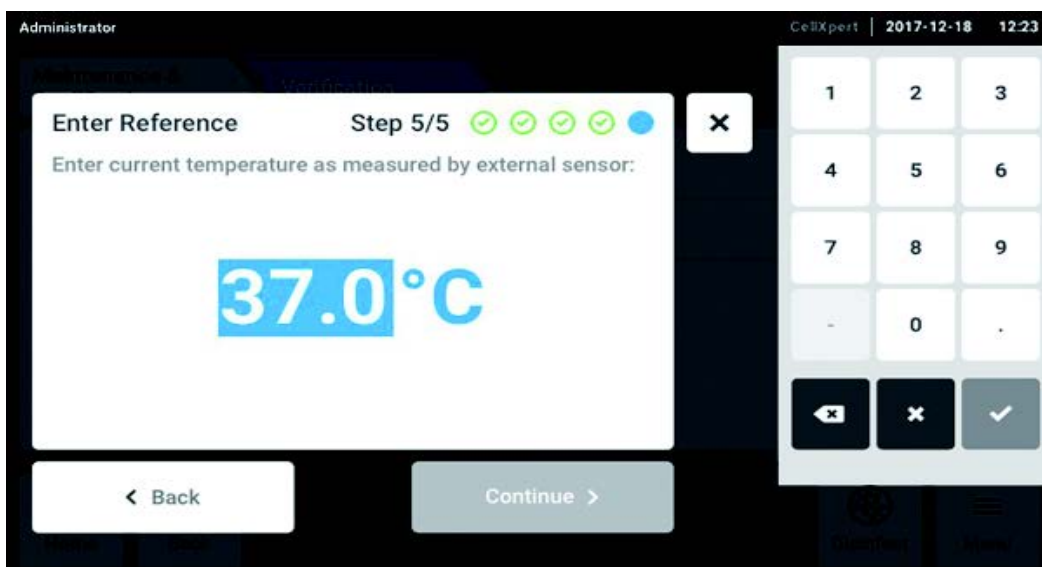


Fig. 10-5: Entering the reference value

- ▶ Confirm the value.
- ▶ Tap the button *Continue*.

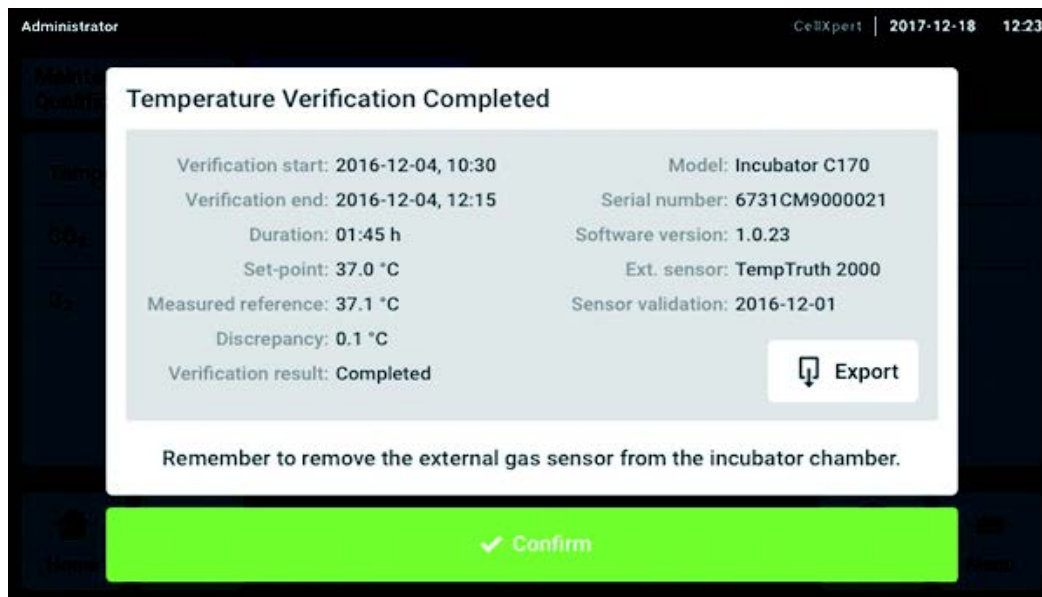


Fig. 10-6: The result of the performance check is displayed

- ▶ To store the result on a USB storage medium, tap the button *Export*.
- ▶ Tap the button *Confirm*.
- ▶ Remove the external measuring instrument.

The incubator is automatically reset to the previously used temperature and gas concentration.

10.3 Exterior cleaning



DANGER! Risk of electric shock from spilled liquid

- ▶ Switch off the device and disconnect it from the mains/power supply before starting cleaning or disinfecting work.
- ▶ Do not allow any liquids to penetrate the inside of the housing.
- ▶ Do not spray the housing.
- ▶ Only connect the device to the mains/power supply, if it is completely dried.



NOTICE! Damage due to aggressive cleaning agent or sharp objects

Incorrect cleaning agents can damage the display, surfaces, and printing.

- ▶ Do not use corrosive cleaning agents, aggressive solvents, or abrasive polishes.
- ▶ Do not incubate the accessories in aggressive cleaning agents or disinfectants for an extended period of time.
- ▶ Do not use sharp objects to clean the device.

1. Clean the exterior of the incubator by wiping it over with a soft cloth, moistened with soapy water.
2. Wipe the exterior surfaces again with a rinsed cloth.

10.3.1 Cleaning the touch screen

The recommended cleaning agent for cleaning the touch screen is a solution of 70 % isopropanol (isopropyl alcohol) and 30 % distilled water. Follow the appropriate safety regulations while you are using this solution.

1. Tap *Menu* and then *Clean Screen* to activate the screen lock.

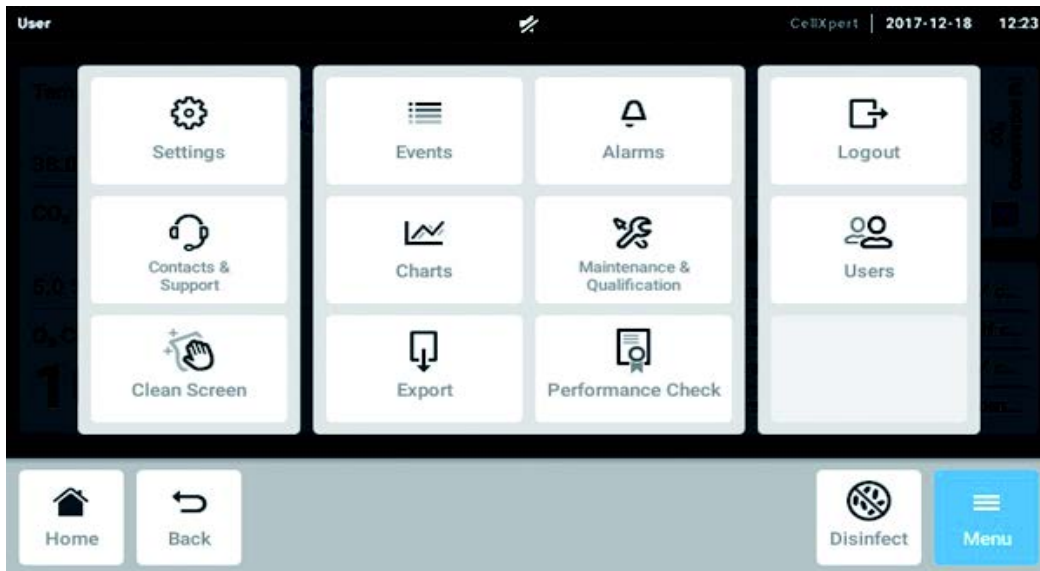


Fig. 10-7: Menu with *Clean Screen*

The touch screen is disabled.

2. Dampen a clean cloth with the alcoholic solution and wipe the touch screen.
3. To unlock the touch screen, tap the corners in the given order.

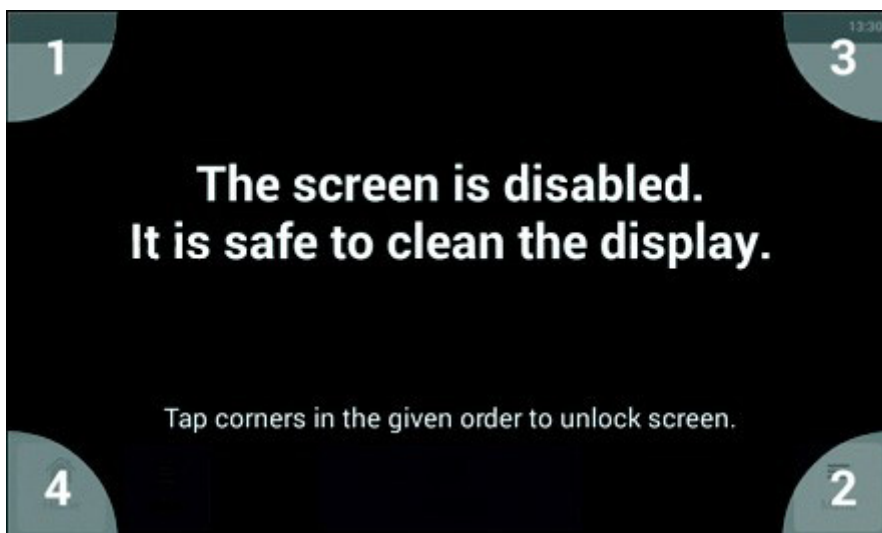


Fig. 10-8: Unlocking the touch screen

10.4 Disinfection/Decontamination



WARNING! Danger due to contact with decontamination agent.

- ▶ Wear protective equipment, gloves, and protective goggles during the cleaning process.
- ▶ Wear respiratory protection when aerosolization is suspected.



WARNING! Risk of personal injury or damage to equipment due to spilled infectious material

- ▶ Immediately decontaminate the exterior and the interior of the device, if infectious material was spilled.



WARNING! Risk of personal injury or damage to equipment

- ▶ While cleaning or disinfecting/decontaminating the chamber, take care not to break small sensors/other parts or destroy your protective gloves by wiping with too much force.



NOTICE! Corrosion due to aggressive cleaning agents and disinfectants.

- ▶ Do not use any corrosive cleaning agents, aggressive solvents or abrasive polishes.
- ▶ Do not incubate the accessories in aggressive cleaning agents or disinfectants for longer periods.



NOTICE! Risk of material damage

- ▶ Never use any of the following substances to clean the stainless steel, it will result in damage: sodium azide, aqua regia, iodine, ferric chloride, or sulphuric acid.



NOTICE! Risk of material damage

- ▶ Do not spray disinfecting agent inside the chamber. Spraying will lead to sensor damage.
-

10.4.1 Preparing the disinfection/decontamination

The recommended disinfecting agent for use with the incubator is a solution of 70 % Isopropanol or Ethanol with 30 % sterile distilled water.



If you have any further questions regarding the cleaning and disinfection or decontamination or regarding the cleaning fluid to be used, contact the Eppendorf AG Application Support. The contact details are provided on the back of this manual.

10.4.2 Disinfecting the exterior



It is not necessary to switch off and disconnect the device, when cleaning and disinfection are part of the software-guided process of high-temperature disinfection.

1. Switch off the incubator.
2. Unplug the incubator from the mains/power supply.
3. Dampen a clean cloth with the alcoholic solution and wipe down all external surfaces, taking care to keep the alcoholic solution from coming into contact with any mains/electrical outlets or assemblies.

10.4.3 Disassembling the interior equipment

1. Remove the water tray from the chamber.
2. Remove the shelves, bottom to top.
3. Remove the tie rod from the shelf racks.
4. Remove the shelf racks.

10.4.4 Disinfecting/Decontaminating the interior



It is not necessary to switch off and disconnect the device, when cleaning and disinfection are part of the software-guided process of high-temperature disinfection.

1. Switch off the incubator.
2. Unplug the incubator from the mains/power supply.
3. Clean the water tray by rinsing it in sterile water, wiping it down with the alcoholic solution, and then rinsing it again with sterile water.

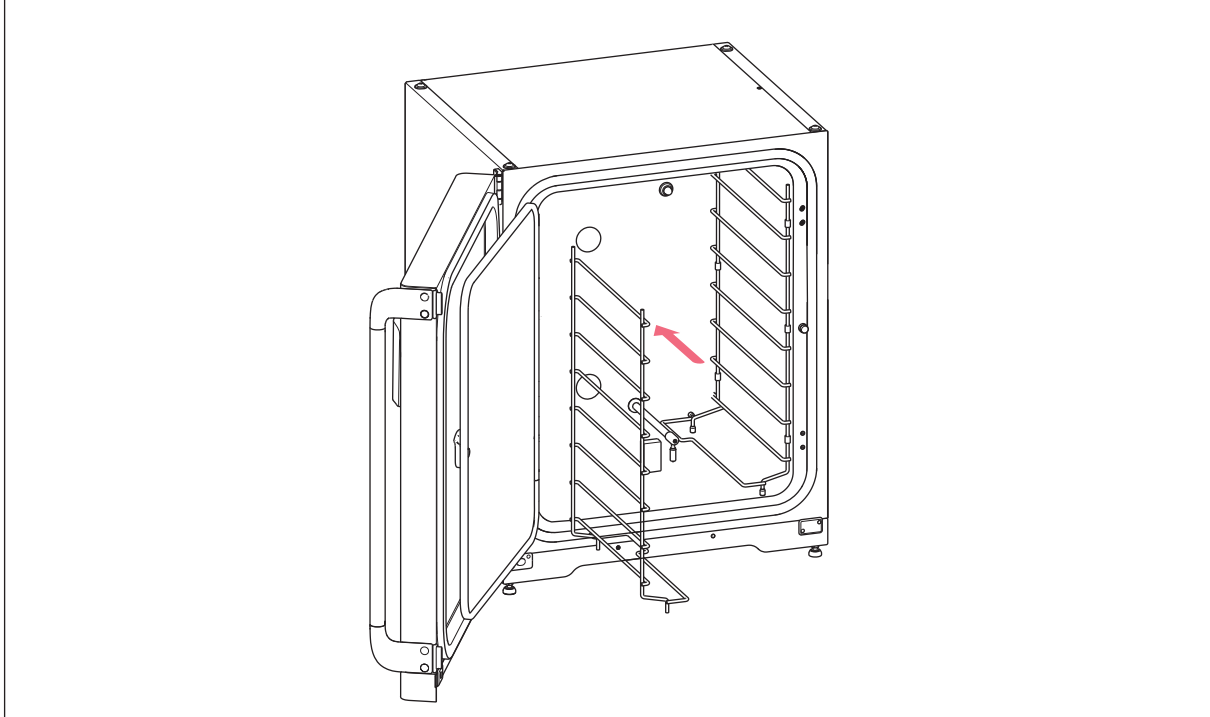


To avoid liquid come into contact with the sensor or the sensor connection, wring out the cloth.

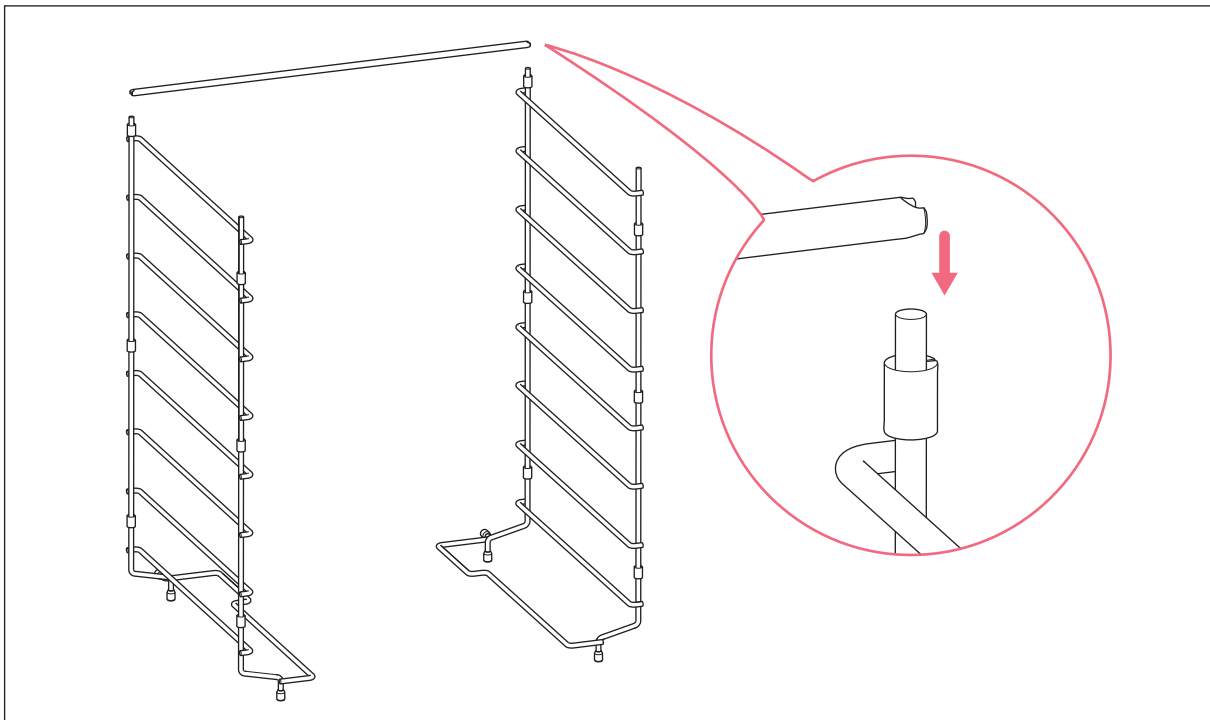
4. Wipe down the inside of the chamber with the alcoholic solution, and leave it to dry completely.
5. Wipe the internal components of the chamber twice with the alcoholic solution. Wipe off excess liquid and leave it to dry.
6. Wipe the inner door seal with the alcoholic solution, rinse, and leave it to dry.

10.4.5 Reassembling the interior equipment

1. Place the shelf racks inside the chamber. Ensure that the shelf rack spacers fit snugly to the side walls.



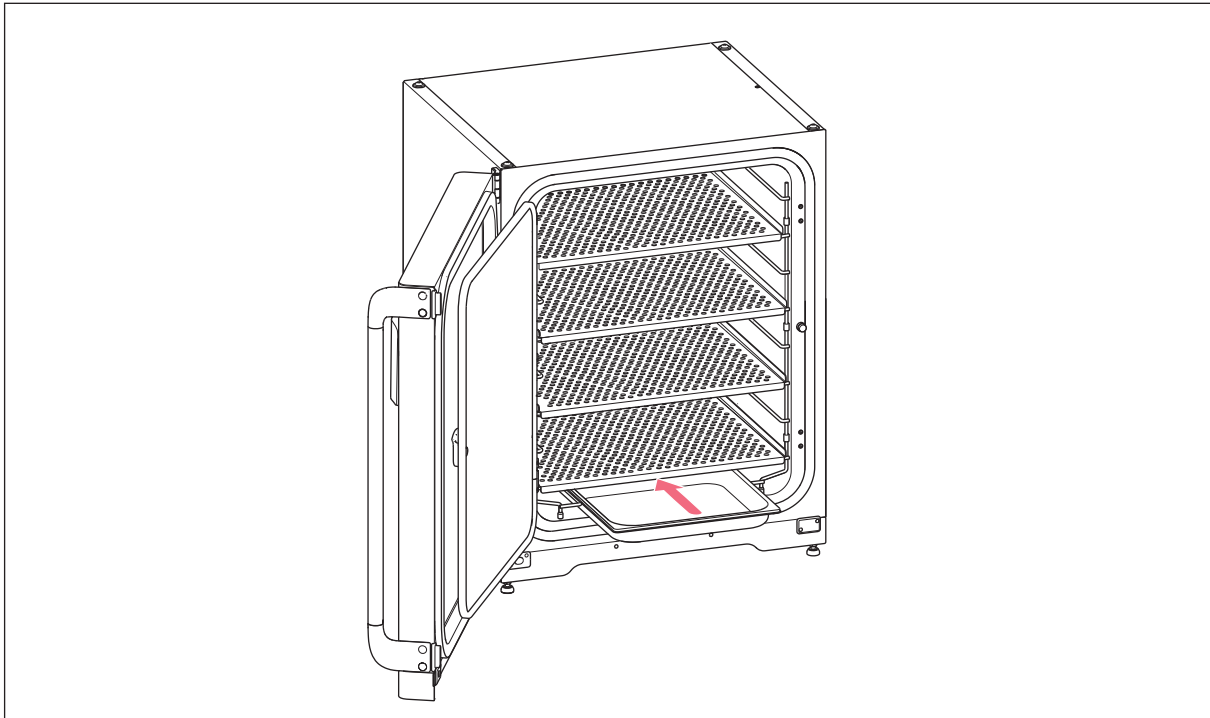
2. To stabilize the shelf rack, install the tie rod.





Do not forget to mount the tie rod. Shelves can wobble and samples can be lost, especially when using just one or two shelves.

3. Install the shelves, top to bottom. Ensure that each shelf's anti-tip groove is properly inserted (faced downward and to the rear of the incubator) onto each of the shelf rack guides.
4. Refill the water tray. Slide the water tray onto the lowest shelf rack support. Ensure that the water tray is pushed fully back.



10.4.6 Putting into operation

1. Plug in the incubator and switch it on.
2. To allow conditions to stabilize, leave the incubator on for at least 2 hours (preferably overnight).

10.5 High-temperature disinfection (HTD)



WARNING! Risk of personal injury

Burns due to hot surface.

- ▶ Do not touch the equipment during the high-temperature disinfection cycle.
- ▶ Do not open the doors during the cycle.
- ▶ Do not open the doors after a system crash or a mains/power outage during the high-temperature disinfection.



WARNING! Risk of personal injury

Scalding due to hot water.

- ▶ Remove water from the water tray before starting the high-temperature disinfection cycle.



WARNING! Risk of personal injury or damage to equipment

- ▶ While cleaning or disinfecting/decontaminating the chamber, take care not to break small sensors/other parts or destroy your protective gloves by wiping with too much force.



NOTICE! Risk of material damage

- ▶ Never let electrical equipment come into contact with the alcoholic solution.



NOTICE! Risk of material damage

- ▶ To avoid possible damage to the CO₂ sensor due to condensation, never leave water in the water tray while the incubator is switched off, or when an HTD cycle is initiated.



NOTICE! Risk of material damage

- ▶ Remove the humidity sensor when executing an HTD and follow the instructions on the touch screen.



When using HTD for the first time, it may cause a smell to develop. Make sure that the location is ventilated.

To work contamination-free, clean and decontaminate the CO₂ incubator regularly. The CellXpert C170i offers the option of activating a reminder that the device is to be decontaminated (see *Recurring tasks on p. 71*).

Prerequisites

The samples have been taken out of the device.

The device is ready to operate.

The *Home* screen is displayed on the touch screen.

When using a user administration, a user or an administrator has to be logged on.

1. Tap the button *Disinfect*.

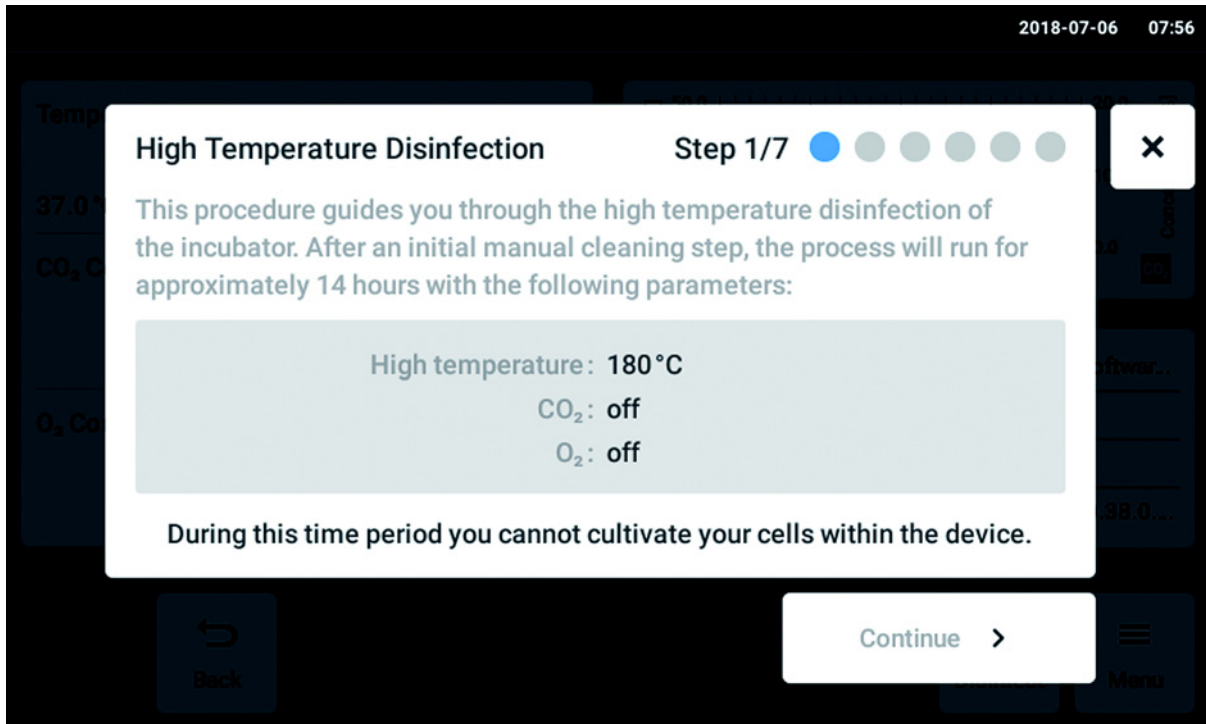
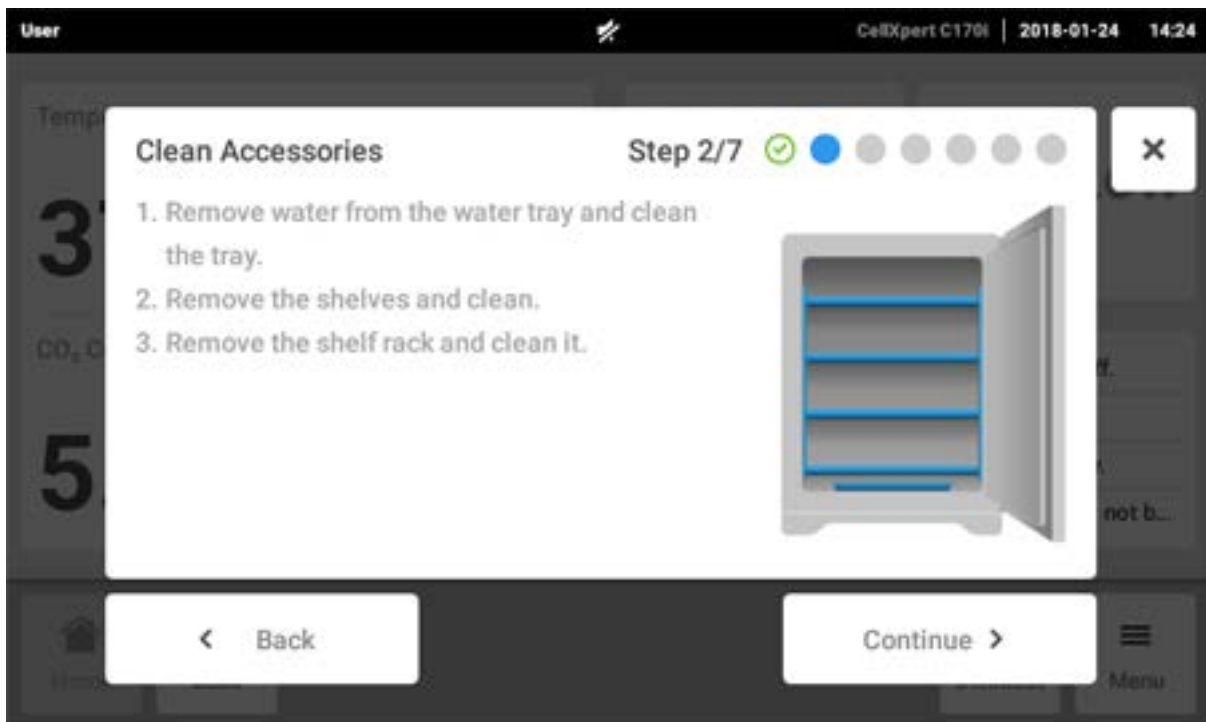


Fig. 10-9: A software-guided process starts.

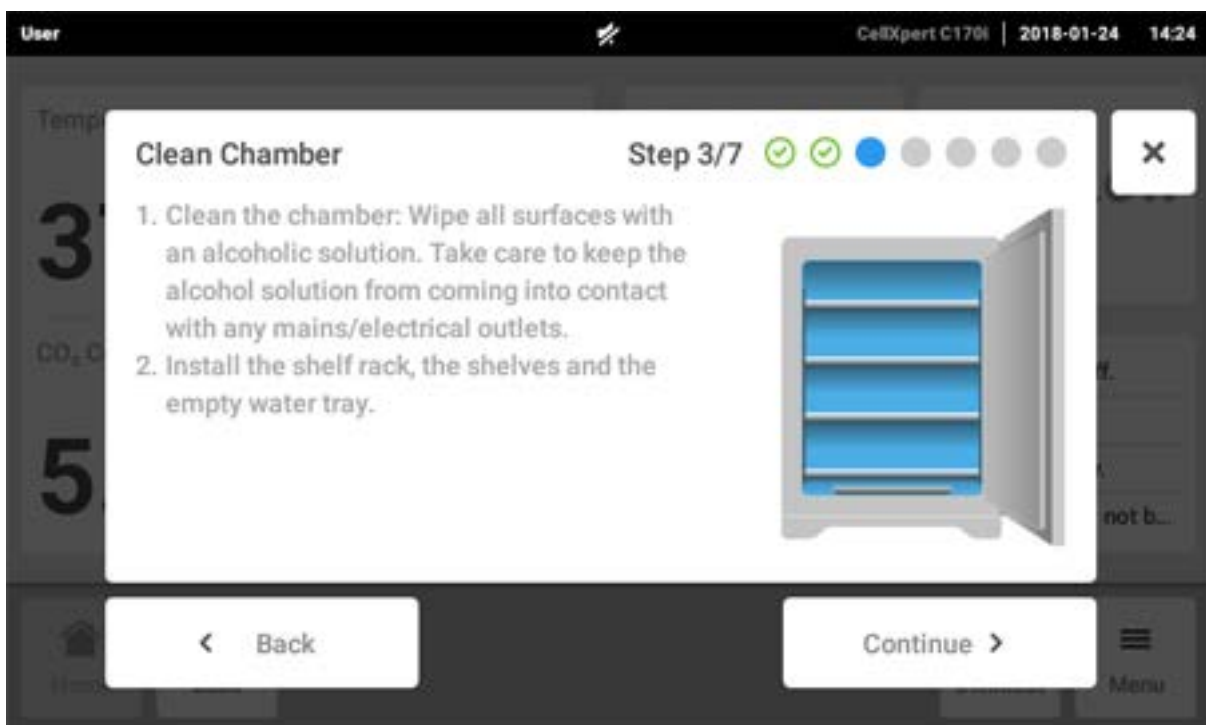
Tap the button *Continue*. During the period of 14 hours, it is not possible to cultivate cells within the device.

2. Follow the instructions on the touch screen.



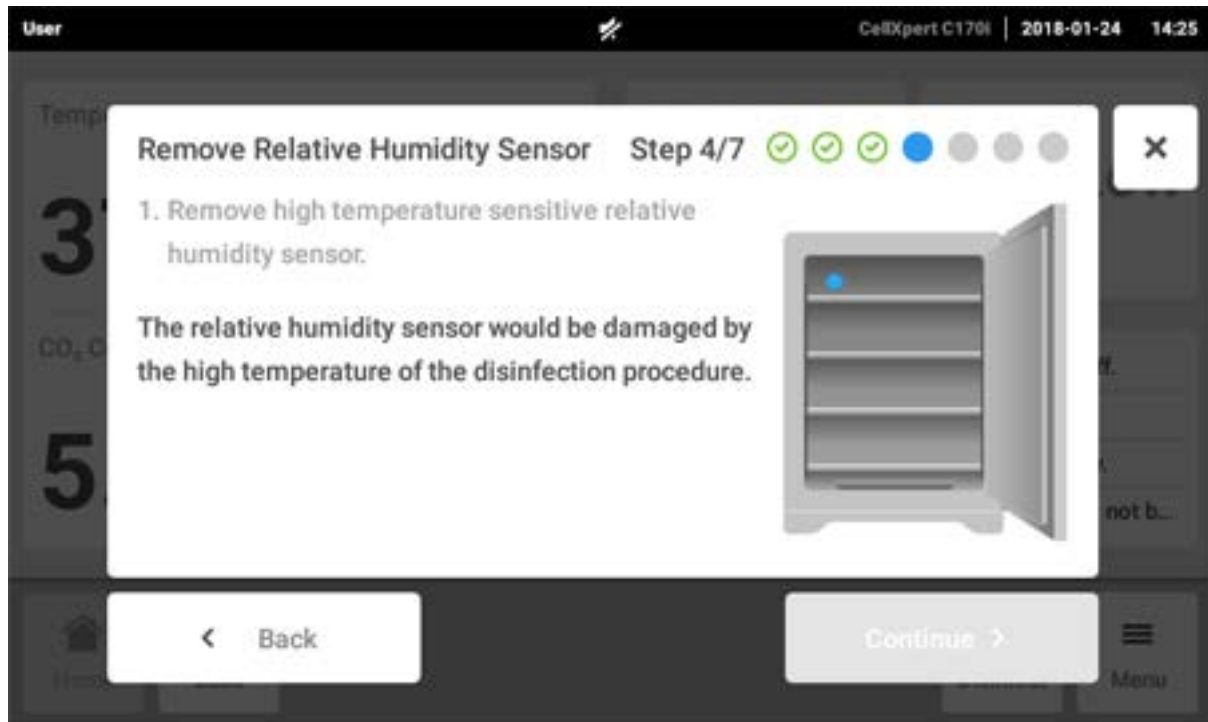
Tap the button *Continue*.

3. Follow the instructions on the touch screen.



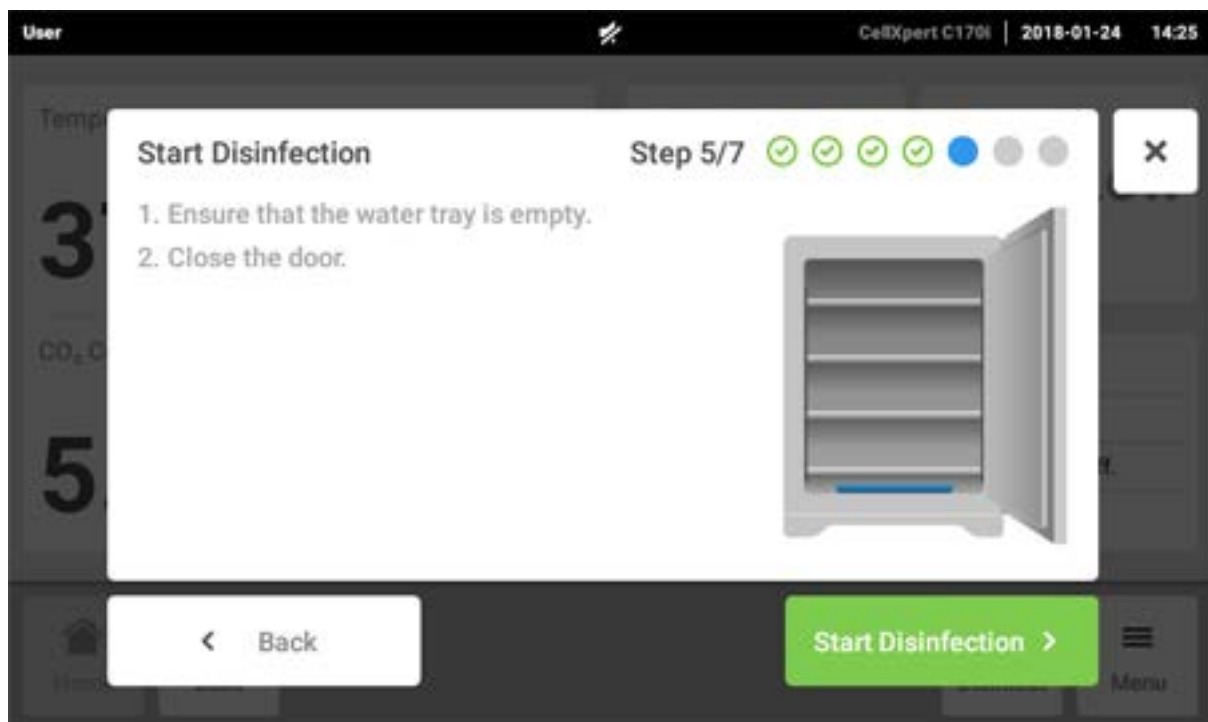
Tap the button *Continue*.

4. For the humidity sensor option: Follow the instructions on the touch screen.



Tap the button *Continue*.

5. Follow the instructions on the touch screen.



Tap the button *Start Disinfection*.

6. The high-temperature disinfection proceeds in 3 steps: Heating to a disinfection temperature of 180 °C (heating ramp), holding the disinfection temperature of 180 °C for 2 hours (disinfection) and cooling down to the preassigned incubation temperature.

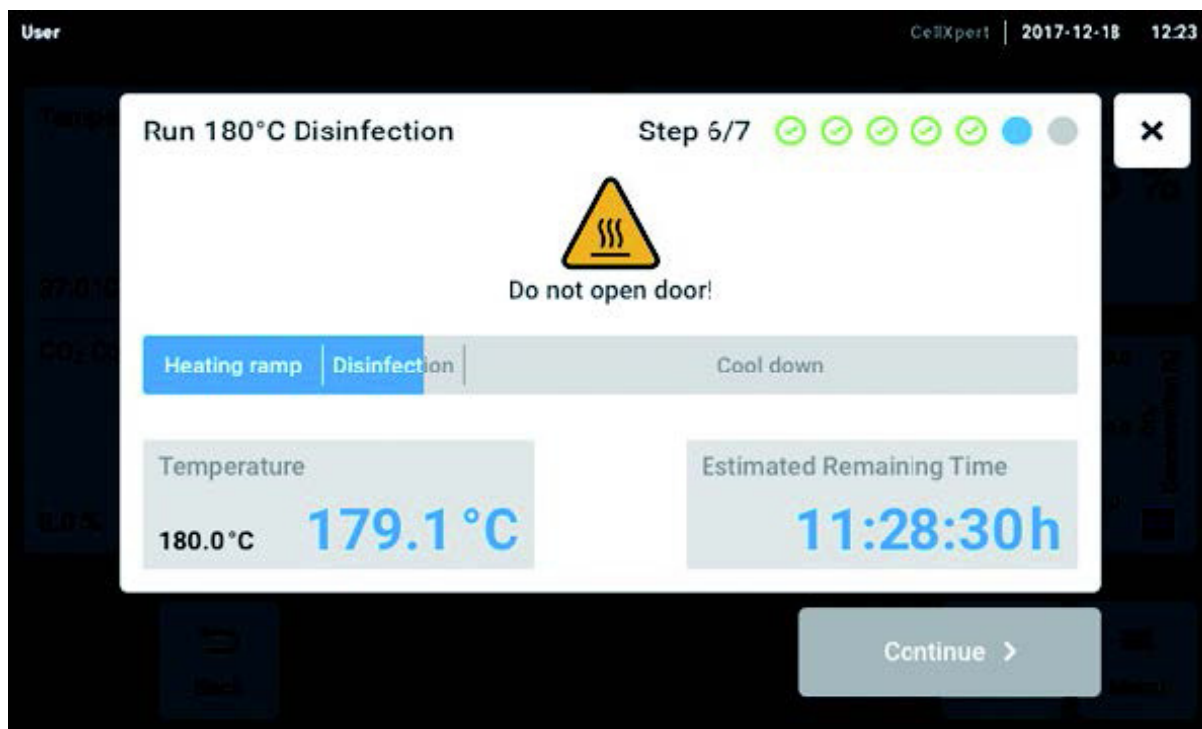


Fig. 10-10: Display of the current temperature and estimated time remaining

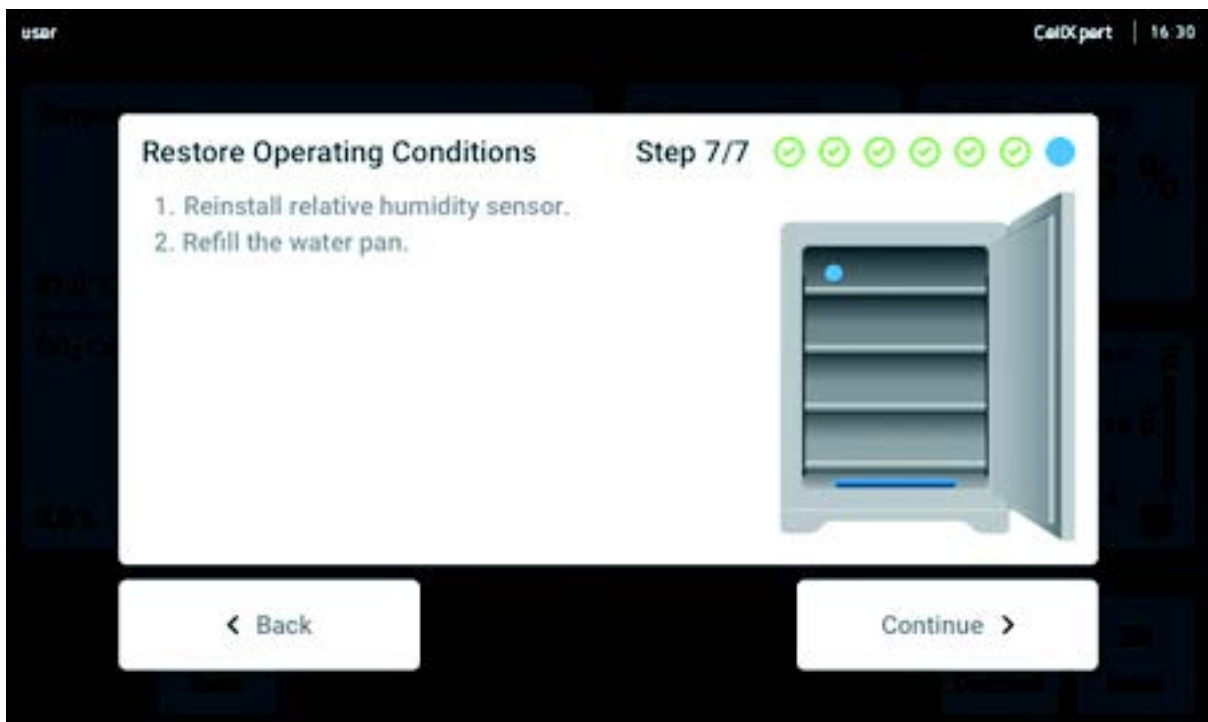
- i** In order to obtain a successful result, keep the incubator doors closed until the HTD process is completed.
 If doors are opened during an HTD, you are asked whether to continue or to cancel the process.
- i** The estimated time remaining may vary depending on the target temperature and ambient conditions.
- i** The result of the HTD can be stored on a USB storage medium. Tap the button *Export*.

7. Tap the button *Continue*.



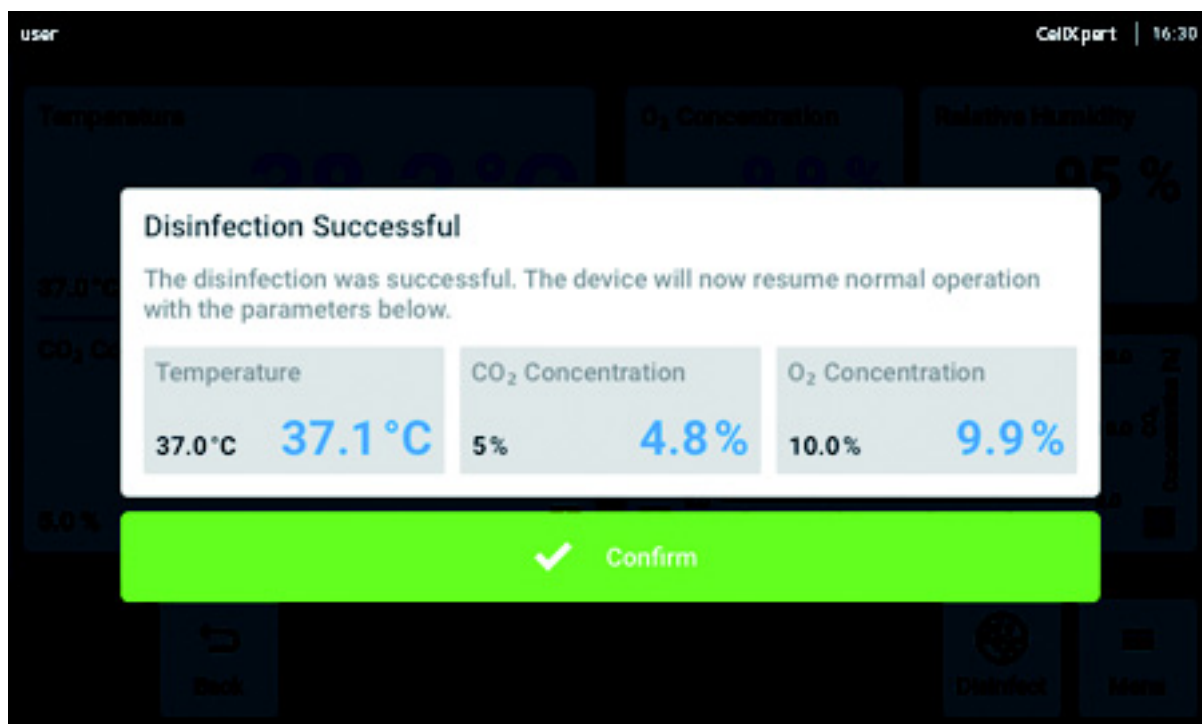
Fig. 10-11: Display of the result of the HTD after achieving the target temperature

8. Follow the instructions on the touch screen.



Tap the button *Continue*.

9. If the HTD was successful, tap the button *Confirm*.



11 Troubleshooting

11.1 General errors

Technical faults may be triggered by faults such as a power failure or power fluctuations. Therefore, it is sufficient to switch off the device briefly and switch it on after approximately 10 seconds. Check the cable connections if necessary.



If the suggested troubleshooting measures fail repeatedly, please contact your local Eppendorf partner. You can find the addresses on the webpage www.eppendorf.com/worldwide.

Tab. 11-1: Door

Problem	Possible cause	Solution
Door longer open than (x)	Door is open longer than 30 seconds.	Close the door. Touch the hint on the display to switch off the sound. Set the signal time for door open signal to another time span: 15, 30, 45, 60 or 90 seconds.
6731FW.50 Long door opening. Close the door.	Door is open longer than 5 minutes.	Close the door. Quit the warning note. The warning note for <i>Door open</i> will not be shown again.

Tab. 11-2: Temperature

Problem	Possible cause	Solution
Temperature below alarm level (x.y °C)	Door is opened too long.	Check the door opening time. Increase the temperature alarm limit, e.g., 1.0 °C.
	Door was opened too often.	Check how often the door was opened throughout a day.
	Due to high impact of cold samples, the temperature setpoint could not be reached in a specific time span.	Use a prewarmed medium. Use a smaller number of cold samples.
	(Permanent) airflow due to open window or open door or air conditioning device	Relocate the incubator to a more suitable place. Relocate the air conditioning. Stop the airflow.

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Problem	Possible cause	Solution
Temperature above alarm level (x.y °C)	Temperature setpoint was decreased without opening doors.	To let the incubator cool down, open the outer and the inner door. Increase the temperature alarm limit, e.g. 1.0 °C.
	Due to high impact of hot samples, the temperature setpoint could not be reached in a specific time span.	Use a colder medium. Use a smaller number of hot samples.
	(Permanent) airflow due to open window or open door or air conditioning device	Relocate the incubator to a more suitable place. Relocate the air conditioning device. Stop the airflow.
	Another hot device is too close to the incubator.	Relocate the incubator to a more suitable place. Relocate the heat emitting device. Check the distance between the devices. Increase the distance if necessary.
	A heat emitting device was inserted into the incubator and generates too much heat.	Take out the heat emitting device. Increase the upper alarm limit.
6731FW.107 Temperature sensor (XY) is out of range. Check acclimatization and ambient conditions.	The incubator is located in a cold room < 16 °C.	Let the incubator acclimate at least 12 h after shipment.
	Sensor defect	Contact your local Eppendorf partner.
6731FW.108 Setpoint not reached. Cooldown too slow. Check environment conditions.	Ambient temperature is too close to the temperature setpoint (less than 4 °C difference). Ambient temperature is above the temperature setpoint.	Change the setpoint to a higher temperature (≥ 4 °C above ambient temperature). Reduce the ambient temperature to ≥ 4 °C to the temperature setpoint, e.g., by venting the room.
6731FW.109 X.Y °C not reached	Technical fault	Restart the incubator.
6731FW.110 X.Y °C not reached in time. Check environment conditions.	Incubator has been started with cold water.	Restart the incubator.
	Technical fault.	Restart the incubator.
6731FW.111 Over-temp detected by Temp limiter. Setpoint not reached. Cooldown too slow. Check environment conditions.	The incubator features a shutdown at 10 K above the setpoint of a heat circuit according to standard DIN 12880. (Temperature limiter class 1).	Change the setpoint to a higher temperature (≥ 4 °C above ambient temperature). Reduce the ambient temperature to ≥ 4 °C to the temperature setpoint, e.g., by venting the room. Restart the device. Increase the temperature setpoint to ≥ 4 °C above ambient temperature.

Problem	Possible cause	Solution
6731W.112 Subnormal temperature detected by Temp limiter	The incubator features a shutdown at 5 K under the setpoint of a heat circuit according to standard DIN 12880. (Temperature limiter class 1).	Restart the device. Increase the temperature setpoint to ≥ 4 °C above ambient temperature.

Tab. 11-3: CO₂

Problem	Possible cause	Solution
CO ₂ Concentration above alarm level (x.y%)	CO ₂ set parameter decreased. CO ₂ cannot pass off the incubator.	Open the outer and the inner door to let CO ₂ pass off the incubator.
	The alarm limit is too close to the setpoint.	Set the alarm limit to the default limit.
	Vessels located in front of the CO ₂ sensor.	Relocate the vessels.
CO ₂ Concentration below alarm level (x.y%)	CO ₂ set parameter increased.	CO ₂ concentration cannot recover in time: Check the pressure supply.
	The alarm limit is too close to the setpoint.	Set the alarm limit to the default limit.
CO ₂ pressure below warning level of 0.04 MPa	CO ₂ cylinder is almost empty.	Check CO ₂ supply. Exchange CO ₂ cylinder and adjust gas supply to 0.1 MPa (or range of 0.05 MPa to 0.15 MPa). Check gas connection on disconnection or leakage, e.g., in-line gas filter, gas connection. Check flow direction of the in-line gas filter: Gas supply must be connected to the <i>INLET</i> side of the in-line gas filter.
	The volumetric flow rate is too low.	Increase the volumetric flow rate, e. g., by opening the CO ₂ gas stop valve.

Problem	Possible cause	Solution
CO ₂ pressure below alarm level of 0.02 MPa	CO ₂ cylinder is empty.	Check CO ₂ supply. Exchange CO ₂ cylinder and adjust gas supply to 0.1 MPa (or range of 0.05 MPa to 0.15 MPa). Check gas connection on disconnection or leakage, e.g., in-line gas filter, gas connection. Check flow direction of the in-line gas filter: Gas supply must be connected to the <i>INLET</i> side of the in-line gas filter. Ventilate the room, if necessary.
	The volumetric flow rate is too low.	Increase the volumetric flow rate, e. g., by opening the CO ₂ gas stop valve.
In a short time alternating notice/alarm message CO ₂ pressure below warning level of 0.04 MPa and CO ₂ pressure below alarm level of 0.02 MPa	CO ₂ pressure dramatically decreased because of closed pressure supply or disconnection/crack of the pressure connection.	Check gas connection on disconnection or leakage, e.g., in-line gas filter, gas connection. Check flow direction of the in-line gas filter: Gas supply must be connected to the <i>INLET</i> side of the in-line gas filter. Ventilate the room, if necessary.
	The volumetric flow rate is too low.	Increase the volumetric flow rate, e. g., by opening the CO ₂ gas stop valve.
No CO ₂ value displayed	<i>Initialization sensor</i> is displayed after (re-)starting the incubator or after HTD.	Wait until the incubator is running in the normal mode.
Setpoint is displayed in red color	The CO ₂ sensor is defective.	Switch off and restart the incubator.
6731FW213 CO ₂ control software error	CO ₂ control loop took too long or CO ₂ control loop aborted or CO ₂ sensor or sensor software defect.	Check gas connection on disconnection or leakage, e.g., in-line gas filter, gas connection. Check if access port is closed. Restart the incubator. Contact your local Eppendorf partner.
6731FW214 CO ₂ control timeout error	CO ₂ value error. CO ₂ setpoint not reached in time. Vessels located in front of the CO ₂ sensor. Too many vessels in the chamber under extreme conditions.	Check gas connection on disconnection or leakage, e.g., in-line gas filter, gas connection. Check if access port is closed. Relocate the vessels. Restart the incubator. Contact your local Eppendorf partner.

Tab. 11-4: O₂

Problem	Possible cause	Solution
No O ₂ value displayed	<i>Initialization sensor</i> is displayed after (re-)starting the incubator or after HTD.	Wait until the incubator is running in the normal mode.
	The O ₂ option is not available.	The O ₂ option was not ordered.
	The O ₂ option is deactivated.	Activate the O ₂ option.
Setpoint is displayed in red color	The O ₂ sensor is not plugged in.	Switch off the incubator and plug in the O ₂ sensor.
	The O ₂ sensor is defective.	Switch off and restart the incubator.
O ₂ Concentration above alarm level (x.y%)	The O ₂ set parameter has been decreased. O ₂ cannot come into the chamber because door is closed.	Open the outer and the inner door to let O ₂ stream in the incubator.
	The alarm limit is too close to the setpoint.	Set the alarm limit to the default limit.
	Vessels located in front of the O ₂ sensor.	Relocate the vessels.
O ₂ Concentration below alarm level (x.y%)	The O ₂ setpoint has been increased.	If the O ₂ concentration cannot build up in time, check the N ₂ pressure supply.
	The alarm limit is too close to the setpoint.	Set the alarm limit to the default limit.
N ₂ pressure below warning level of 0.04 MPa	N ₂ gas cylinder is almost empty.	<p>Check N₂ supply. Exchange the gas cylinder and adjust gas supply to 0.1 MPa (or range of 0.05 MPa to 0.15 MPa).</p> <p>Check flow direction of the in-line gas filter: Gas supply must be connected to the <i>INLET</i> side of the in-line gas filter.</p> <p>Check gas connection on disconnection or leakage, e.g., in-line gas filter, gas connection.</p>

Problem	Possible cause	Solution
N ₂ pressure below alarm level of 0.02 MPa	N ₂ gas cylinder is empty.	Check N ₂ supply. Exchange the gas cylinder and adjust gas supply to 0.1 MPa (or range of 0.05 MPa to 0.15 MPa). Check flow direction of the in-line gas filter: Gas supply must be connected to the <i>INLET</i> side of the in-line gas filter. Check gas connection on disconnection or leakage, e.g., in-line gas filter, gas connection. Ventilate the room, if necessary.
In a short time alternating notice/alarm message N ₂ pressure below warning level of 0.04 MPa and N ₂ pressure below alarm level of 0.02 MPa	N ₂ pressure dramatically decreased because of closed pressure supply or disconnection/crack of the pressure connection.	Check gas connection on disconnection or leakage, e.g., in-line gas filter, gas connection. Check flow direction of the in-line gas filter: Gas supply must be connected to the <i>INLET</i> side of the in-line gas filter. Ventilate the room, if necessary.
6731FW313 O ₂ control software error	O ₂ control loop took too long or O ₂ control loop aborted or O ₂ sensor or sensor software defect.	Check gas connection on disconnection or leakage, e.g., in-line gas filter, gas connection. Check if access port is closed. Restart the incubator. Contact your local Eppendorf partner.
6731FW314 O ₂ control timeout error	O ₂ value error. O ₂ setpoint not reached in time. Vessels located in front of the O ₂ sensor. Too many vessels in the chamber under extreme conditions.	Check gas connection on disconnection or leakage, e.g., in-line gas filter, gas connection. Check if access port is closed. Relocate the vessels. Restart the incubator. Contact your local Eppendorf partner.

Tab. 11-5: Humidity

Problem	Possible cause	Solution
RH below alarm level (x.y%)	Door is opened too long Door was opened too often.	Check the door opening time. Check how often the door was opened in a day. Decrease the alarm limit for humidity to a lower value.

Problem	Possible cause	Solution
Sensor disconnected	The humidity sensor is not plugged in, e.g., after HTD.	Plug in the humidity sensor (switching off the incubator is not necessary).
	The humidity sensor is defective.	Switch off and restart the incubator.
No RH value displayed	<i>Initialization sensor</i> is displayed after (re-)starting the incubator or after HTD.	Wait until the incubator is running in the normal mode.
	The RH option is not available.	The RH option was not ordered.
	The RH option is deactivated	Activate the RH option.
No water level value displayed	<i>Initialization sensor</i> is displayed after (re-)starting the incubator or after HTD.	Wait until the incubator is running in the normal mode.
	The water level option is not available.	The water level option was not ordered.
	The water level option is deactivated	Activate the water level option.
	The water level sensor is defective.	Switch off and restart the incubator.
6731FW.454 Water level sensor error	The measured value is out of range	Restart the incubator.

Tab. 11-6: High-temperature disinfection (HTD)

Problem	Possible cause	Solution
6731FW.110 180 °C not reached in time. Check environment conditions	The water tray is not empty.	Switch off and restart the incubator. Empty the water tray. Restart the HTD.
	Technical fault.	Contact your local Eppendorf partner.
Sensor has been switched off due to high temperature <ul style="list-style-type: none"> • CO₂ (6731FW.202) • O₂ (6731FW.302) • RH (6731FW.402) • Water level (6731FW.452) 	The incubator was restarted with a too high residual temperature after the HTD has been interrupted.	Let the incubator cool down to <50 °C before restarting the HTD.
6731FW.750 Error occurred during High Temperature Disinfection	Another error occurred during the HTD.	Check previous error messages and follow the solution table.
6731FW.751 High Temperature Disinfection interrupted due to power loss	The incubator has been turned off during the HTD. A mains/power failure occurred.	Restart the HTD.

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Problem	Possible cause	Solution
6731FW.753 Door has been opened during High Temperature Disinfection	Do not open the door during the HTD.	Restart the HTD.

Tab. 11-7: General errors

Problem	Possible cause	Solution
Sample is partially dry	Shelves are not properly leveled.	Level the incubator by placing a spirit level on a shelf: <ul style="list-style-type: none"> • aligned left to right • aligned front to rear Add more medium to the cells.
	No water in the water tray.	Check the water tray weekly. Refill it or clean and refill it weekly.
Sample evaporation	Low humidity due to empty water tray.	Check the water tray weekly. Refill it or clean and refill it weekly.
Circular cell growth in cell culture dish	Vibrations from other devices result in sample vibrations.	Check if vibration generating elevators or devices like freezers or centrifuges are too close to the incubator, see <i>Installation</i> .
Sample contaminated	Consistent contamination	Perform an HTD.
	Contamination of sample	Check your sample handling. Check for contamination during your application steps.
<i>Fatal Error – Restart the device displayed on red screen</i>	Software error	Switch off and restart the incubator.
Sensor error <ul style="list-style-type: none"> • CO₂ (6731FW.203) • O₂ (6731FW.303) • RH (6731FW.403) • Water level (6731FW.453) 	The initialization of the sensor failed after switching on the incubator.	Restart the incubator.
XY value over range: x.y or XY value under range: x.y <ul style="list-style-type: none"> • CO₂ (6731FW.204) • O₂ (6731FW.304) • Water level (6731FW.404) 	The measured value is above the allowed range or the measured value is below the allowed range.	Restart the incubator.

12 Transport, storage and disposal

12.1 Transport



CAUTION! Risk of injury from lifting and carrying heavy loads

- ▶ At least 4 people are required to safely lift the incubator.
- ▶ Use a transport aid for transporting the incubator.



CAUTION! Risk of tipping over

Stacked incubators may topple during transport.

- ▶ Do not move 2 stacked incubators.
-



NOTICE! Damage as a result of improper packing.

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

- ▶ The device may only be stored and transported in its original packaging.



NOTICE! Damage to the incubator

Lifting the incubator by the door will cause permanent damage to the incubator.

- ▶ Lift the incubator only by the lifting handles.
 - ▶ Never lift the incubator by its door.
-

12.1.1 Conditions of transport

- ▶ Temperature: -25–60 °C
- ▶ Relative humidity: 10–95 %
- ▶ Atmospheric pressure: 30–106 kPa

12.2 Storage

- Temperature: -25–55 °C
- Relative humidity: 10–95 %
- Atmospheric pressure: 70–106 kPa

12.3 Decontamination before shipment

If you are going to ship the device to the authorized Technical Service for repairs or to your authorized dealer for disposal, note:

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**WARNING! Risk to health from contaminated device**

1. Observe the information on the decontamination certificate. You can find it as a PDF document on our webpage (www.eppendorf.com/decontamination).
2. Decontaminate all the parts you would like to dispatch.
3. Include the fully completed decontamination certificate in the package.

12.4 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:



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

13 Technical data
13.1 Weight/dimensions
13.1.1 Equipment dimensions

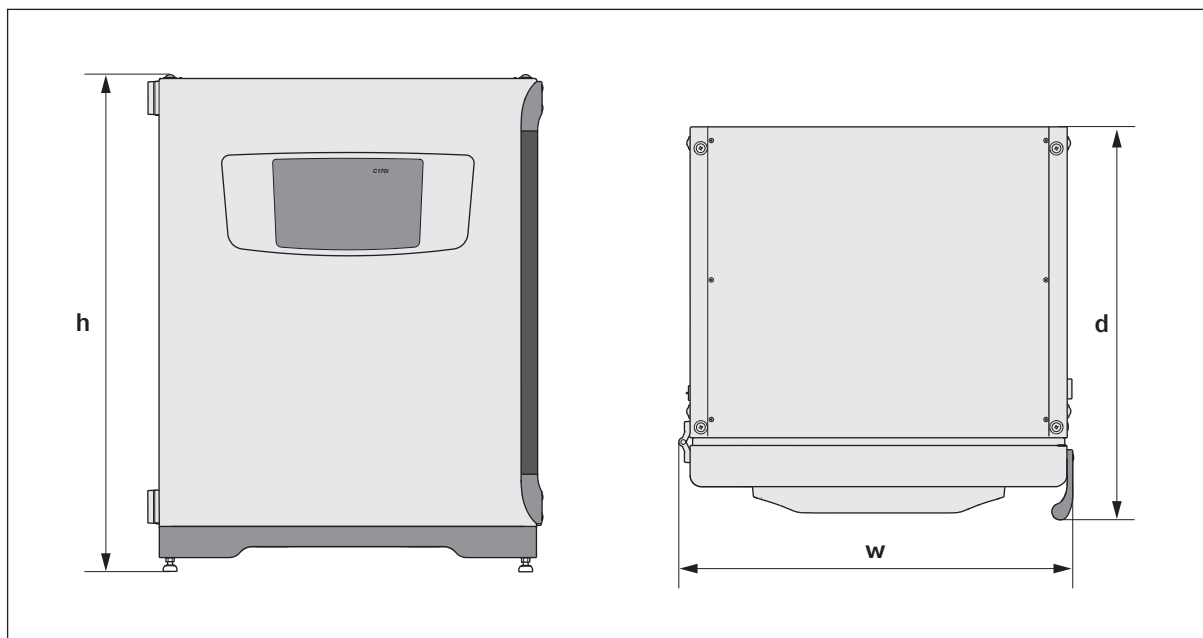


Fig. 13-1: Dimensions of CellXpert C170i (without safety latch)

Width (w)	71.8 cm (28.3 in)
Height (h)	90.0 cm (35.4 in)
Depth (d)	71.5 cm (28.1 in)
Depth w/o handle/control panel	65.5 cm (25.8 in)
Weight	81 kg (179 lb) – 105 kg (231.5 lb) depending on options, w/o accessories

13.1.2 Internal dimensions

Width	53.9 cm (21.2 in)
Height	69.2 cm (27.2 in)
Depth	44.5 cm (17.5 in)
Volume (total)	167 L
Volume (useable, with 4 shelves)	124 L

13.1.3 Floor space required

Width	81 cm (31.9 in)
Depth	60 cm (23.6 in)
Height	95 cm (37.4 in)

13.1.4 Transporting dimensions

Width	120.4 cm (47.4 in), pallet included
Height	117.6 cm (46.3 in), pallet included
Depth	80 cm (31.5 in), pallet included
Weight	107 kg (236 lb) – 122 kg (269 lb) depending on options

13.1.5 Shelves

Polished stainless steel, perforated (standard)

Width	52.2 cm (20.6 in)
Depth	42.8 cm (16.9 in)
Number of shelves	4 standard; upgrade to 8 shelves
Flatness tolerance of shelf	1 mm
Thickness of shelf	1.5 mm
Max. load to the shelf (with 1.3° deflection)	8 kg
Max. load of the shelf rack	40 kg

13.1.6 Stacked CellXpert C170i

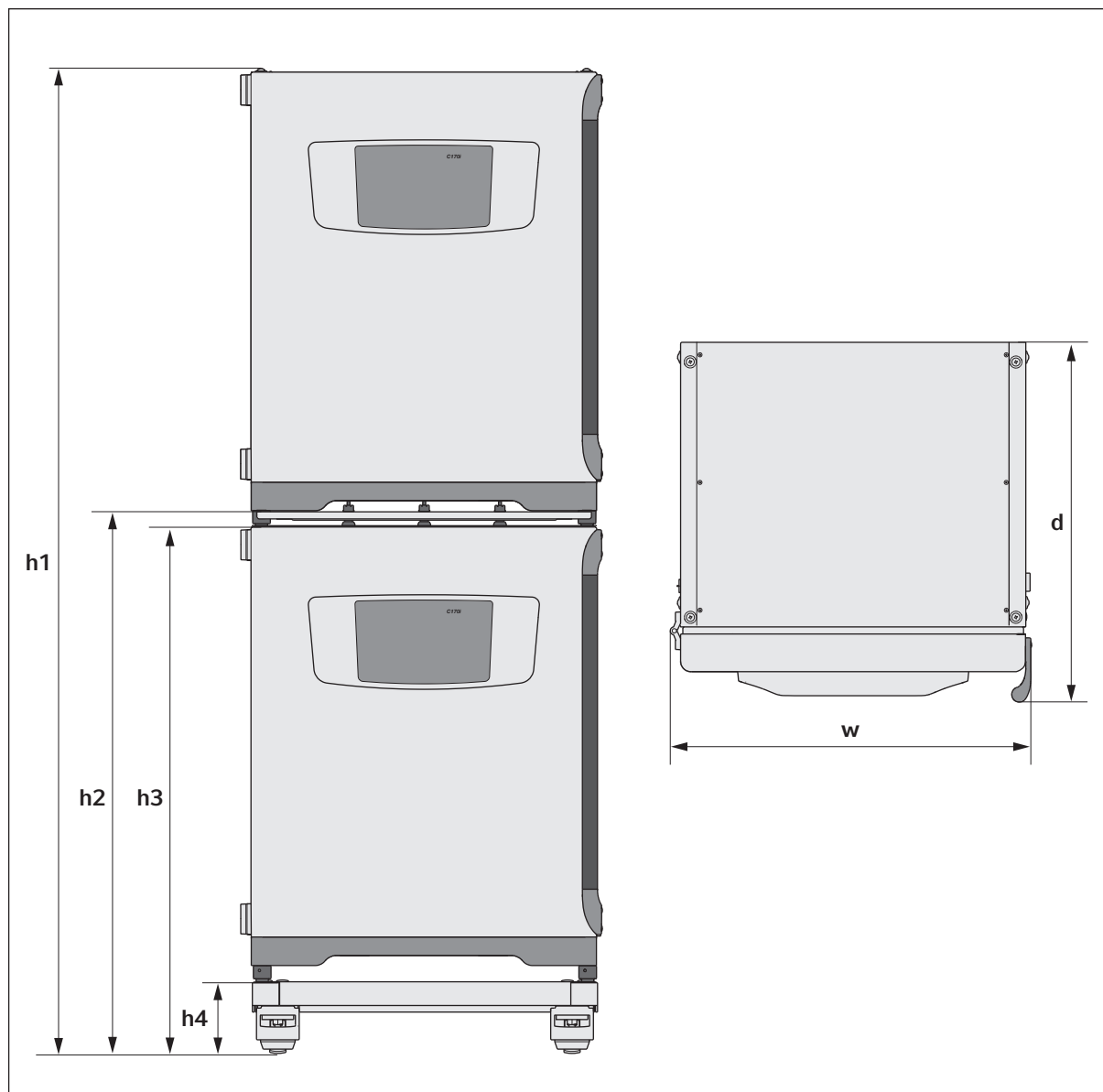


Fig. 13-2: Dimensions of 2 stacked CellXpert C170i (without safety latch)

Height				Depth	Width
h1	h2	h3	h4	d	w
194.6 cm	107.3 cm	104.5 cm	14.2 cm	71.5 cm	71.8 cm
(76.7 in)	(42.3 in)	(41.2 in)	(5.6 in)	(28.1 in)	(28.3 in)

13.2 Power supply

Mains/power connection	100 V – 127 V $\pm 10\%$, 50 Hz – 60 Hz 220 V – 240 V $\pm 10\%$, 50 Hz – 60 Hz
Power consumption for 110 V – 127 V	1150 W
Power consumption for 220 V – 240 V	1150 W
Overvoltage category	II (IEC 61010-1)
Protection class	I

Tab. 13-1: Connections

USB	2 × USB 2.0
Ethernet	1 × user 1 × service
BMS relays	4 × 0–5 V

13.3 Interfaces

BMS relays	4
BMS max. current	2 A
BMS max. voltage	30 V DC/AC

13.4 Ambient conditions

Environment	For indoor use only. No wet environment.
Ambient temperature	18–28 °C
Relative humidity	20–80 %, non-condensing
Pollution degree	2
Atmospheric pressure	79.5–106 kPa (use up to a height of 2000 m above sea level)

13.4.1 Temperature management

Range	4 °C above ambient temperature to 50 °C
Control increment	0.1 °C
Accuracy	± 0.4 °C (DIN 12880) at 37 °C and ambient 22 °C
Stability	± 0.1 °C at 37 °C and ambient 22 °C
Uniformity	± 0.3 °C at 37 °C and ambient 22 °C

13.4.2 High-temperature disinfection

Max. temperature	180 °C / 2 h
Approx. duration	14 h

13.4.3 CO₂ control

Range	0.1–20 %
Control increment	0.1 %
Accuracy	±0.3 % at 5 % CO ₂ at specified relative humidity and at 37 °C and ambient 22 °C
Stability	±0.1 % at 5 % CO ₂ at specified relative humidity and at 37 °C and ambient 22 °C
Uniformity	±0.1 % at specified relative humidity and at 37 °C and ambient 22 °C
Gas tubing	Inner diameter of 6.5 mm and outer diameter of 10 mm
Sensor type	NDIR sensor
Required gas pressure	0.1 MPa (1 bar, 14.5 psi), range 0.05–0.15 MPa (0.5–1.5 bar; 7.2–21.8 psi)

13.4.4 Humidity

Water tray capacity	2.5 Liters
Humidity control	95 % at 37 °C

The relative humidity attained could vary in the range of 92.5 ±2.5 % depending on the ambient humidity level and other factors.

13.4.5 O₂ control

Range	0.1–20 %
Control increment	0.1 %
Accuracy	±0.25 vol% at 37 °C and at specified relative humidity
Stability	±0.1 % at 37 °C and at specified relative humidity
Uniformity	±0.1 % at 37 °C and at specified relative humidity
Gas tubing	Inner diameter of 6.5 mm and outer diameter of 10 mm
Sensor type	ZrO ₂ (Zirconium dioxide)
Required gas pressure	0.1 MPa (1 bar, 14.5 psi), range 0.05–0.15 MPa (0.5–1.5 bar; 7.2–21.8 psi)

13.4.6 Calibration



The maximum operating ambient temperature is 28 °C.
Factory calibration of the incubator is carried out at 37 °C, 5 % CO₂ and 90–95 % RH, in an ambient temperature of 20–25 °C with no heat-generating apparatus inside the chamber.

Software calibration adjustments are required to optimize performance if the incubator is being used outside the operating conditions. Performance specifications are also affected.

Contact Eppendorf Service for advice on calibration adjustments and relevant performance specifications. Be prepared with the model and serial number of your incubator and the complete details of your operating conditions.

Performance values represent the average of instruments checked in the factory under optimum conditions.

14 Ordering information

14.1 Shelves and shelf rack

Order no. (International)	Description
6710 859.009	Shelves for 170 L incubators, 2 pieces
P0628-6390	Shelf rack for 170 L incubators
P0628-6140	Water tray for 170 L incubators
6710 859.106	Copper shelves for 170 L incubators, 2 pieces
P0628-6260	Copper water tray for 170 L incubators

14.2 Gas system

Order no. (International)	Description
6731 070.107	Gas tubing 3 m, with in-line gas filter
6710 070.251	In-line gas filter 2 pieces

14.3 Electrics

Order no. (International)	Description
6731 070.069	BMS connector

14.4 Housing

Order no. (International)	Description
6731 070.034	Plug for access port 2 pieces
6731 070.093	Stacking stand, lower frame with castors
6731 070.085	Stacking stand, upper frame
6710 070.235	Safety fastening kit

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14.5 Accessories

Order no. (International)	Description
P0628-5000	Automatic gas cylinder change-over unit
P0628-6150	New Brunswick™ Galaxy® Gas Analyzer CO₂
P0628-6831	New Brunswick™ Galaxy® Gas Analyzer CO₂, O₂
P0628-7890	New Brunswick™ Galaxy® Gas Analyzer CO₂, O₂, RH
P0628-7880	Temperature probe 100 mm tip
P0628-7881	Temperature probe 5 mm tip

14.6 Upgrade options

The following upgrade options are available:

- Relative humidity sensor
- Water level sensor
- Connection for remote monitoring (4–20 mA interface)
- Inner door with 4 door segments
- Inner door with 8 door segments
- Reversal of door opening

Contact your local Eppendorf partner for ordering upgrade options.

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