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Incubator Shaker

CellXpert® CS220

Operating Manual

6740 900 015-00/072024

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1 About this manual

1.1 Notes on this manual

1. Please read this manual before you use the product.
2. Please ensure that you have the manual available during the use of the product.

You can find the current version of the manual at www.eppendorf.com/manuals.

– Please contact Eppendorf SE to obtain a different version of the manual.

1.2 Warning notice structure

HAZARD LEVEL! Type of danger

Source of danger
Consequences of disregarding the danger

– Measures to avoid the danger

Symbol	Hazard level	Type of danger	Meaning
	**DANGER**	Personal injury	Will lead to severe injuries or death.
	**WARNING**	Personal injury	May lead to severe injury or death.
	**CAUTION**	Personal injury	May lead to minor or moderate injuries.
	**NOTE**	Material damage	May lead to material damage.

1.3 Graphics

Depiction	Meaning
1. 2.	Work steps
•	Bullet point
Text	Display text
Key	Name for port, button, status lamp, or key
	Important information
	Hint

1.4 Other applicable documents

The following documents supplement this manual:

- Short instructions for the CellXpert CS220
- Safety information for the CellXpert CS220
- Instructions for accessories and consumables
- Information sheet "Information on performing a risk assessment for the operation of incubators with CO_2 and N_2"
- Declaration of conformity
- Certificate of conformity

All other applicable documents can be found on the webpage www.eppendorf.com.

2 Safety

2.1 Intended use

The incubator shaker is designed to create optimal conditions for cell culture by providing adjustable and stable humidity, temperature and carbon dioxide levels in the workspace. A sample platform with adjustable shaking speed inside the device enables the cultivation of cells in suspension.

This device is intended for general laboratory use and may only be operated by persons trained in laboratory techniques and procedures.

2.2 Residual risks when used as intended

If the product is not used as intended, the installed safety devices may not function correctly. To reduce the risk of personal injury and material damage and to avoid dangerous situations, please observe the general safety instructions.

2.2.1 Personal injury

2.2.1.1 Biological hazard

Pathogenic biological agents can harm your health and the environment.

- Observe the national regulations and the biosafety level of your laboratory.
- Wear suitable personal protective equipment.
- Observe the Safety Data Sheets and instructions for use for the accessories.
- For instructions regarding the handling of germs and biological material in risk group II or above, please refer to the "Laboratory Biosafety Manual" (source: World Health Organization, Laboratory Biosafety Manual, check the most current edition).

If the device has come into contact with infectious liquids or pathogenic germs, people can become contaminated and their health can be harmed.

- Clean and decontaminate the device immediately.

2.2.1.2 Chemical hazards

Radioactive, toxic and aggressive fluids can cause serious damage to health.

- Wear suitable personal protective equipment.
- Observe any national regulations regarding the handling of such substances.
- Observe the manufacturers' safety data sheets and instructions for use.

2.2.1.3 Electrical hazards

If you touch parts that are under high voltage, you may receive an electric shock. A fatal electric shock causes cardiac arrhythmia and respiratory paralysis.

- Use only earth/grounded sockets with a PE conductor.
- Make sure that a residual current circuit breaker is present and accessible.
- Make sure that the housing and the mains/power cord are undamaged.
- Disconnect the device from the mains/power supply voltage in an emergency situation.

- Do not open or remove the housing.
- Compare the technical information on the mains/power cord and mains/power plug with the technical information on the name plate, taking into account national laws and regulations. This also includes test seals if they are required by law. Use only approved mains/power cords with plugs.
- Make sure that the mains/power plug and earth/grounded socket match and that the electrical PE conductors of the device and the building installation are securely connected to each other.
- Clean and perform maintenance on the device only when it is disconnected from the mains/power line.
- Have the device regularly checked for electrical safety in accordance with national requirements.

2.2.1.4 Risks of burns

There is a risk of burns from hot components during high-temperature disinfection.

- Do not touch the device while a high-temperature disinfection cycle is running.
- Do not open the doors while the high-temperature disinfection cycle is running.
- Allow the device to cool down completely if a system crash or mains/power outage occurs during high-temperature disinfection.

2.2.1.5 Mechanical hazards

The device is very heavy. Transporting and lifting the device improperly can lead to serious injuries.

- Only transport and lift the device with a sufficient number of people and with suitable means.
- Use transport aids and load-carrying devices that are designed for the weight of the device.

2.2.1.6 Incorrect handling

If the device or technical equipment is not properly connected to the gas supply or is damaged, the CO_2 concentration in the breathing air may increase. Persons may become unconscious as a result and suffocate due to insufficient oxygen supply.

- Gas tubing may only be installed and connected by trained personnel.
- Observe the national guidelines for handling gases and setting up and operating laboratories.
- Ensure that the CO_2 concentration in the breathing air does not exceed permitted levels when working in the laboratory.
- Read the "Information on performing a risk assessment for the operation of incubators with CO_2 and N_2" by Eppendorf SE.

2.2.2 Material damage

2.2.2.1 Electrical hazards

Connecting the device to an incorrect mains/power supply will damage the device.

- Connect the device only to a mains/power supply that meets the requirements on the name plate.
- Use only earth/grounded sockets with a PE conductor.

- Compare the technical information on the mains/power cord and mains/power plug with the technical information on the name plate, taking into account national laws and regulations. This also includes test seals if they are required by law. Use only approved mains/power cords with plugs.
- Make sure that the mains/power plug and earth/grounded socket match and that the electrical PE conductors of the device and the building installation are securely connected to each other.

Condensate may form in the device after transport of the device from a cool environment to a warmer one.

- Wait for at least 12 h after setting up the device. Then connect the device to the mains/power line.

This device has been checked and complies with the threshold limits for a Class B digital device according to Section 15 of the FCC guidelines. Meeting these limits ensures appropriate protection is provided against harmful interference within residential buildings. This device generates and emits radio frequency energy during use, which may cause harmful interference to radio communications if the device has not been installed properly or is not used in accordance with the manufacturer's instructions. There is, however, no guarantee that interference will not occur in any particular installation. If the device does cause interference to radio and television reception, which can be verified by switching the device on and off, try to resolve the problem with one or several of the following measures:

- Reposition the receiving antenna or the wireless device or move it to another location.
- Increase the distance between the device and the receiver or the wireless device.
- Connect the device to a different circuit than the one to which the receiver is connected.

2.2.2.2 Incorrect handling

The use of accessories and spare parts other than those recommended by Eppendorf SE may impair the safety, functioning, and precision of the device. Eppendorf SE cannot be held liable or accept any liability for damage resulting from the use of accessories and spare parts other than those recommended.

- Only use the accessories and spare parts recommended by Eppendorf SE.
- Only use accessories and spare parts that are in perfect technical condition.

Excessive pressure can cause the gas tubing or the in-line gas filter to burst or break.

- Make sure that the gas inlet pressure does not exceed 0.15 MPa (1.5 bar, 21.8 PSI).

2.3 Application limits

Due to its design, the product is not suitable for use in a potentially explosive atmosphere.

The product may only be used in a safe environment, such as a ventilated laboratory or under a fume hood. Substances which may potentially contribute to an explosive atmosphere may not be used.

2.4 Target groups

This manual is intended for the following target groups, who have different qualifications and levels of knowledge.

Owner

The owner is any natural or legal person who operates or owns the device.

The owner provides the product and the necessary infrastructure. The owner has a special responsibility to ensure the safety of all persons working on the product.

User

The user operates the product and works with it. The user must be instructed in the use of the product. The user must have read and fully understood the manual.

Any tasks that go beyond operation may only be performed by the user if this is specified in this manual. The owner must explicitly assign these tasks to the user.

Technical personnel

The technical personnel supervises the building services and ensures the technical prerequisites for the operation of the product.

Authorized service technician

The authorized service technician is trained and certified by Eppendorf SE to service, maintain and repair the product.

2.5 Information for the owner

The owner must ensure the following:

- The product is in a safe operating condition.
- The safety devices are all available and functional.
- The product is serviced and cleaned according to the information in this manual.
- The product is disposed of in accordance with local regulations.
- All work on the product is carried out by users, technical personnel or authorized service technicians who are suitably qualified.
- Personal protective equipment is available and is worn.
- The manual is available during the use of the product.
- The manual is part of the product. The product will only be passed on to others with its manual.

2.6 Personal protective equipment

Personal protective equipment serves to ensure the safety and protection of the user when working with the product.

Personal protective equipment must comply with country-specific regulations and the regulations of the laboratory.

2.7 Information on product liability

The owner of the device will be held liable for personal and material damage in the following cases:

- The device is used outside of its intended use
- The device is not used in accordance with the operating manual
- Manipulation of safety devices
- The device has spare parts installed that are not authorized by Eppendorf SE

- The device is used with accessories or consumables that are not recommended by Eppendorf SE
- Cleaning agents are used that are not recommended by Eppendorf SE
- Chemicals are used that are not recommended by Eppendorf SE
- Shipment not in original packing or in improper substitute packing
- The device is maintained or repaired by persons not authorized by Eppendorf SE
- Unauthorized modifications

2.8 Information on the device

Information	Meaning	Location
	Observe the safety-relevant information in the operating manual.	Visible on the right door panel when the door is open
	CAUTION Risk of crushing your hands and fingers when opening and closing the door.	Visible on the right door panel when the door is open
	CAUTION Risk of eye damage.	Visible on the right door panel when the door is open
	WARNING Contact with hot surfaces may cause burn injuries.	Visible on the door and on the right door panel when the door is open
	WARNING The door lock magnets generate strong magnetic fields.	Visible on the right door panel when the door is open

3 Product description

3.1 Features

The device has the following features:

- Chamber with extendable sample platform
- Suitable for large sample volumes
- Optimum setting of CO_2 content, humidity, and shaking speed
- Touch screen
- Integrated high-temperature disinfection
- Preservation of software settings after mains/power outage
- Interfaces: USB, Ethernet
- Connection to VisioNize possible
- Three devices stackable

3.2 Product overview

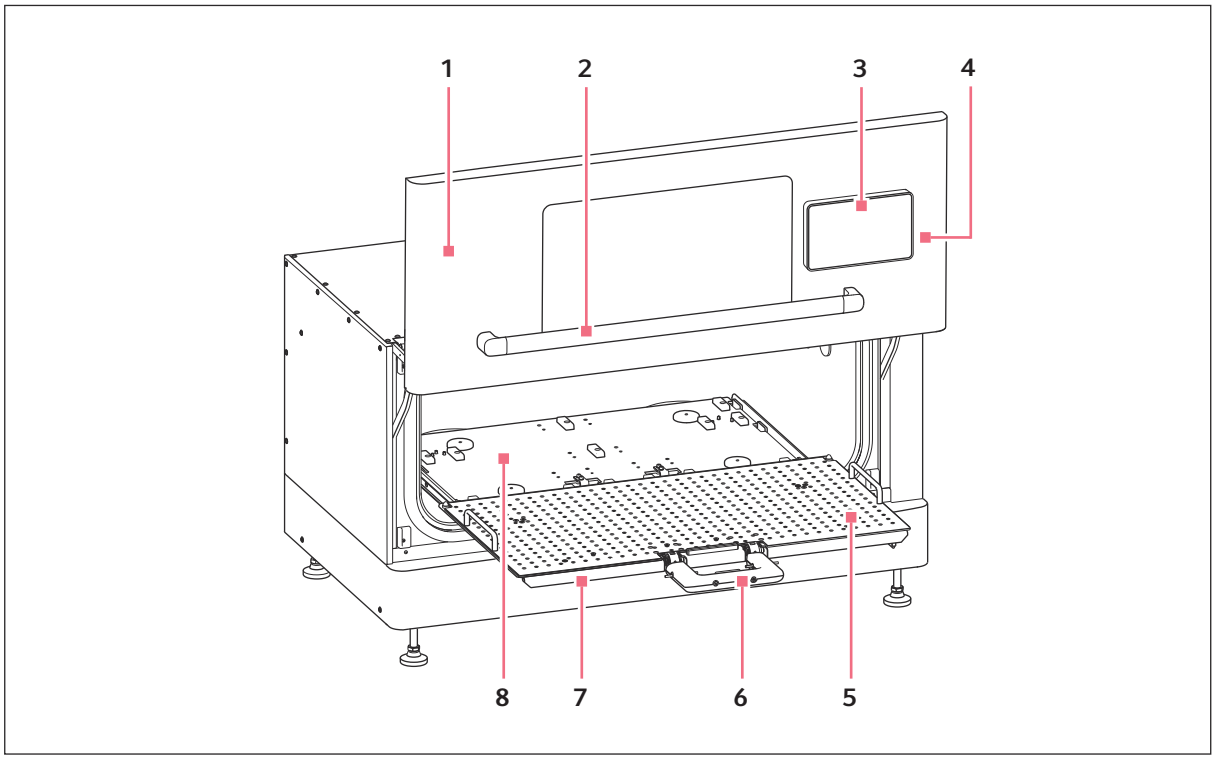


Fig. 3-1: Front view

1 Door

2 Door handle

3 Control panel

4 USB port

5 Sample platform (available as a required accessory)

6 Handle for pulling out the sample platform

7 Pull-out tray

8 Sub-platform

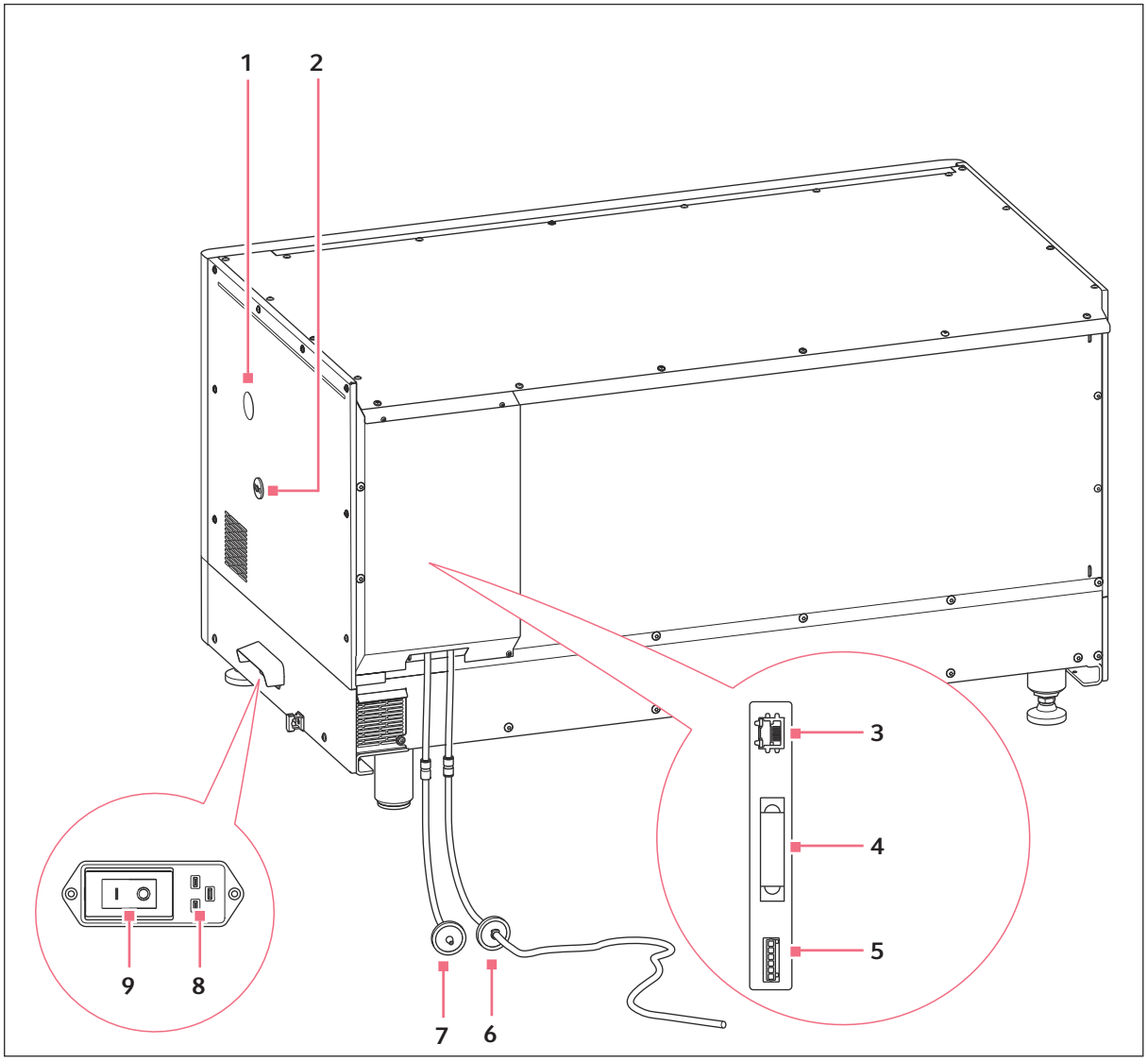


Fig. 3-2: Rear view

1 Access port for external sensors
2 Water connection
3 Ethernet interface (VisioNize connection)
4 Expansion connector (optional)
5 Interface for building management system
6 CO_2 port
7 Air filter with length of tubing
8 Mains/power cord socket
9 Mains/power switch

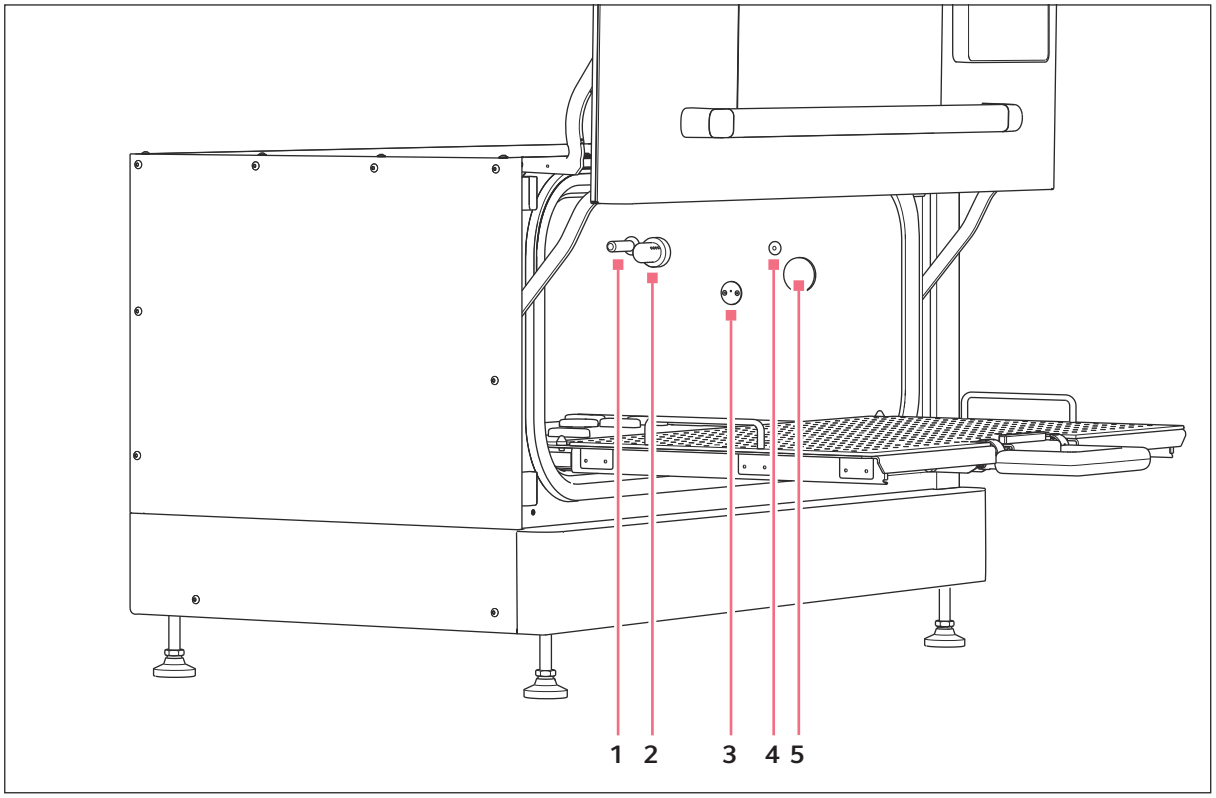


Fig. 3-3: Internal view

1 Humidity sensor with temperature sensor

2 CO_2 sensor

3 Water vapor inlet

4 Gas inlet and interior lighting

5 Access port, e.g., for external sensors with blind plug

3.3 Control panel

3.3.1 Touch screen

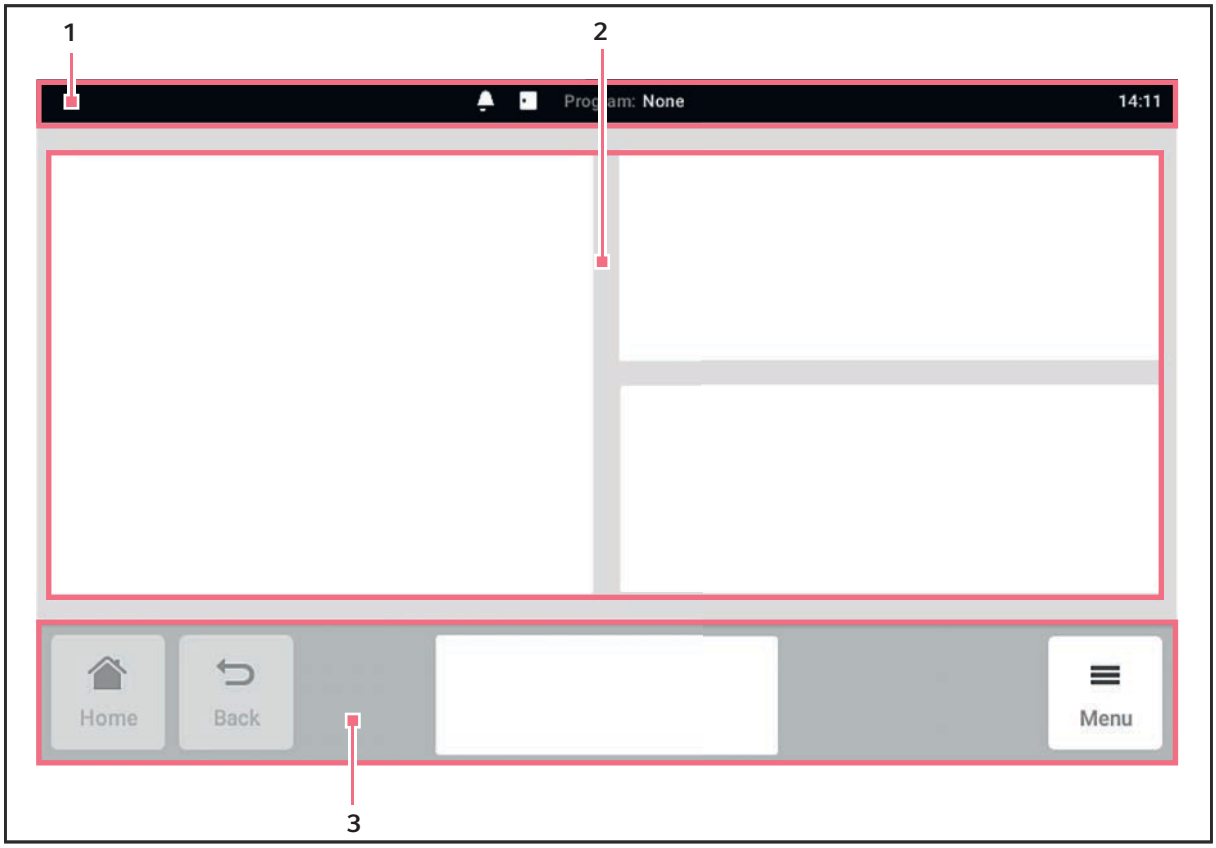


Fig. 3-4: Schematic structure of the software surface

1 Status bar
2 Display
3 Toolbar

Status bar

The status bar contains information about the user, time, device status, and messages.

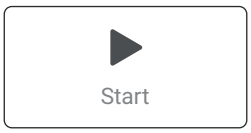
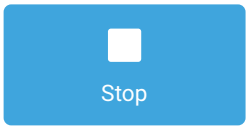
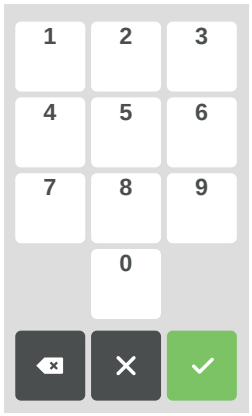
Display

The touch screen display is divided into separate function areas. The function areas are configurable.

Toolbar

The toolbar contains buttons for navigating the software and operating the device.

3.3.2 Operating controls

Operating control	Function
	Start the application with the set parameters
	Stop the application with the set parameters
	Increase or decrease reduce values gradually
	Enter a value
	Activate the function Active elements are blue.

3.3.3 Symbols

Symbol	Description
	Status: Function active
	Status: Function inactive
	Door open
	Error message
	Alarm message
	Warning message

Symbol	Description
	Notification
	Alarms
	Access events
	Open the charts area
	Select the time span to be shown in the chart. Display the selected time span
	Close
	Activate filter
	Open the export area and export data
	Change function position
	Restore factory settings
	Fine adjustment
	Display recently used parameters
	Switch on the chamber light
	Start decontamination

3.4 Accessories

3.4.1 Required accessories

Required accessories must be ordered separately. You can find more information regarding accessories on our website www.eppendorf.com.

Sample platform

The sample platform has several M4 holes allowing you to use virtually any combination of flask clamps, test tube racks and other accessories.

The sample platform enables the safe and intended use of the device. The device must not be operated without a sample platform.

Sample holder

The following material is available to securely attach sample tubes to the sample platform:

- Flask clamps
- Sticky pads

The flask clamps are made from stainless steel and are supplied as a complete set including the required screws. They are equipped with coiled wire springs to provide more stability at higher speeds.

The sticky pads are supplied as 20 cm × 20 cm pads. They can cover the entire surface of the sample platform or they can be used in combination with screw accessories such as test tube racks or flask clamps.

The test tube racks and the microplate holders may only be attached with the screws that are provided with the sample platform.

Water supply package

The water supply package includes all the parts required for a secure water supply for up to 3 stacked devices:

- Water tank
- Tube distributor with sealing rings
- Air filter
- Tube weight with o-rings
- 3 water tubes
- 3 water filters

Water tank with tube distributor set

The plastic water tank can hold a max. volume of 5 L.

The tube distributor set is used to ensure the proper distribution and ventilation of the water tubes in the water tank. It includes the following parts:

- Lid
- Air filter
- Caps
- Sealing rings
- Tube weight with o-rings

Water tube package

The water tube package enables a secure connection between the device and the water tank. The package includes the following parts:

- Water tube
- Water filter

3.4.2 Optional accessories

Optional accessories can be ordered separately. More information on accessories can be found on our website www.eppendorf.com.

Stacking kit

A stacking kit allows two devices to be stacked one on top of the other in a safe and stable manner. The stacking kit may only be installed by an authorized service technician.

Positioning base with storage space

The positioning base with storage space is used to position a single device at the ideal working height and to create space for other laboratory equipment. The base may only be installed by an authorized service technician.

Water tank holder

The water tank is accessibly positioned at the side of the device thanks to the water tank holder. It can also be used as a holding fixture for the humidity sensor dust cap and sub-platform tool.

3.5 Name plate

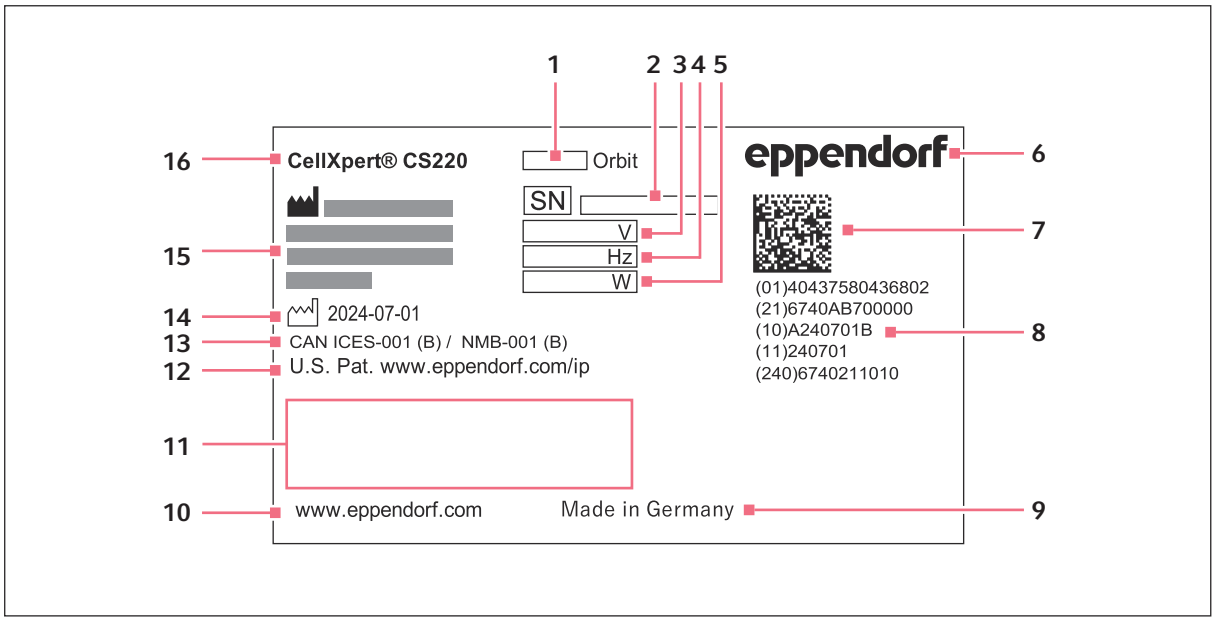


Fig. 3-5: Device identification (example)

1	Device variant	9	Designation of origin
2	Serial number	10	Manufacturer’s Internet address
3	Voltage	11	Regulatory symbols
4	Frequency	12	Patents
5	Power consumption	13	Additional regulatory information
6	Manufacturer	14	Date of manufacture
7	Data matrix code for serial number	15	Manufacturer's address

8 Readable information of the data matrix code
16 Product name

4 Functional description

4.1 Principle of application

To create optimum conditions for the cell culture in the workspace, the following application parameters can be configured on the device:

- Temperature
- Rotational speed
- CO_2 concentration
- Relative humidity

4.2 Safety features

Temperature limitation

In accordance with DIN EN 12880, the device switches off automatically at 10 K above or 5 K below the heating temperature setpoint.

Gas pressure limitation

At pressures above 1.8 bar (0.18 MPa), the gas supply inlet valve closes.

Drive limitation

If the load is too high, the speed is automatically reduced. The drive of the device switches off when the door is opened.

4.3 Message concept

The device issues different types of messages:

- **Alarms**
  An alarm is triggered when a safety-relevant situation occurs. The user must immediately eliminate the cause of the alarm.
- **Warnings**
  A warning is triggered if a safety-relevant situation may occur. The user must observe the device.
- **Messages**
  The device issues a message when the time for a recurring task is reached.
- **Error messages**
  The device issues a error message when the software detects an error.

Optical and acoustic signals are defined for each message type.

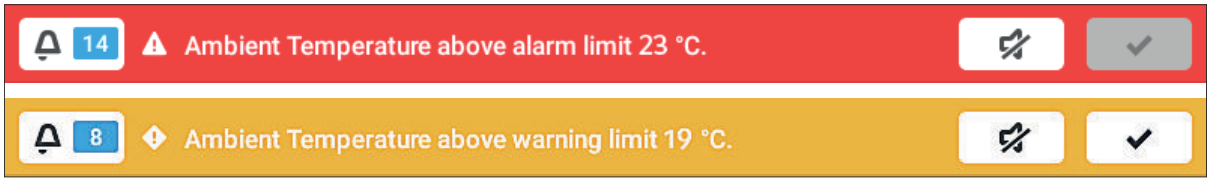


Fig. 4-1: Notification bar for alarm and warning (example)

The messages are shown in the notification bar. The color indicates the message type.

- Red corresponds to an alarm
- Yellow corresponds to a warning
- Green corresponds to a message

4.4 Device-specific messages

Alarms

The device can generate the following alarms and forward them to a building management system (BMS):

- "Door alarm" is triggered if the outer door is left open for too long.
- "Interior temperature" is triggered if the alarm limit is exceeded or not reached.
- " CO_2 alarm" is triggered if the CO_2 concentration in the interior is exceeded or not reached.
- "Relative humidity alarm" is triggered if the humidity in the interior is exceeded or not reached.

4.5 VisioNize Lab Suite

VisioNize Lab Suite is a cloud-based platform.

To send, for example, performance data to the VisioNize Lab Suite, you can integrate the device into a local network via a standard SF/FTP, S/FTP, SF/UTP, or S/UTP Ethernet cable.

For more information, contact your local Eppendorf partner and refer to the VisioNize Lab Suite Setup Guide.

5 Installation

The device may only be installed and put into operation by an authorized service technician.

5.1 Checking the delivery

Do not use the product if the packing or the contents are damaged. In case of damaged or missing parts, contact the Eppendorf SE customer service or your Eppendorf partner.

1. Check the packing and the contents for any visible external damage.
2. Check whether the delivery is complete and matches the order.

Table 1: Delivery package

Quantity	Description
1	Incubator shaker
1	Mains/power cord
1	Protective cap for humidity sensor
1	Blind plug for access port
1	Air filter with tubing connector
1	Tubing with an outer diameter of 10 mm and an inner diameter of 6.5 mm, with an in-line gas filter, length 3 m
1	Hex key 6.0 mm for sub-platform
1	Plug for building management system
1	Short instructions
1	Information sheet "Information on performing a risk assessment for the operation of incubators with CO_2 and N_2"

5.2 Checking prerequisites

All prerequisites must be met before the device can be installed and put into operation.

Checking the location

1. Check whether the location meets the following requirements:
    - The ambient conditions meet the requirements set out in the "Technical data" chapter
    - Minimum distance to other devices and walls:
        - 20 cm on the left and right sides
        - 5 cm on top
        - 3 cm at the rear
    - Good ventilation
    - Sufficient air volume
    - Non-explosive environment
2. Check whether the location is protected from the following influences:
    - Heat sources
    - Cold sources
    - Sparks
    - Open flames
    - Direct exposure to sunlight
    - Air currents
    - UV radiation
    - Strong electromagnetic radiation

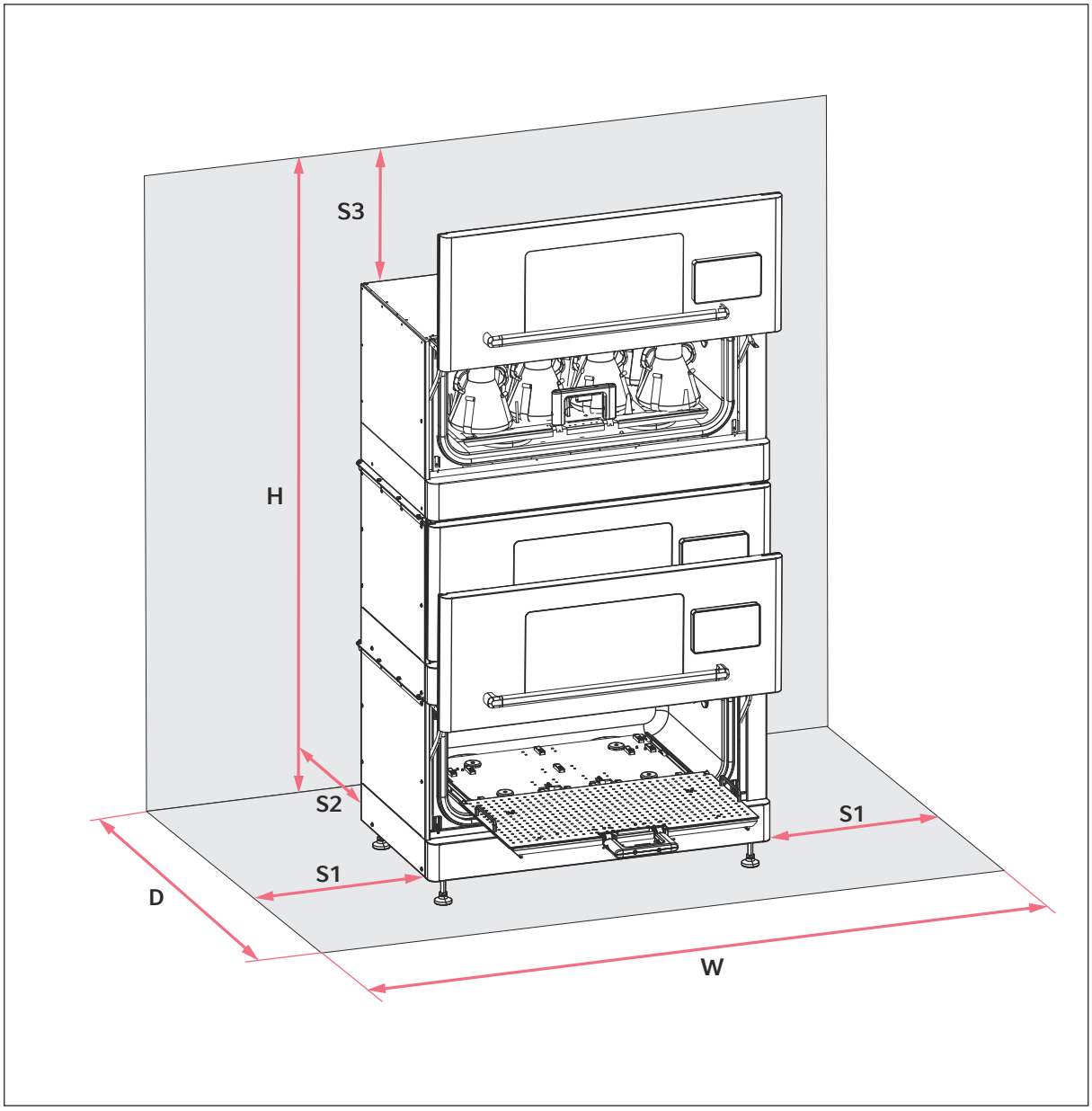


Fig. 5-1: Three stacked devices with long device foot

W	167.7 cm	S1	20.0 cm
D	96.5 cm	S2	10.0 cm
H	255.4 cm	S3	47.0 cm

Checking the floor conditions

To ensure that the function is not affected, the device should not be installed near other devices that are particularly sensitive to vibrations. If it is installed on the ceiling of an upper floor in a multi-story building, devices located on adjoining ceiling panels may also be affected.

1. Contact building management to check whether the floor conditions meet the following requirements.
   - If possible, it should be installed on the foundation slab in the lowest level of the building (in the basement, if there is one, on the first floor if there is no basement):
     - For new buildings: a continuous, solid foundation slab made from reinforced concrete
     - In existing buildings with foundations: a base filled with hard core only, not a reinforced base, if applicable
   - Installation on the ceiling of an upper floor in a multi-story building, e. g. the second floor:
     - Static load capacity in case of a single device: 4 kN per m^2
     - Static load capacity in case of 2 stacked devices: 6 kN per m^2
     - Static load capacity in case of 3 stacked devices: 9 kN per m^2
     - Ceiling constructions should be as rigid as possible with span widths kept as small as possible
   - Installation directly on the base or the raw ceiling, on the bonded screed, if applicable:
     - Do not use floor constructions with soft intermediate layers like floating screed and/or thermal insulation
     - Use hard, level and non-skid surfaces, no soft floor coverings
2. To plan and implement more extensive construction work, involve the following departments/parties:
   - Operations
   - Structural dynamics
   - Structural engineering design, also, building physics, if applicable
   - Architects
   - Building services
   - Geotechnical engineering

At a ceiling eigenfrequency of > 18.75 Hz no adverse ceiling vibrations are to be expected.

Checking the electrical connection

DANGER! Electric shock

If the PE conductor connection is missing, you may receive an electric shock. An electric shock causes cardiac injuries and respiratory paralysis.

- Make sure that the mains/power plug and earth/grounded socket match and that the electrical PE conductors of the device and the building installation are securely connected to each other.

1. Check whether the electrical connection meets the following requirements:
   - The mains/power connection matches the details on the name plate.
   - An earth/grounded socket with a PE conductor is available.
   - The earth/grounded socket can be reached with the mains/power cord provided. Junction boxes or extension cables are not permitted.
   - A residual current circuit breaker is available and accessible.
   - The mains/power plug on the device or the earth/grounded socket is accessible at all times during operation so that the device can be disconnected properly from the mains/power line.

Checking the gas connection

WARNING! Personal injury

If the device is not connected correctly to the gas supply, increased levels of CO_2 can occur in the breathing air. This poses a risk of poisoning and suffocation.

– Make sure that gas tubing is only installed and connected by trained personnel.
– Avoid excessive CO_2 concentrations in the breathing air when working in the lab.

NOTICE! Damage to the device and accessories

Excessive pressure can cause the gas tubing or the in-line gas filter to burst or break.

– Make sure that the gas inlet pressure does not exceed 0.15 MPa (1.5 bar, 21.8 PSI).

1. Check that the gas connection meets the following requirements:
   - The main gas valve is easily accessible.
   - A large CO_2 cylinder with vapor recovery and a two-stage CO_2 pressure reducer are available to regulate the pressure between 0.05 MPa – 0.15 MPa (0.5 bar – 1.5 bar, 7.2 PSI – 21.8 PSI).

Checking the water supply

NOTICE! Damage to device

If no ultrapure water is used in the water tank, the device can become damaged due to internal corrosion.

– Only use ultrapure water with a conductivity of < 1.1 µS/cm in the water tank.

1. The water tank is positioned above the water inlet of the uppermost device in the stack.
2. The max. volume of the water tank is 5 L.
3. The water tank only contains sterile water.

6 Preparing the device for use

6.1 Switching on the device

Prerequisites:

- The device has been installed and connected by Eppendorf Service.
- The device has been allowed to acclimatize for at least 12 h.

1. Switch on the device using the mains/power switch. Leave the device switched on until the set chamber temperature and CO_2 concentration have been reached.

   The display lights up.

   The CO_2 sensor requires 30 min for initialization after the device has been switched on. No process value is displayed during the initialization phase.

2. Leave the device switched on for at least 2 h to allow conditions to stabilize.

6.2 Preparing the sample platform

Installing the flask clamps

NOTICE! Damage to device

If you do not use the screws listed below, the screws may protrude at the bottom of the sample platform and damage the sub-platform of the device.

– Do not use any other screws than those listed below to attach the accessories to the sample platform.

Tool:

- Cross-head screwdriver PH 2

Material:

- Phillips screws M4x7 with countersunk head

Prerequisites:

- A sample platform is available.

1. Place the flask clamp on the sample platform so that its mounting holes are aligned with the holes in the sample platform.
2. Attach the flask clamp using the screws provided.

The test tube racks and the microplate holders may only be attached with the screws that are provided with the sample platform.

Using sticky pads

Prerequisites:

- A sample platform is available.

1. Peel off the protective film from the bottom of the sticky pad.
2. Attach the sticky pad evenly to the surface of the sample platform.
3. To change its position, peel off the sticky pad from the sample platform and re-attach it.
4. Make sure that the tube is properly attached to the sticky pad.

6.3 Configuring the network

Configuring the network automatically

Prerequisites:

- You have administrator rights.

1. Tap on *Menu* > *Settings* > *System Settings* > *Network*.
2. Activate the function *Enable DHCP*.

   The device will automatically connect to the network.

   If the device is integrated in the network, its IP address will appear in the field *IP Addresses*.

Configuring the network manually

Prerequisites:

- You have administrator rights.

1. Tap on *Menu* > *Settings* > *System Settings* > *Network*.
2. Disable the function *Enable DHCP*.

   The field *Manual Setup* is enabled.
3. Tap on *Manual Setup*.
4. Enter the parameters.
5. Confirm the parameters.

   The entries are saved. The device connects to the network.

   When the device is integrated in the network, its IP address will appear in the field *IP Addresses*.

6.4 Registering the device for VisioNize

You can connect the device to the VisioNize Lab Suite for remote monitoring and alarm notifications.

Prerequisites:

- Use the following required network components:
  - DNS server
  - NTP server
- Use an automated NTP time server protocol to ensure smooth data transfer between your laboratory devices and the software.
- To enable communication between your lab devices and the cloud-based VisioNize Lab Suite services, define the following exceptions for the firewall settings:
  - URL: *.eppendorf.com
  - Interface: 443 TCP
  - Protocol: MQTT via web sockets
- The Eppendorf device that you want to connect is ready for operation.
- The latest device software version is installed on the Eppendorf device.
- You are logged in to the VisioNize Lab Suite as an administrator.

1. Use a standard Ethernet cable to connect the device with your local network.
2. Check whether the device is connected to the Internet and the VisioNize Lab Suite cloud servers by tapping on *Menu* > *Contacts & Supports* > *Diagnostics* > *Check Cloud Connectivity Prerequisites* on the device's touch screen.

   As soon as the device is connected to the Internet and the VisioNize Lab Suite cloud servers the top menu ribbon of the touch screen will display a cloud symbol.

   If the cloud symbol is crossed out although all prerequisites are fulfilled and an Internet connection has been established, please contact your local Eppendorf partner.

3. Click on *Device Management* in the VisioNize Lab Suite.
4. Click on *Add Device* +.
5. Click on *A VisioNize Touch Enabled Device*.
6. Enter the serial number of the device which you want to connect.

   You will find the serial number on the device's name plate on the rear of the device.

   The *Next Step* button is enabled.
7. Click on *Next Step*.
8. To send a registration request for the device, click on *Submit*.

   You must send an individual registration request for each VisioNize touch enabled device that you want to register. This request can only be accepted or rejected by an administrator. If you have entered the wrong serial number, the registration request cannot be accepted.

   The registration request is displayed in the *Requests* tab in the top left corner.
9. Click on the *Requests* tab.

10. Select the device from the list of registration requests.
11. Click on *Accept Device* to accept the registration request.

    The device data are only documented after the registration request was accepted successfully.

    The device is added to the device list in the *Device* tab.

    The device is added to the *Monitoring* device list.

6.5 Setting the date and time

If the date, time or time zone is changed, the display of the *Charts* function may be temporarily impaired. The *Events* function sorting may be incorrect.

If a connection to the VisioNize Lab Suite exists, use the automatic date and time setting function to prevent deviations.

Prerequisites:
- You have administrator rights.

1. Tap on *Menu* > *Settings* > *System Settings* > *Date & Time*.

Setting the date and time automatically

Prerequisites:
- The device is connected to the network and to a time server.
- You have administrator rights.

1. Tap on *Menu* > *Settings* > *System Settings* > *Date & Time*.
2. Activate the function *Automatic date & time*.
3. Tap on *Select time zone*.
4. Select the continent.
5. Select the time zone.

   The entries are saved.

Setting the date and time manually

Prerequisites:
- You have administrator rights.

1. Tap on *Menu* > *Settings* > *System Settings* > *Date & Time*.
2. Disable the function *Automatic date & time*.

   The *Set date* and *Set time* fields are enabled.
3. Tap on *Set date*.

4. Set the current date and confirm your entry.
5. Tap on *Set time*.
6. Set the current time and confirm your entry.
7. Tap on *Select time zone*.
8. Select the continent.
9. Select the time zone.

   The entries are saved.

6.6 Entering device parameters

Prerequisites:

- You have administrator rights.

1. Tap on *Menu* > *Settings* > *About this CellXpert CS220*.
2. Enter the device-specific parameters.

6.7 Configuring signal tones

Prerequisites:

- You have administrator rights.

1. Tap on *Menu* > *Settings* > *Device Settings* > *Acoustic Signals*.
2. To activate the signal tones without an interface signal (door alarm), tap on *Alarms*.
3. To activate the signal tones with an interface signal (door alarm), tap on *Alarms and Interface*.
4. Check the signal tones by tapping on *Test*.

6.8 Configuring the touch screen

Adjusting brightness, power saving mode and screensaver

1. Tap on *Menu* > *Settings* > *Device Settings* > *Display Settings*.
2. Tap on *Display brightness*.
3. Adjust to the required brightness.
4. Activate the *Energy save mode* function to save energy.
5. Tap on *Display timeout*.
6. Select the time after which the display will be dimmed.

6.9 Changing the function areas of the touch screens

The home screen shows the most important information for the different functions. You can select the function areas to be displayed:

- Temperature
- Velocity
- CO_2 concentration
- Relative humidity
- Timer function for velocity

Prerequisites:

- You have administrator rights.

1. Tap on *Menu* > *Settings* > *Device Settings* > *Home Screen Configuration*.
2. To display a function area on the home screen, use the slider to activate the corresponding function area.
3. To hide a function area on the home screen, use the slider to deactivate the corresponding function area.
4. To adjust the order of the function areas on the home screen, hold and move the function areas with the arrow keys.

The order of the function areas also determines which graphs are displayed in the chart area.

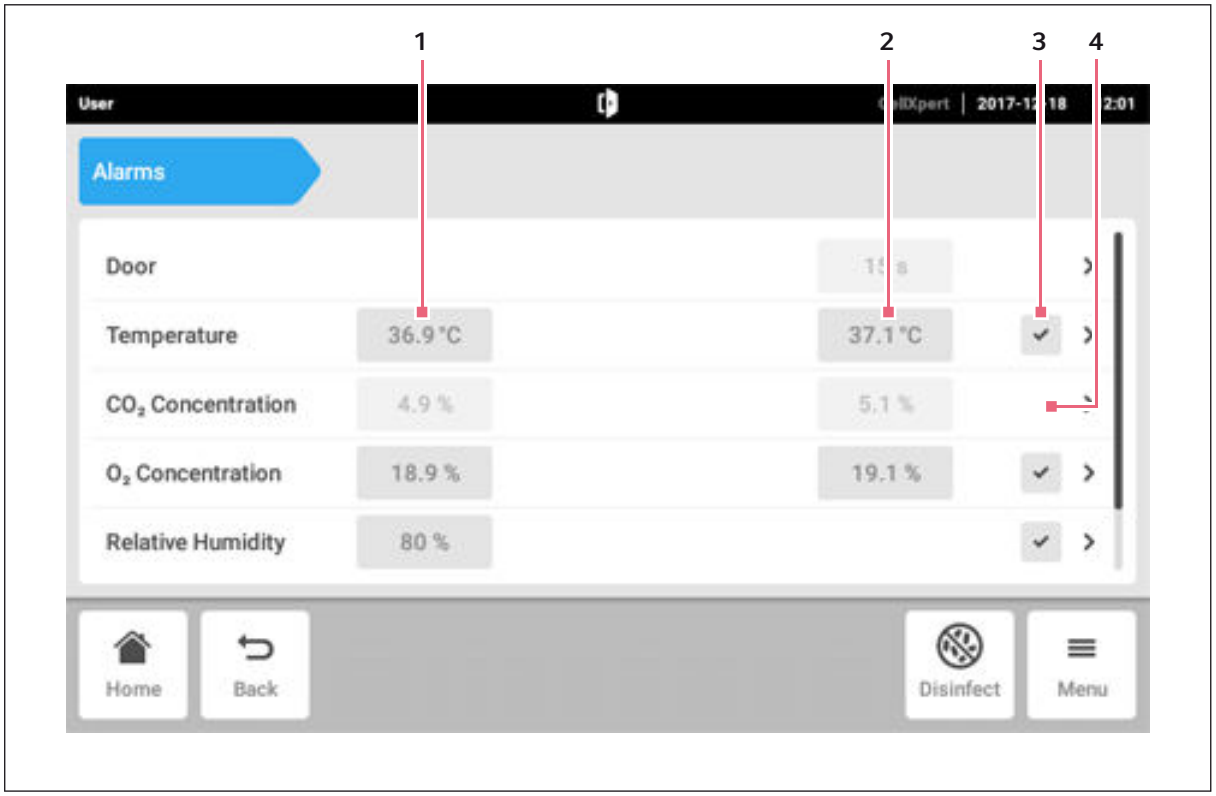
6.10 Setting alarm limits

An alarm message appears in the information bar if a value is not within a specified range of setpoints. The alarm remains active until the value is back within the defined alarm limits. The alarm system is deactivated for a defined time so that no unnecessary alarms are generated after:

- switching on the device
- changing a setpoint
- closing the door
- high-temperature disinfection

Accessing the alarm overview

1. Tap on *Menu* > *Alarms*.



1 Lower alarm limit

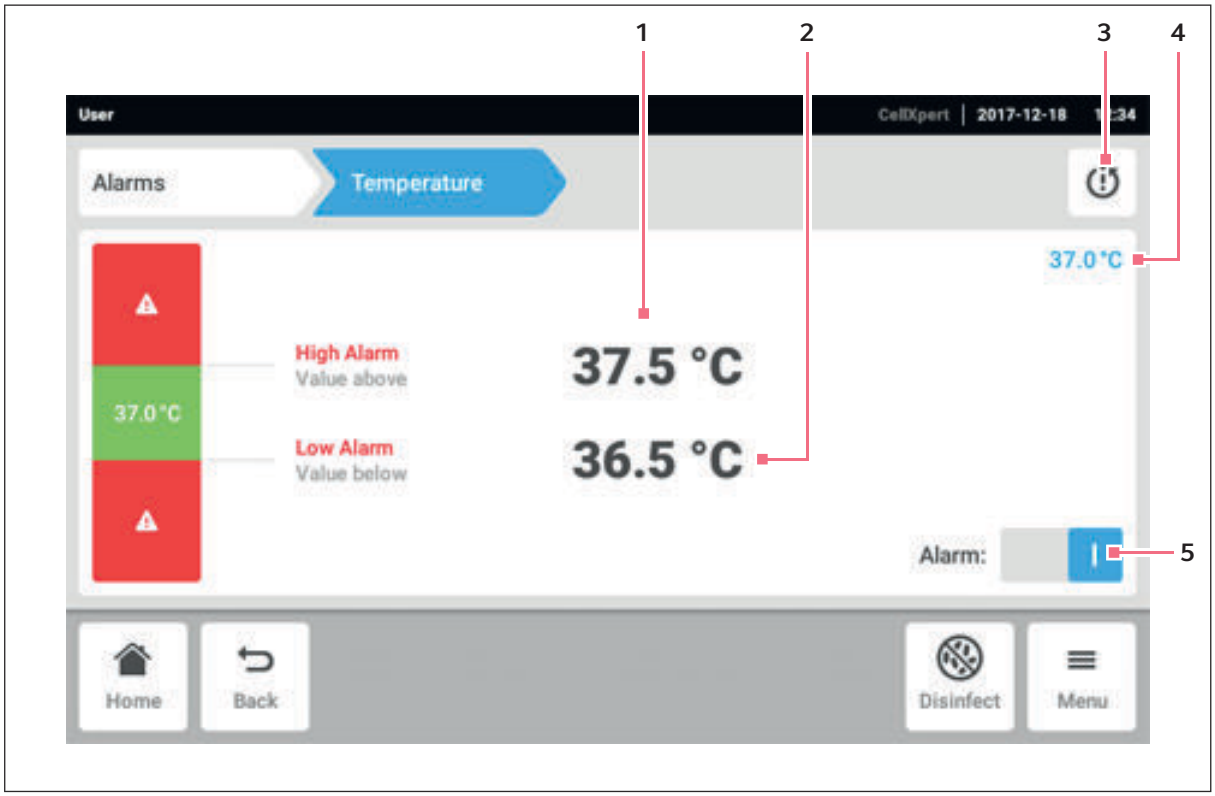
2 Upper alarm limit

3 Alarm enabled (temperature)

4 Alarm disabled (CO_2)

When an alarm is active, the exceeded alarm limit is highlighted red.

Setting alarms and alarm limits



1 Upper alarm limit
2 Lower alarm limit
3 Factory settings
4 Actual value-
5 Enable or disable alarms

Upon delivery, the factory-set alarm limits are as follows:

- Temperature: ±0.5 K
- CO_2: ±0.5 %
- Humidity: 80 %
- Door: 30 s

1. Tap on *Menu* > *Alarms*.
2. To access the alarm, tap on the corresponding line.

   The alarm settings window opens.
3. Tap on the value to be changed.

   The number pad appears.

4. Enter the desired value.

   When changing a setpoint, the alarm limits are changed in relation to it. Alarm limits can become closer to the setpoint. In that case, alarm messages can occur more frequently.

5. Confirm the entry.

   The entered alarm limit appears on the display.

6.11 Deactivating alarms

Deactivating the "Door" alarm

Prerequisites:

- You have administrator rights.

1. Tap on *Menu* > *Alarms* > *Door*.
2. Deactivate the alarm with the slider.

Deactivating the "Temperature in the interior" alarm

Prerequisites:

- You have administrator rights.

1. Tap on *Menu* > *Alarms* > *Temperature*.
2. Deactivate the alarm with the slider.

Deactivating the "Rotational speed" alarm

Prerequisites:

- You have administrator rights.

1. Tap on *Menu* > *Alarms* > *Speed*.
2. Deactivate the alarm with the slider.

Deactivating the "CO_2 concentration" alarm

Prerequisites:

- You have administrator rights.

1. Tap on *Menu* > *Alarms* > *CO_2-Concentration*.
2. Deactivate the alarm with the slider.

Deactivating the "Humidity" alarm

Prerequisites:

- You have administrator rights.

1. Tap on *Menu* > *Alarms* > *Relative Humidity*.
2. Deactivate the alarm with the slider.

6.12 Setting the chamber light

1. Tap on *Settings* > *Device Settings* > *Chamber Light*.
2. Tap on a setting:
   - *Off*: The chamber light is always switched off. The light key is not displayed on the home screen.
   - *Auto*: The chamber light goes out 15 s seconds after the door is closed and after the light key on the home screen has been pressed.
   - *On*: The chamber light is always switched on. The light key is displayed on the home screen.

6.13 Setting gas pressure monitoring

Without low pressure monitoring, error messages may be generated for the gas concentration as the device might be operating below the specified conditions of between 0.05 MPa – 0.15 MPa.

When gas pressure monitoring is activated, an alarm is triggered if the gas pressure drops too much.

1. Tap on *Settings* > *Device Settings* > *Gas System*.
2. Tap on the switch to activate or deactivate gas pressure monitoring.

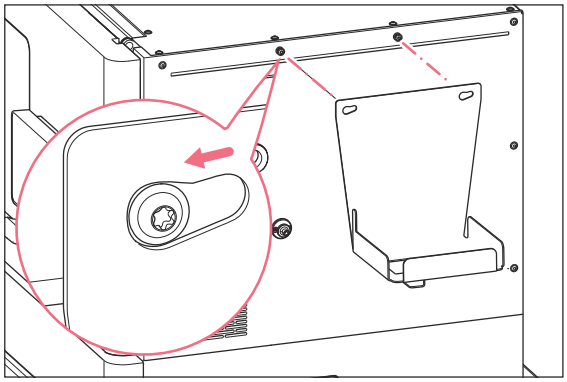
6.14 Connecting the device to the water supply

Checking prerequisites

1. Make sure that the following requirements are met:
   - The device has been properly installed or stacked at the location.
   - The water tank is positioned above the water inlet of the uppermost device in the stack.

Mounting the water tank holder (optional)

The water tank holder is not included in the delivery package and can be ordered as an option.



1. Hang the water tank holder on the screws with the spacers on the outer right housing plate of the uppermost device in the stack.
2. Secure the water tank holder to the device by pushing it sideways until the screws click into place.

Filling the water tank

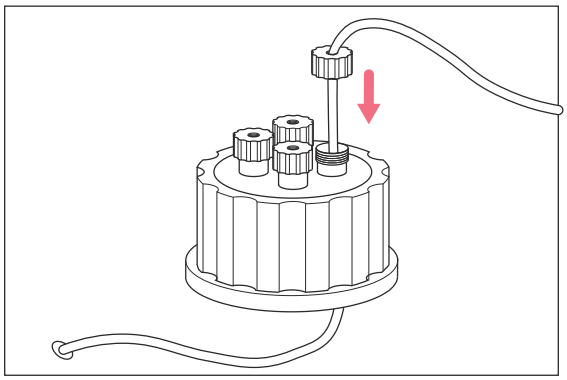
NOTICE! Damage to device

If no ultrapure water is used in the water tank, the device can become damaged due to internal corrosion.

– Only use ultrapure water with a conductivity of < 1.1 µS/cm in the water tank.

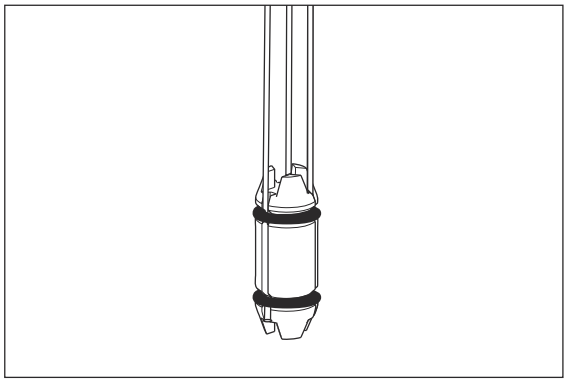
1. Remove the lid from the water tank.
2. Fill the water tank with suitable water.
3. Close the water tank with the tube distributor.
4. Place the water tank in the water tank holder, if available.

Preparing the tube distributor

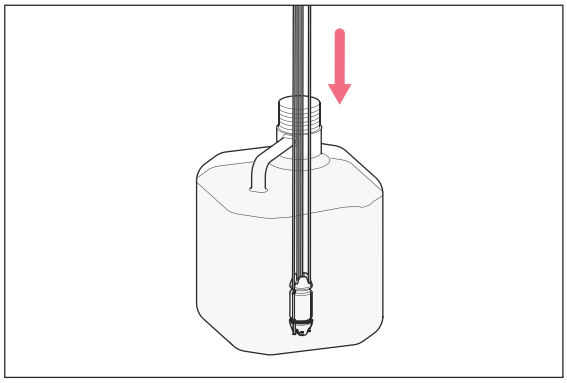


1. Unscrew the tube distributor from the water tank.
2. Depending on the number of water tubes, unscrew one or several caps from the tube distributor.
3. Insert a small diameter sealing ring into each of the unscrewed caps.
4. Pull one water tube each through the caps with the sealing ring.

Using the tube weight

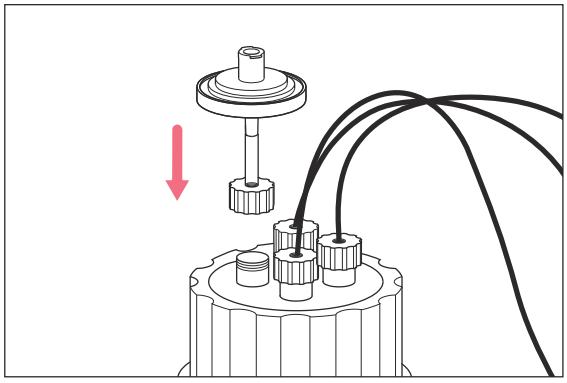


1. Place the water tubes into the grooves of the tube weight.
2. Pull both o-rings over the tube weight to secure the water tubes.



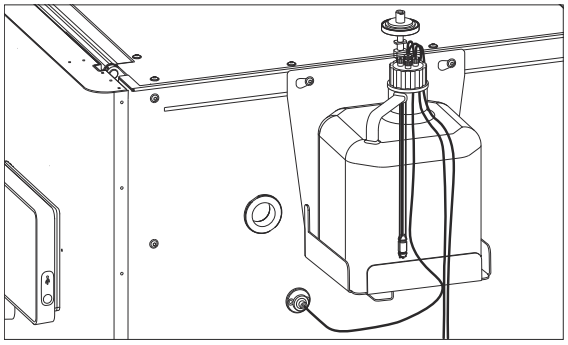
3. Hang the water tubes with the tube weight in the water tank.
4. Ensure that the water tubes reach the bottom of the water tank.
5. Screw the tube distributor onto the water tank.

Inserting the air filter



1. Remove a cap from the tube distributor.
2. Screw the air filter onto the tube distributor.

Mounting the water filter



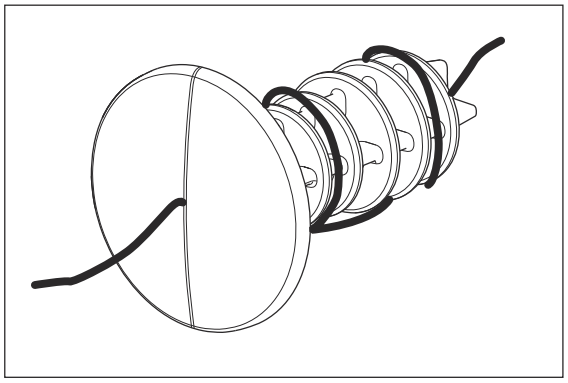
1. Screw the water filter into the water connection of the device.
2. Screw a water tube into the water filter of each device.
3. Make sure that all water tubes are properly and tightly connected to the devices.

6.15 Using the access port

It is possible to insert a component (e.g., a sensor) into the chamber via the access port.

Prerequisites:

- The access port is sealed with a plug from the inside.
- The assembly (e.g., a sensor) is not bigger than the inner diameter of the access port of 30 mm.



1. Remove the blind plug.
2. Pull the cable of the assembly through the open access port.
3. To ensure optimum gas tightness, make a cut into the blind plug cover.
4. Wrap the cable of the assembly around the blind plug.
5. Re-insert the blind plug. Make sure that the blind plug is firmly seated and flush with the side panel. Make sure that the access port is clean and dry before the blind plug is re-inserted.
6. Guide the end of the cable upwards onto the device.

6.16 Connecting the device to the building management system

The owner is responsible for connecting the plug to the building management system.

The device has an interface to a building management system. A plug for the interface to the building management system is included in the delivery.

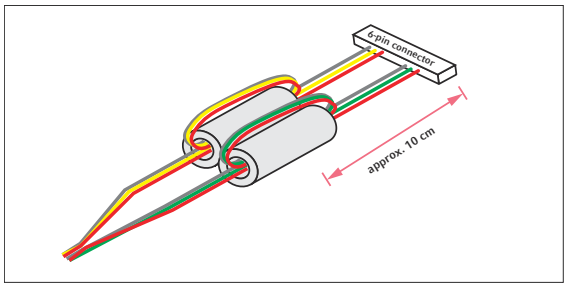
An alarm is forwarded to the building management system in the following cases:

- The interior temperature is too high
- The interior temperature is too low
- In the event of a mains/power outage
- CO_2 too high or too low
- Error and warning messages

Channel	Factory-set alarms
Channel 1 (relay 1)	Temperature alarm
Channel 2 (relay 2)	CO_2 alarm

Prerequisites:

- Unshielded single harness or multi-core harness
  - Cross section 0.08 mm^2 – 1.5 mm^2
  - Maximum length 30 m



1. Connect the cable harness to the device and the building management system.
2. Attach the ferrite core at a distance of 10 cm from the plug.
3. Ensure that the cable is looped around the ferrite core.

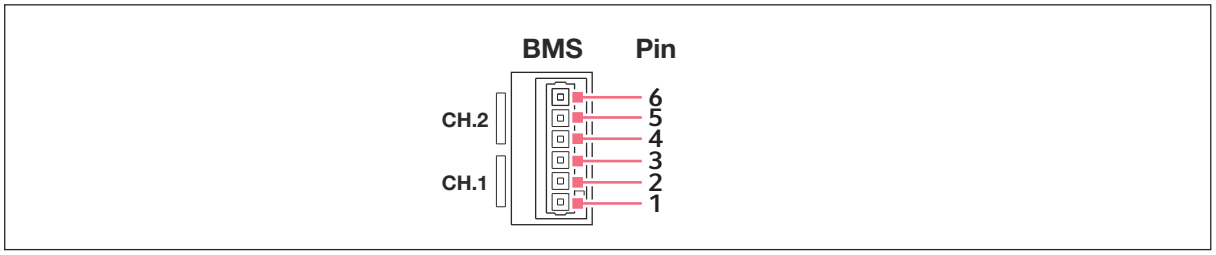


Fig. 6-1: Connection to building management system

1	Channel 1 common contact	4	Channel 2 common contact
2	Channel 1 normally closed	5	Channel 2 normally closed
3	Channel 1 normally open	6	Channel 2 normally open

The relay may not be operated with more than 2 A and 30 V.

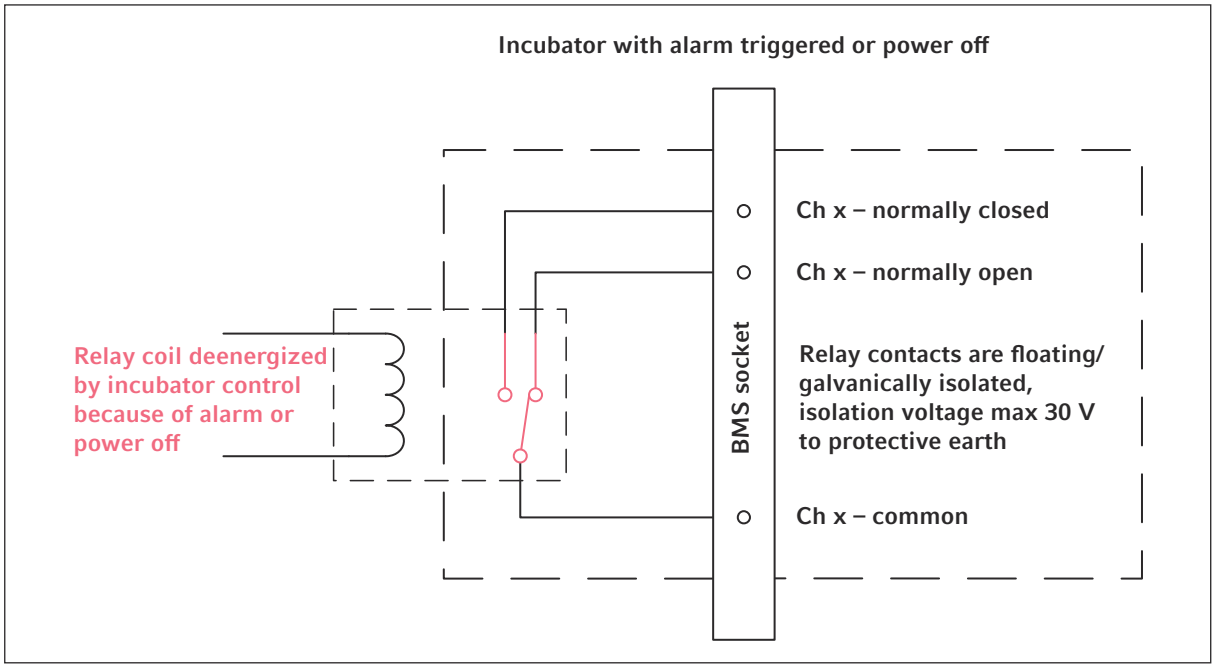


Fig. 6-2: Device operation with alarm

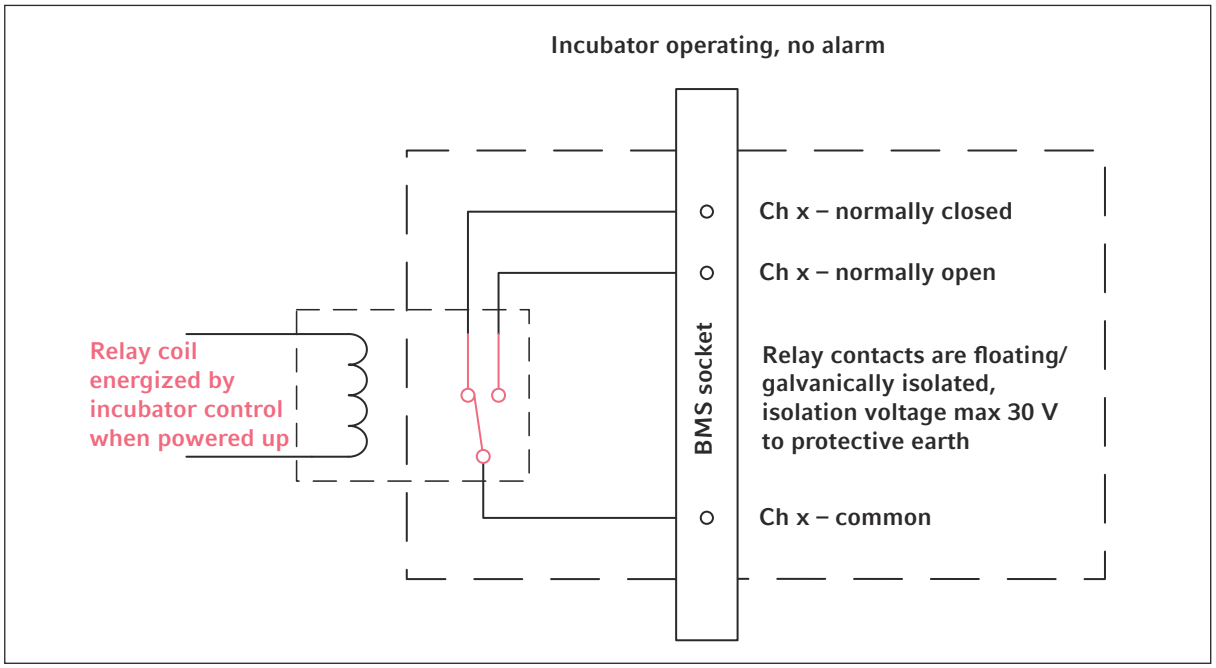


Fig. 6-3: Device operation without alarm

7 User management

7.1 User administration concept

User management is used to organize the access to the device.

3 user roles have been defined:

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

If user management has not been set up, all users have the same rights as an administrator. The first user account that is created will automatically be the administrator account.

7.2 Roles and rights

Tasks	***Administrator***	***User***	***Restricted User***
Changing parameters	×	×	–
Changing alarm limits	×	–	–
Changing settings	×	–	–
Changing relay settings	×	–	–
Changing the alarm volume	×	×	–
Changing the configuration of the home screen	×	×	–
Changing your own PIN/password	×	×	×
Changing the user name	×	–	–
Changing user rights	×	–	–
Acknowledging alarms	×	×	–
Acknowledging errors	×	–	–
Acknowledging warnings	×	×	×
Staring high-temperature decontamination	×	×	–
Starting a performance check	×	–	–
Starting a relay function	×	–	–
Exporting the event log	×	×	×
Exporting charts	×	×	×
Login/logout	×	×	×
Viewing administrator settings	×	×	×
Viewing user settings	×	×	×

Tasks	*Administrator*	*User*	*Restricted User*
Viewing device information	×	×	×
Configuring network settings	×	–	–
Creating a user account	×	–	–
Resetting the user password	×	–	–
Deleting a user account	×	–	–

7.3 Setting up user management

To set up user management, you need to create an administrator account.

Creating an administrator account

If the administrator's credentials are lost, it is no longer possible to make any changes to the user administration and system settings.In this case, an authorized service engineer must reset the factory default settings on the device.All user accounts as well as all data and settings stored on the device will be deleted.

- Keep the user ID and the administrator password in a safe location.
- Create a second user account with administrator rights.

1. Tap on *Menu* > *Settings* > *User Management*.
2. Activate *User Management*.
3. Select whether users log in with a password or a PIN.
4. Tap on *Continue*.
5. Enter the user name for the administrator.
6. Tap on *Continue*.
7. Enter the password or the PIN. Repeat the entry.
8. Tap on *Confirm*.

   The user account for the administrator has been created.

   User management is now active and can be edited.

   Login data is displayed.
9. Note down the login data for the administrator account.

7.4 Editing the user management

Prerequisites:

- You have administrator rights.

1. Tap on *Menu* > *Settings* > *User Management*.
2. Define the user management settings:
   - *User Management*: Enable or disable the user management.
   - *Automatic Logout*: Time after which an inactive user will be logged out automatically.
   - *Login Mode*: Login via password or PIN.
   - *Grant all users extra privileges*: If this function is enabled, no login is required and all users of the device have the rights of the selected user role.Even users who are not registered in the user administration can operate the device with the rights that were set.

7.5 Disabling the user management

Disabling the user management will delete all user accounts.

Prerequisites:

- You have administrator rights.

1. Tap on *Menu* > *Settings* > *User Management*.
2. Disable the user management.
3. Tap on *Continue*.
4. Enter the password or the PIN.
5. Tap on *Confirm*.

   The user management is disabled.

7.6 Creating a user account

You can create 999 user accounts.

Prerequisites:

- You have administrator rights.

1. Tap on *Menu* > *Users*.

   The overview of user accounts appears.
2. Tap on *Add User*.

   The *New User Credentials* window appears.
3. Enter the name of the new user in the *Enter user name* field and confirm the entry.
4. Assign either the password or the four-digit PIN for the new user. Repeat the entry to confirm.
5. Tap on *Continue*.

6. Select the desired user group from the *Select role* drop-down menu.

   User name, user ID and role are displayed.

   The new user is assigned to the selected user group.

7. Write down or export the user data you just created.

7.7 Editing a user account

Editing your own user account

Prerequisites:

- A user is logged in.

1. Tap on *Menu* > *Users*.
2. Select your user account.
3. Edit the required user data.

Editing user accounts as administrator

Prerequisites:

- You have administrator rights.

1. Tap on *Menu* > *Users*.
2. Select a user account.
3. Tap on the corresponding field to change the data.

   You can change the entries in the following fields:

   - *Full Name*
   - *E-mail*
   - *User ID*
   - *Role*

7.8 Deleting a user account

It is not possible to delete the last remaining user account of the user group Administrator.

Prerequisites:

- You have administrator rights.

1. Tap on *Menu* > *Users*.
2. Highlight the user account you wish to delete.
3. Tap on the recycling bin symbol and confirm your selection.

7.9 Logging in as a User

If you are logging in for the first time or have received a new password, change the old password.

Prerequisites:

- User management has been enabled.
- The user accounts have been created.

1. Tap on *Login*.
2. Enter your login details.

7.10 Editing password or PIN

Changing the password or PIN

Prerequisites:

- A user is logged in.

1. Tap on *Menu* > *Users*.
2. Select your user account.
3. Tap on *Change Password/PIN*.
4. Enter the current password in the *Enter current password/PIN* field.
5. Enter the new password in the *Enter new password/PIN* field.
6. Repeat the entry in the *Repeat new password/PIN* field.
7. Confirm the entry.

Resetting the password or PIN

If a user has forgotten his or her password, the administrator can generate a new password.

Prerequisites:

- You have administrator rights.

1. Tap on *Menu* > *Users*.
2. Select a user account.
3. Tap on *Reset password/PIN*.
4. Tap on *Reset*.

   The new password or PIN is generated and displayed automatically.

7.11 Logging off as a user

Prerequisites:

- You are logged in as a user.

1. Tap on *Logout*.

8 Operation

8.1 Opening and closing the door

Opening the door

CAUTION! Personal injury

If the spring force of the door springs decreases, the door may fall down and cause injury.

– Have the door springs replaced by an authorized service technician according to the specified service interval.

CAUTION! Crushing injuries to hands

There is a risk of crushing your hands and fingers when opening and closing the door.

– Always open and close the door fully using the door handle.
– Do not reach between the housing and the door.
– Do not reach into the door locking mechanism.

Prerequisites:

- The application has been stopped.

1. Pull the door handle.
2. Push the door up until it engages in the open position.

   The "Door open" symbol is displayed.

   The device stops operating.

Closing the door

CAUTION! Crushing injuries to hands

There is a risk of crushing your hands and fingers when opening and closing the door.

– Always open and close the door fully using the door handle.
– Do not reach between the housing and the door.
– Do not reach into the door locking mechanism.

If the application was not stopped before the door was opened, the device drive will start again after the door is closed.

1. Push the door down until it engages.

   The "Door closed" symbol is displayed.

   The device will continue operating with the previously entered values if the application was not stopped before.

8.2 Loading the device

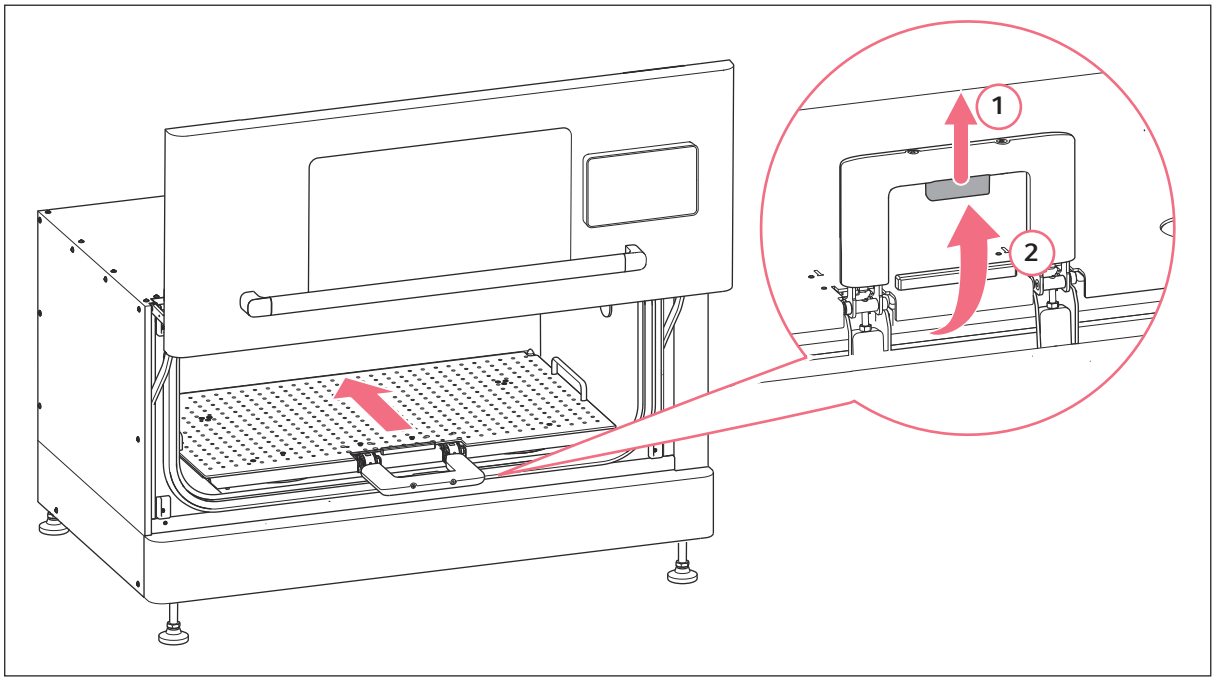


Fig. 8-1: Locking the sample platform

CAUTION! Personal injury

Improperly secured sample tubes on the sample platform can cause injuries or material damage.

- Before operating the device, make sure that the sample tubes (particularly those made from glass) are properly secured and do not protrude beyond the edge of the sample platform.
- Make sure that the sample platform is locked before closing the door. The handle must be folded up.

Prerequisites:

- The sample platform is installed on the sub-platform.

1. To unlock the sample platform, keep the button at the handle pressed and fold the handle down.
2. Pull out the sample platform.
3. Only load the sample platform on the extension tray. Secure the tubes using the flask clamps or sticky pads.
4. Slide the sample platform back into the device as far as it will go.
5. To lock the sample platform, keep the button at the handle pressed and fold the handle up.

8.3 Starting and stopping the application

After a mains/power outage, all software settings are retained and the device drive starts up again.

Starting the application

Prerequisites:

- The device is loaded and the door is closed.

1. Make sure that all parameters for the application are set correctly.

   Make changes if necessary.

2. Tap on *Start* in the toolbar.

   The device starts the application with the set parameters:
   - Temperature
   - Speed
   - CO_2 concentration
   - Relative humidity

Stopping the application

Prerequisites:

- The door is closed.

1. Tap on *Stop* in the toolbar.

   The device stops the application with the set parameters:
   - Temperature
   - Speed
   - CO_2 concentration
   - Relative humidity

8.4 Administration of programs

8.4.1 Creating a program

Creating a program

1. Tap on *Menu* > *Programs*.
2. Tap on the + symbol.

   The Program Editor opens.

Duplicating the program

1. Tap on *Menu* > *Programs*.
2. Tap on the program you want to duplicate.

3. Tap on the ... symbol.

   A query window opens.

4. Tap on *Duplicate*.

   The duplicated program is displayed in the Program Editor.

8.4.2 Editing programs

Selecting a program

1. Tap on the program you want to edit.
2. Tap on the pen symbol.

Editing program settings

1. To edit global settings, tap on an element.
   - Name of the program (editable)
   - Duration
   - Status (editable)
   - Number of steps
   - Loop options (editable)

Inserting program steps

1. To add a new program step at the end of the sequence, tap on the + symbol.
2. To insert a program step between two existing steps, tap on a program step.

   The editing options are displayed.

3. Tap on one of the buttons:
   - Insert on the left
   - Insert on the right
   - Move step to the left
   - Move step to the right

Editing program steps

1. Tap on a program step.

   The editing options are displayed.

2. Tap on the pen symbol.
3. To adjust the values, tap on a parameter.

Deleting program steps

1. Tap on a program step.

   The editing options are displayed on the right-hand side.
2. Tap on the recycling bin symbol.

8.4.3 Deleting a program

1. Tap on *Menu* > *Programs*.
2. Tap on the program you want to delete.
3. Tap on the ... symbol.

   A query window opens.
4. Tap on *Delete* and confirm.

You can select and delete several programs together.

8.5 Starting a program

Prerequisites:

- The device is loaded and the door is closed.

1. Tap on *Menu* > *Programs*.

   The device displays the available programs.
2. To select a program, tap on a program.
3. Tap on *Start Program*.
4. Edit or adopt the details in the *Run identification* edit box.
5. Tap on *Confirm*.

   The program starts.

8.6 Locking and unlocking the touch screen

You can lock the touch screen to prevent any unwanted changes during operation.

Locking the touch screen manually

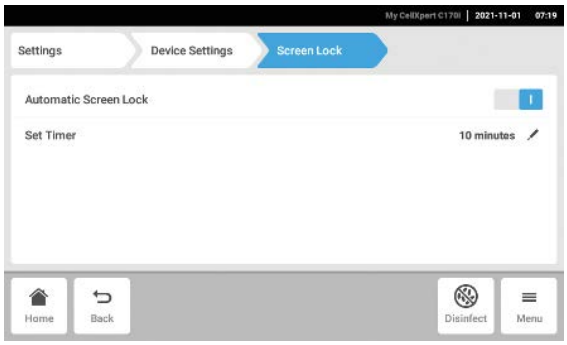
1. Tap on *Menu* > *Screen Lock*.

   There is a black border around the touch screen.

Unlocking the touch screen manually

1. Tap on the *Unlock Screen* button and keep it pressed until the touch screen is unlocked.

Automatically locking and unlocking the touch screen



1. Tap on *Menu* > *Settings* > *Device Settings* > *Screen Lock*.
2. Tap on the slider to activate or deactivate *Automatic Screen Lock*.
3. When you have activated *Automatic Screen Lock*, set the time after which the *screen lock* will be activated.
4. Tap on *Set Timer* and select the desired time.

8.7 Accessing *Events*

The event log stores a maximum of 100 000 user-specific and device-specific events. If there are more than 100 000 entries, the oldest entries are overwritten.

Accessing the details of an entry

1. Tap on *Menu* > *Events*.
2. Tap on an entry.

   The details of the entry are displayed.

Filtering *Events*

1. Tap on *Menu* > *Events*.
2. Tap on the filter symbol.
3. Select the required filter.

To deactivate all filters, tap on *Reset Filters*.

8.8 Editing *charts*

In the charts, you can assign different functions to the two y-axes as required. The x-axis only displays the time.

Selecting *Y-Achsen* functions

1. Tap on *Menu* > *Charts*.
2. Tap on the symbol next to the y-axes.

   A selection window appears on the touch screen.
3. To assign a function to the left y-axis, tap on the top row in the selection window.

   A selection window appears on the touch screen.
4. Select the desired y-axis function.
5. To select the function for the right y-axis, tap on the bottom row.

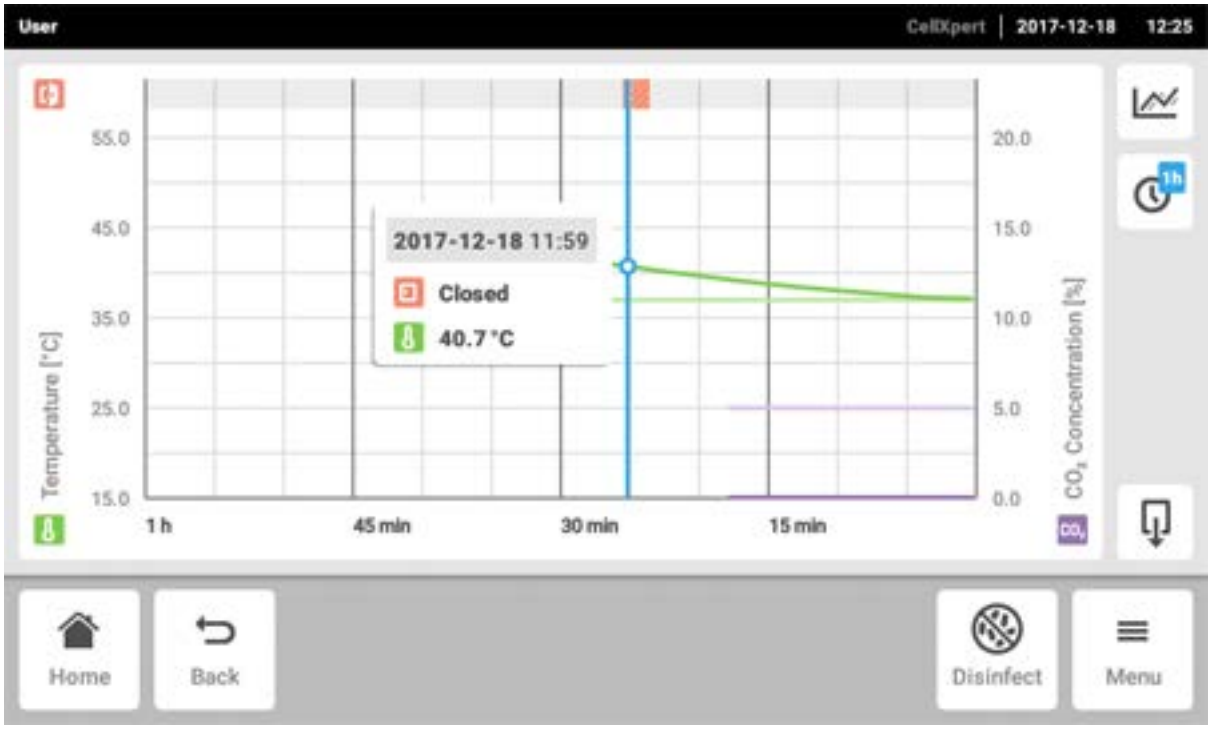
   A selection window appears on the touch screen.
6. Select the desired y-axis function.
7. Confirm the entry.

Selecting the time span for the y-axis function

The program measures the data of a function every 10 s. If you select a larger time span, the resolution of the displayed data changes.

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

Displaying measured values from the charts



1. Tap on *Menu* > *Charts*.
2. Tap on a point in the chart to display numeric values.

   The measured values of the functions are displayed in a separate window.

8.9 Opening logs

The device saves 1000 program runs. If there are more than 1000 program runs, the oldest data will be overwritten.

Entering the company name for *Operation Records*

You can enter the name of your company to appear on all the logs that are to be exported.

1. Tap on *Menu* > *Settings* > *Device Settings* > *Operation Records Settings*.
2. Enter a company name.

Creating *Operation Records*

1. Tap on *Menu* > *Operation Records*.
2. Enter the name of the experiment.
3. Enter the start date.

4. Enter the end date.
5. Confirm the entry by tapping on *Confirm*.

Accessing *Operation Records*

1. Tap on *Menu* > *Operation Records*.
2. Tap on an entry.

   The following entry details are displayed which can also be exported:
   - *Result*: result of *Successfully Created*, *Record contains warnings*, *Record contains alarm* or *Record contains error*
   - *Initial Parameters*: set temperature, CO_2 concentration including alarm limit and alarm limit of relative humidity
   - *Time Span*: start and end times
   - *Event*: event information
   - *System*: system information

Filtering *Operation Records*

1. Tap on *Menu* > *Operation Records*.
2. Tap on the filter symbol.
3. Select the required filter.

To deactivate all filters, tap on *Reset Filters*.

8.10 Exporting data

You can export *Charts*, *Events*, *Operation Records* and system information as an Excel file onto a USB stick.

1. Connect a USB storage medium.
2. Tap on *Menu* > *Export*.
3. Select which data is to be exported.
4. Tap on *Export*.
5. Confirm the export.

9 Maintenance

9.1 Service

Eppendorf SE recommends having your device inspected and maintained at regular intervals by trained and skilled personnel.

Eppendorf SE offers customized service solutions for preventive maintenance, qualification and calibration of your device. For information, offers and contact options, visit our website www.eppendorf.com/epservices.

9.1.1 Maintenance plan

Interval	Maintenance work
As required	↳ *Chapter 9.1.8 "Carrying out a performance check" on page 63*
	↳ *Chapter 9.2.1 "Cleaning the device on the outside" on page 66*
	↳ *Chapter 9.2.2 "Cleaning the inside of the device" on page 67*
	↳ *Chapter 9.2.3 "Cleaning the touch screen" on page 68*
	↳ *Chapter 9.3.3 "Performing a wipe disinfection" on page 70*
	↳ *Chapter 9.3.4 "Performing high-temperature disinfection" on page 72*
Daily	↳ *Chapter 9.1.3 "Checking the device for damage" on page 61*
	↳ *Chapter 9.1.4 "Checking the gas supply" on page 61*
Weekly	↳ *Chapter 9.2.4 "Change water in the water tank" on page 68*
Monthly	↳ *Chapter 9.3.1 "Disinfecting the water tube with tube weight" on page 68*
	↳ *Chapter 9.3.2 "Disinfecting the water tank" on page 69*
Yearly	↳ *Chapter 9.1.5 "Replacing the device filter" on page 62*
	↳ *Chapter 9.1.6 "Replacing the water supply filter" on page 62*

9.1.2 Managing recurring tasks

Adding a recurring task

1. Tap on *Menu* > *Settings* > *Maintenance & Qualification* > *Recurring Task*.
2. Tap on *Add*.
3. Enter the name of the task.
4. Tap on *Next*.
5. Activate or deactivate the notification.
6. Tap on *Continue*.

7. Determine the following time frames:
   - Task interval
   - Notification

   Determine the time after which the device triggers the notification.
8. Tap on *Finish*.

   The task has been saved.

Confirming the execution of recurring tasks

1. Tap on *Menu* > *Settings* > *Maintenance & Qualification* > *Recurring Task*.
2. Select the completed task.
3. Tap on *Perform Task*.
4. Confirm the execution of the task.

Deleting a recurring task

1. Tap on *Menu* > *Settings* > *Maintenance & Qualification* > *Recurring Task*.
2. Select the task you want to delete.
3. Tap on the *recycling bin* symbol and confirm your selection.

9.1.3 Checking the device for damage

1. Check that the device, the touch screen and the mains/power cord are undamaged.

   If the device, the touch screen or the mains/power cord is damaged, inform your authorized service technician.

   Take the damaged device out of operation.

9.1.4 Checking the gas supply

Checking the primary gas supply

When full, the gas pressure is 50 bar (725 PSI). If the gas pressure drops significantly, the CO_2 cylinder is almost empty and must be replaced.

1. Check the reserve pressure in the CO_2 cylinder.
2. Make sure that the connections to the CO_2 cylinder are not leaking.

Checking the secondary gas supply

1. Check the secondary pressure via the building supply.

   The secondary pressure is set to approx. 1 bar (14.5 PSI).

9.1.5 Replacing the device filter

Replacing the device air filter with tubing connector

1. Remove the used air filter with tubing connector.
2. Insert a new air filter with tubing connector.

Replacing the CO_2 tubing with gas filter on the device

WARNING! Personal injury

If the device is not connected correctly to the gas supply, increased levels of CO_2 can occur in the breathing air. This poses a risk of poisoning and suffocation.

– Make sure that gas tubing is only installed and connected by trained personnel.
– Avoid excessive CO_2 concentrations in the breathing air when working in the lab.

Prerequisites:

- The device has been disconnected from the gas supply.

1. Remove the used CO_2 tubing with gas filter.
2. Insert a new CO_2 tubing with gas filter.

9.1.6 Replacing the water supply filter

Replacing the air filter of the tube distributor

1. Remove the used air filter from the tube distributor.
2. Replace the used air filter with a new air filter.
3. Screw the new air filter onto the tube distributor.

Replacing the water filter on the device

Prerequisites:

- The tube distributor has been unscrewed from the water tank.
- The water tube with tube weight has been removed from the water tank.
- The water tube has been unscrewed from the water filter of the device.

1. Unscrew the used water filter from the water connection of the device.
2. Replace the used water filter with a new water filter.
3. Screw the new water filter into the water connection of the device.
4. Screw the water tube into the water filter of the device.
5. Hang the water tubes with tube weight in the water tank.

6. Ensure that the water tubes reach the bottom of the water tank.
7. Screw the tube distributor onto the water tank.

9.1.7 Setting the contamination status

If the device is contaminated, other users can be informed by means of a message on the touch screen.

The message *Contaminated* appears in the notification bar.

Setting the status to *Contaminated*

1. Tap on *Menu* > *Maintenance & Qualification*.
2. Tap on *This device is not contaminated*.

   The *Change Qualification* window appears.
3. Select *Contaminated*.
4. Confirm the selection.
5. Carry out a high-temperature disinfection.

Setting the status to *Not Contaminated*

1. Tap on *Menu* > *Maintenance & Qualification*.
2. Tap on *This device is contaminated*.

   The *Change Qualification* window appears.
3. Select *Not Contaminated*.
4. Confirm the selection.

   The message *Not Contaminated* appears in the notification bar for 24 h.

9.1.8 Carrying out a performance check

The performance check cannot replace the verification by the Eppendorf service.

The performance check is used to check the accuracy of the temperature, gas concentration and relative humidity with an external measuring device. Each performance check is to be considered and carried out separately. Programmable time intervals remind you to carry out the performance check.

Any values that were set by the user and are not to be checked will not be changed during the performance check. Any values that are not to be checked will be set to 0 for the performance check. The values that are to be checked will be set to the factory settings for the duration of the performance check.

Default settings:

- Temperature: 37 °C
- CO_2 concentration: 5 %

- Relative humidity: 85 %
- Rotational speed: 150 rpm

If your samples tolerate the presetting of a value that is to be checked, they can remain in the device. If not, remove the samples from the device.

Prerequisites:
- External measuring devices are available.
- The device is ready for use.
- The home screen appears on the touch screen.
- If user management is used, the administrator must be logged in.

1. Tap on *Menu* > *Maintenance & Qualification* > *Recurring Tasks*.
2. Select *Performance check temperature* or *Performance check CO_2* or *Performance check relative humidity*.
3. Confirm the selection with *Continue*.

   Use a calibrated measuring device. Observe the specifications of the measuring device, particularly the operating conditions and the measuring accuracy.

4. Enter the name of the measuring device and the last calibration date.

Performance check temperature

Prerequisites:
- The cable is guided through the access port into the chamber to ensure that the door is tight.

1. Open the door.
2. Position the measuring probe approx. 1.5 cm above the center of the sample platform.
3. Securely attach the measuring probe to ensure that it does not move at a speed of 150 rpm.
4. Close the door.

Performance check relative humidity

Prerequisites:
- The cable is guided through the access port into the chamber to ensure that the door is tight.

1. Open the door.
2. Position the measuring probe approx. 1.5 cm above the center of the sample platform.
3. Securely attach the measuring probe to ensure that it does not move at a speed of 150 rpm.
4. Close the door.

Performance check CO_2

1. Open the door.
2. Guide the cable through the access port.

3. Position the measuring probe approx. 1.5 cm above the center of the sample platform.
4. Securely attach the measuring probe to ensure that it does not move at a speed of 150 rpm.
5. Close the door.
6. Tap on *Start Verification*.
7. Enter the determined temperature or gas concentration values on the touch screen.
8. Confirm the entered value.
9. Tap on *Continue*.
10. Tap on *Export* to save the result on a USB storage medium.
11. Confirm the selection with *Confirm*.
12. Remove the measuring probe.

    The device automatically reverts to the previously set temperature and gas concentration.

9.1.9 Installing a software update

Downloading the software from the website

Material:
- A computer with Internet access
- USB storage medium

1. Use *Menu* > *Settings* > *About this CellXpert CS220* to check which software version is installed on the device.
2. Check whether a higher software version is available on the webpage www.eppendorf-support.com.
3. Download the current software version from the webpage. Save the ZIP file to the computer.
4. Extract the ZIP file to the top level of the USB storage medium (FAT32 formatted).

   The folder *vti2* is located in the top level. The data in this folder must not be extracted or altered.

Performing a software update

Do not cancel the software update. If you cancel the software update, data will be lost and the device must be reset to factory settings. Contact your local Eppendorf partner.

1. Tap on *Menu* > *Settings* > *Install Software Update from USB Drive*.
2. Connect the USB storage medium to the USB port of the device.

   An installation dialog appears on the display.
3. Confirm the installation.

   The device prepares the installation and then restarts.
4. Wait until the update file has been copied to the device.
5. Remove the USB storage medium to start the installation procedure.

9.2 Cleaning

For any questions regarding cleaning and decontamination, or the cleaning agents used, please contact your local Eppendorf partner.

9.2.1 Cleaning the device on the outside

DANGER! Electric shock

If liquids get inside the device, users may suffer an electric shock. A fatal electric shock causes cardiac arrhythmia and respiratory paralysis.

- Switch off the device and disconnect it from the mains/power line before starting cleaning or disinfection.
- Do not allow any liquids to enter the inside of the housing.
- Do not spray the device.
- Do not connect the device to the mains/power line unless both the inside and outside of the device are completely dry.

DANGER! Electric shock

If the door cable is damaged when cleaning the device, you are at risk of receiving an electric shock. Electric shocks cause heart injury and respiratory paralysis.

- Take care not to pull or bend the door cable when cleaning the device.

NOTICE! Damage to the device and accessories

The use of unsuitable cleaning agents or sharp objects may damage the device and its accessories.

- Do not use any aggressive cleaning agents, strong solvents or abrasive polishes.
- Check the compatibility with the materials used.
- Do not clean the device with acetone or organic solvents with a similar effect.
- Do not use any sharp or pointed objects to clean the device.

Material:

- Water
- pH-neutral soap
- Cloth

Prerequisites:

- The device is disconnected from the mains/power line.

1. Moisten a lint-free cloth with water and soap.
2. Use the cloth to clean the outer surfaces.
3. Clean the outer surfaces again with a rinsed lint-free cloth.

9.2.2 Cleaning the inside of the device

DANGER! Electric shock

If liquids get inside the device, users may suffer an electric shock. A fatal electric shock causes cardiac arrhythmia and respiratory paralysis.

- Switch off the device and disconnect it from the mains/power line before starting cleaning or disinfection.
- Do not allow any liquids to enter the inside of the housing.
- Do not spray the device.
- Do not connect the device to the mains/power line unless both the inside and outside of the device are completely dry.

DANGER! Electric shock

If the door cable is damaged when cleaning the device, you are at risk of receiving an electric shock. Electric shocks cause heart injury and respiratory paralysis.

- Take care not to pull or bend the door cable when cleaning the device.

CAUTION! Damage to eyes

Looking into the interior light lamp may cause damage to your eyes.

- Do not look directly into the interior light lamp. The interior lighting is classified in risk group 1 according to IEC 62471.

NOTICE! Damage to the device and accessories

The use of unsuitable cleaning agents or sharp objects may damage the device and its accessories.

- Do not use any aggressive cleaning agents, strong solvents or abrasive polishes.
- Check the compatibility with the materials used.
- Do not clean the device with acetone or organic solvents with a similar effect.
- Do not use any sharp or pointed objects to clean the device.

Material:

- Cloth

Prerequisites:

- The device is disconnected from the mains/power line.

1. If liquid has been spilled, clean it up with a cloth.
2. Wipe down splashed surfaces inside the device with a cloth. Be careful not to touch the sensors and light unit of the device.
3. Wipe down the device with disinfectant.

9.2.3 Cleaning the touch screen

Material:

- Soap-based cleaning agent
- Disinfectant with at least 70 % ethanol
- Cloth

1. Tap on *Menu* > *Screen Lock*.

   The touch screen is locked.

2. Dampen the cloth with cleaning agent or disinfectant.
3. Clean the touch screen.
4. To enable the touch screen, tap on *Unlock Screen*.

   The touch screen is unlocked.

9.2.4 Change water in the water tank

Prerequisites:

- The tube distributor has been unscrewed from the water tank.
- The water tube with tube weight has been removed from the water tank.

1. Change the water in the water tank.
2. Hang the water tubes with tube weight in the water tank.
3. Ensure that the water tubes reach the bottom of the water tank.
4. Screw the tube distributor onto the water tank.

9.3 Decontamination

9.3.1 Disinfecting the water tube with tube weight

NOTICE! Damage to the device and accessories

The use of unsuitable cleaning agents or sharp objects may damage the device and its accessories.

- Do not use any aggressive cleaning agents, strong solvents or abrasive polishes.
- Check the compatibility with the materials used.
- Do not clean the device with acetone or organic solvents with a similar effect.
- Do not use any sharp or pointed objects to clean the device.

The water is heated to a high temperature before it enters the workspace. Therefore, contamination cannot occur inside.

Material:
- Ethanol 70 %
- Deionized water

Prerequisites:
- The tube distributor has been unscrewed from the water tank.
- The water tube with tube weight has been removed from the water tank.
- The water tube has been unscrewed from the water filter of the device.

1. Rinse the outside of the water tube below the tube distributor and the tube weight with disinfectant.
2. Allow the disinfectant to take effect.
3. Rinse the outside of the water tube and the tube weight thoroughly with deionized water.
4. Allow the water tube and the tube weight to dry.

9.3.2 Disinfecting the water tank

NOTICE! Damage to the device and accessories

The use of unsuitable cleaning agents or sharp objects may damage the device and its accessories.
- Do not use any aggressive cleaning agents, strong solvents or abrasive polishes.
- Check the compatibility with the materials used.
- Do not clean the device with acetone or organic solvents with a similar effect.
- Do not use any sharp or pointed objects to clean the device.

Material:
- Ethanol 70 %
- Deionized water

Prerequisites:
- The tube distributor has been unscrewed from the water tank.
- The water tube with tube weight has been removed from the water tank.
- The water tank is empty.

1. Rinse the inside of the water tank with disinfectant.
2. Allow the disinfectant to take effect.
3. Rinse the water tank thoroughly with deionized water.
4. Allow the water tank to dry.

9.3.3 Performing a wipe disinfection

DANGER! Electric shock

If liquids get inside the device, users may suffer an electric shock. A fatal electric shock causes cardiac arrhythmia and respiratory paralysis.

- Switch off the device and disconnect it from the mains/power line before starting cleaning or disinfection.
- Do not allow any liquids to enter the inside of the housing.
- Do not spray the device.
- Do not connect the device to the mains/power line unless both the inside and outside of the device are completely dry.

DANGER! Electric shock

If the door cable is damaged when cleaning the device, you are at risk of receiving an electric shock. Electric shocks cause heart injury and respiratory paralysis.

- Take care not to pull or bend the door cable when cleaning the device.

CAUTION! Personal injury

The sample platform is heavy. Incorrect transport and locking of the sample platform can cause injury.

- Lift and move the sample platform only at the provided handles.
- Transport the sample platform only when it is not loaded.
- Make sure that the sample platform is locked before closing the door. The handle must be folded up.

CAUTION! Personal injury

The sub-platform is heavy. Improper lifting and moving of the sub-platform can cause injury.

- The sub-platform should only be removed and transported by two persons.

NOTICE! Damage to the device and accessories

The use of unsuitable cleaning agents or sharp objects may damage the device and its accessories.

- Do not use any aggressive cleaning agents, strong solvents or abrasive polishes.
- Check the compatibility with the materials used.
- Do not clean the device with acetone or organic solvents with a similar effect.
- Do not use any sharp or pointed objects to clean the device.

NOTICE! Damage to components

If disinfectant gets inside the device, it can cause electronic components to corrode. This will impair the function of the device.

- Only spray disinfectant onto a cloth.

Tool:

- 6.0 mm Allen key

Material:

- Ethanol 70 %
- Deionized water
- Cloth

Prerequisites:

- The device is not loaded.

1. Tap on *Disinfect*.
2. Tap on *Wipe Disinfection* in the selection menu.

   The device starts the software-based procedure. Follow the instructions on the screen.
3. Tap on *Continue*.
4. Remove the sample platform.
   - Use the handle to pull the sample platform out of the chamber.
   - Remove the sample platform.
   - Remove the sticky pads and flask clamps.
   - Clean the sample platform and the accessories.
   - Tap on *Continue*.
5. Remove the sub-platform.
   - Slide the sub-platform back into the chamber.
   - To fix the sub-platform in place, press and hold the button on the handle and fold up the handle.
   - Undo the 4 screws using the tool provided.
   - Lift the sub-platform out of the chamber with the help of another person.
   - Clean the sub-platform.
   - Tap on *Continue*.
6. Clean the chamber.
   - Clean the surfaces and the sensors.
   - Reinsert the sub-platform.
   - Reinsert the sample platform without any accessories.
   - Tap on *Continue*.
7. Get the device ready to be used again.
   - Install the flask clamps and sticky pads on the sample platform.
   - Tap on *Continue*.

   The procedure has been completed.

   The device returns to normal operation.

9.3.4 Performing high-temperature disinfection

WARNING! Burns

There is a risk of burns from hot components during high-temperature disinfection.

– Do not touch the device while a high-temperature disinfection cycle is running.
– Do not open the doors while a high-temperature disinfection cycle is running.
– Allow the device to cool down completely if a system crash or mains/power outage occurs during high-temperature disinfection.

CAUTION! Personal injury

The sample platform is heavy. Incorrect transport and locking of the sample platform can cause injury.

– Lift and move the sample platform only at the provided handles.
– Transport the sample platform only when it is not loaded.
– Make sure that the sample platform is locked before closing the door. The handle must be folded up.

CAUTION! Personal injury

The sub-platform is heavy. Improper lifting and moving of the sub-platform can cause injury.

– The sub-platform should only be removed and transported by two persons.

You cannot cultivate your cells in the device during high-temperature disinfection. The temperature in the device stacked directly above may increase.

When you perform high-temperature disinfection for the first time, an odor may develop. Make sure the room is ventilated.

Tool:

- 6.0 mm Allen key

Prerequisites:

- The device is not loaded.

1. Tap on *Disinfect*.
2. In the selection menu, tap on *High Temperature Disinfection*.

   The device starts the software-supported procedure. Follow the instructions on the screen.
3. Tap on *Continue*.

4. Remove the sample platform.
   - Use the handle to pull the sample platform out of the chamber.
   - Remove the sample platform.
   - Remove the sticky pads and flask clamps.
   - Clean the sample platform and accessories.
   - Tap on *Continue*.
5. Remove the sub-platform.
   - Slide the sub-platform back into the chamber.
   - To fix the sub-platform in place, press and hold the button on the handle and fold the handle up.
   - Loosen the 4 screws using the tool provided.
   - Lift the sub-platform out of the chamber with the help of another person.
   - Clean the sub-platform.
   - Tap on *Continue*.
6. Clean the chamber.
   - Clean the surfaces and sensors.
   - Reinsert the sub-platform.
   - Reinsert the sample platform without accessories.
   - Tap on *Continue*.
7. Place the dust cap on the humidity sensor. Tap on *Continue*.
8. Close the door.

   The *Start Disinfection* button turns green.
9. Tap on *Start Disinfection*.

   The progress of the procedure is displayed.

   After the procedure is completed, the result is displayed. You can export the result as a PDF to a USB stick.
10. Make the device ready for use again.
    - Remove the dust cap from the humidity sensor.
    - Install flask clamps and sticky pads on the sample platform.
    - Tap on *Continue*.

    The procedure is complete.

    The device returns to normal operation.

10 Troubleshooting

10.1 Editing messages

When the dangerous situation has been corrected, all signals will stop. Only the message will remain in the information bar until it is acknowledged.

1. To deactivate the signal tone, tap on the speaker symbol in the notification bar.

   If the hazardous situation is still not remedied after 5 min, the signal tone will sound again.
2. To call up the message, tap on the notification bar.
3. Remove the hazardous situation.
4. To confirm the message tap on the, tap on the cross symbol.

   The message will be removed from the information bar. When all messages have been acknowledged, the information bar will disappear. The status bar becomes visible.

10.2 Entering contact details

Information on your Eppendorf partners can be entered in this area.

1. Tap on *Menu* > *Contacts & Support* > *Contacts*.
2. Tap on *Add Contact*.
3. Enter the name of the Eppendorf partner.
4. Confirm the entry.
5. Enter all desired information about the Eppendorf partner.

10.3 Accessing service information

In this area, you can access device information for communication with the authorized service.

1. Tap on *Menu* > *Contact & Support* > *Diagnostics* > *Service Information*.
2. Pass the information on to the authorized service.

10.4 General errors

Error description	Cause	Solution
The USB stick is not recognized.	The USB stick is invalid.	Use another USB stick.
The sample is contaminated.	The contamination occurs consistently.	Perform a high-temperature disinfection.

Error description	Cause	Solution
The sample is contaminated.	The contamination occurs occasionally.	Check your sample handling. Check for contamination during your application steps.
Fatal Error - Restart the device.	A software error has occurred.	Switch off the device. Switch the device back on after 10 s.
The sensor error *CO_2 6740FW.203* appears.	Sensor initialization has failed following activation of the device.	Start the device again.
The sensor error *RH 6740FW.403* appears.	Sensor initialization has failed following activation of the device.	Start the device again.
XY value over range: x.y CO_2 6740FW.204 or *XY value under range: x.y CO_2 6740FW.204*.	The measured value lies above the permitted range or the measured value lies below the permitted range.	Start the device again.

10.5 Error of the door

Error description	Cause	Solution
Door longer open than	The door is left open for longer than ... min.	Close the door. Tap on the notification in the display to switch off the alarm. Set the alarm limit for the door to a different time span.
6740FW.50 Long door opening. Close the door.	The door is left open for longer than ... min.	Close the door. Tap on the warning in the display to remove it.
When opening the door, an alarm signal sounds.	The drive of the device has not yet switched off completely.	In the display, tap on *Stop* and wait until the sample platform has come to a complete standstill before opening the door.
Service life of door gas lift springs has expired, please contact Service.	The door springs have reached 6500 cycles.	Have the door springs replaced by an authorized service technician.

10.6 Drive errors

Error description	Cause	Solution
The rotational speed cannot be reached.	There are too many vibrations in the stacked device due to the load.	Change the load on the sample platform. Try again with a higher or lower weight. Avoid leaving the sample platform empty.

Error description	Cause	Solution
The sub-platform generates rattling noises.	The screws in the coupling rods have not been tightened or have become loose.	Tighten the screws using the tool provided.

10.7 Error messages due to the temperature

Error description	Cause	Solution
Condensate has formed in the device.	There is a (constant) airflow due to an open window, an open door or a climate control unit.	Move the device to a more suitable location. Move the climate control unit. Stop the airflow.
	Humidity control was switched on too early. The device has not been heated through yet.	Do not activate humidity control after a re-start until the device is fully (> 5 h) heated through and this is not indicated on the display.
Temperature below alarm level (x.y °C).	The door has been left open for too long.	Check how long the door has been open. Increase the temperature alarm limit, e.g., by 1 °C.
	The door has been opened too often.	Check how often the door has been opened during the course of the day.
	The set temperature could not be reached within a certain time span as a large number of cold samples was added.	Use a preheated medium or a smaller number of cold samples.
	There is a (constant) airflow due to an open window, an open door or a climate control unit.	Move the device to a more suitable location. Move the climate control unit. Stop the airflow.
Temperature above alarm level (x.y °C).	The set temperature was reduced without opening the doors.	Open the door to let the device cool down. Increase the temperature alarm limit, e.g., by 1 °C.
	The set temperature could not be reached within a certain time span as a large number of hot samples was added.	Use a colder medium or a smaller number of hot samples.
	There is a (constant) airflow due to an open window, an open door or a climate control unit.	Move the device to a more suitable location. Move the climate control unit. Stop the airflow.
	Another device that gives off heat is too close to the device.	Move the device to a more suitable location. Move the device that gives off heat. Check the distance between the devices and increase it, if necessary.

Error description	Cause	Solution
Temperature above alarm level (x.y °C).	A device that gives off heat is in the interior of the device and generates too much heat.	Remove the device that gives off heat. Increase the upper alarm limit for the temperature.
6740FW.107 Temperature sensor (XY) is out of range. Check acclimatization and ambient conditions.	The device is in a cold room <10 °C.	Let the device acclimatize for a minimum of 12 h after receipt.
	The sensor is defective.	Contact your local Eppendorf partner.
6740FW.108 Setpoint not reached. Cooldown too slow. Check environment conditions.	The ambient temperature is too close to the set temperature (difference is less than 8 °C). The ambient temperature is above the set temperature.	Change the set value to a higher temperature (≥ 8 °C above ambient temperature). Lower the ambient temperature to ≥ 8 °C in relation to the set temperature, e.g., by ventilating the room.
6740FW.109 X.Y °C not reached.	A technical error has occurred.	Restart the device.
6740FW.110 X.Y °C not reached in time. Check environment conditions.	A technical error has occurred.	Restart the device.
6731FW.111 Over-temp detected by Temp limiter. Setpoint not reached. Cooldown too slow. Check environment conditions.	The device switches off at 10 K above the set value of a heat cycle in accordance with DIN EN 12880 (class 1 temperature limiter).	Change the set value to a higher temperature (≥ 8 °C above the ambient temperature). Lower the ambient temperature to ≥ 8 °C in relation to the set temperature, e.g., by ventilating the room. Restart the device and increase the set temperature to ≥ 8 °C above the ambient temperature.
6731W.112 Subnormal temperature detected by Temp limiter.	The device switches off at 5 K below the set value of a heat cycle in accordance with DIN EN 12880 (class 1 temperature limiter).	Restart the device. Increase the set temperature to ≥ 8 °C above the ambient temperature.

10.8 Error message due to the CO_2 concentration

Error description	Cause	Solution
CO_2 Concentration above alarm level (x.y %).	The set CO_2 value has decreased. The CO_2 cannot escape from the device.	Open the door to let the CO_2 escape from the device.
	The alarm limit is too close to the set value.	Set the alarm limit to the standard limit.

Error description	Cause	Solution
CO_2 Concentration below alarm level (x.y %).	The set CO_2 value has increased.	The CO_2 concentration cannot be restored in time. Check the gas pressure supply.
	The alarm limit is too close to the set value.	Set the alarm limit to the standard limit.
CO_2 pressure below warning level of 0.04 MPa.	The CO_2 cylinder is nearly empty.	Check the CO_2 supply. Replace the CO_2 cylinder and set the gas supply to 0.1 MPa (or to a range of 0.05 MPa – 0.15 MPa). Check whether the gas connection is disconnected or leaking, e.g., in-line gas filter and gas connection. Check the flow direction of the in-line gas filter: The gas supply must be connected to the INLET side of the in-line gas filter.
	The volume flow is too small.	Increase the volume flow, e.g., by opening the CO_2 gas shut-off valve.
CO_2 pressure below warning level of 0.02 MPa.	The CO_2 cylinder is empty.	Check the CO_2 supply. Replace the CO_2 cylinder and set the gas supply to 0.1 MPa (or to a range of 0.05 MPa – 0.15 MPa). Check whether the gas connection is disconnected or leaking, e.g., in-line gas filter and gas connection. Check the flow direction of the in-line gas filter: The gas supply must be connected to the INLET side of the in-line gas filter. Ventilate the room, if required.
	The volume flow is too small.	Increase the volume flow, e.g., by opening the CO_2 gas shut-off valve.
Alternates quickly between notification and alarm *CO_2 pressure below warning level of 0.04 MPa* and *CO_2 pressure below alarm level of 0.02 MPa*.	The CO_2 pressure has fallen significantly due to a closed gas pressure supply, an interruption or a crack in the pressure connection.	Check whether the gas connection is disconnected or leaking, e.g., in-line gas filter and gas connection. Check the flow direction of the in-line gas filter: The gas supply must be connected to the INLET side of the in-line gas filter. Ventilate the room, if required.
	The volume flow is too small.	Increase the volume flow, e.g., by opening the CO_2 gas shut-off valve.

Error description	Cause	Solution
CO_2 pressure above alarm level of 0.18 MPa. Check gas supply.	The CO_2 pressure is above the alarm value of 0.18 MPa. The inlet valve is closed because of the high pressure.	Reduce the CO_2 pressure to 0.1 MPa (14.5 PSI, 1 bar) or to a range of 0.05 – 0.15 MPa (7.2 – 21.8 PSI, 0.5 – 1.5 bar). Release the pressure from the gas tubing that leads to the device. To disconnect the gas tubing, switch off the gas pressure, push the thin ring of the hose connection downwards and pull out the gas tubing.
No CO_2 value is displayed.	After (re)starting the device or a high-temperature disinfection *Initialization sensor* appears on the display.	Wait until the device switches to normal operation.
The set value is displayed in red.	The CO_2 control is defective.	Tap on CO_2 in the function area. Restart CO_2 control using the active error symbol by tapping on the red button with the X.
	The CO_2 sensor is defective.	Switch off the device and restart it.
6731FW213 CO_2 control software error	The CO_2 control loop took too long, the CO_2 control loop was interrupted or the CO_2 sensor or the sensor software is defective.	Check whether the gas connection is disconnected or leaking, e.g., in-line gas filter and gas connection. Check whether the access port is closed. Restart the device. Contact your local Eppendorf partner.
6731FW214 CO_2 control timeout error	A CO_2 value error has occurred. The CO_2 set value was not reached in time. There are tubes in front of the CO_2 sensor. Under extreme conditions there are too many tubes in the chamber.	Check whether the gas connection is disconnected or leaking, e.g., in-line gas filter and gas connection. Check whether the access port is closed. Rearrange the tubes and restart the device. Contact your local Eppendorf partner.
6731FW215 CO_2 control timeout error	The CO_2 value is too high as the cells are, e.g., producing too much CO_2.	Open the door. Reduce the number of samples or the sample volume.
Various CO_2 errors occur, e.g., *timeout.*	Gas pressure monitoring is switched off. CO_2 low pressure is not monitored.	Switch on gas pressure monitoring. Look out for warning and error messages. Check the CO_2 supply. Replace the CO_2 cylinder and set the gas supply to 0.1 MPa (or to a range of 0.05 MPa – 0.15 MPa).
	The gas cylinder is empty.	Check whether the gas connection is disconnected or leaking, e.g., in-line gas filter and gas connection. Ventilate the room, if required.

Error description	Cause	Solution
CO_2 concentration control is not active.	The application for CO_2 control was not started or it is not activated when the device is started.	Tap on *Start* on the display. Adjust the start/stop behavior in *Device Settings* > *Start/Stop Behaviour*, if required.

10.9 Error message due to the humidity

Error description	Cause	Solution
6740FW.412 No water detected timeout.	The water tank is empty.	Fill the water tank.
The set value of the humidity control cannot be reached.	The set value of the relative humidity is below the ambient humidity.	Increase the set value of the relative humidity inside the device.
Relative humidity control is not active.	The application for humidity control has not been started.	Tap on *Start* on the display. Adjust the start/stop behavior in *Device Settings*, if required.
6740FW.415 No rising rh detected, please check that rh sensor has no cap.	The rH value does not increase after the door is closed as the protective cap is still on the humidity sensor.	Remove the protective cap from the humidity sensor after each high-temperature disinfection.

10.10 Error due to high-temperature disinfection

Error description	Cause	Solution
6740FW.110 180 °C not reached in time. Check environment conditions.	A technical error has occurred.	Contact your local Eppendorf partner.
Sensor switched off because temperature too high: *CO_2 (6740FW.202)*	The device was restarted with a residual temperature that was too high following an interruption to the high-temperature disinfection.	Leave the device to cool to < 50 °C before restarting the high-temperature disinfection.
Sensor switched off because temperature too high: *RH (6740FW.402)*	The device was restarted with a residual temperature that was too high following an interruption to the high-temperature disinfection.	Leave the device to cool to < 50 °C before restarting the high-temperature disinfection.
6731FW.750 Error occurred during High Temperature Disinfection.	Another error has occurred during the high-temperature disinfection.	Check the previous error messages and follow the advice given in the solution table.
6731FW.751 High Temperature Disinfection interrupted due to power loss.	The device was switched off during the high-temperature disinfection. A mains/power outage has occurred.	Restart the high-temperature disinfection.

Error description	Cause	Solution
6731FW.753 Door has been opened during High Temperature Disinfection.	Do not open the door during the high-temperature disinfection cycle.	Restart the high-temperature disinfection.

11 Shut down

11.1 Switching off the device

If the application was not stopped before the device was switched off, the drive starts again when the device is switched on.

Prerequisites:

- The device is not loaded.
- The application has been stopped.

1. Switch off the device at the mains/power switch.

11.2 Disconnecting the device from the voltage supply

Prerequisites:

- The device has been switched off.

1. Disconnect the mains/power plug from the earth/grounded socket.

11.3 Disconnecting the device from the gas supply

Prerequisites:

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

1. Switch off the gas pressure.
2. Press down the thin ring of the barbs.
3. Remove the gas tubings.

11.4 Disconnecting the device from the water supply

Prerequisites:

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

1. Unscrew the hose distributor from the water tank.
2. Remove the water hose with hose weight from the water tank.
3. Unscrew the water hose from the water filter of the device.

12 Transport

WARNING! Personal injury

The device is heavy. Improper lifting and moving of the device can lead to serious injuries.

- Use a suitable transport aid to transport the device.
- Move the device only with a sufficient number of transport helpers..
- Keep the door closed when the device is on the transport aid.

WARNING! Contamination

Storing or shipping a contaminated device or contaminated accessories may lead to contamination of persons or to damage to health.

- Clean and decontaminate the device and accessories before storage or shipment.

The device must only be transported and installed by Eppendorf service or service providers authorized by Eppendorf. To organize correct transport, contact the authorized service.

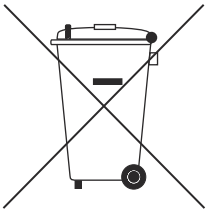
13 Disposal

13.1 Legal requirements

EU countries

In the EU member states, electrical and electronic equipment must be disposed of in accordance with Directive 2012/19/EU. This directive has been transposed into national law by all EU member states.

Electrical and electronic equipment which has been put on the market after August 13, 2005 must be marked in a special way. According to the European standard DIN EN 50419 the following symbol can be used to mark this equipment:



In the EU member states, batteries and rechargeable batteries must be disposed of in accordance with Directive 2006/66/EC. This directive has been transposed into national law by all EU member states.

Non-EU countries

Non-EU countries have country-specific standards for the disposal of waste electrical and electronic equipment and the disposal of batteries and rechargeable batteries.

13.2 Preparing for disposal

Preparing disposal in accordance with legal regulations

For information on the legal regulations that apply in your country, please contact your local competent authority or your Eppendorf partner.

Dispose of non-decontaminable devices as hazardous waste.

1. Check which legal regulations apply to disposal in your country.
2. Choose a certified disposal company or contact your Eppendorf partner.

Removing batteries and rechargeable batteries

1. Check whether your device contains permanently installed batteries or rechargeable batteries.
2. Only remove the batteries and rechargeable batteries that are not permanently installed.
3. Dispose of the removed batteries and rechargeable batteries in accordance with the legal regulations of your country.

Creating a decontamination certificate

Prerequisites:

- The device has been decontaminated.

1. Download a decontamination certificate from our webpage www.eppendorf.com.
2. Complete the decontamination certificate.

13.3 Handing over the device to the disposal company

1. Inform the disposal company of any hazards posed by the device, e.g., locking devices, flammable substances.
2. Hand over the device and the decontamination certificate to the certified disposal company.

14 Technical data

14.1 Dimensions

Device with positioning base

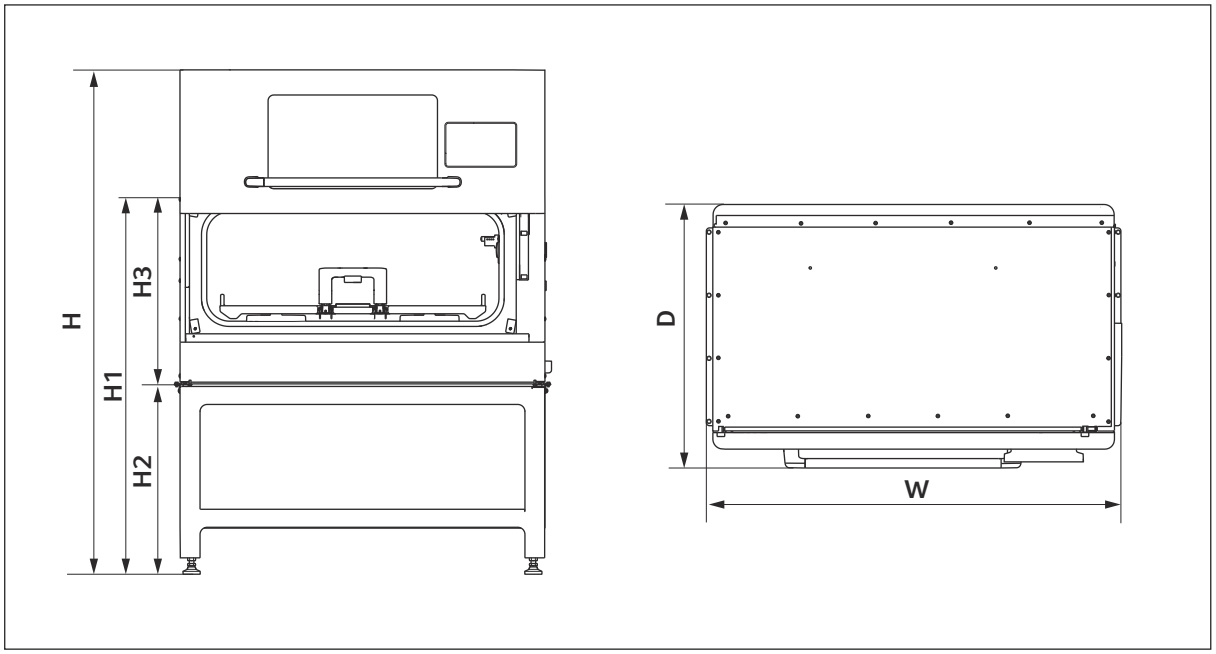


Fig. 14-1: Device with positioning base

W	131.8 cm	H1	133.0 cm
D	83.8 cm	H2	65.7 cm
H	178.5 cm	H3	67.3 cm

Device with positioning base and water tank

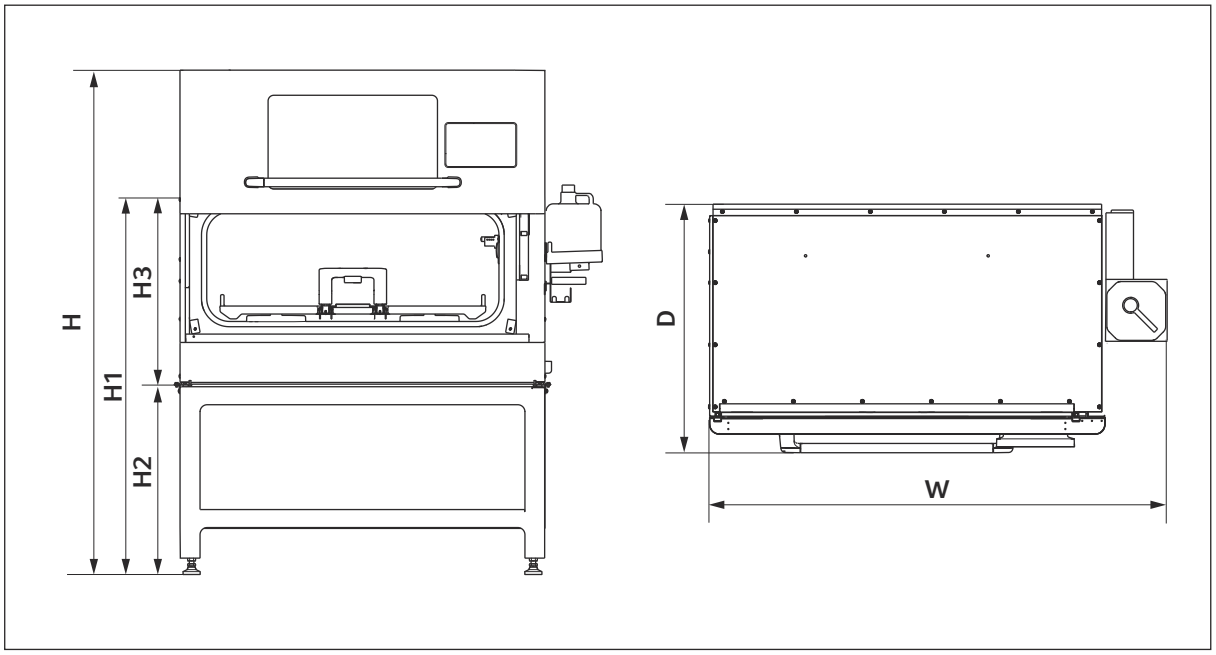


Fig. 14-2: Device with positioning base and water tank

W	149.8 cm	H1	133.0 cm
D	83.8 cm	H2	65.7 cm
H	178.5 cm	H3	67.3 cm

Two stacked devices

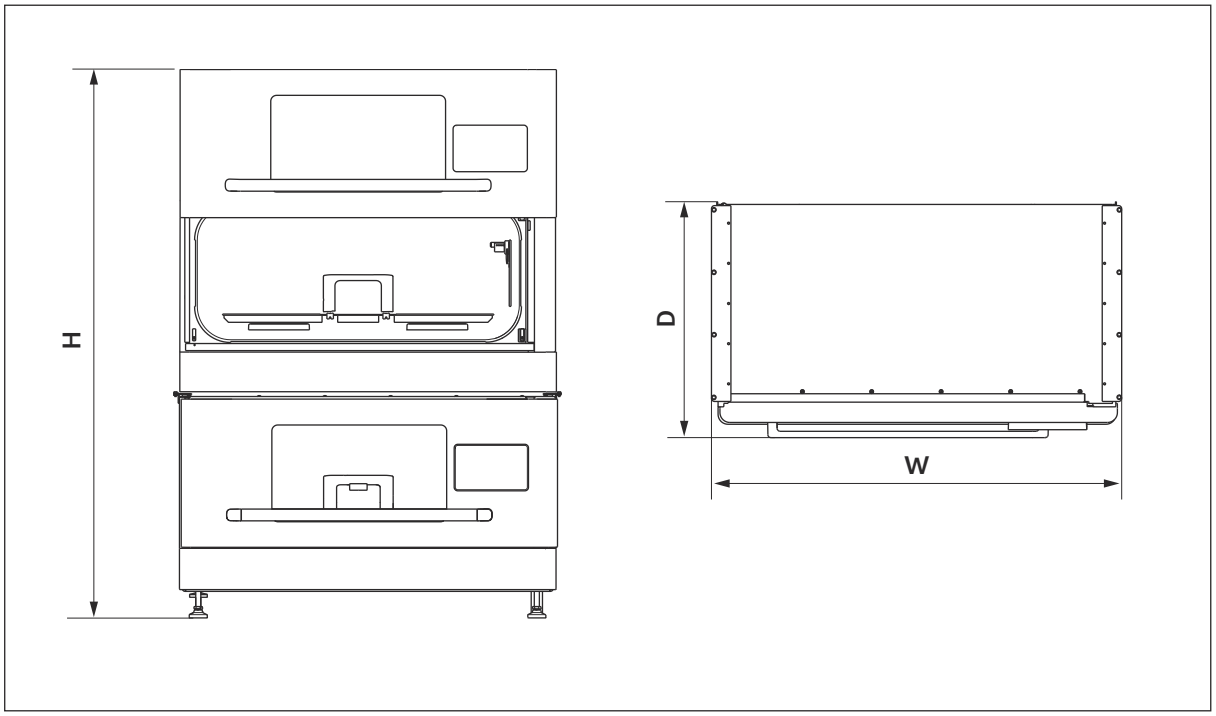


Fig. 14-3: Two stacked devices

W 131.8 cm

H 188.4 cm

D 80.5 cm

Three stacked devices

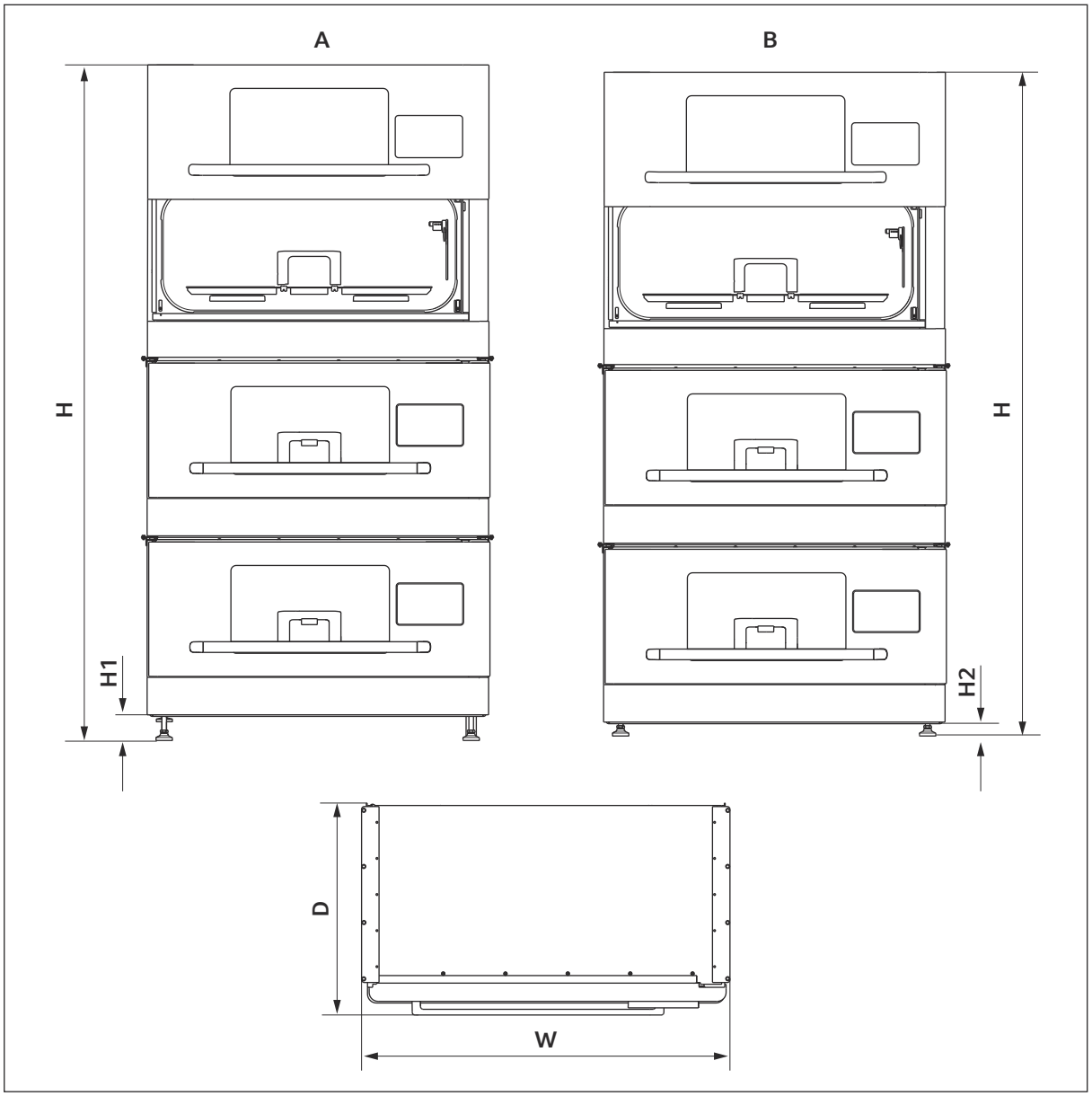


Fig. 14-4: Three stacked devices

W	131.8 cm	H1	9 cm
D	80.5 cm	B – H	247.9 cm
A – H	255.4 cm	H2	2 cm

Internal dimensions

Width	102.5 cm
Depth	58.0 cm
Height from chamber bottom to chamber ceiling	38.5 cm
Height from sample platform to chamber ceiling	33.0 cm
Volume (total)	224.2 L

Sample platform

Width	93 cm
Depth	51.4 cm
Height	5.9 cm

14.2 Weight

Device without accessories	approx. 240 kg
Device transport weight without accessories	approx. 275 kg
Sample platform	6.8 kg
Positioning base	90 kg
Transport weight of positioning base	approx. 113 kg

14.3 Mains/power supply

Mains/power connection	100 V – 127 V ±10 %, 50 Hz – 60 Hz 220 V – 240 V ±10 %, 50 Hz – 60 Hz
Power consumption for 110 V – 120 V	900 W
Power consumption for 220 V – 240 V	900 W
Protection class	I
Overvoltage category	II
Pollution degree	2
Specifications for mains/power cords in Europe with E/F mains/power plugs	Cable type AC 300 V / 16 A 3G 1.5 mm^2 with mains/power plug according to IECEE CE-7 / IEC 60884-1 and C19 appliance coupler according to IEC 60320-1

Specifications for mains/power cords in Europe with other mains/power plugs	Use the mains/power cord in accordance with national regulations Cable type AC 300 V / 16 A 3G 1.5 mm^2 with C19 appliance coupler according to IEC 60320-1 and with mains/power plug according to national regulations and IEC 60884-1
Specifications for mains/power cords in Canada and in the USA	Mains/power cord set according to UL 817 and CSA 22.2 No. 21-95 Cable type AC 125 V / 15 A SJT 3x14 AWG with NEMA 5-15 mains/power plug according to ANSI/ NEMA WD-6 and C19 appliance coupler according to UL/IEC 60320-1
Specifications for mains/power cords outside of Europe, Canada and the USA	Use the mains/power cord in accordance with national regulations

14.4 Ambient conditions

Operation

Ambience	For indoor use only
Ambient temperature	18 °C – 28 °C
Relative humidity	20 % – 80 %, non-condensing
Atmospheric pressure	79.5 kPa – 106 kPa Can be used up to an altitude of 2000 m above MSL

Transport

Air temperature	-25 °C – 60 °C
Relative humidity	10 % – 95 %
Atmospheric pressure	30 kPa – 106 kPa

Storage

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

14.5 Electromagnetic compatibility

Electromagnetic compatibility	IEC 61326-1, Class B ICES-001, Class B Class B is the basic electromagnetic environment (environment at locations which are directly supplied with low voltage from the public supply network) FCC Part 15, Class B

14.6 Application parameters

Temperature

Range	8 °C above ambient temperature – 60 °C
Control steps	0.1 °C
Accuracy	±0.4 °C (DIN EN 12880) at 37 °C and an ambient temperature of 22 °C
Stability	±0.1 °C at 37 °C and an ambient temperature of 22 °C
Uniformity	±0.3 °C at 37 °C and an ambient temperature of 22 °C

Speed

Speed with orbit 2.5 cm (1 inch)	20 rpm – 300 rpm
Speed with orbit 5.1 cm (2 inch)	20 rpm – 250 rpm
Control steps	1 rpm
Control accuracy	±1 rpm

CO_2 concentration

Range	0.1 % – 20 %
Control steps	0.1 %
Accuracy	±0.3 % at 5 % CO_2 at a fixed relative humidity and at 37 °C and an ambient temperature of 22 °C
Stability	±0.1 % at 5 % CO_2 at a fixed relative humidity and at 37 °C and an ambient temperature of 22 °C
Uniformity	±0.1 % at 5 % CO_2 at a fixed relative humidity and at 37 °C and an ambient temperature of 22 °C

Gas tubing	Inner diameter 6.5 mm, outer diameter 10 mm
Pore size of the in-line gas filter	0.2 µm
Sensor type	NDIR sensor
Required gas pressure	0.1 MPa (1 bar, 14.5 PSI), range 0.05 MPa – 0.15 MPa (0.5 bar – 1.5 bar, 7.2 PSI – 21.8 PSI)

Relative humidity

Range	20 % to 85 %
Control steps	1 %
Accuracy	±5 %
Sensor type	Capacitive sensor

High-temperature disinfection

Temperature	max. 180 °C/2 h
Approximate duration	19 h

14.7 Interfaces

Building management system	2 relays max. 30 V, max. 2 A
USB	2.0 type A
Ethernet	100 MBit/s
Access port	1x 30 mm

Only connect the devices to interfaces that meet the requirements of the IEC 62368-1 and IEC 60950-1 standards.

14.8 Load

Maximum load on the sample platform	18 kg
Maximum load of the device (including clamps, glassware and contents)	25.4 kg

14.9 Noise level

The noise level was measured frontally in a sound measuring room with accuracy class 1 (DIN EN ISO 3745) at a distance of 1 m from the device and at lab bench height.

Device	< 70 dB(A)

14.10 Schott bottles

Maximum size Erlenmeyer flask Fernbach flask	5 L max.

15 Ordering information

15.1 Accessories

Current ordering information can be found on our website www.eppendorf.com.

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Eppendorf SE · Barkhausenweg 1 · 22339 Hamburg · Germany
eppendorf@eppendorf.com · www.eppendorf.com