EN-US

Installation and operating manual

QWIK-PURE® iCS

› 550
› 1100
› 2200
› 3300

02-607

Table of contents

1. Information on documentation

This documentation contains all the necessary steps for use of the product and the accessories.

1.1 Contact

Service and tools
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1.2 Information about this installation and operating manual

INFORMATION	Copyright protection
	The content of this installation and operating manual, in the form of text, images, photos, drawings, diagrams, and other illustrations, is copyright protected by the manufacturer. The distribution as well as the duplication of this document, the exploitation and the communication of its contents are prohibited unless expressly authorized.

Publication date	Revision	Version	Reason for change	Scope of change
November 15, 2023	00	01	Initial creation	Initial creation
June 18, 2024	01	01	Revision	Revision
February 03, 2025	02	00	Revision	Revision

The installation and operating manual, hereinafter referred to as the manual, must always be kept close to the product and be in a permanently legible condition.

The manual must be handed over along with the product if it is sold or passed on.

NOTICE	Follow the instructions given in the manual
	This manual contains all the basic information required for safe operation of the product and must be read before any actions are performed. Otherwise personal and material hazards as well as malfunction and device failure are possible.

2. Safety

2.1 Use

2.1.1 Intended use

The **QWIK-PURE® iCS**, hereafter also referred to as the “product,” is used to treat unstable oil–water emulsions and condensates from oil-lubricated and oil-free compressors. Physical processes are used to separate oils that can be directly separated from the corresponding water.

Any use of this system other than the use described in this manual is hereby deemed to be non-intended and can cause a hazard for the safety of people and the environment.

The following must be noted for intended use:

- Read and observe this manual.
- Use the product and the accessories exclusively within the operating parameters and agreed delivery conditions specified in section Technical data.
- Use the product and accessories exclusively with fluids that are free of caustic, aggressive, corrosive, toxic, flammable, oxidizing and inorganic components.
  In cases of doubt an analysis must be carried out.
- Use the product and the accessories exclusively within a pipeline system designed in conformity with the operating parameters specified in section Technical data.
- Use the product and the accessories exclusively outside of areas exposed to mechanical loads and splash water.
- Only use the product and accessories outside potentially explosive atmospheres.
- Use the product and the accessories exclusively outside of areas exposed to direct sunlight and heat sources.
- Combine the product and the accessories only with the recommended manufacturer products and components indicated in this manual.
- Adhere to the prescribed maintenance plan.

Before using the product and the accessories, the operating company must make sure that all conditions and prerequisites for intended use are given.

The product and the accessories have been exclusively designed for stationary use in a commercial or industrial area. All of the assembly, installation, operation, maintenance, disassembly and disposal work described may only be performed by qualified skilled technical personnel.

2.1.2 Foreseeable misuse

Foreseeable misuse is deemed to have occurred if the product or the accessories are used in any other way than that described in the section “Intended use”. Foreseeable misuse includes using the product or accessories in a manner that is not intended by the manufacturer or suppliers but that may occur due to foreseeable human behavior.

Foreseeable misuse includes:

- The execution of any kind of modification, in particular constructive and process-technology related interventions.
- Disabling or failing to use available or recommended safety equipment.
- Use for filtering wastewater other than compressor condensate (e.g., industrial wastewater).
- Disposal of waste oils.
- Using the product on water vessels, railway vehicles and motor vehicles.

This list is not exhaustive as not all possible inappropriate use can be foreseen in advance. If the operating company is aware of any inappropriate use of the product or accessories which are not listed here, the manufacturer must be informed immediately.

2.2 Responsibility of the operating company

The responsible operating company must ensure the following to prevent accidents, incidents and adverse effects on the environment:

- Before all actions, check to ensure that the manual available does in fact belong to the product.
- The product and the accessories are used, serviced and repaired in accordance with the intended use.
- The product and accessories are only used with the recommended and fully operable safety equipment.
- All assembly, installation and maintenance work is carried out by qualified skilled technical personnel only.
- Personnel have the required personal protective equipment, and this equipment is used.
- Suitable technical safety measures are taken to ensure that the permissible operating parameters are observed.
- Keep all safety symbols and the type plate on the product and accessories in a legible state. Replace damaged and illegible markings immediately.
- All locally applicable legal requirements and regulations regarding the protection of bodies of water, as well as the associated mandatory documentation obligations (e.g., results from turbidity test, retention periods), must be complied with.

2.3 Target group and personnel

This manual addresses the personnel listed below who are involved with work on the product or the accessories.

INFORMATION	Personnel requirements
	• Minors are strictly prohibited from working with and on the product and its accessories. • The personnel may not execute any actions on the product or the accessories when they are under the influence of drugs, medications, alcohol or other substances that may impair their consciousness.

Operating personnel

"Operating personnel" refers to personnel that is able to safely operate the product and accessories based on its familiarity with the manual and briefing on the product and accessories. Operating personnel can recognize possible malfunctions and dangerous situations independently and arrange for corresponding measures.

Skilled technical personnel specialized in transportation and storage

Skilled technical personnel specialized in transportation and storage are people who, due to their training, professional experience and qualifications, have all the necessary skills to safely execute all actions in connection with the transportation and storage of the product, to instruct, to recognize possible dangerous situations independently and to execute measures to avoid danger.

The skills required include, in particular, experience operating hoists, forklifts and lifting equipment and familiarity with locally applicable laws, standards and guidelines relating to transportation and storage.

Skilled technical personnel specialized in pressure equipment and systems

"Skilled technical personnel specialized in pressure equipment and systems" refers to personnel whose training, professional experience, and qualifications have provided them with all the skills necessary to safely complete any work associated with pressurized fluids and systems, provide instructions, identify potential hazards independently, and take measures to prevent those hazards.

The skills required include, in particular, experience using measuring equipment and control equipment, as well as familiarity with locally applicable laws, standards and regulations for pressurized systems.

Trained electricians
Trained electricians are people whose basic and advanced training, professional experience, and qualifications have provided them with all the skills necessary to safely complete any work involving electricity, identify potential hazards independently, and take measures to prevent those hazards. These skills include, in particular, experience handling electrical equipment, measuring equipment, control equipment, and regulation equipment, as well as familiarity with all regionally applicable regulations, standards, and directives for electrical and electronic equipment.

Qualified service technicians
Qualified service technicians are persons who have the skills and qualifications as defined in all the aforementioned definitions concerning skilled technical personnel. Qualified service technicians must be verifiably trained and authorized for all work on the product.

2.4 Explanation of the symbols used

The symbols used below indicate safety-relevant and important information which must be adhered to when handling the product and to ensure safe and optimum operation.

Symbol	Description / explanation
	General warning symbol (danger, warning, caution)
	Pressurized system warning
	Hazardous voltage warning

Symbol	Description / explanation
	Read and understand the installation and operating manual
	General mandatory requirement
	Wear safety footwear
	Use protective gloves (cut-proof and liquid-resistant)
	Wear safety goggles with side shields
	General information

2.5 Safety instructions and warning notices

This section provides an overview of all the important safety aspects for personal protection as well as for the safe and problem-free operation of the product and accessories.

The following sections list the dangers posed by this product and the accessories even with intended use. To minimize the risk of personal injury and property damage and to avoid dangerous situations, observe the safety instructions listed and adhere to the warning notices in the other sections of this manual.

Basic warning notices and the necessary qualifications of skilled technical personnel are always listed at the beginning of the section in the “Warning notices“ section.

Warning notices related to specific actions are printed directly before potentially hazardous procedures or sequences of actions.

As well as causing personal injury, failure to observe safety instructions and warning notices may result in malfunctions, disruption to operations, and property damage.

2.5.1 Basic safety instructions

- Before starting work, refer to the technical documentation for the entire system and observe the overall operating instructions.
- Carry out a risk assessment before starting work on site (last minute risk assessment).
- Use suitable personal protective equipment for all work.
- Set up a safety area around the working area during all installation, maintenance and repair work.
- Use existing system-specific protection procedures (e.g., LOTO procedure) in order to safely de-energize and isolate the system or system sections.

2.5.2 Safe operation

The following actions may result in serious injury or death:

- Setting up and operating the product and accessories outside the permissible limits and operating parameters
- Unauthorized interference and unauthorized modifications of the product and accessories

To guarantee the safe operation of the product and accessories, observe the following:

- Observe the limits and operating parameters specified on the type plate and in the manual.
- Check whether the permissible operating parameters have been changed or restricted by the use of accessories.
- Observe the installation conditions and the ambient conditions.
- Adhere to the maintenance intervals.

2.5.3 Sudden escape of pressurized fluids

The following situations may result in serious injury or death:

- Contact with fast or suddenly escaping fluids
- Bursting system components
- Pressurized hose and pipe whipping as a result of disconnection

In order to safely handle pressurized systems, observe the following:

- Observe the following safety rules during all work:
  1. Shut down the system or system section.
  2. Secure the system or system section against restarting.
  3. Reduce the pressure in the system or all system sections to the ambient pressure, e.g. by slowly releasing the pressure in a controlled manner via relief valves
  4. Lock out and tag out the system or system section so that it cannot be pressurized again.

- Check the pressurized system or system section for safety, contamination and possible damage.
- Before pressurization, check all system connections for leak tightness and tighten if necessary.
- Make absolutely sure to charge the system or system section with pressure slowly.
- Avoid pressure blows and high differential pressures.
- Compensate any vibrations occurring in the pipe network by using vibration dampers.

2.5.4 Electrical voltage

Contact with live components may result in serious personal injury or death.

In order to safely handle live components, make sure to observe the following:

- Connect the product and accessories to a power supply only if they are in proper working order.
- Comply with all locally applicable legal requirements and regulations during installation.
- The power supply must have a disconnect device that is easily accessible in the proximity of the product.
  → This disconnect device must disconnect all live cables.
- Connect the equipment grounding conductor (earthing) in compliance with all applicable standards and regulations.
- Only operate the product and accessories with the cover complete and closed or the electronics housing closed.
- Before starting work on the product:
  1. De-energize and isolate
     → Disconnect the product from all poles on all sides
  2. Secure against restarting.
  3. Determine the absence of voltage at all poles.
     → Use a suitable and approved measuring device (e.g., twin lead tester)
  4. Earth and short circuit.
- Only the manufacturer is allowed to open the housing of the **FRC** control unit.

2.5.5 Transportation and storage

Improper transportation and improper storage may result in personal injury or property damage.

In order to ensure safety during the transportation and storage of the product and accessories, observe the following:

- Use personal protective equipment for all work with packaging material.
- Handle packaging, the product and accessories carefully.
- Transport and handle the product and accessories according to the markings on the packaging.
- Only use suitable transportation equipment, hoisting gear, and slinging gear that is in proper working condition and that is sized for the product's total weight.
- Always adhere to the permissible transportation and storage parameters.
- Store the product and accessories only outside of areas exposed to direct sunlight, heat sources and splash water.

2.5.6 Installation

Improper physical or electrical installation of the product and accessories may result in personal injury and property damage as well as impair operation.

For safe physical and electrical installation, observe the following:

- Assemble the product and all the parts, accessories and materials used free of mechanical stress.
- Check all plug-type connections for a correct fit.
- Avoid stumbling risks by routing cables and hoses accordingly.
- Avoid mechanical stress on the cables.
- Fix and fasten hoses in such a way that they cannot flap around.
- Install the inlet and drain lines as fixed pipes.

2.5.7 Maintenance

Improperly carrying out maintenance and repair work may result in serious injury or death.

For safe maintenance and repairs, observe the following:

- Before starting work, depressurize the pressurized product and accessories and secure them against unintentional pressurization.
- Before starting work, isolate the product and accessories from the power source and secure them against being switched back on again unintentionally.
- Only use materials approved for the respective application.
- Use only suitable tools that are in proper working order.
- Only use cleaned pipes and hoses that are free of dirt and corrosion.
- Never use abrasive or aggressive cleaning agents or solvents which could damage the outer coating (e.g. markings, type plate, corrosion protection, etc.).
- Never clean the device with hard or pointed implements.
- Use only the specified materials and media for cleaning.
- Observe statutory, local and in-house hygiene regulations.
- Pay attention to order and cleanliness during maintenance and repair work. Prevent contamination from entering the opened product or accessories. Store disassembled components and accessories directly in a safe place.
- After completing maintenance and repair work, remove all tools, cleaning agents, and parts no longer required from the work area.
- Only dispose of the product and accessories when they have been cleaned and are free of any residual fluids.
- Dispose of all components, parts, operating and auxiliary materials as well as cleaning agents professionally and in accordance with all locally applicable legal requirements and regulations.
- Dispose of electrical and electronic components through a specialized disposal company or return them to the manufacturer.

2.5.8 Handling hazardous substances

Contact with condensate containing substances which endanger health and the environment can pose a health hazard, causing irritation and/or damage to the eyes, skin and mucous membranes. In addition, polluted condensate must be prevented from entering the sewerage system, waters or the ground.

For the safe handling of polluted condensate, observe the following:

- Use suitable personal protective equipment when handling condensate.
- Collect and dispose of leaked or spilled condensate in accordance with the locally applicable legal requirements and regulations.

2.5.9 Working on electronic components

Electrostatic discharge (ESD) can cause damage to electronic components and result in malfunctions, operational disruptions, and property damage.

- Take proper measures to prevent electrostatic discharge (e.g., grounding, equipotential bonding, anti-static mats, etc.).

2.5.10 Use of spare parts, accessories or materials

Use of incorrect spare parts, accessories, materials, auxiliary and operating materials, may result in death or serious injury. Malfunction, device failure or material damage may occur.

- Only use undamaged original parts, auxiliary and operating materials which are specified by the manufacturer to complete all work.
- Only use the materials approved for the respective application and suitable tools in proper working order.
- Only use cleaned pipes that are free of dirt and corrosion.
- Only use electric components and materials that comply with locally applicable legal requirements and regulations (standards, directives, etc.) for electrical safety.

2.6 Warning notices

Warning notices warn against dangers when handling the product and accessories.

Failure to observe warning notices may result in personal injury, damage to property, and impairment to operations.

Structural set up:

SIGNAL WORD	Type and source of danger
 Symbol	Possible consequences if the danger is ignored • Measures to prevent the danger

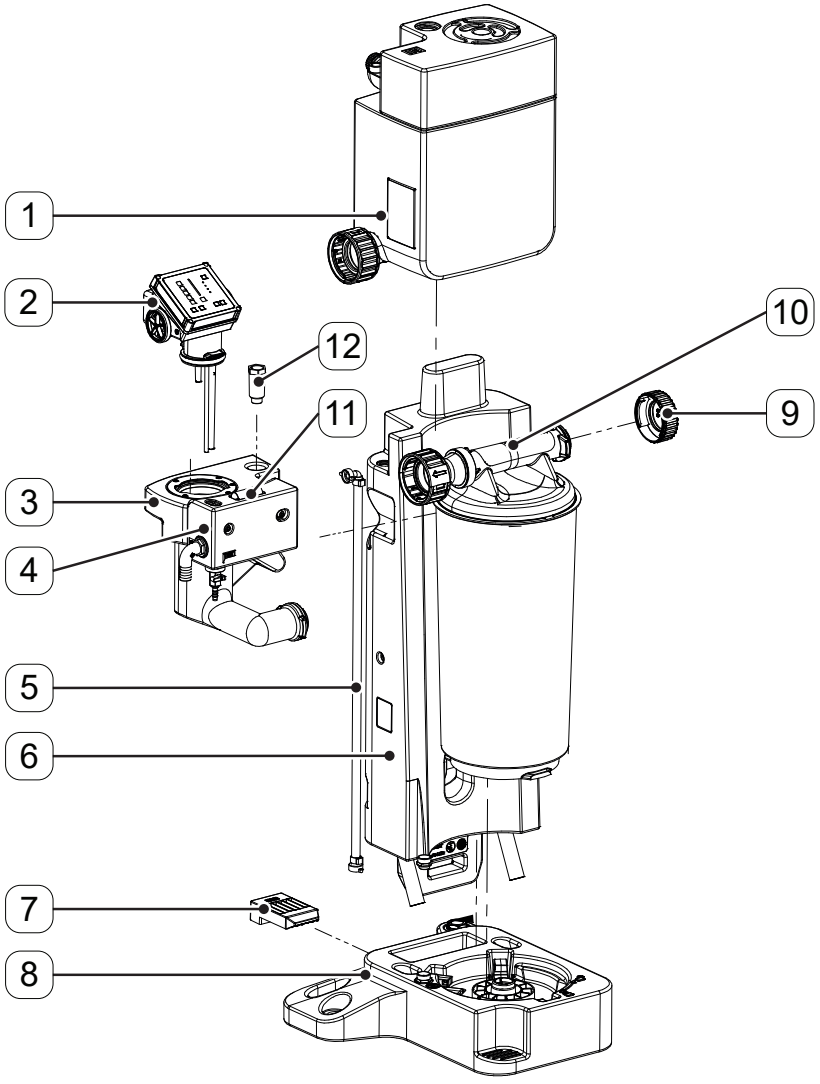
Signal words:

DANGER	**Imminent hazard** Consequences of non-compliance: Death or serious personal injury
WARNING	**Imminent hazard** Consequences of non-compliance: Death or serious personal injury are possible
CAUTION	**Potential hazard** Consequences of non-compliance: Personal injury is possible
NOTICE	**Possible damage to property** Consequences of non-compliance: Damage to property, malfunction and device failure are possible. No hazard to people or endangerment of safe operation.

3. Product information

3.1 Product overview

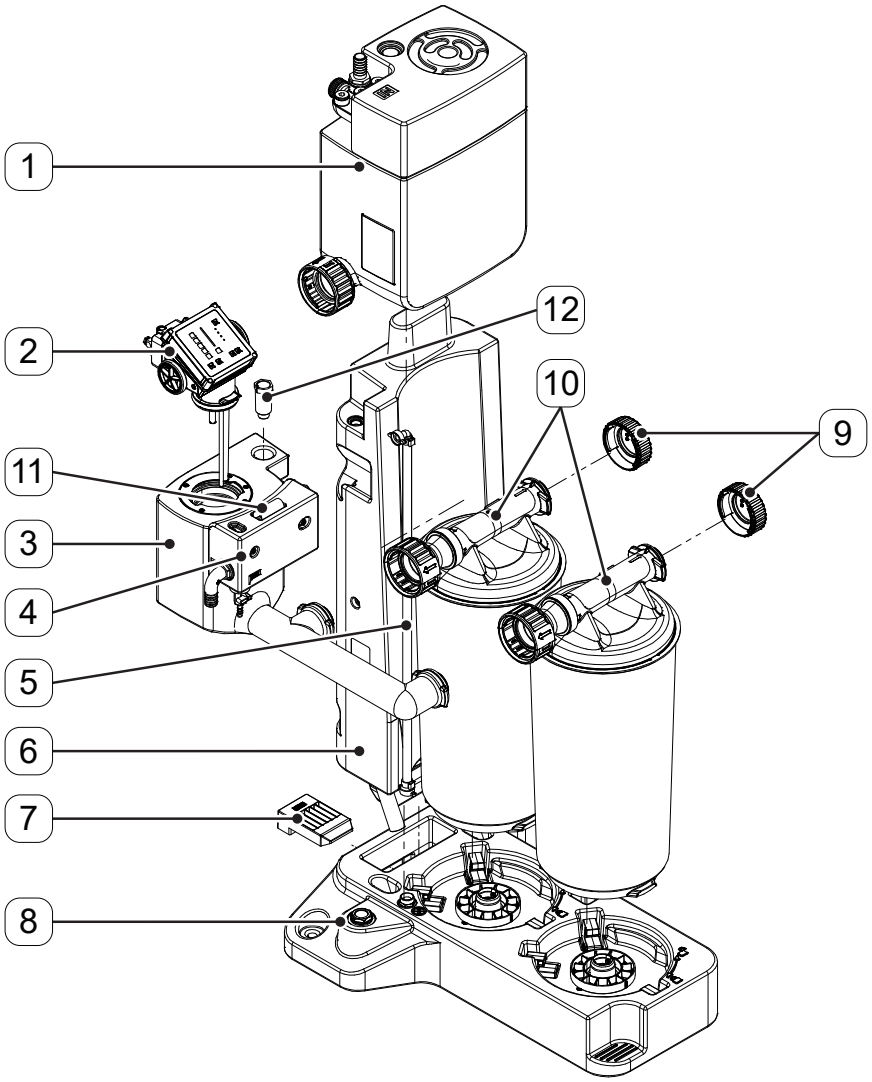
3.1.1 QWIK-PURE® iCS 550



No.	Description / explanation
[1]	Pressure relief chamber
[2]	Flow Regulation Controller (**FRC**), control unit
[3]	Measuring chamber
[4]	Clean water tank
[5]	Riser duct
[6]	Foot

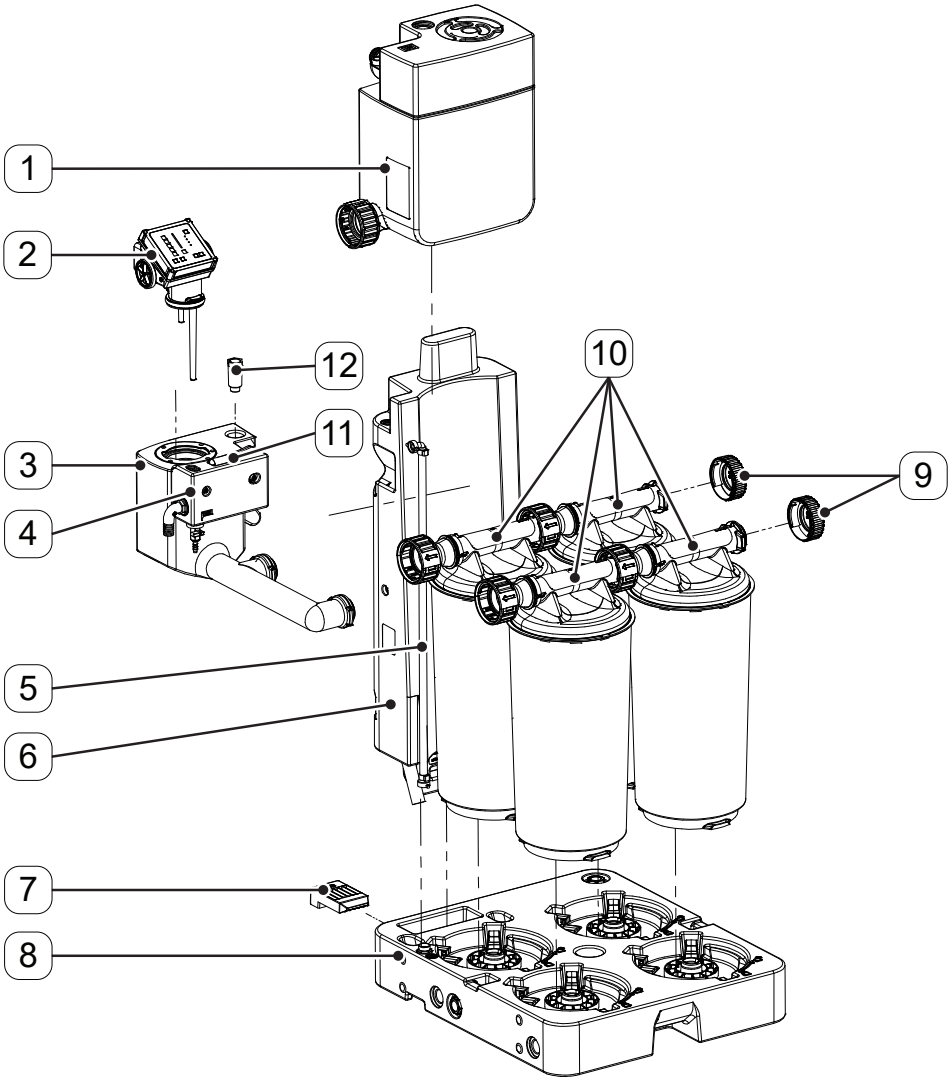
No.	Description / explanation
[7]	Locking device
[8]	Collector 1 x 1 filter cartridge
[9]	End cap
[10]	Filter cartridge
[11]	Reference turbidity tube
[12]	Fixing screw

3.1.2 QWIK-PURE® iCS 1100



No.	Description / explanation	No.	Description / explanation
[1]	Pressure relief chamber	[7]	Locking device
[2]	Flow Regulation Controller (**FRC**), control unit	[8]	Collector 1 x 2 filter cartridges
[3]	Measuring chamber	[9]	End cap
[4]	Clean water tank	[10]	Filter cartridge
[5]	Riser duct	[11]	Reference turbidity tube
[6]	Foot	[12]	Fixing screw

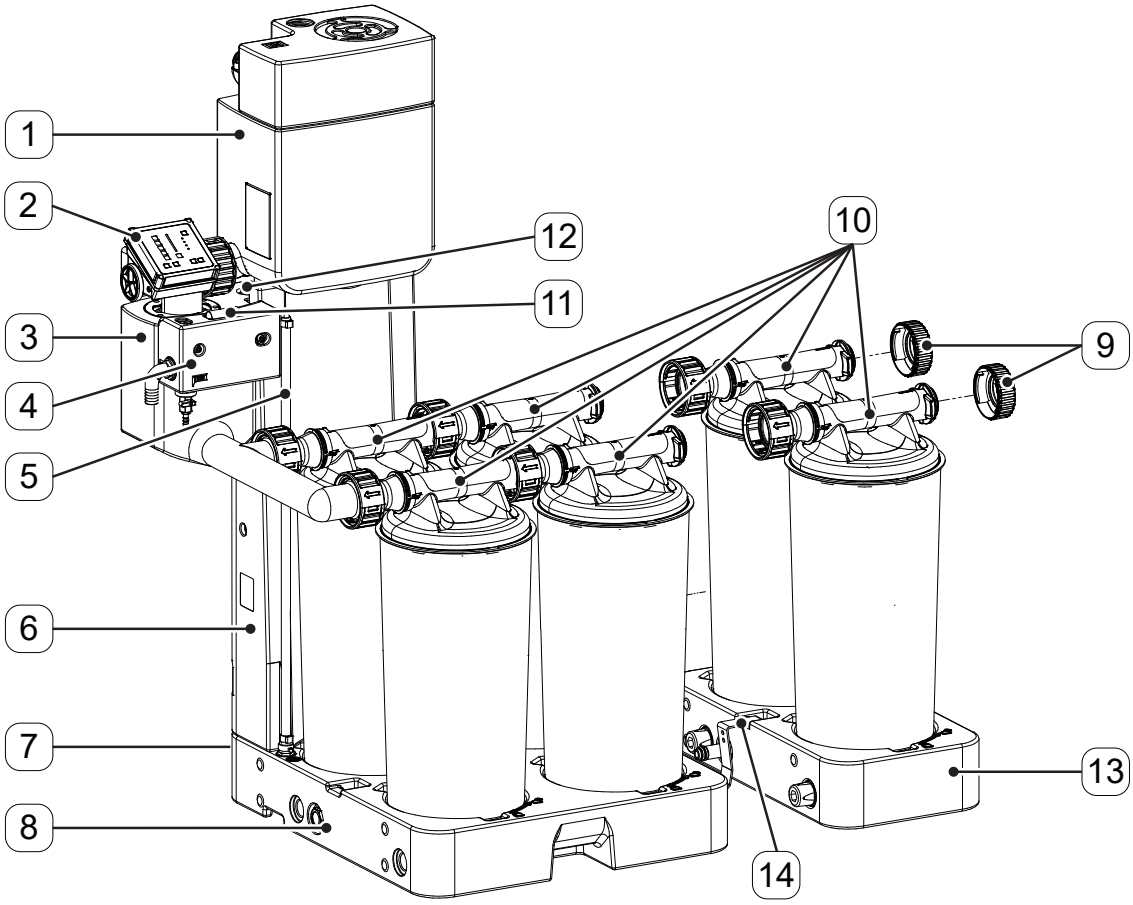
3.1.3 QWIK-PURE® iCS 2200



No.	Description / explanation
[1]	Pressure relief chamber
[2]	Flow Regulation Controller (**FRC**), control unit
[3]	Measuring chamber
[4]	Clean water tank
[5]	Riser duct
[6]	Foot

No.	Description / explanation
[7]	Locking device
[8]	Collector 2 x 2 filter cartridges
[9]	End cap
[10]	Filter cartridge
[11]	Reference turbidity tube
[12]	Fixing screw

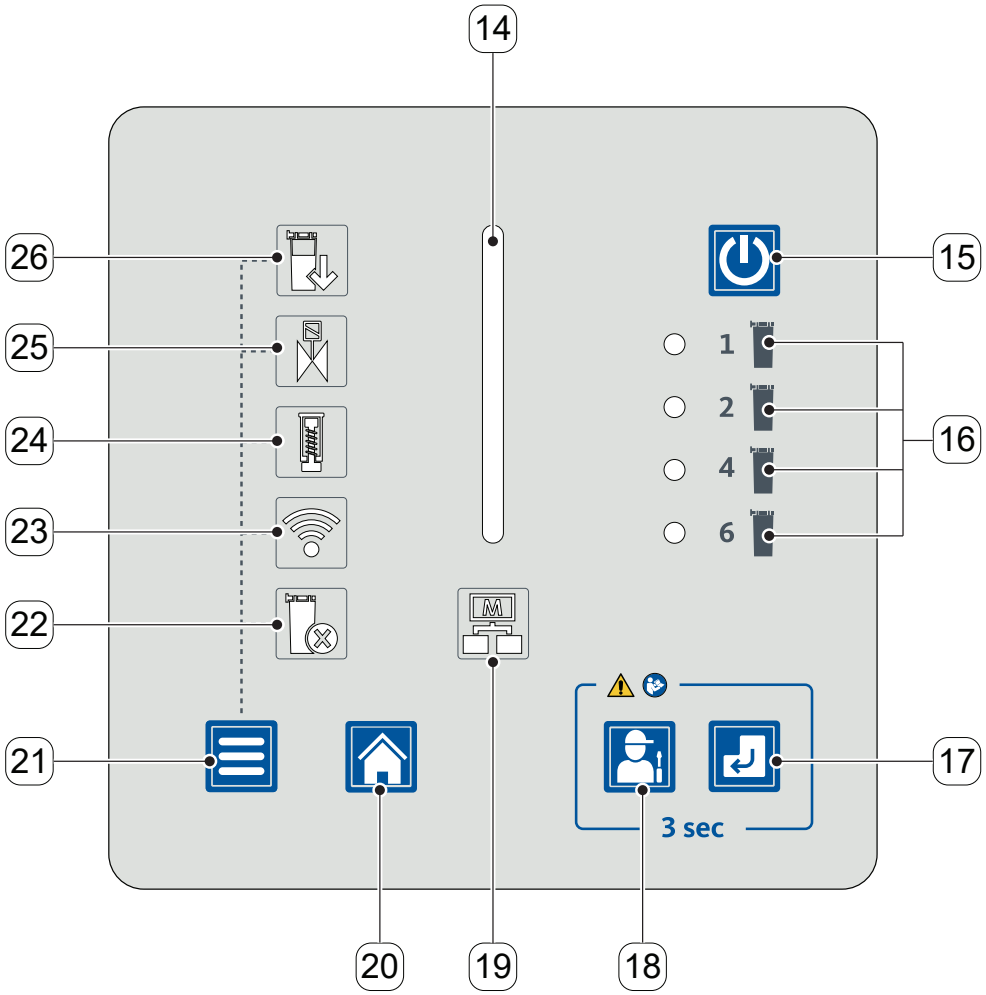
3.1.4 QWIK-PURE® iCS 3300



No.	Description / explanation
[1]	Pressure relief chamber
[2]	Flow Regulation Controller (**FRC**), control unit
[3]	Measuring chamber
[4]	Clean water tank
[5]	Riser duct
[6]	Foot
[7]	Locking device (not visible)

No.	Description / explanation
[8]	Collector 2 x 2 filter cartridges
[9]	End cap
[10]	Filter cartridge
[11]	Reference turbidity tube
[12]	Fixing screw
[13]	Extension module
[14]	Locking device

3.2 User interface



Display elements	
No.	**Description / explanation**
[14]	STATUS BAR status LED
[16]	NUMBER OF FILTER CARTRIDGES LED
[19]	DATA TRANSFER status LED
[22]	FILTER CARTRIDGE SELECTION status LED
[23]	WLAN status LED
[24]	PISTON status LED
[25]	SOLENOID VALVES status LED
[26]	FILTER CARTRIDGES status LED

Controls	
No.	**Description / explanation**
[15]	On-Off button
[17]	Enter button
[18]	Service button
[20]	Start Menu button
[21]	Menu button

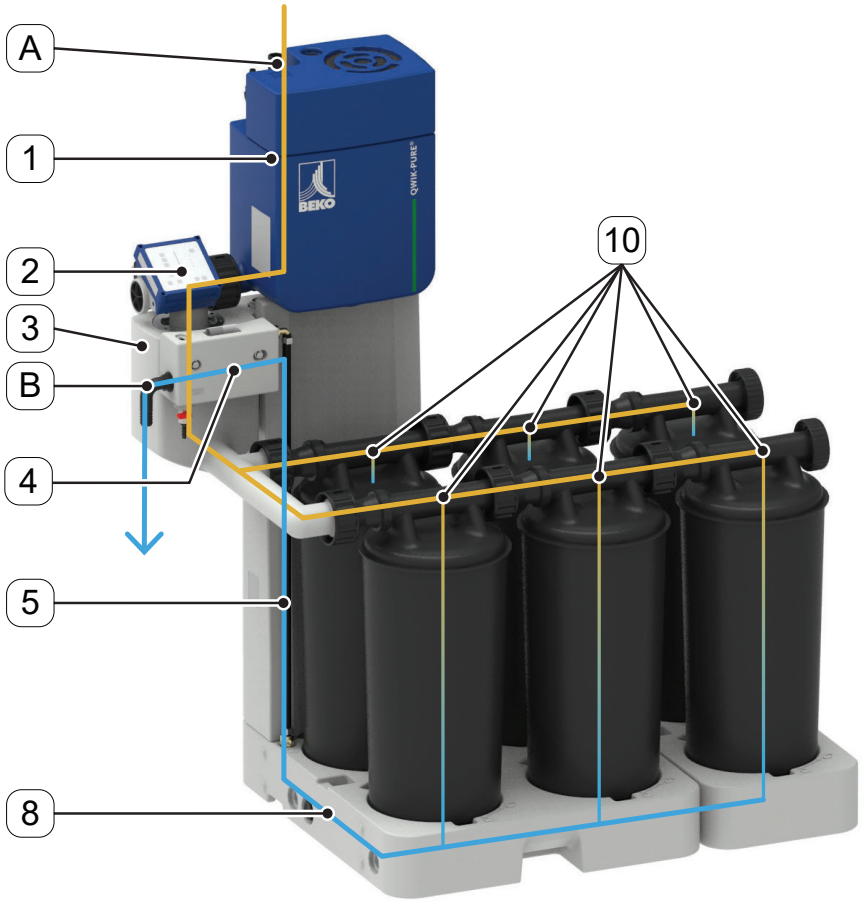
3.3 Description of the controls and displays

<table>
<tr><th>Figure</th><th>Description / explanation</th></tr>
<tr><td>  </td><td>STATUS BAR status LED
<table>
<tr><th>LED</th><th>Status bar</th></tr>
<tr><td>Flashing white</td><td>FRC in standby mode</td></tr>
<tr><td>Lights up blue</td><td>Function started by the operator is executed</td></tr>
<tr><td>Lights up green</td><td>The status of a selected function is displayed</td></tr>
<tr><td>Solid yellow light</td><td>Warning, FRC with restricted operation</td></tr>
<tr><td>Flashes red</td><td>Malfunction, FRC stopped, condensate separation without the use of auxiliary air</td></tr>
</table></td></tr>
<tr><td>  </td><td>On-Off button
• Used to turn the FRC on and off</td></tr>
<tr><td> 
</td><td>NUMBER OF FILTER CARTRIDGES LED
<table>
<tr><th>LED</th><th>Number of filter cartridges</th></tr>
<tr><td>1 lights up green</td><td>1 filter cartridge</td></tr>
<tr><td>2 lights up green</td><td>2 filter cartridges</td></tr>
<tr><td>4 lights up green</td><td>4 filter cartridges</td></tr>
<tr><td>6 lights up green</td><td>6 filter cartridges</td></tr>
</table></td></tr>
<tr><td>  </td><td>Enter button
• Confirm entries</td></tr>
<tr><td>  </td><td>Service button
• Start service functions</td></tr>
<tr><td>  </td><td>DATA TRANSFER status LED
<table>
<tr><th>LED</th><th>Data transfer status</th></tr>
<tr><td>Off</td><td>No data connection</td></tr>
<tr><td>Lights up green</td><td>Data connection established</td></tr>
</table></td></tr>
<tr><td>  </td><td>Start Menu button
• Call up the START MEMU screen
• Cancel operation actions</td></tr>
<tr><td>  </td><td>Menu button
• Used to switch between menu screens</td></tr>
</table>

<table>
<tr><th>Figure</th><th>Description / explanation</th></tr>
<tr><td>  </td><td>FILTER CARTRIDGE SELECTION status LED
<table>
<tr><th>LED</th><th>Filter cartridge selection</th></tr>
<tr><td>Flashes green</td><td>Number of filter cartridges can be configured</td></tr>
</table></td></tr>
<tr><td>  </td><td>WLAN status LED
<table>
<tr><th>LED</th><th>WLAN status</th></tr>
<tr><td>Off</td><td>Deactivated</td></tr>
<tr><td>Flashes blue</td><td>Active and a WLAN connection can be established</td></tr>
</table></td></tr>
<tr><td>  </td><td>PISTON status LED
<table>
<tr><th>LED</th><th>Piston status</th></tr>
<tr><td>Lights up green</td><td>No service necessary</td></tr>
<tr><td>Lights up red</td><td>Replace PISTON Service-Unit</td></tr>
</table></td></tr>
<tr><td>  </td><td>SOLENOID VALVES status LED
<table>
<tr><th>LED</th><th>Solenoid valve status</th></tr>
<tr><td>Lights up green</td><td>No service necessary</td></tr>
<tr><td>Lights up red</td><td>Replace SOLENOID VALVES Service-Unit</td></tr>
</table></td></tr>
<tr><td>  </td><td>FILTER CARTRIDGES status LED
<table>
<tr><th>LED</th><th>Filter cartridge status</th></tr>
<tr><td>Lights up green</td><td>No service necessary</td></tr>
<tr><td>Lights up red</td><td>Replace filter cartridges</td></tr>
</table></td></tr>
</table>

3.4 Function description

The condensate flow through the product is controlled and monitored by the **flow regulation controller** unit, hereafter referred to as **FRC** as well.



The condensate is conveyed from the condensate collection line through the condensate inlet **[A]** into the pressure relief chamber **[1]**. In the pressure relief chamber **[1]**, entrained compressed air is separated before the condensate flows through the **FRC [2]** into the measuring chamber **[3]** and then into the filter cartridges **[10]**.

The **FRC [2]** monitors the fill level in the measuring chamber **[3]**with the following sensors:

- Sensor High Level Alarm (HLA)
- Sensor High Level (HL)
- Sensor Low Level (LL)

When the fill level in the measuring chamber **[3]** reaches the High Level (HL) sensor, the condensate is conveyed through the filter cartridge **[10]** with auxiliary air. The **FRC [2]** will perform a discharge operation with the following steps:

1. The PISTON solenoid valve is switched.
   → The piston in the **FRC [2]** is pressurized with auxiliary air and closes the connection to the pressure relief chamber **[1]**.
2. The PULSE solenoid valve is opened at intervals.
   → Auxiliary air is conveyed into the measuring chamber **[3]** at intervals.

3. The auxiliary air that is introduced displaces the condensate from the measuring chamber **[3]** and forces the condensate into the collector **[8]** through the filter cartridges **[10]**.
4. The flow of auxiliary air is stopped as soon as the fill level in the measuring chamber **[3]** falls below the Low Level (LL) sensor.
5. The PISTON solenoid valve is switched.
   → The piston is depressurized and opens the connection to the pressure relief chamber **[1]**.
6. The measuring chamber **[3]** is filled with condensate.

The purified condensate is conveyed from the collector **[8]** through the riser duct **[5]** into the clean water tank **[4]**. The purified condensate is conveyed into the wastewater connection through the condensate drain port **[B]** of the clean water tank **[4]**.

During operation, a layer of oil will settle on the condensate surface in the measuring chamber **[3]** and then be conveyed into the filter cartridges **[10]** during ongoing operation.

After a pre-set number of discharge cycles, the level of the condensate will be lowered until the oil layer comes into contact with the filter material.

If the oil layer on the condensate surface reaches the High Level Alarm (HLA) sensor, the **FRC [2]** will perform an unscheduled discharge operation referred to as an “oil cycle.” The oil cycle will lower the level of the condensate until the oil layer is in contact with the filter material.

The following reasons may cause the level to rise to the High Level Alarm (HLA) sensor:

- Excessive oil settles during the period of the set number of discharge cycles.
- The filter cartridges **[10]** are saturated and free oil can no longer be bound by an oil cycle in the filter cartridges **[10]**.
- Relatively large quantities of oil have entered the product from outside (e.g., an oil leak in the compressor)

If the filter cartridges **[10]** are saturated with oil, it is necessary to change the filter cartridges **[10]** (please refer to section “10.3.2 Replace filter cartridges” on page 96). Pressing the Service button reduces the condensate level to such an extent that as little condensate as possible will remain in the filter cartridges **[10]**.

In the de-energized state, in standby mode, and in the event of a malfunction, the condensate is conveyed through the filter cartridges **[10]** by gravity alone, without the assistance of auxiliary air.

3.5 Modbus function

The control unit features an integrated Modbus RTU interface that can be used to read the operating parameters and device information.

The control unit is operated in the client–server system with the Modbus RTU operating mode.

Data is transmitted via an RS485 interface in binary format.

3.5.1 Preset interface parameters

Value	Parameters
Baud Rate	19200
Data Bits	8
Stop Bits	1
Parity	even
Server Address	247

3.5.2 Byte sequence

Data type	Modbus register	Division
float	2 register	ABCD
u32	2 register	ABCD
u16	1 register	AB
u8	1 register	A
u8		B

3.5.3 Implemented functions

The following Modbus functions are supported:

1. Read Input Registers (0x04)
2. Read Device Identification (0x2B / 0x0E)
3. Modification of interface parameters

3.5.3.1 Read Input Registers (0x04)

Modbus address	Content	Description / explanation	Format
1104	Piston valve operation counts, Hi-Word	Switching cycles, PISTON solenoid valve	u32
1105	Piston valve operation counts, Lo-Word		
1106	Pulse valve operation counts, Hi-Word	Switching cycles, PULSE solenoid valve	u32
1107	Pulse valve operation counts, Lo-Word		
1116	Operating hours	Operating time [h]	u32
1117	Operating hours		
1118	Uptime	Operating time [s] during which the product is connected to the power supply	u32
1119	Uptime		
1540	Temperature (PCB), Hi-Word	Circuit board temperature [°C]	float
1541	Temperature (PCB), Lo-Word		
1542	Temperature (PCB), Hi-Word	Circuit board temperature [°F]	float
1543	Temperature (PCB), Lo-Word		
1544	Voltage (PCB), Hi-Word	Circuit board voltage [V]	float
1545	Voltage (PCB), Lo-Word		
1700	LED displays	FILTER CARTRIDGES status LED LED off = 0 LED 100% = 1 LED 50% = 2 LED flashes = 3	u16
1701	LED displays	SOLENOID VALVES status LED LED off = 0 LED 100% = 1 LED 50% = 2 LED flashes = 3	u16

Modbus address	Content	Description / explanation	Format
1702	LED displays	PISTON status LED LED off = 0 LED 100% = 1 LED 50% = 2 LED flashes = 3	u16
1703	LED displays	WLAN status LED LED off = 0 LED 100% = 1 LED 50% = 2 LED flashes = 3	u16
1704	LED displays	FILTER CARTRIDGE SELECTION status LED LED off = 0 LED 100% = 1 LED 50% = 2 LED flashes = 3	u16
1705	LED displays	DATA TRANSFER status LED LED off = 0 LED 100% = 1 LED 50% = 2 LED flashes = 3	u16
1706 1707 1708 1709	LED displays	STATUS BAR status LED 0/1/2/3 LED off = 0 LED 100% = 1 LED 50% = 2 LED flashes = 3	u16
1710 1711 1712 1713	LED displays	NUMBER OF FILTER CARTRIDGES LED 1/2/4/6 LED off = 0 LED 100% = 1 LED 50% = 2 LED flashes = 3	u16
1760	Digital Input	On-Off button Not activated = 0 Activated = 1	u16
1761	Digital Input	Menu button Not activated = 0 Activated = 1	u16

Modbus address	Content	Description / explanation	Format
1762	Digital Input	Start Menu button Not activated = 0 Activated = 1	u16
1763	Digital Input	Service button Not activated = 0 Activated = 1	u16
1764	Digital Input	Enter button Not activated = 0 Activated = 1	u16
3200	Error Flags	All error flags 1 = Error active 0 = Error inactive	u16
3201	Error1 Flag	General fault message, code flash 1 = Error active 0 = Error inactive	u16
3202	Error2 Flag	General fault message, configuration 1 = Error active 0 = Error inactive	u16
3203	Error3 Flag	General fault message, adjustment 1 = Error active 0 = Error inactive	u16
3204	Error4 Flag	General fault message, hardware fault 1 = Error active 0 = Error inactive	u16
3205	Error5 Flag	General fault message (1 ... 13) 1 = Error active 0 = Error inactive	u16
3206	Error6 Flag	General fault message (1 ... 4) 1 = Error active 0 = Error inactive	u16
3217	System error mode state	General fault message (1 ... 13)	u16
3218	System limp home mode state	General fault message (1 ... 4) Bit 1 = Warning message 1 Bit 2 = Warning message 2 Bit 3 = Warning message 3 Bit 4 = Warning message 4	u16

Modbus address	Content	Description / explanation	Format
3310	Cartridge operation time left	Filter cartridges, remaining service time [%]	float
3314	Piston operation time left	Piston, remaining service time [%]	float
3316	Piston operation count left	Piston, remaining switching cycles [%]	float
3318	Valve operation time left	Solenoid valves, remaining service time [%]	float
3322	Operating hours at last service	Operating time at last service [s]	u32
3410	Amount of cartridges	The set number of filter cartridges	u16

3.5.3.2 Read Device Identification (0x2B / 0x0E)

The extended function **Read Device Identification** is used to read out the following device-specific data.

Object ID	Alternate Input Register*1	Item name	Description / explanation	Format
0x00	6000 ... 6099	VendorName	Manufacturer	ASCII
0x01		ProductCode	Manufacturer's material number, circuit board	ASCII
0x02		MajorMinorRevision	Software version numbers*2	ASCII
0x03		VendorUrl	Manufacturer's website	ASCII
0x04		ProductName	Product name	ASCII
0x05		ModelName	Product variant	ASCII
0x06		UserApplicationName	Manufacturer's serial number, circuit board	ASCII
0x80	6100 ... 6199	n.a.	Production: Date of board test	ASCII
0x81		n.a.	Production: Date of board adjustment	ASCII
0x82		n.a.	Production: Date of board calibration	ASCII
0x83		n.a.	Production: free	ASCII
0x85	6200 ... 6298	n.a.	Manufacturer's material number, product	ASCII
0x86		n.a.	Manufacturer's serial number, product	ASCII

*1 ASCII strings are separated by 0x00. Unused characters at the ends of strings are filled with 0x00.

*2 Legend: APP = Application
BBS = BEKO basic software
CFG = Configuration

3.5.3.3 Modification of interface parameters

This procedure is used to change interface parameters required for communication.

1. Write a value of 0xAC1D (decimal: 44061) to holding register 0x1392 (decimal: 5010).
2. Write the parameter to the holding register 0x07D0 (Decimal: 2000).

	Description / explanation
HighByte:	See the following table
LowByte:	Modbus server address 1 ... 246
Example value:	0x070A (Decimal: 1802) Interface parameters see table Index 0x07 (Decimal: 7) Client address 0x0A (decimal: 10)

3. To save the settings, write a value of 0xBA5E (decimal: 47710) to holding register 0x139C (decimal: 5020).
4. Switch the product off and on again.
   → The changes take effect approx. 10 seconds after the restart.

HighByte			
Selection	Baud Rate [Bd]	Parity	Stop Bit
0x00	4800	No	2
0x01	4800	Even	1
0x02	4800	Odd	1
0x03	9600	No	2
0x04	9600	Even	1
0x05	9600	Odd	1
0x06	19200	No	2
0x07	19200	Even	1
0x08	19200	Odd	1
0x09	38400	No	2
0x0A	38400	Even	1
0x0B	38400	Odd	1

HighByte			
Selection	Baud Rate [Bd]	Parity	Stop Bit
0x0C	57600	No	2
0x0D	57600	Even	1
0x0E	57600	Odd	1
0x0F	76800	No	2
0x10	76800	Even	1
0x11	76800	Odd	1
0x12	115200	No	2
0x13	115200	Even	1
0x14	115200	Odd	1

3.5.3.4 Error messages

Error code	Error message	Description / explanation
01	ILLEGAL FUNCTION	Function not implemented
02	ILLEGAL DATA ADDRESS	Requested address out of valid range
03	ILLEGAL DATA VALUE	Faulty data
04	SERVER DEVICE FAILURE	Unrecoverable error occurred during the request

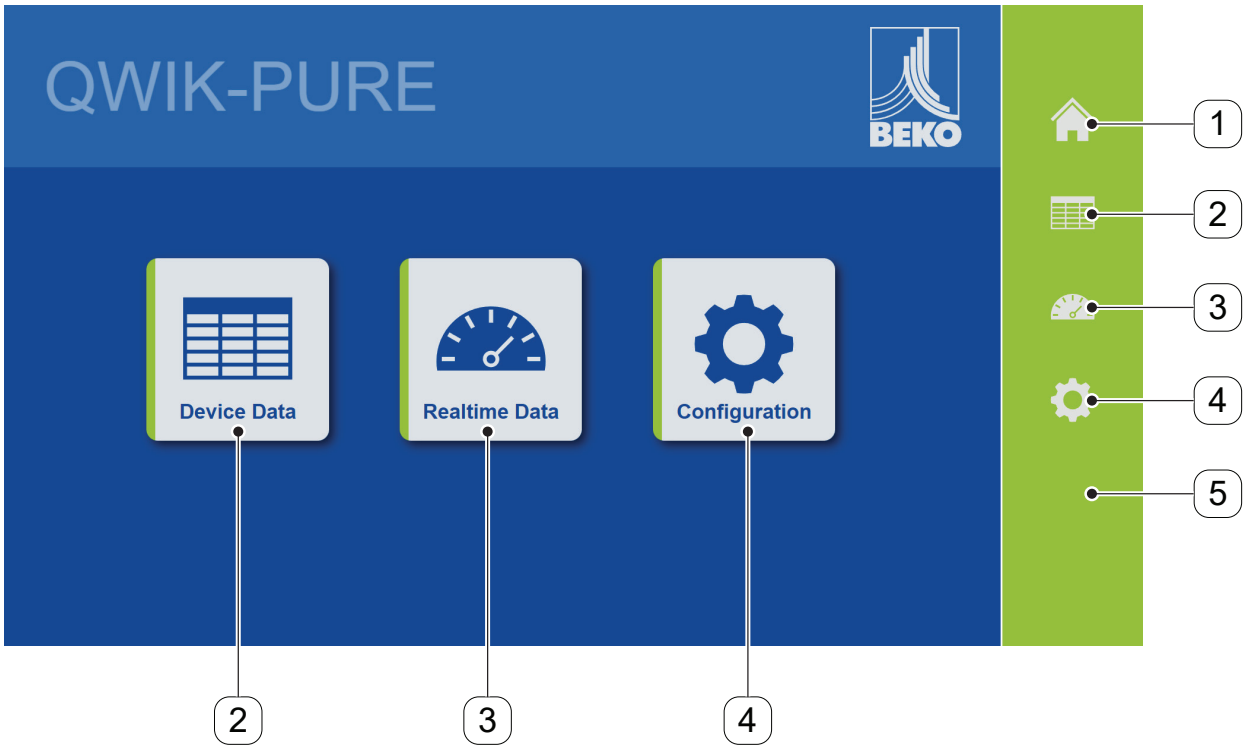
3.6 WLAN function

The **FRC** features an integrated password-protected WLAN interface through which the following functions can be called on the **FRC**:

- Display device data
- Showing operating data in real time
- Change **FRC** settings

INFORMATION	Activating the WLAN interface
	The process for activating the WLAN interface is described in the “Activating the WLAN” section (please refer to section “9.2.6 Activating the WLAN” on page 87).

3.6.1 Home

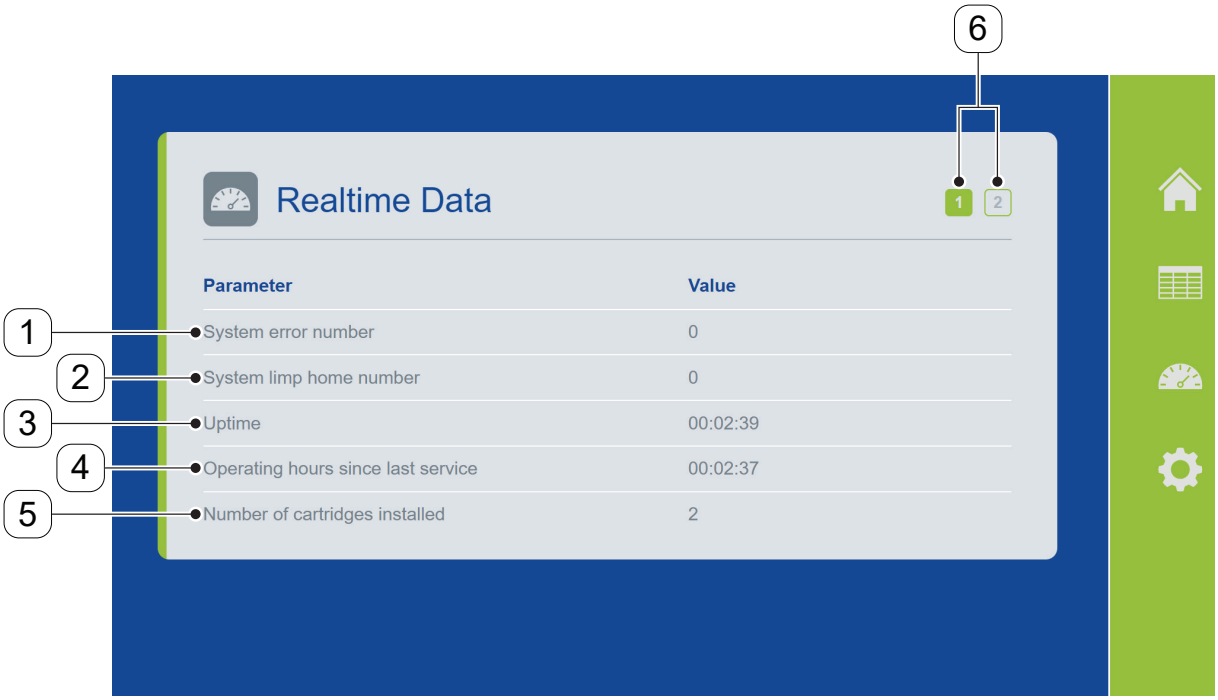


No.	Menu	Description / explanation
[1]	Home	Start menu
[2]	Device Data	Menu for showing device data
[3]	Realtime Data	Menu for showing operating data in real time
[4]	Configuration	Menu for configuring interface parameters
[5]	Task bar	Task bar for navigating between the individual menus

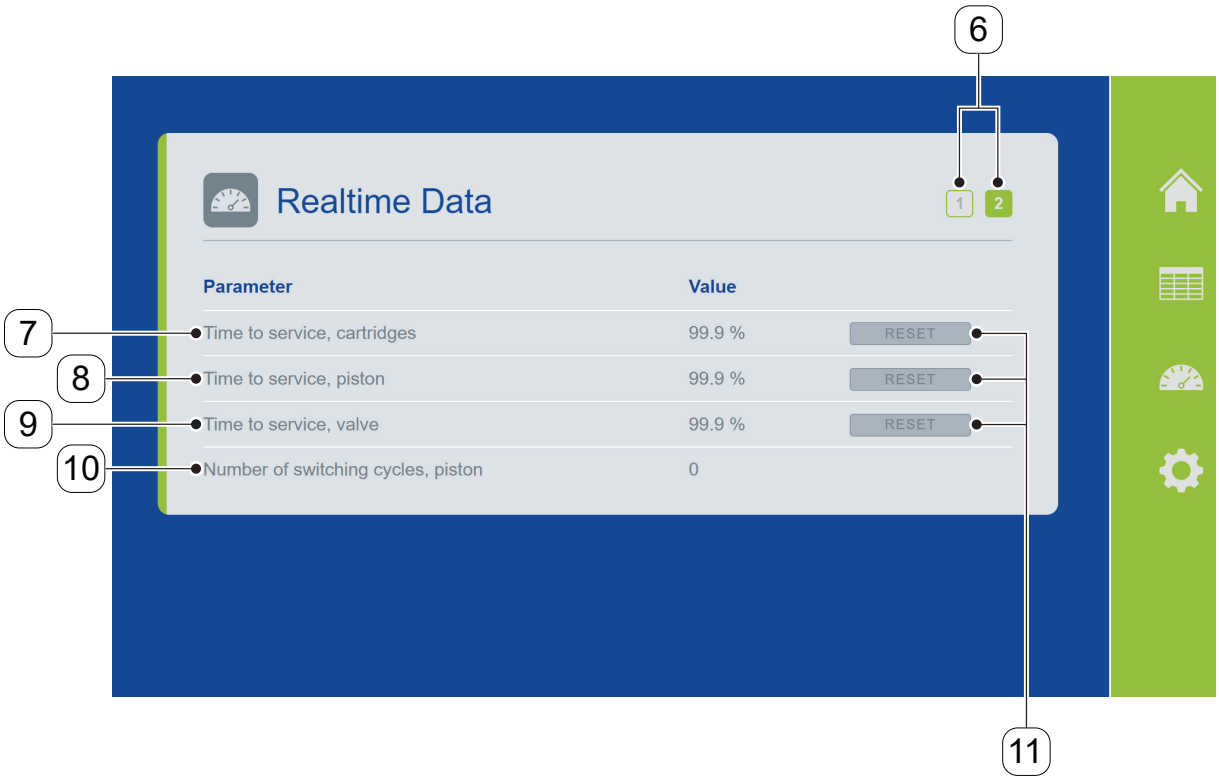
3.6.2 Device Data

No.	Content	Description / explanation
[1]	Firmware version	Firmware version number
[2]	Website version	Web interface version number
[3]	Board serial number	Circuit board serial number
[4]	Device SAP number	Device material number
[5]	Device serial number	Device serial number

3.6.3 Realtime Data

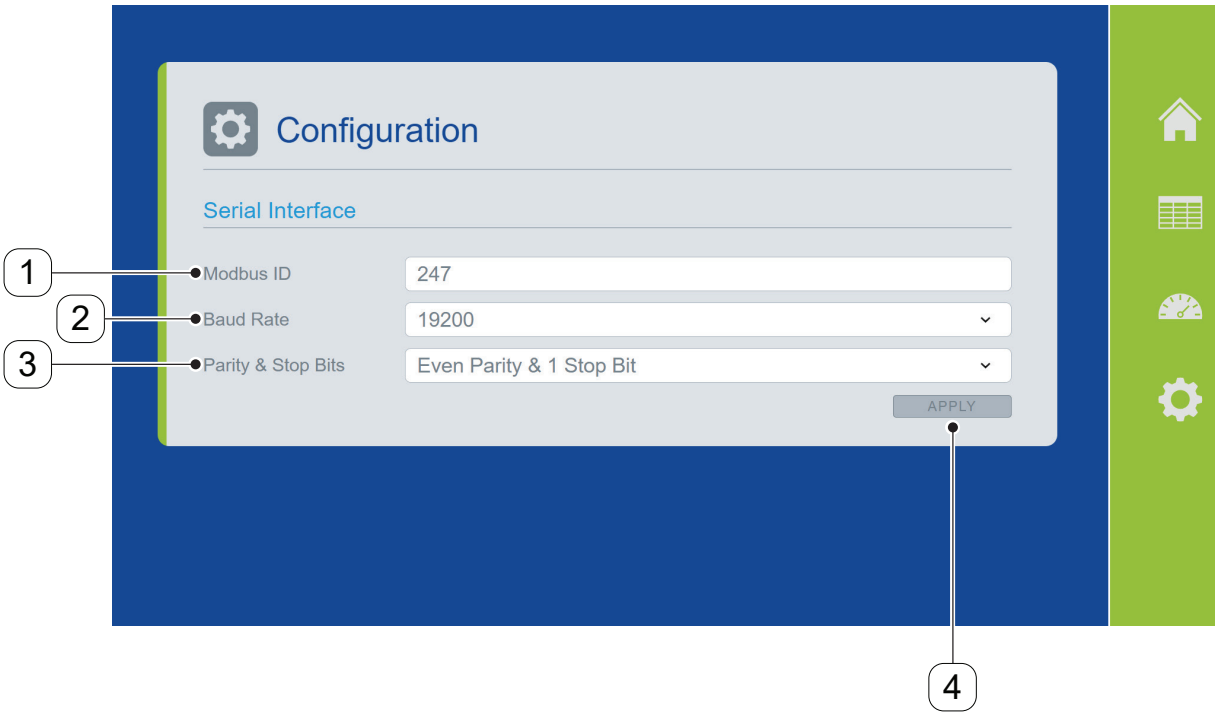


No.	Content	Description / explanation
[1]	System Error number	Displays the number of the fault message in question. 0 = there is no fault message.
[2]	System limp home number	Displays the number of the warning message in question. 0 = there is no warning message.
[3]	Uptime	Operating time [hh:mm:ss] during which the product is connected to the power supply
[4]	Operating hours since last service	Operating time since last service [hh:mm:ss]
[5]	Number of cartridges installed	Number of filter cartridges installed
[6]	Page	Indicates the current menu page



No.	Content	Description / explanation
[6]	Page	Indicates the current menu page
[7]	Time to service, cartridges	Service time remaining until filter cartridge needs to be changed [%]
[8]	Time to service, piston	Service time remaining until piston needs to be changed [%]
[9]	Time to service, valve	Service time remaining until solenoid valve needs to be changed [%]
[10]	Number of switching cycles, piston	Number of switching cycles, piston
[11]	Reset	Press this button to reset the counter to 100%.

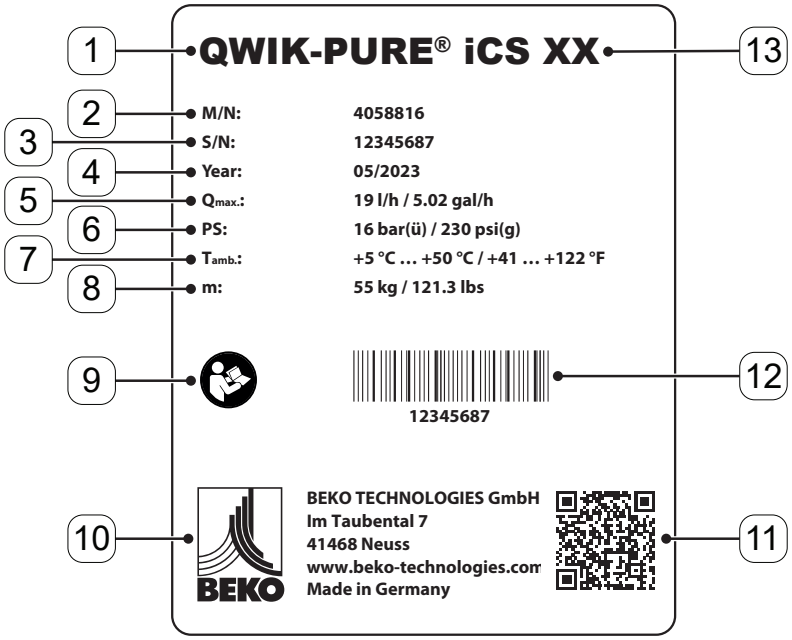
3.6.4 Configuration



No.	Content	Description / explanation
[1]	Modbus ID	Input server address 247 (factory setting)
[2]	Baud Rate	Drop-down list for selecting baud rate • 4800 • 9600 • 19200 (factory setting) • 38400 • 57600 • 76800 • 115200
[3]	Parity & Stop Bits	Drop-down list for selecting parity and stop bits • No parity & 2 stop bits • Even parity & 1 stop bit (factory setting) • Odd parity & 1 stop bit
[4]	Apply	Press this button to apply all settings.

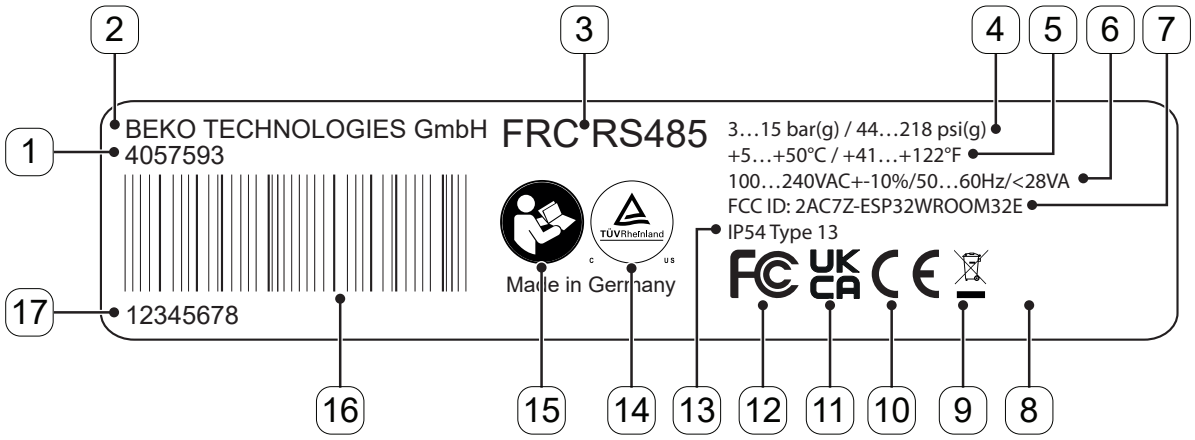
3.7 Type plate

3.7.1 QWIK-PURE® iCS 550 ... 3300



No.	Description / explanation
[1]	Product name
[2]	Material number
[3]	Serial number
[4]	Month and year of manufacture
[5]	Maximum condensate flow rate
[6]	Maximum operating pressure
[7]	Ambient temperature
[8]	Maximum operating weight
[9]	“Read and understand the installation and operating manual” instruction symbol
[10]	Manufacturer contact information
[11]	QR code for downloading the product-specific documentation
[12]	Bar code
[13]	Size (e.g. 550)

3.7.2 FRC control unit



No.	Description / explanation
[1]	Material number
[2]	Manufacturer name
[3]	Device name
[4]	Operating pressure
[5]	Operating temperature
[6]	Supply voltage / frequency range / maximum power consumption
[7]	FCC approval number
[8]	Marking for the disposal of electrical and electronic equipment
[9]	Approval mark
[10]	Approval mark
[11]	Approval mark
[12]	Degree of protection
[13]	Approval mark
[14]	“Read and understand the installation and operating manual” instruction symbol
[15]	Bar code
[16]	Serial number

3.8 Scope of delivery

INFORMATION	Scope of delivery
	The size and further delivery details are provided in the contractual documents.

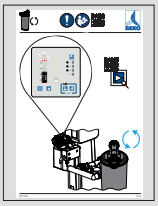
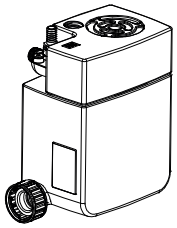
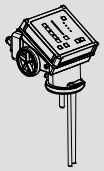
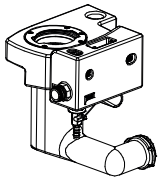
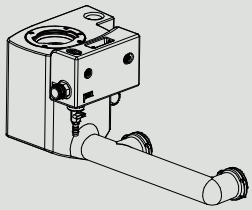
Figure	Description / explanation	QWIK-PURE®iCS			
		550	1100	2200	3300
	Quick Start Guide	1	1	1	1
	Quick Guide	1	1	1	1
	Pressure relief chamber	1	1	1	1
	Flow Regulation Controller (**FRC**), control unit	1	1	1	1
	2.5 l (0.66 gal) measuring chamber, with clean water tank	1	—	—	—
	5 l (1.32 gal) measuring chamber, with clean water tank	—	1	1	1

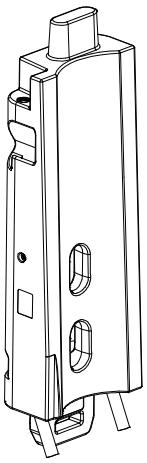
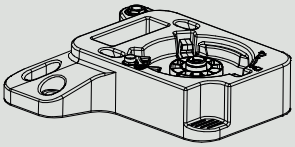
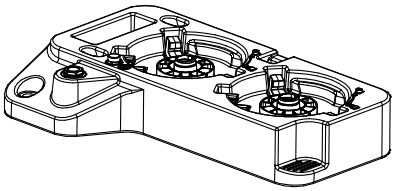
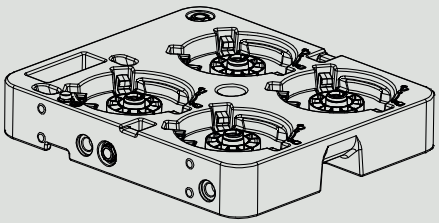
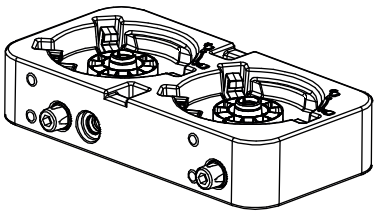
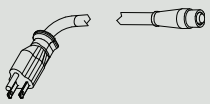
Figure	Description / explanation	QWIK-PURE®iCS			
		550	1100	2200	3300
	Foot	1	1	1	1
	Collector 1 x 1 filter cartridge	1	—	—	—
	Collector 1 x 2 filter cartridges	—	1	—	—
	Collector 2 x 2 filter cartridges	—	—	1	1
	Expansion module 1 x 2 filter cartridges	—	—	—	1
	Filter cartridge	1	2	4	6

Figure	Description / explanation	QWIK-PURE®iCS			
		550	1100	2200	3300
	Elbow connector with union nut and flat gasket	1	1	1	1
	Fixing screw	1	1	1	1
	Riser duct	1	1	1	1
	End cap	1	2	2	2
	Locking device, foot	1	1	1	1
	Locking unit, expansion module	—	—	—	1
	Connecting pipe, expansion modules	—	—	—	1
	Reference turbidity tube 5 mg/l (5 ppm) / 10 mg/l (10 ppm)	2	2	2	2
	Vaseline	1	1	1	1
	Power supply cable with M12 connector with S keying and IEC Type B, NEMA 5-15 connector	1	1	1	1

4. Technical data

4.1 QWIK-PURE® iCS operating parameters

Parameters	QWIK-PURE® iCS			
	550	1100	2200	3300
Relative ambient air humidity	≤10 ... 80 %, without condensation			
Maximum operating altitude above sea level*1	2000 m 2187.23 yd			
Maximum operating pressure at condensate inlet	16 bar(g) 230 psi(g)			
Minimum / maximum operating temperature, fluids and environment	+5 ... +50 °C +41 ... +122 °F			
Maximum condensate flow rate*2	19 l/h 5.02 gal/h	38 l/h 10.04 gal/h	76 l/h 20.08 gal/h	114 l/h 30.12 gal/h
Condensate inlet port	3 x G1/2", male, 1 x G1", male, barbed hose fitting: 1 x 25 mm (0.98 in), male, 1 x 13 mm (0.52 in), male			
Condensate outlet port	25 mm (0.98 in), male, barbed hose fitting			
Media	Compressor condensate, oil-contaminated			
Maximum operating weight	55 kg 121.3 lbs	100 kg 220.5 lbs	180 kg 396.8 lbs	250 kg 551.2 lbs
Maximum oil concentration at condensate drain port*2	10 mg/l 10 ppm			

*1 Will continue to operate up to a maximum of 3000 m (3280.84 yd) above sea level

*2 Provided that the reference conditions published by DIBt (Deutsches Institut für Bautechnik) are adhered to

4.2 FRC operating parameters

Parameters	FRC control unit
Relative ambient humidity	≤10 ... 80 %, without condensation
Maximum operating altitude above sea level*1	2000 m 2187.23 yd
Min. / max. operating pressure*1, compressed air	3 ... 15 bar(g) 44 ... 218 psi(g)
Contamination class*2, compressed air	[2 : 4 : 2]
Minimum / maximum operating temperature, fluids and environment	+5 ... +50 °C +41 ... +122 °F
Connection, compressed air	Barbed hose fitting 8 mm (0.31 in), male
Operating voltage	90 ... 264 VAC / 24 VDC
Frequency range	50 ... 60 Hz
Power consumption	28 VA
Protection rating	IP54
Enclosure rating (UL50E)	Type 13
Overvoltage category (IEC 61010-1)	I
Pollution degree (IEC 61010-1)	2
Recommended cable diameter, power supply	8 ... 10 mm 0.32 ... 0.33 in
Recommended wire cross-section, power supply	0.75 ... 1.5 mm² 20 ... 16 AWG
Recommended cable type, power supply	EU: H05VV-F 3G US: SJT
Recommended maximum cable length, power supply	3 m 10 ft
WLAN standard	IEEE 802.11 n/g/b
WLAN frequency range	2.4 GHz (24120 ... 2462 MHz)
Maximum WLAN transmission power	19.5 dBm / 89 mW
WLAN encryption	WPA2-PSK

*1 Will continue to operate up to a maximum of 3000 m (3280.84 yd) above sea level at operating pressures ≤4 bar(g)

*2 Contamination class in conformity with ISO 8573-1

4.3 Storage parameters

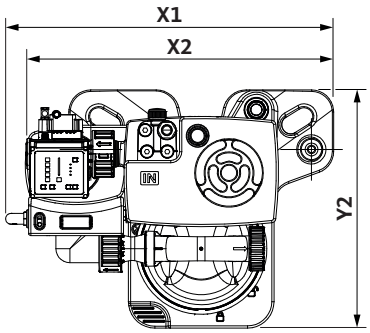
Parameters	QWIK-PURE® iCS			
	550	1100	2200	3300
Minimum / maximum temperature	+5 °C ... +50 °C +33.8 °F ... +122 °F			
Relative ambient air humidity	≤10 ... 80 %, without condensation			
Empty weight	16 kg 35.3 lbs	35 kg 77.2 lbs	45 kg 99.2 lbs	60 kg 132.3 lbs

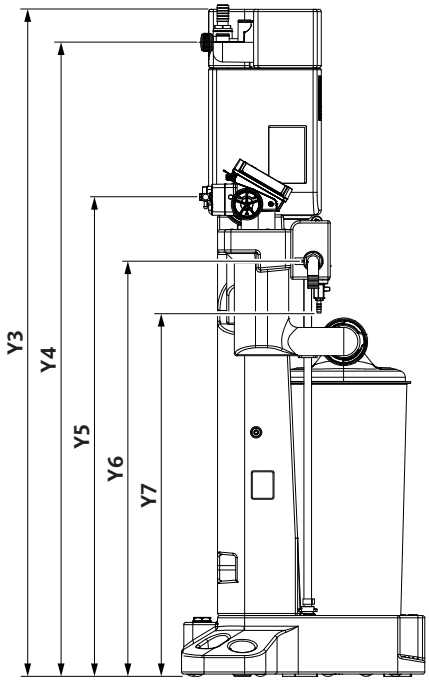
4.4 Materials

Component	Material
Filter cartridge	Plastic blend and cellulose
FRC	Plastic blend and electronics
Pressure relief chamber	PE
Condensate inlet	PA/PP/VA
Measuring chamber	PE
Clean water tank	PE
Foot	PE
Collector	PE
Additional module	PE

4.5 Dimensions

4.5.1 QWIK-PURE® iCS 550

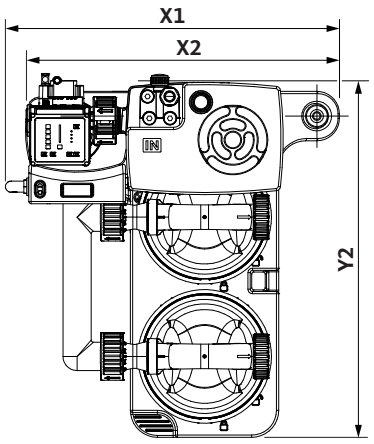


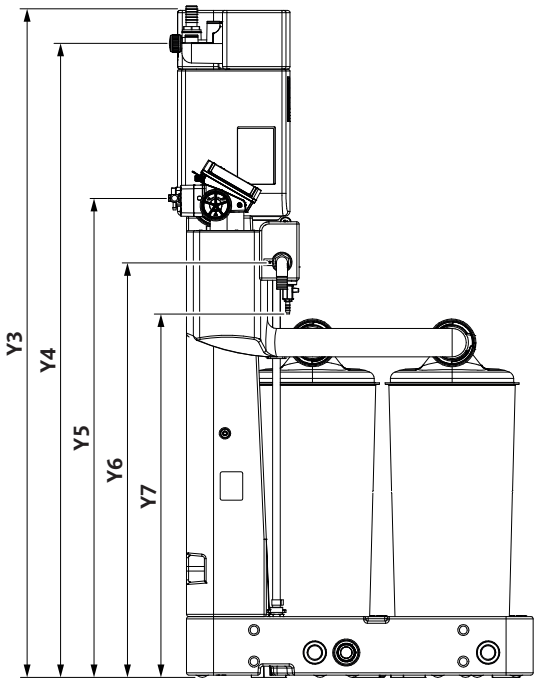


No.	[mm]	[in]
[X1]	744	29.29
[X2]	699	27.52
[X3]	--	--
[Y1]	--	--
[Y2]	540	21.26

No.	[mm]	[in]
[Y3]	1482	58.35
[Y4]	1408	55.43
[Y5]	1065	41.93
[Y6]	922	36.30
[Y7]	807	31.78

4.5.2 QWIK-PURE® iCS 1100

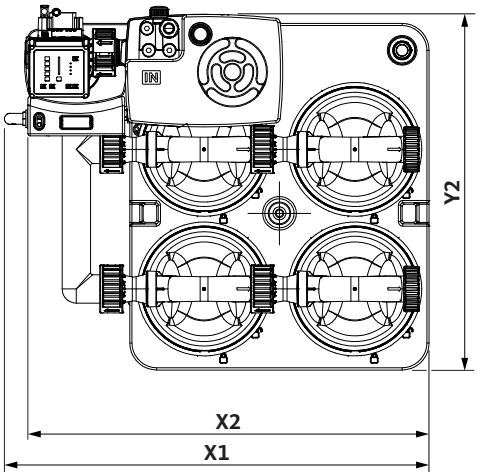


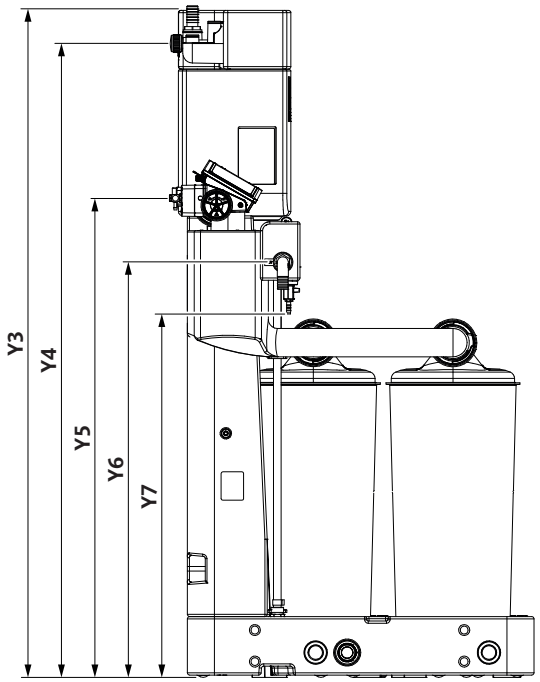


No.	[mm]	[in]
[X1]	744	29.29
[X2]	699	27.52
[X3]	--	--
[Y1]	--	--
[Y2]	790	31.10

No.	[mm]	[in]
[Y3]	1482	58.35
[Y4]	1408	55.43
[Y5]	1065	41.93
[Y6]	922	36.30
[Y7]	807	31.78

4.5.3 QWIK-PURE® iCS 2200

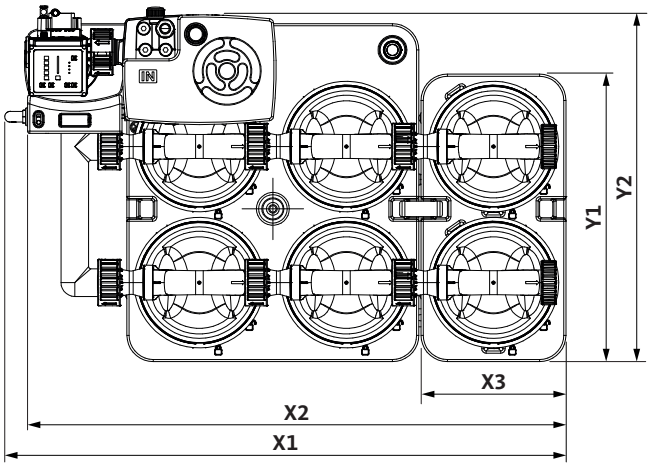


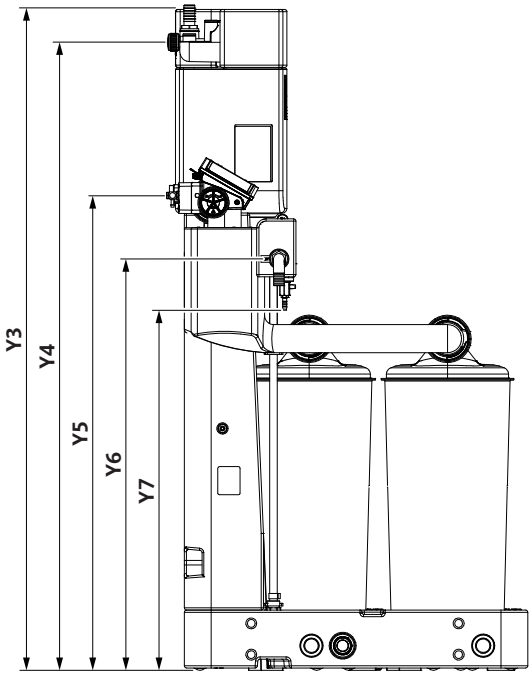


No.	[mm]	[in]
[X1]	943	37.13
[X2]	899	35.39
[X3]	--	--
[Y1]	--	--
[Y2]	790	31.10

No.	[mm]	[in]
[Y3]	1482	58.35
[Y4]	1408	55.43
[Y5]	1065	41.93
[Y6]	922	36.30
[Y7]	807	31.78

4.5.4 QWIK-PURE® iCS 3300

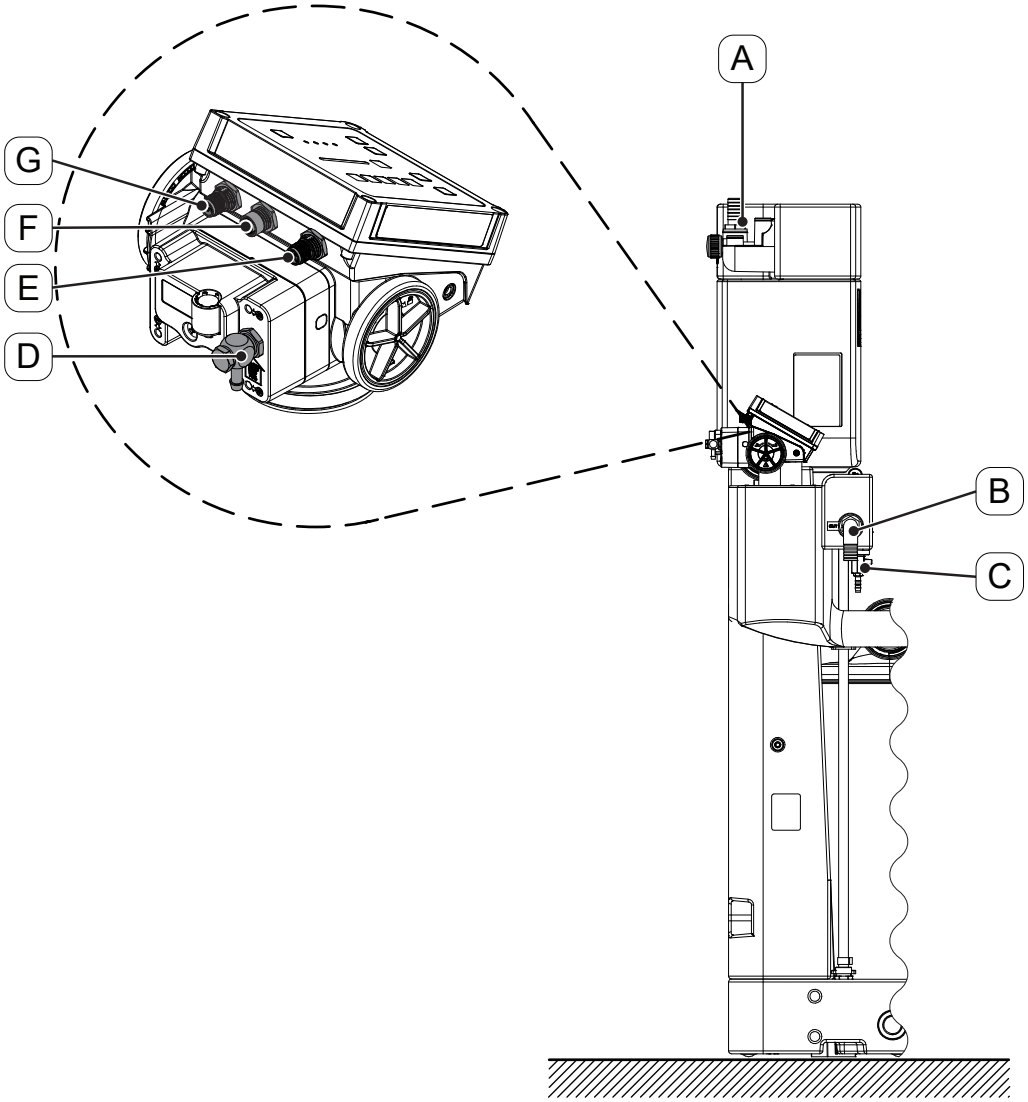




No.	[mm]	[in]
[X1]	1278	50.32
[X2]	1234	48.58
[X3]	335	13.19
[Y1]	655	25.79
[Y2]	790	31.10

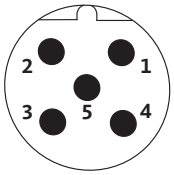
No.	[mm]	[in]
[Y3]	1482	58.35
[Y4]	1408	55.43
[Y5]	1065	41.93
[Y6]	922	36.30
[Y7]	807	31.78

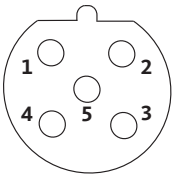
4.6 Connections

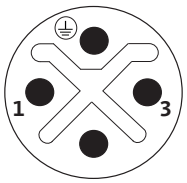


No.	Connection	Qty.	Description / explanation
[A]	25 mm (0.98 in)	1	Hose connection, connection for the condensate inlet
	13 mm (0.52 in)	1	Hose connection, connection for the condensate inlet
	G1/2"	2	Connection for the condensate inlet
[B]	25 mm (0.98 in)	1	Elbow connector, connection for draining the purified condensate
[C]	12 mm (0.47 in)	1	Service valve and hose connection
[D]	8 mm (0.32 in)	1	Elbow connector, connection for compressed air
[E]	M12	1	Plug, connection for external power supply
[F]	M12	1	Plug, connection for Modbus output
[G]	M12	1	Plug, connection for Modbus input

4.7 Pinouts

Modbus input				
Figure	**Device connection [G]**	**Pin**	**Signal**	**Description / explanation**
	M12, external thread B keying, male	1	VP	+5 VDC, power for bus connection
		2	Data +	RS485-A, data line
		3	GND	Earth connection
		4	Data -	RS485-B, data line
		5	V+	+24 VDC, supply voltage

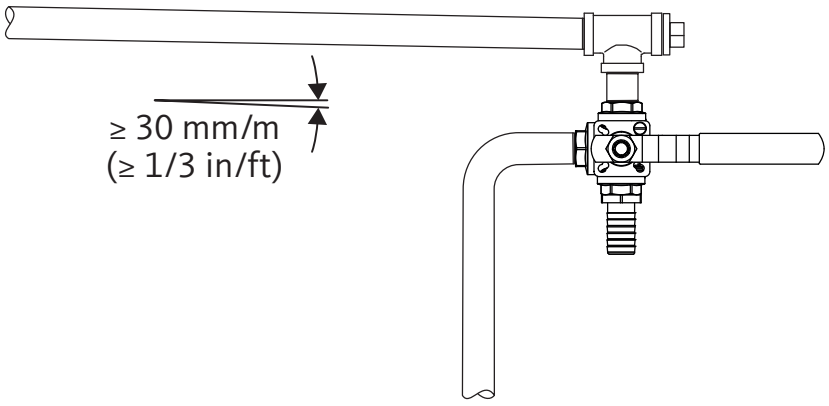
Modbus output				
Figure	**Device connection [F]**	**Pin**	**Signal**	**Description / explanation**
	M12, internal thread B keying, female	1	VP	+5 VDC, power for bus connection
		2	Data +	RS485-A, data line
		3	GND	Earth connection
		4	Data -	RS485-B, data line
		5	V+	+24 VDC, supply voltage

External power supply				
Figure	**Device connection [E]**	**Pin**	**Signal**	**Description / explanation**
	M12, internal thread S keying, male	1	L	Phase
		2	--	Not used
		3	N	Neutral conductor
			PE	Grounding conductor

4.8 Installation conditions

Observe the following conditions when setting up and selecting the place of installation:

- The place of installation must meet the following conditions:
  - → Indoors
  - → Protected from mechanical loads
  - → Protected from splash water
  - → Protected from direct sunlight and areas exposed to heat sources
  - → Protected from frost
  - → Outside of hazardous locations
- The setup area must be level (gradient ≤10 mm/m (1/8 in/ft)) and smooth.
- The setup area's load capacity must be suitable for the maximum operating weight of the product (please refer to section "4.1 QWIK-PURE® iCS operating parameters" on page 45).
- The mounting surface must be sealed, or a suitable spill protection basin must be in place.
  - → In the event of damage, no untreated condensate or oil may get into the sewer system or the soil.
  - → All locally applicable legal requirements and regulations regarding the protection of bodies of water must be complied with.
- Bumper guards must be installed if the product is being set up in the vicinity of traffic routes.
- A compressed air supply line provided by the customer must be available and equipped with a maintenance unit (pressure reducer and filter).
- The cross-sectional area of the condensate collection line must be greater than G1" (Ø = 25 mm).
- Route the condensate collection line with a downward gradient ≥30 mm/m (1/3 in/ft) to where the product is being installed.
- The manufacturer recommends installing a P-trap at the wastewater connection in order to prevent unpleasant odors.
- The manufacturer recommends installing a 3-way valve at the tapping point on the condensate collection line to divert the condensate inlet into a separate container during maintenance work.
- The power supply must have a disconnect device that is easily accessible in the proximity of the product. This disconnect device must disconnect all live cables.



Example

5. Transportation and storage

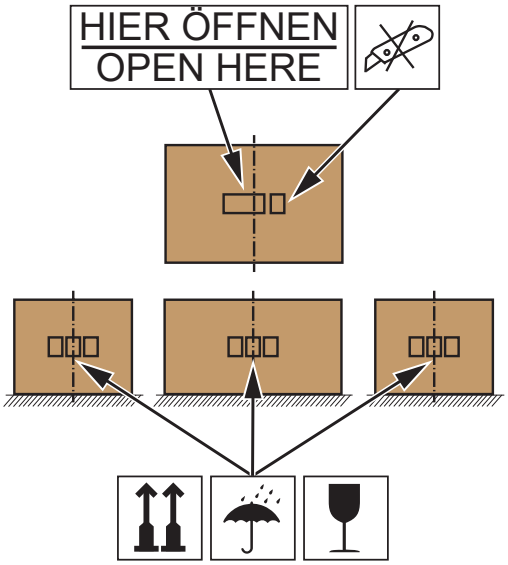
Personnel
Skilled technical personnel specialized in transportation and storage (see section “2.3 Target group and personnel” on page 9)

5.1 Warning notices

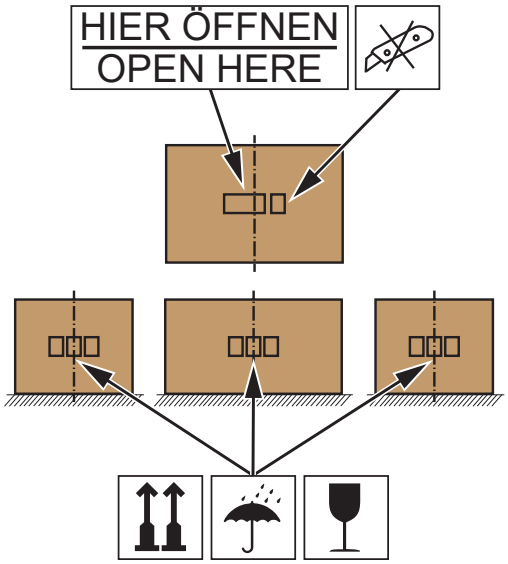
CAUTION	Improper transportation or storage
	Improper transportation or storage may result in personal injury.
	• Use personal protective equipment for all work with packaging material. • Handle packaging, the product and accessories carefully. • Use only proper transportation, lifting and lashing equipment that is in proper working order.

NOTICE	Handling packaging materials
	Inappropriate disposal of packaging materials can cause environmental damage.
	• Dispose of the packaging material in accordance with the applicable legal requirements and provisions of the country and place of use.

5.2 Transportation

Transportation work	
Figure	Description / explanation
	• Pack the product and accessories exclusively in their original packaging or with padding and other suitable materials that will prevent shocks. • Transport and handle the product and accessories according to the markings on the packaging. • Secure the product and accessories in an upright position on a pallet so that they will not fall or shift during transportation. • Do not tilt the product or the accessories.

5.3 Storage

Storage work	
Figure	**Description / explanation**
	• Only store the product and accessories in their original, undamaged packaging. • Observe the storage conditions in section “4.3 Storage parameters”. • The storage location is dry, frost-free and lockable. • Protect the product and accessories from external weather influences, direct sunlight and sources of heat. • Secure the product and accessories at the storage location so that they will not topple over or vibrate.

6. Installation

Personnel
Skilled technical personnel – pressure equipment and systems (please refer to section 2.3, “Target group and personnel” on page 8)

6.1 Warning notices

DANGER	Sudden escape of pressurized fluids
	There is a danger of death or serious personal injury resulting from contact with fast or suddenly escaping fluids or through bursting system parts.
	• Before starting work, depressurize the pressurized system and secure it against unintentional pressurization. • Assemble all pipes and hoses free of mechanical stress.

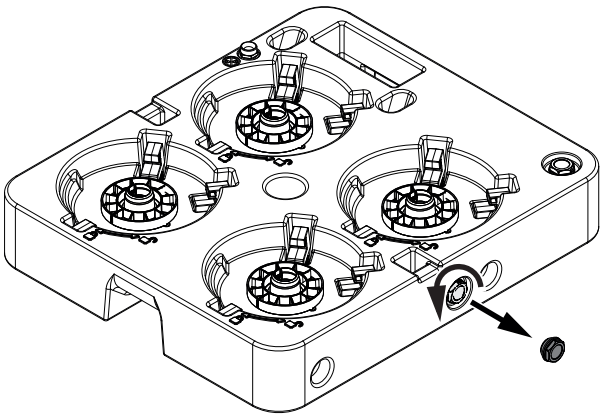
6.2 Installation work

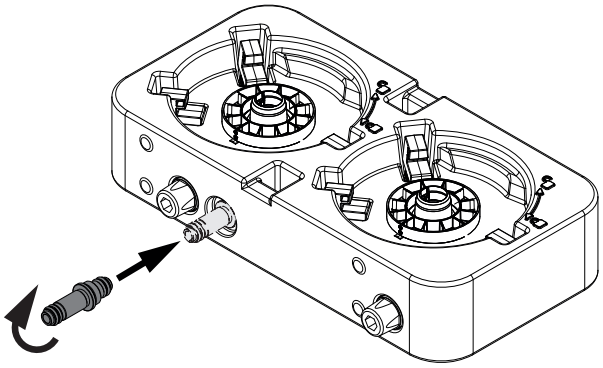
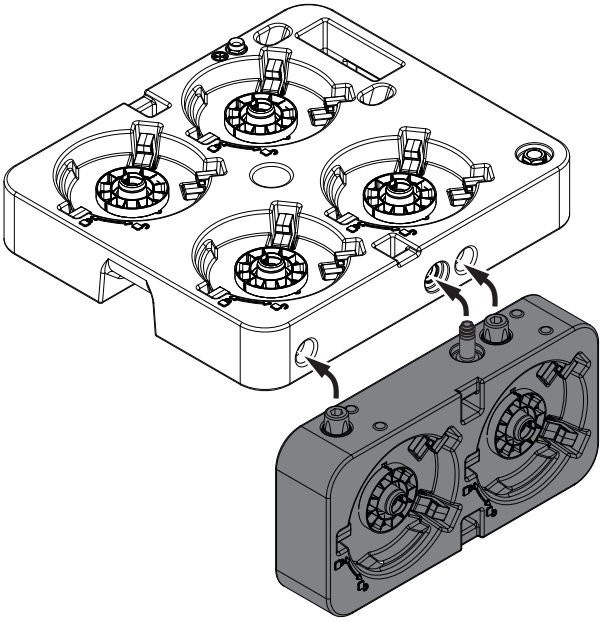
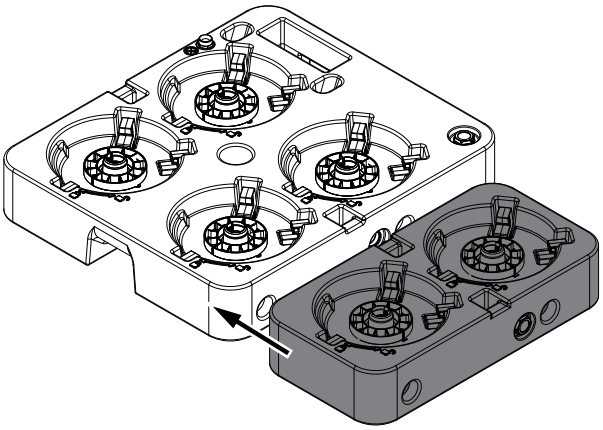
For installation work to be carried out, the following prerequisites must be fulfilled and the preparatory tasks must have been completed.

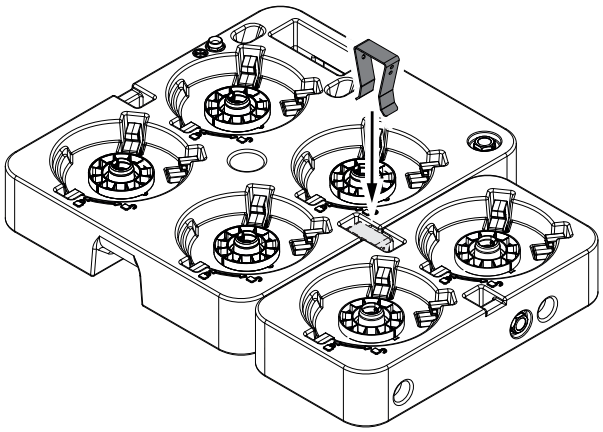
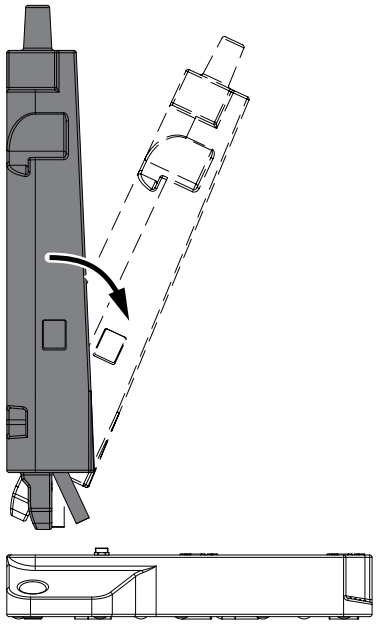
Prerequisites		
Tools	**Material**	**Protective equipment**
• Adjustable wrench • Water pump pliers • Spirit level	• Sealing material (e.g. PTFE tape) for sealing the condensate connections provided by the customer • Hose clamps • Hose for condensate and compressed air • Vaseline supplied	**To be worn at all times:** 

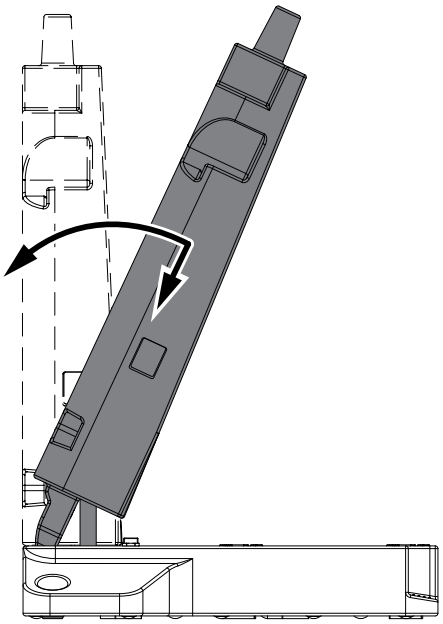
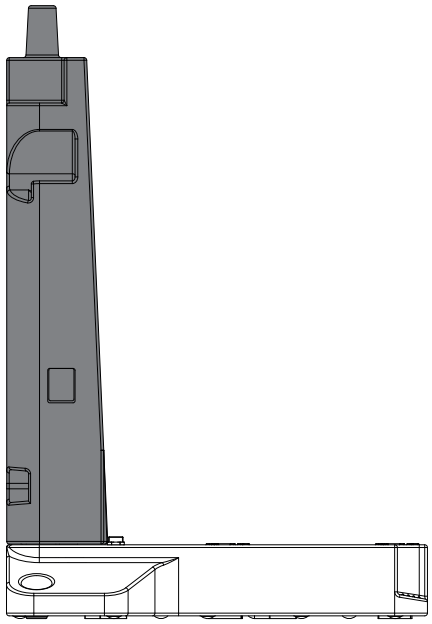
Preparation work	
1.	Select and set up the place of installation according to the specifications in section “4.8 Installation conditions” on page 54.
2.	The condensate inlet line provided by the customer must be depressurized and locked and tagged out to prevent unintentional pressurization.
3.	Have the necessary tools and materials ready.
4.	Prepare the required connection materials suitable for the pressure and temperature range.
5.	Check the product for damage. Use the product only in undamaged condition.

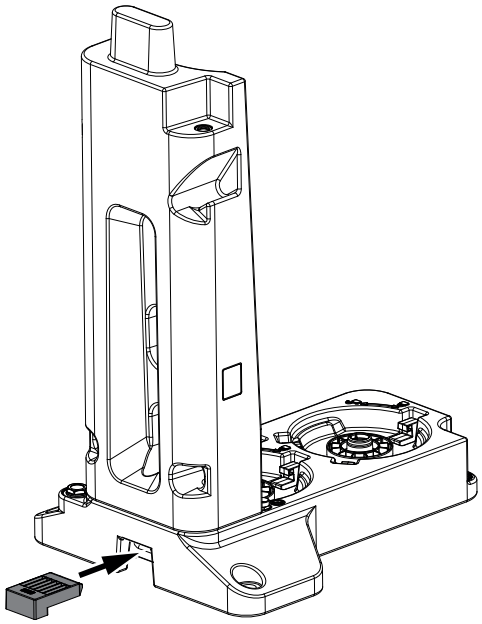
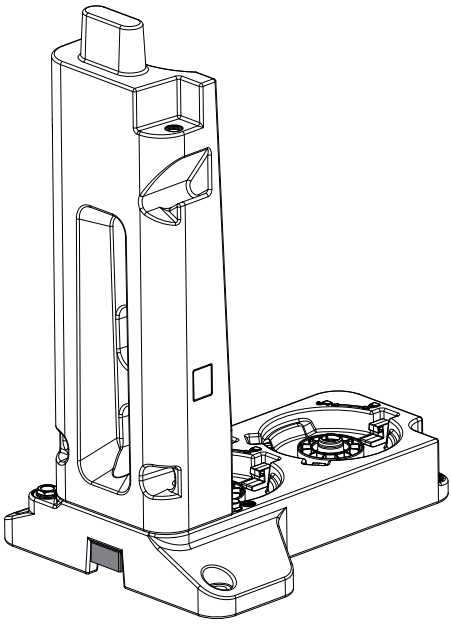
INFORMATION	QWIK-PURE® iCS 550 ... 2200 assembly
	Start assembling the **QWIK-PURE® iCS 550 ... 2200** from step 8. The collector of the **QWIK-PURE® iCS 550 ... 2200** is delivered ready for installation. Skip steps 1 through 7.

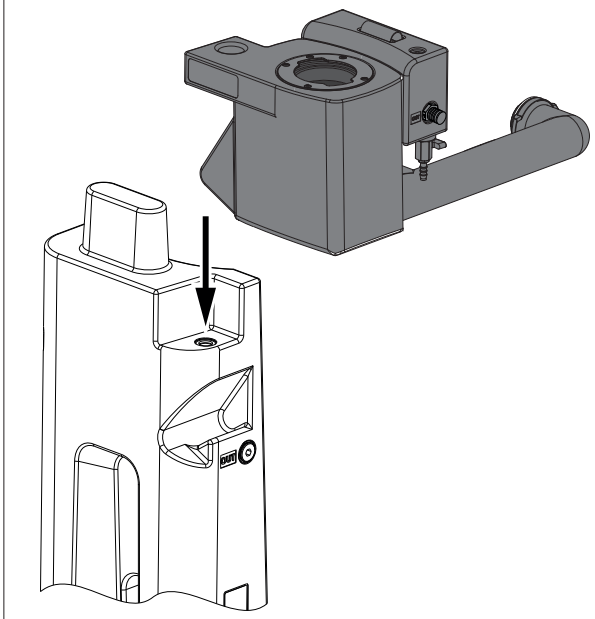
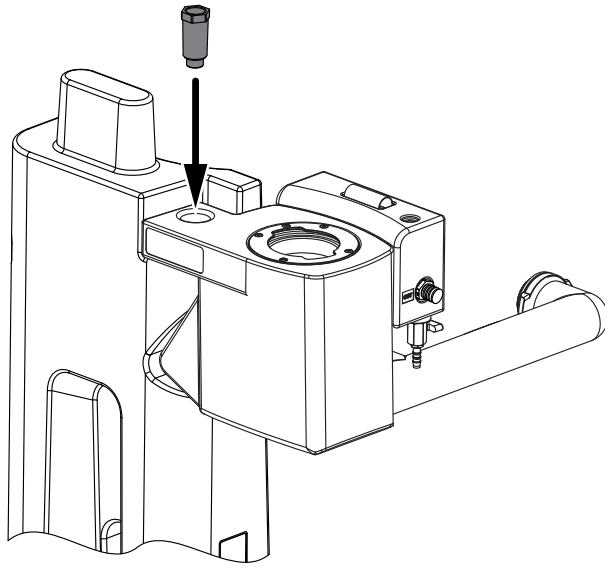
Installation work	
Figure	**Description / explanation**
	1. Position the collector on a flat surface. 2. Remove the plug from the collector’s expansion connection anticlockwise.

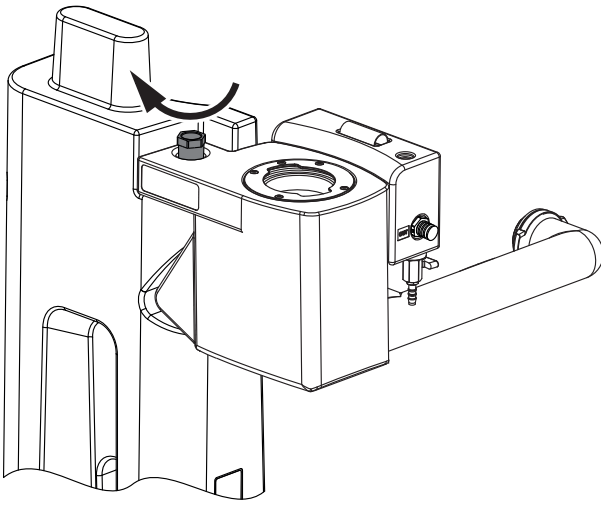
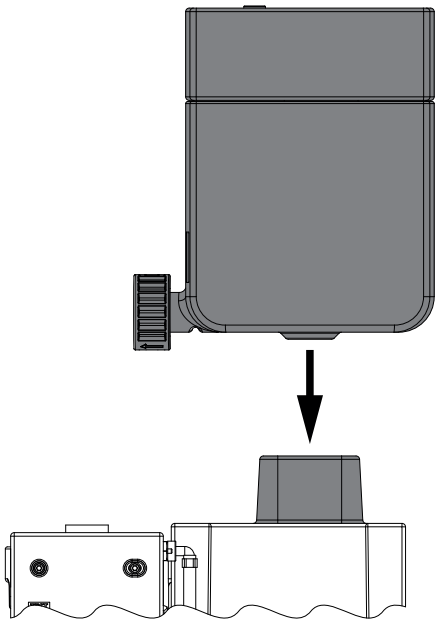
Installation work	
Figure	**Description / explanation**
	3. Insert the connecting pipe into the expansion module. 4. Screw in the connecting pipe clockwise by hand all the way and tighten hand-tight.
	5. Align the expansion module with the collector. → Insert the connecting pipe into the collector's expansion connection. → Insert the expansion module's positioning pins into the position openings on the collector.
	6. Push the expansion module and the collector together. → The expansion module must fully abut the collector.

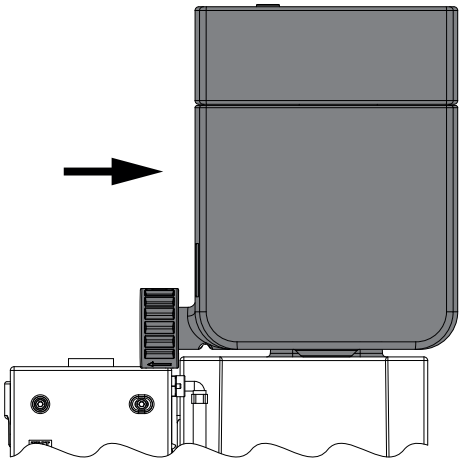
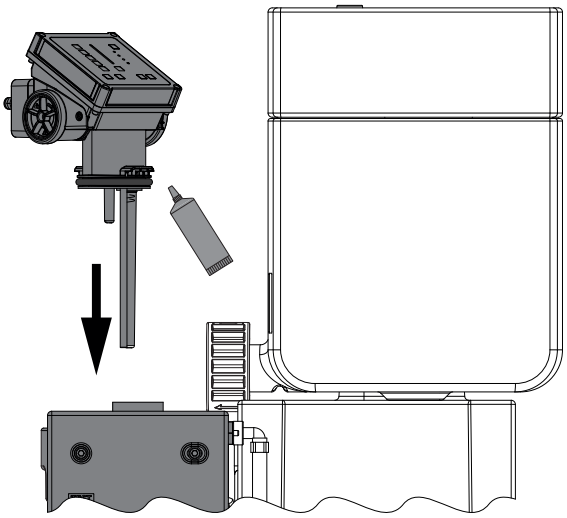
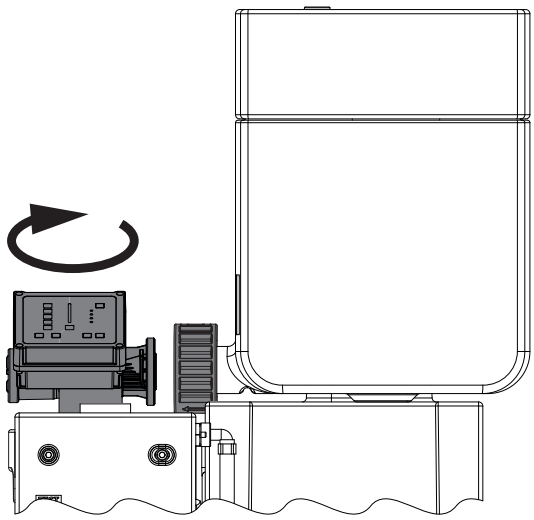
Installation work	
Figure	**Description / explanation**
	7. Insert the locking unit and push it down all the way.
	8. Position the collector on a flat surface at the installation location. 9. Align the foot with the positioning tubes facing downwards and position it over the assembly opening. 10. Tilt the upper end of the foot towards the filter cartridge holder until the positioning tubes are vertical.

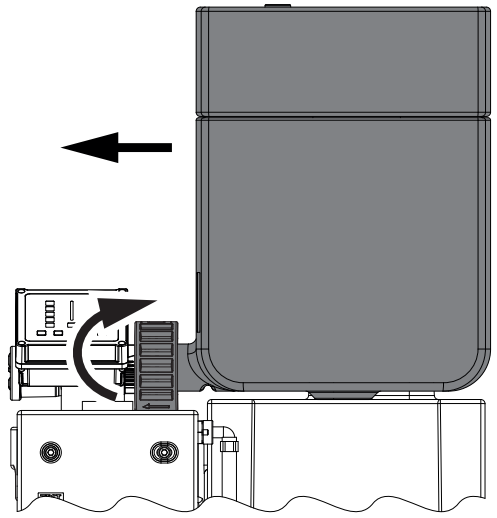
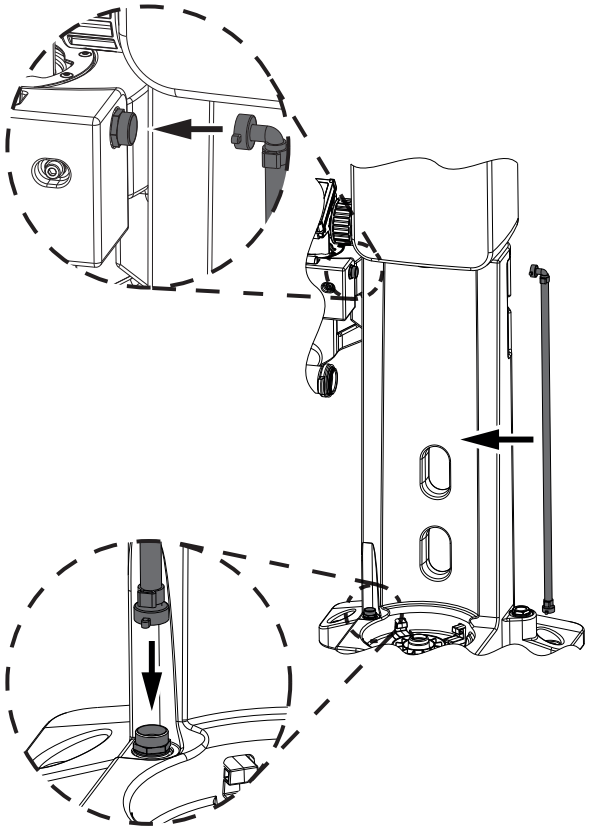
Installation work	
Figure	**Description / explanation**
	11. Carefully insert the foot into the installation openings while straightening it at the same time.
	

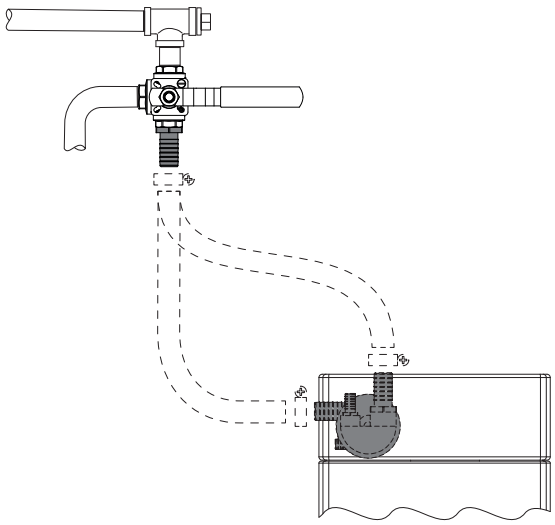
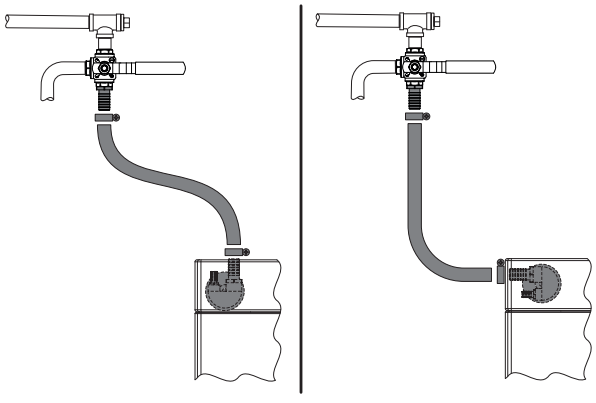
Installation work	
Figure	**Description / explanation**
	12. Align the locking device with the heel facing downwards and insert it into the locking device opening in the collector.
	13. Press the locking device into the locking device opening as far as it will go.

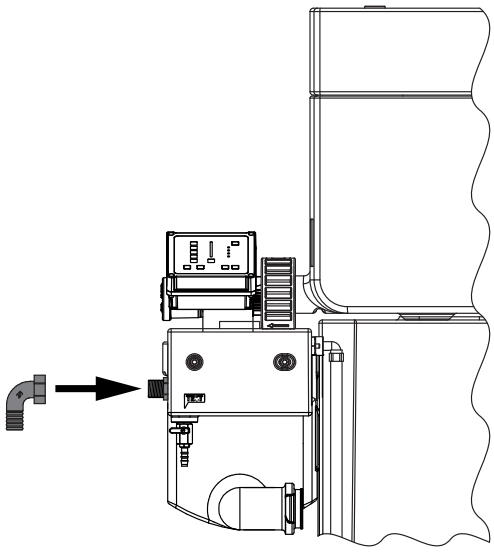
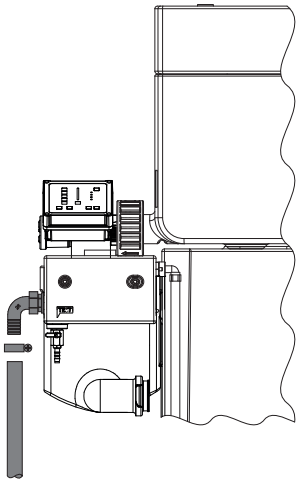
Installation work	
Figure	**Description / explanation**
	14. Insert the measuring chamber into the holder in the foot.
	15. Insert the fixing screw into the fixing hole of the measuring chamber.

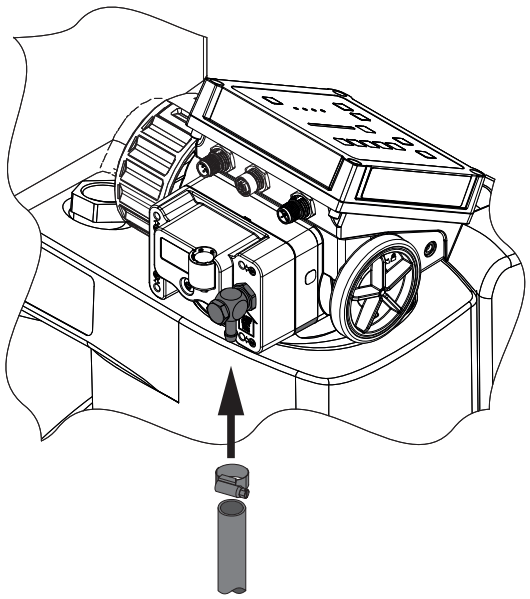
Installation work	
Figure	Description / explanation
NOTICE 	**Thread overloading** Using tools to tighten the fixing screw, or tilting it when positioning it, can overload the thread on the fixing screw and in the foot and cause serious damage (e.g., plastic parts breaking, the thread being pulled out). • Place the fixing screw vertically and screw it in. • Tighten the fixing screw by hand only.
	16. Screw in the fixing screw clockwise by hand all the way and tighten hand-tight.
	17. Place the pressure relief chamber on the foot. ➞ Align the connection in the direction of the measuring chamber.

Installation work	
Figure	**Description / explanation**
	18. Slide the pressure relief chamber as far away from the measuring chamber as possible.
	19. Check the sealing surfaces on the measuring chamber for damage and dirt. ➔ Remove any dirt. ➔ If there is any damage, contact the manufacturer's service department (please refer to section "1.1 Contact" on page 5). 20. Apply a thin layer of the supplied Vaseline to the O-ring on the **FRC**. 21. Align the **FRC** with the assembly opening in the measuring chamber and insert it.
	22. Turn the **FRC** clockwise until the **FRC** connection is aligned with the pressure relief chamber connection.

Installation work	
Figure	**Description / explanation**
	23. Slide the pressure relief chamber towards the **FRC** until the connection of the pressure relief chamber comes into contact with the connection of the **FRC**. 24. Slide the bayonet mount over the **FRC** connection and turn it clockwise as far as it will go.
	25. Install the riser duct between the collector and the measuring chamber. → Place the riser duct's straight fitting on the connection in the collector and tighten it clockwise by hand. → Place the elbow union of the riser duct on the connection in the measuring chamber and tighten it clockwise by hand.

Installation work	
Figure	**Description / explanation**
NOTICE 	**Damage due to incorrect hose routing** Incorrect hose routing can result in material and environmental damage, as well as impaired operation. • Route all hoses in the shortest possible way. • Install all hoses in such a way that they are free of mechanical stress and without any kinks. • Route all hoses in such a way that no mechanical stress will be transmitted to the condensate inlet and that the minimum bending radii of the respective hose are adhered to. • Do not lay the hoses in a slack manner (sagging).
	26. Set up the installed product at an offset from the tapping point. → In order to be able to route the hose optimally, you can loosen the knurled head screw in order to turn the condensate inlet up to 90 degrees by hand. After turning it, tighten the knurled head screw hand-tight.
	27. Connect the tapping point with the condensate inlet of the pressure relief chamber with a hose and secure it against slipping with a hose clamp. → Do not lay the hose in a slack manner (sagging). 28. Tighten the hose clamps hand-tight.

Installation work	
Figure	**Description / explanation**
	29. Screw the supplied elbow connector with the mounted flat gasket clockwise as far as it will go onto the condensate drain and position it in such a way that the outlet is pointing downwards.
NOTICE 	**Clean water tank overflow** If there is no gradient towards the wastewater system connection, or if there are cross-sectional constrictions in the water outlet hose, this can lead to the clean water tank overflowing. • The connection to the wastewater system is located below the condensate outlet. • Route the water outlet hose with a steady slope and without any kinks to the connection to the wastewater system.
	30. Attach a water outlet hose to the angled elbow connector on the condensate outlet and secure it against slipping off with a hose clamp. 31. Tighten the hose clamp hand-tight. 32. Route the water outlet hose with a steady slope and without any kinks to the connection to the wastewater system.

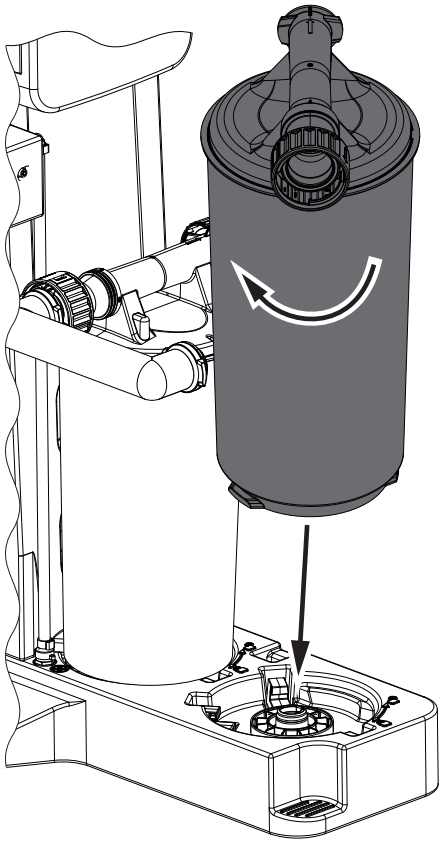
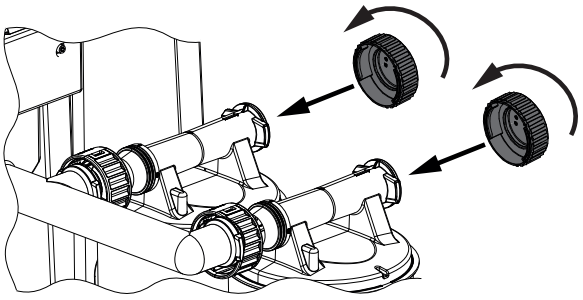
Installation work	
Figure	**Description / explanation**
	33. Connect the **FRC** to the compressed air system. Attach a compressed air hose to the compressed air connection and secure it against slipping with a hose clamp. 34. Tighten the hose clamp hand-tight.

NOTICE

Filter cartridge insertion

Use of incorrect filter cartridges or incorrect insertion of the filter cartridges can cause damage or leakage to the collector and the filter cartridges.

- Before inserting the filter cartridges, check to make sure that the filter cartridge is the right one for the product.
  - → The color of the cap at the bottom of the filter cartridge must be identical to the color of the cap in the collector.
- Insert the filter cartridges vertically and carefully into the collector.

Installation work	
Figure	**Description / explanation**
	35. Insert the first filter cartridge into the mount on the foot with the bayonet mount facing the measuring chamber outlet. 36. Turn the filter cartridge clockwise all the way. 37. Align the connecting filter cartridge's connection with the connection on the measuring chamber outlet. 38. Slide the bayonet mount over the connection and turn it clockwise as far as it will go. 39. Insert the other filter cartridges into the holders and connect them together using the bayonet catches.
	40. Place the end caps on the last filter cartridge in each row and turn them clockwise all the way.

Concluding work	
1.	Before pressurization, check all system connections for leak tightness and tighten if necessary.
2.	Slowly pressurize the system.

7. Electrical installation

Personnel
Trained electricians (refer to section “2.3 Target group and personnel” on page 9)

7.1 Warning notices

DANGER	Electrical voltage
	Components in contact with electrical voltage may pose a mortal danger or the danger of severe injuries.
	• Always de-energize and isolate the product and accessories and lock and tag them out before starting any installation, maintenance, or repair work on them. • Comply with all locally applicable legal requirements and regulations during installation. • Connect the equipment grounding conductor (grounding) in compliance with all applicable standards and regulations.

WARNING	Ingress of moisture or foreign objects
	Water and foreign objects can get into the opened connections or the FRC control unit if electrical connections are disconnected or if the control unit is opened. This can result in accidents and personal injury.
	• Protect the control unit and the electrical connections from splash water and moisture. • Open the control unit and disconnect the electrical connections in a dry location only. • Do not insert any foreign objects into the openings of the control unit. • Keep all contact surfaces and openings free of impurities and moisture.

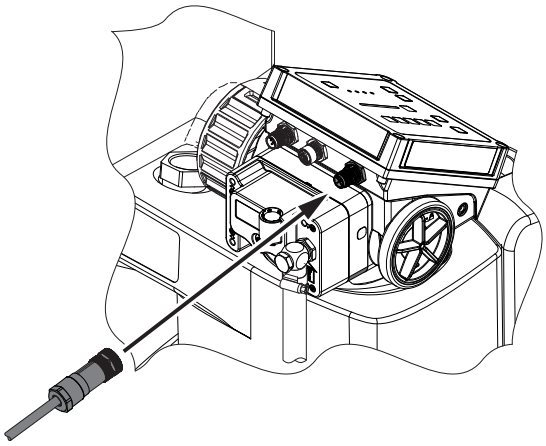
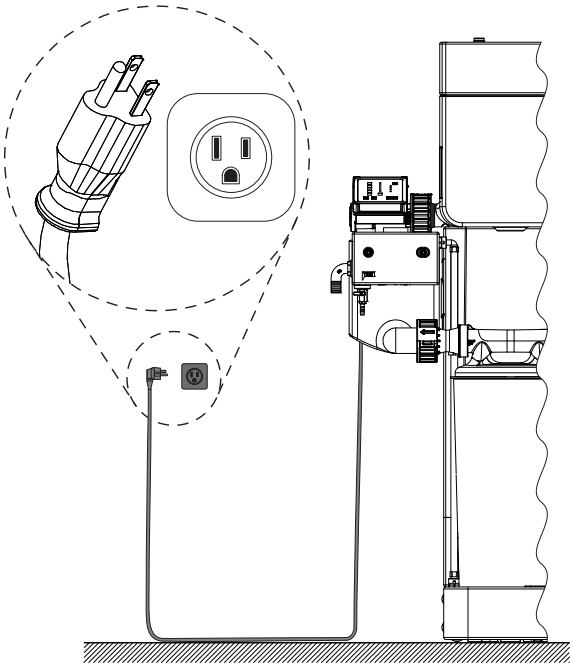
7.2 Connection work

The following prerequisites must be met before carrying out electrical installation work, and all preparation work must be completed first.

Prerequisites		
Tools	**Material**	**Protective equipment**
• 1.5 mm slotted screwdriver • Wire stripper	• Cable for the power supply • Modbus cable • Included connector	**To be worn at all times:** 

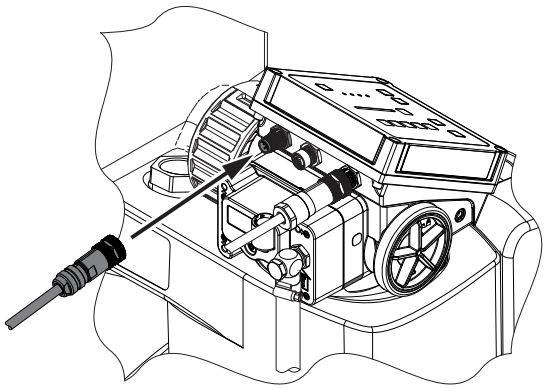
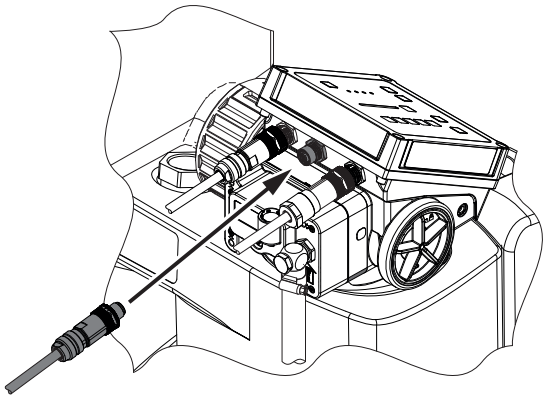
Preparation work	
1.	A socket with a grounding contact is installed within reach (<3 m (19 ft)) of where the product is installed.
2.	The fusing for the protective contact socket is adequately dimensioned for the corresponding power consumption.
3.	The product's installation must have been completed.

7.2.1 Connecting the external power supply

Connection work	
Figure	**Description / explanation**
	1. Plug the power supply cable's threaded connection onto the power supply connection and tighten the union nut clockwise hand-tight.
	2. Route the power supply cable all the way to the protective contact socket. → Route the cable in such a way that it is free of any mechanical stress. → Prevent trip hazards by routing the cable adequately. 3. Insert the protective contact plug into the protective contact socket. → The **FRC** will start and the SET NUMBER OF FILTER CARTRIDGES menu will be shown.

7.2.2 Modbus

NOTICE	Interference caused by signal reflection
	If there is no termination at the end of a daisy chain of several consecutive Modbus-capable devices, this will result in signal reflections. These signal reflections will lead to data transmission faults and impaired operation.
	• Connect a terminating resistor at the end of the daisy chain of several consecutive Modbus-capable devices.

Connection work	
Figure	**Description / explanation**
	1. Plug the Modbus signal cable onto the Modbus input connection and tighten the union nut clockwise hand-tight. → Route the cable in such a way that it is free of any mechanical stress. → Prevent trip hazards by routing the cable adequately.
	2. Plug the Modbus signal cable onto the Modbus output connection and tighten the union nut clockwise hand-tight. → Route the cable in such a way that it is free of any mechanical stress. → Prevent trip hazards by routing the cable adequately.

8. Commissioning

Personnel
Skilled technical personnel specializing in pressure equipment and systems and trained electricians (refer to section “2.3 Target group and personnel” on page 9)

8.1 Warning notices

DANGER	Sudden escape of pressurized fluids
	There is a danger of death or serious personal injury resulting from contact with fast or suddenly escaping fluids or through bursting system parts.
	• Before pressurization, check all system connections for leak tightness and tighten if necessary. • Slowly pressurize the system.

DANGER	Electrical voltage
	Contact with live components may result in serious injury or death.
	• Only operate the product and accessories with the cover complete and closed or the electronics housing closed.

NOTICE	Reduced filter cartridge performance
	When the clean water tank’s ventilation opening is closed, the draining water will produce a negative pressure in the clean water tank. This negative pressure will result in the condensate being sucked through the filter cartridges in an uncontrolled manner. This uncontrolled flow will reduce the performance of the filter cartridges.
	• Keep the clean water tank’s ventilation opening open.

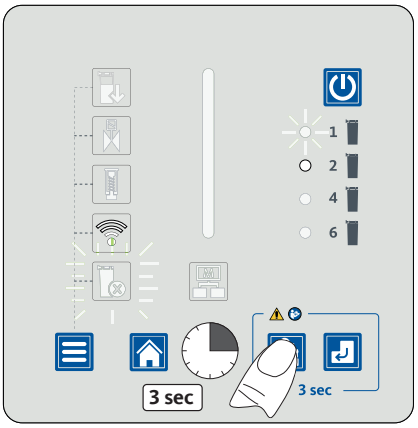
8.2 First time putting the product into operation

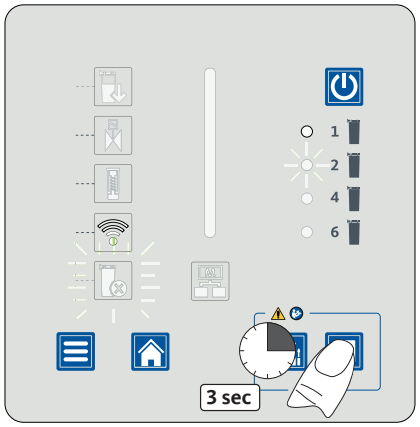
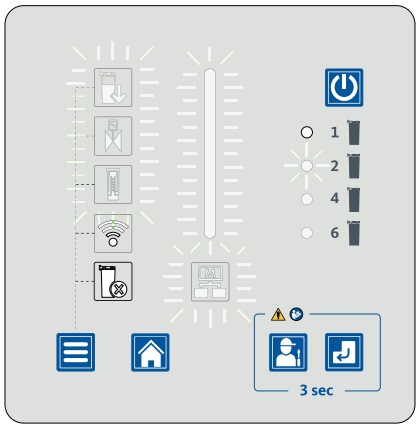
Before the first time the product is put into operation, the following prerequisites must be fulfilled and the preparatory tasks must have been completed.

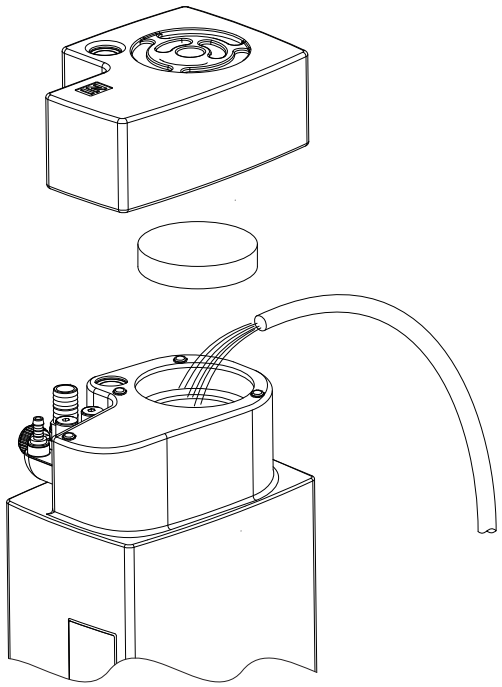
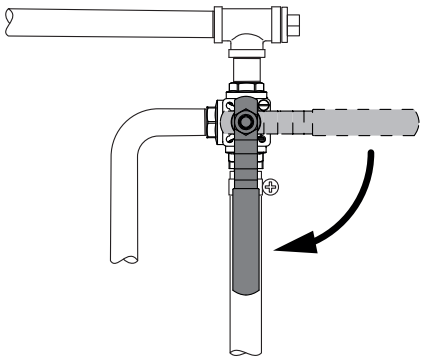
Prerequisites		
Tools	**Material**	**Protective equipment**
• No tool necessary	• No material necessary	**To be worn at all times:** 

Preparation work	
1.	The product's installation must have been completed.
2.	The product's electrical installation must have been completed.

NOTICE	Configuring the number of filter cartridges
	Entering the wrong number of filter cartridges may result in property damage, environmental damage or impaired operation.
	• Make sure to set the correct number of filter cartridges being used.

Commissioning work	
Figure	**Description / explanation**
	As soon as the power supply is established, the FILTER CARTRIDGE SELECTION status LED and the NUMBER OF FILTER CARTRIDGES LED will flash green. 1. Press the Service button and hold it down for 3 seconds in order to set the number of filter cartridges being used. → The NUMBER OF FILTER CARTRIDGES LED will switch from the current flashing number to the next higher number (e.g., from 1 to 2). 2. Repeat this step until the correct number of installed filter cartridges is set.

Commissioning work	
Figure	**Description / explanation**
	3. Press and hold the Enter button for 3 seconds. → The set number of filter cartridges will be saved. → The NUMBER OF FILTER CARTRIDGES LED for the set number of filter cartridges will light up green. → The FILTER CARTRIDGE SELECTION status LED will turn off. → The display will switch to the START MENU screen.
	4. The **FRC** is set up and controls the condensate flow. → The STATUS BAR status LED lights up green. → The CARTRIDGE status LED lights up green. → The SOLENOID VALVES status LED lights up green. → The PISTON status LED lights up green. → The DATA TRANSFER status LED lights up green. → The NUMBER OF FILTER CARTRIDGES LEDlights up green.

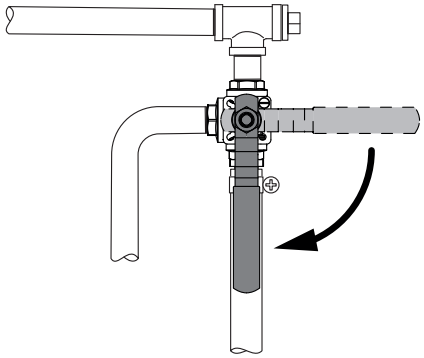
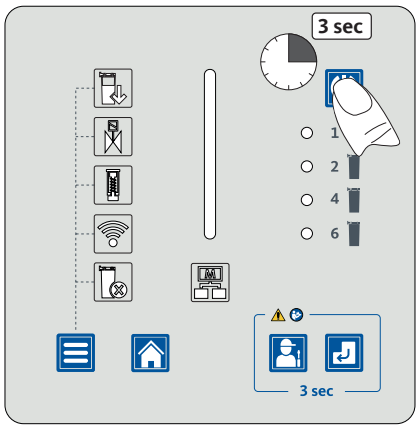
Commissioning work	
Figure	**Description / explanation**
	5. Remove the cover from the pressure relief chamber and remove the activated carbon mat from the vent of the pressure relief chamber. 6. Fill the pressure relief chamber with tap water via the vent. → Stop filling as soon as the **FRC** performs a discharge operation. 7. Insert the activated carbon mat into the vent of the pressure relief chamber and place the cover on the pressure relief chamber.
	8. Slowly open the condensate feed. 9. Check all hoses and connections for leaks (see section “10.3.7 Leak test” on page 116). 10. The product is now successfully set up and fed condensate will be treated.

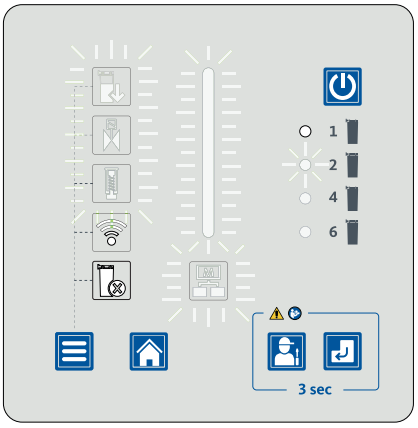
8.3 Recommissioning

For recommissioning work to be carried out, the following prerequisites must be fulfilled and the preparatory tasks must have been completed.

Prerequisites		
Tools	**Material**	**Protective equipment**
• No tool necessary	• No material necessary	**To be worn at all times:** 

Preparation work	
1.	The work or troubleshooting on the product is complete.
2.	The compressed air supply and power supply have been established.
3.	The Modbus connection has been established.

Commissioning work	
Figure	**Description / explanation**
	1. Slowly open the condensate feed.
	2. Press and hold down the ON/OFF button on the **FRC** for 3 seconds. → The **FRC** switches from standby mode to normal mode.

Commissioning work	
Figure	**Description / explanation**
NOTICE 	**Configuring the number of filter cartridges** Entering the wrong number of filter cartridges may result in property damage, environmental damage or impaired operation. • Make sure to set the correct number of filter cartridges being used.
	3. The product is now successfully set up and fed condensate will be treated. → The STATUS BAR status LED lights up green. → The CARTRIDGE status LED lights up green. → The SOLENOID VALVES status LED lights up green. → The PISTON status LED lights up green. → The DATA TRANSFER status LED lights up green. → The NUMBER OF FILTER CARTRIDGES LEDlights up green.

9. Operation

Personnel
Operating personnel (please refer to section 2.3, “Target group and personnel” on page 10)

9.1 Warning notices

DANGER	Electrical voltage
	Contact with live components may result in serious injury or death.
	• Only operate the product and accessories with the cover complete and closed or the electronics housing closed.

NOTICE	Reduced filter cartridge performance
	When the clean water tank’s ventilation opening is closed, the draining water will produce a negative pressure in the clean water tank. This negative pressure will result in the condensate being sucked through the filter cartridges in an uncontrolled manner. This uncontrolled flow will reduce the performance of the filter cartridges.
	• Keep the clean water tank’s ventilation opening open.

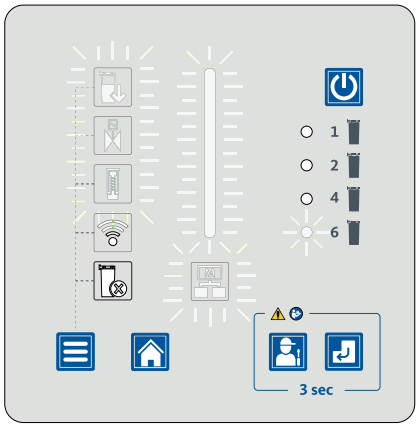
9.2 Menu displays

To operate the product, the preparation tasks must have been completed.

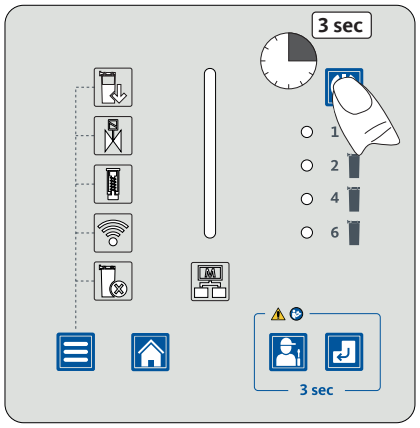
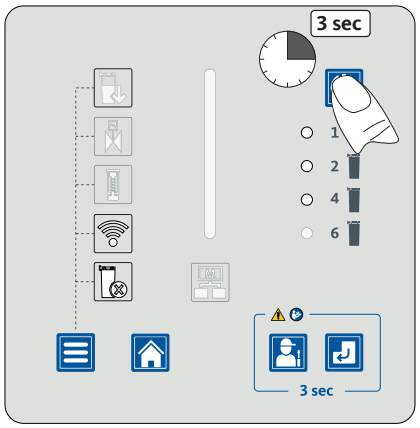
Preparation work	
1.	The product has been installed and connected to the condensate collection line and the drain.
2.	The **FRC** is connected to the power supply and turned on.
3.	The **FRC** is connected to the compressed air supply and has been set up.
4.	The **FRC** is connected to the MODBUS system.

INFORMATION	Cancel operation action
	Actions can be cancelled at any time by pressing the Start Menu button. Any changes made are not saved when you cancel.

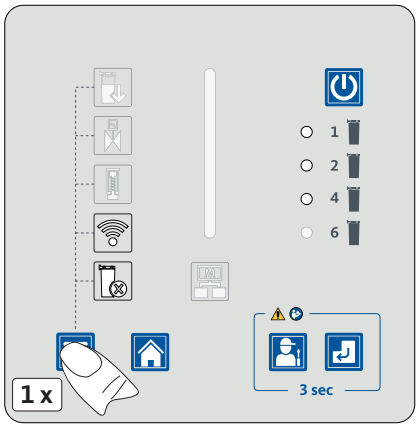
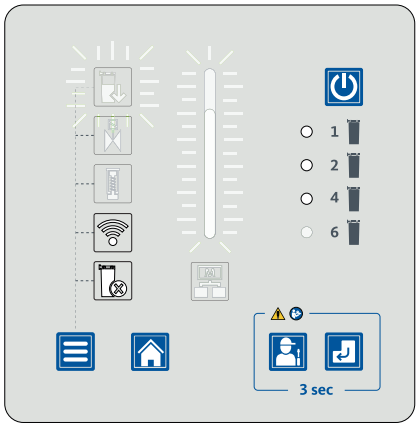
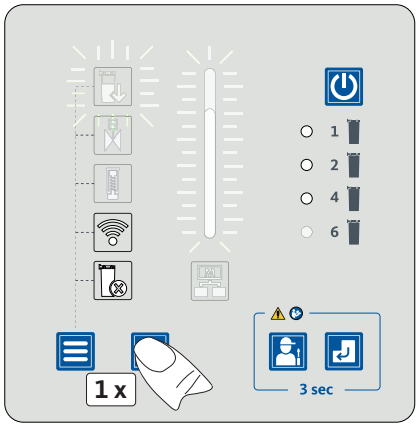
9.2.1 Start menu

Figure	Description / explanation
	**START MENU** → STATUS BAR status LED lights up green → FILTER CARTRIDGES status LED lights up green → SOLENOID VALVES status LED lights up green → PISTON status LED lights up green → DATA TRANSFER status LED lights up green → The NUMBER OF FILTER CARTRIDGES LED for the set number of filter cartridges lights up green

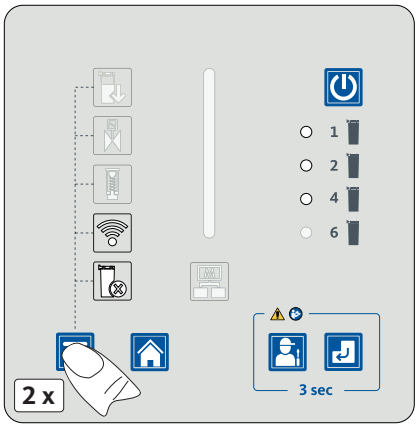
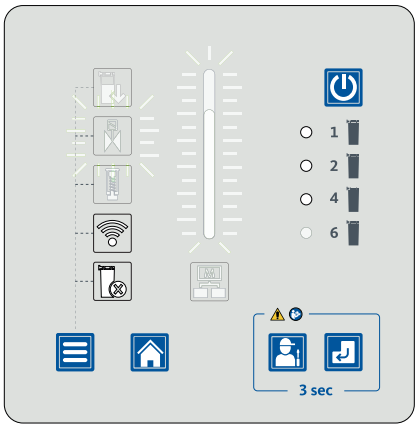
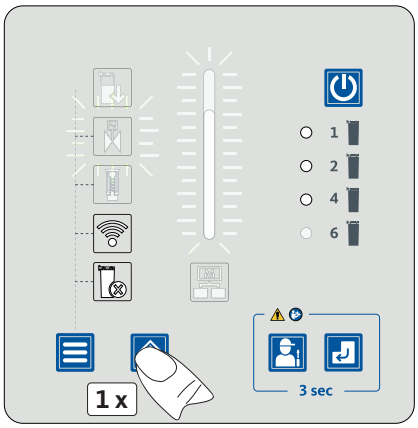
9.2.2 Switching the FRC on and off

Figure	Description / explanation
	**Switching on the FRC** Press and hold down the ON/OFF button for 3 seconds. → The **FRC** switches from standby mode to normal mode. → The START MENU will appear. → The **FRC** regulates the product's condensate flow.
INFORMATION	**First time putting the product into operation** The **FRC** will start with the SET NUMBER OF FILTER CARTRIDGES menu only the first time that the product is put into operation, in which case the FILTER CARTRIDGE SELECTION status LED will flash green. • Set the number of filter cartridges in order to get to the START MENU.
	**Switching off the FRC** Press and hold down the ON/OFF button for 3 seconds. → The **FRC** will switch to standby mode. → All LEDs go out and the STATUS BAR status LED flashes white at regular intervals. → The condensate is conveyed through the filter cartridges by gravity only.

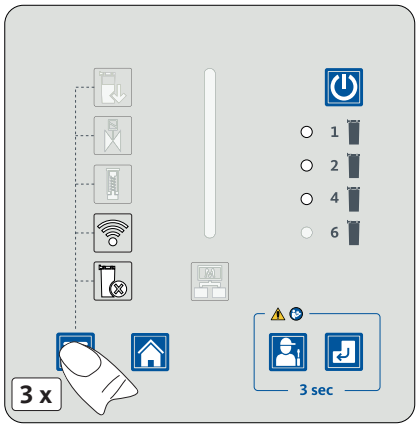
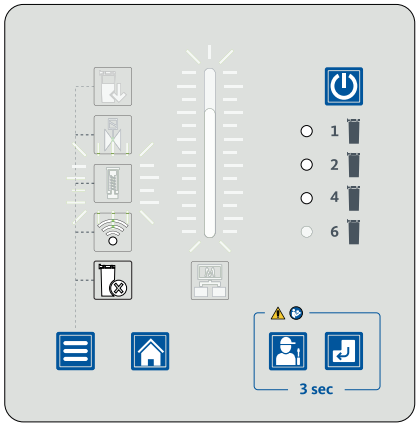
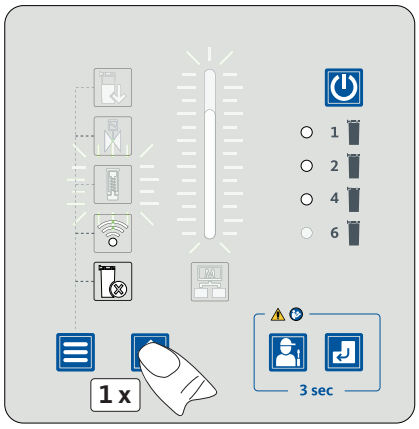
9.2.3 Querying filter cartridge status

<table>
<tr><th>Figure</th><th>Description / explanation</th></tr>
<tr><td> 
</td><td>1. Press the menu button once.</td></tr>
<tr><td> 
</td><td>The remaining lifetime of the filter cartridges is displayed.
→ The FILTER CARTRIDGES status LED will flash green.
<table>
<tr><th>STATUS BAR status LED</th><th>Filter cartridge service life</th></tr>
<tr><td>4/4 of the length lights up green</td><td>100%</td></tr>
<tr><td>3/4 of the length lights up green</td><td>75%</td></tr>
<tr><td>2/4 of the length lights up green</td><td>50%</td></tr>
<tr><td>1/4 of the length lights up green</td><td>25%</td></tr>
<tr><td>1/4 of the length flashes red</td><td>Exceeded</td></tr>
</table>
→ If the FILTER CARTRIDGES status LED flashes red, replace the filter cartridges (see section “10.3.2 Replace filter cartridges” on page 96).</td></tr>
<tr><td> 
</td><td>2. Press the start menu button to exit the menu.</td></tr>
</table>

9.2.4 Querying the solenoid valve status

Figure	Description / explanation
	1. Press the menu button twice.
	The time remaining until replacement of the solenoid valves is displayed. ➝ The SOLENOID VALVES status LEDflashes green. **STATUS BAR status LED** / **Solenoid valve service life** 4/4 of the length lights up green – 100% 3/4 of the length lights up green – 75% 2/4 of the length lights up green – 50% 1/4 of the length lights up green – 25% 1/4 of the length flashes red – Exceeded ➝ If the SOLENOID VALVES status LED flashes red, replace the SOLENOID VALVES Service-Unit (see section “10.3.3 Replace the solenoid valves” on page 102).
	2. Press the start menu button to exit the menu.

9.2.5 Querying piston status

Figure	Description / explanation
	1. Press the menu button three times.
	The time remaining until replacement of the piston is displayed. → The PISTON status LED flashes green. **STATUS BAR status LED** / **Piston service life** 4/4 of the length lights up green — 100% 3/4 of the length lights up green — 75% 2/4 of the length lights up green — 50% 1/4 of the length lights up green — 25% 1/4 of the length flashes red — Exceeded → If the PISTON status LED flashes red, replace the PISTON Service-Unit (see section “10.3.4 Replace the piston” on page 106).
	2. Press the start menu button to exit the menu.

9.2.6 Activating the WLAN

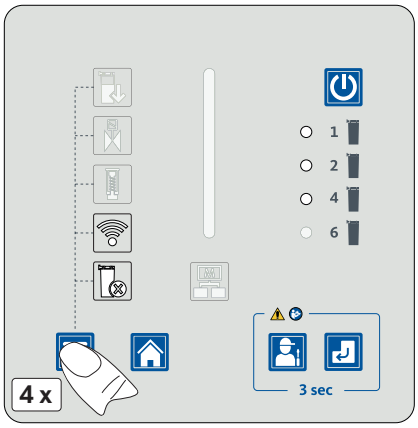
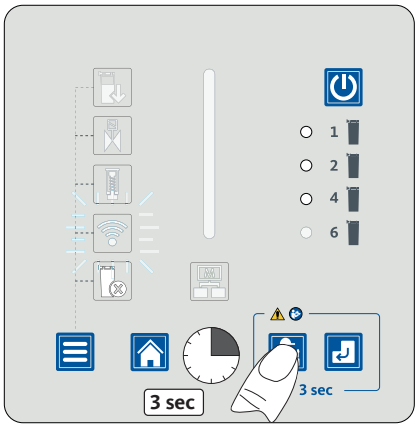
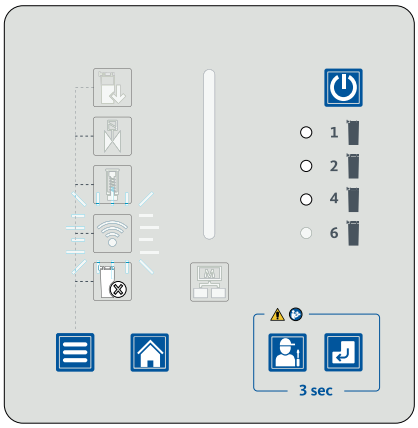
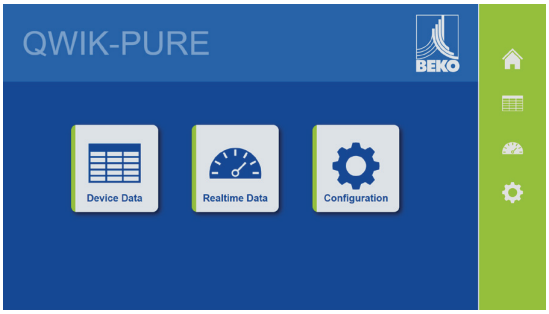
Figure	Description / explanation
	1. Press the menu button four times.
	The WLAN status is displayed. → The status LED WLAN flashes blue. 2. Press and hold the Service button for 3 seconds.
	The WLAN is active. → The status LED WLAN flashes blue. → The FILTER CARTRIDGES status LED lights up green. → The SOLENOID VALVES status LED lights up green. → The PISTON status LED lights up green. → The STATUS BAR status LED lights up green. 3. Select the **QWIK-PURE 2...** network. 4. Enter the password into the security prompt. **Password:** → The last 10 digits of the network name (e.g., QWIK-PURE **2320900028**) → Scan the QR code on the control unit's housing The WLAN is automatically deactivated after 5 minutes.

Figure	Description / explanation
	5. Enter address http://192.168.4.1 into a browser. → The start menu will appear.

9.2.7 Setting number of filter cartridges

NOTICE	Configuring the number of filter cartridges
	Entering the wrong number of filter cartridges may result in property damage, environmental damage or impaired operation.
	• Make sure to set the correct number of filter cartridges being used.

INFORMATION	First time putting the product into operation
	Start from step 3 for the first time the product is put into operation. The NUMBER OF FILTER CARTRIDGES LED and the FILTER CARTRIDGE SELECTION status LED will flash green at the same time. Skip steps 1 and 2.

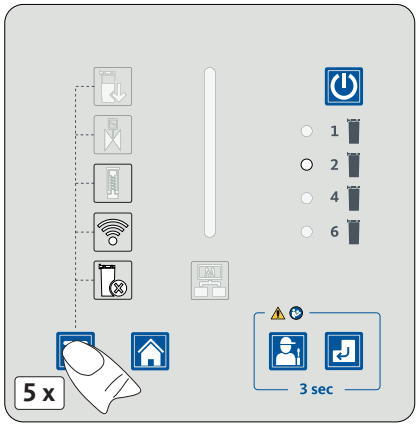
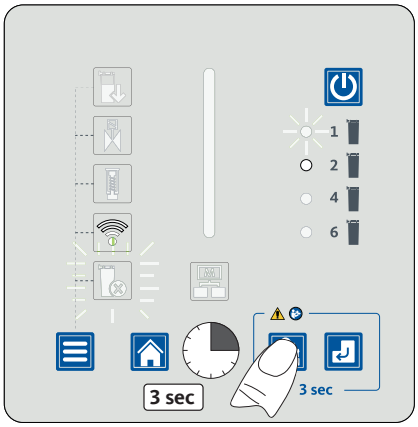
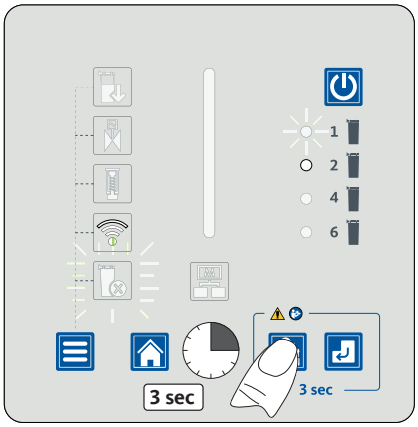
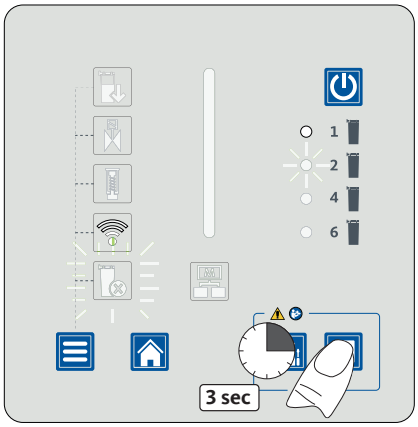
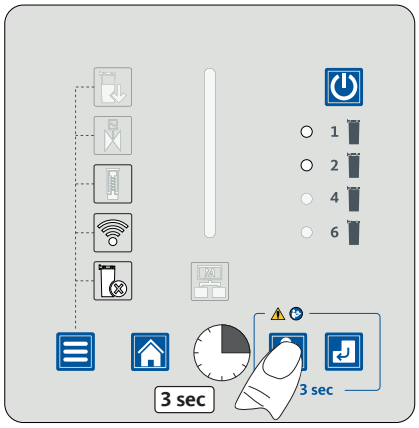
Figure	Description / explanation
	1. Press the menu button five times. → The FILTER CARTRIDGE SELECTION status LED flashes green.

Figure	Description / explanation
	2. Press and hold the Service button for 3 seconds. → The NUMBER OF FILTER CARTRIDGES LED flashes green.
	3. Press and hold the Service button for 3 seconds. → The NUMBER OF FILTER CARTRIDGES LED will switch from the current flashing number to the next higher number (e.g., from 1 to 2). 4. Repeat this step until the correct number of installed filter cartridges is set.
	5. Press and hold the Enter button for 3 seconds. → The set number of filter cartridges will be saved. → The NUMBER OF FILTER CARTRIDGES LED for the set number of filter cartridges will light up green. → The FILTER CARTRIDGE SELECTION status LED will turn off. → The display will switch to the START MENU screen.

9.2.8 Manually starting a discharge operation

Figure	Description / explanation
	1. Press and hold the Service button for 3 seconds. → The piston in the **FRC** will close the condensate inlet from the pressure relief chamber into the **FRC**. → The measuring chamber is supplied with auxiliary air at timed intervals. → The condensate is passed through the filter cartridges. 2. If the filling level in the measuring chamber has fallen below the Low Level (LL) sensor, the discharge operation will stop. → The measuring chamber is no longer pressurized with auxiliary air. → The piston in the **FRC** will open the condensate inlet from the pressure relief chamber into the **FRC**.

9.2.9 Resetting IP settings

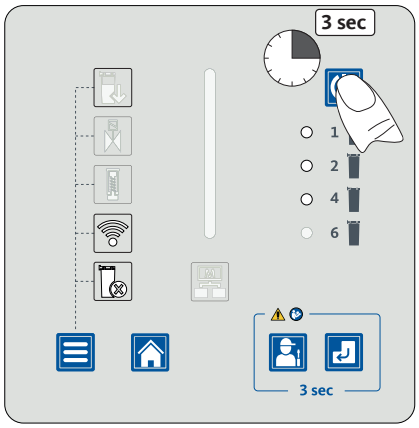
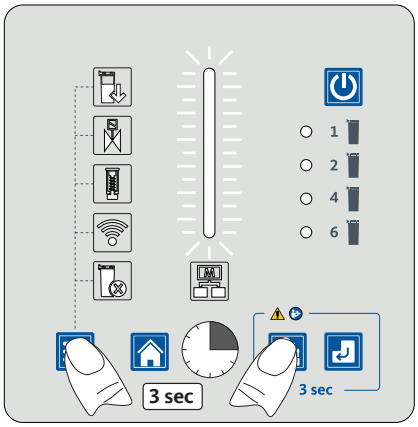
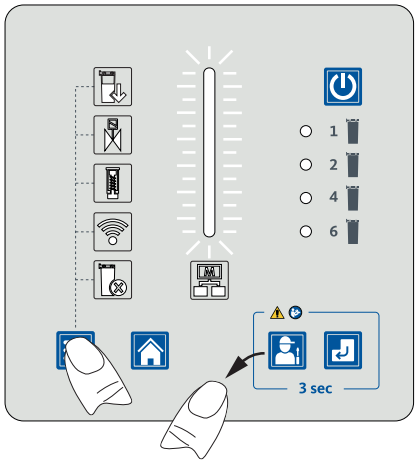
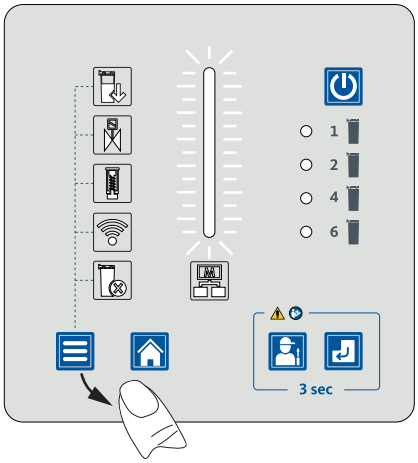
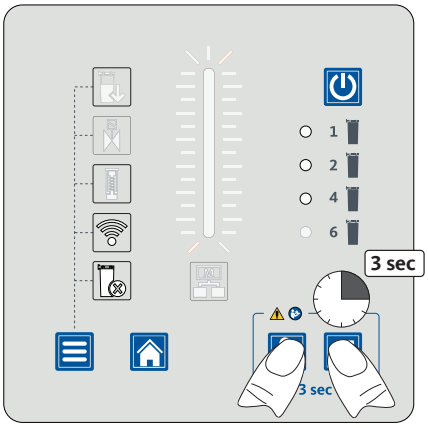
Figure	Description / explanation
	1. Press and hold down the ON/OFF button for 3 seconds.

Figure	Description / explanation
	The **FRC** will switch to standby mode. → All LEDs go out and the STATUS BAR status LED flashes white at regular intervals. → The condensate passes through the filter cartridges only by gravity. 2. Press and hold down the Service button and the menu button simultaneously for 3 seconds.
	3. Release the Service button only.
	4. Release the menu button. → The IP settings are reset to the factory settings. 5. Press and hold down the ON/OFF button for 3 seconds. → The **FRC** switches from standby mode to normal mode.

9.2.10 Reset error message

Figure	Description / explanation
	1. Read the error message with the WLAN function (please refer to section “3.6 WLAN function” on page 34) or the Modbus function (please refer to section “3.5 Modbus function” on page 27). 2. Determine the cause of the error and rectify the error (see section “15. Troubleshooting” on page 130). If you cannot fix the cause of the error, contact the manufacturer’s service department (please refer to section “1.1 Contact” on page 5). 3. Press and hold down the Service button and the Enter button simultaneously for 3 seconds. → The error message will be reset. → The display will switch to the START MENU screen.

10. Maintenance

Personnel
Qualified service technicians (see section “2.3 Target group and personnel” on page 9)

10.1 Warning notices

DANGER	Sudden escape of pressurized fluids
	There is a danger of death or serious personal injury resulting from contact with fast or suddenly escaping fluids or through bursting system parts.
	• Before starting work, depressurize the pressurized system and secure it against unintentional pressurization.

WARNING	Ingress of moisture or foreign objects
	Water and foreign objects can get into the opened **FRC** control unit or into the opened electrical connections if electrical connections are disconnected or if the **FRC** control unit is opened. The ingress of water or foreign objects can result in accidents and personal injury.
	• Protect the **FRC** control unit and the electrical connections from splash water and moisture. • Open the **FRC** control unit and disconnect the electrical connections in a dry location only. • Do not insert any foreign objects into the openings of the **FRC** control unit. • Keep all contact surfaces and openings free of impurities and moisture.

10.2 Maintenance plan

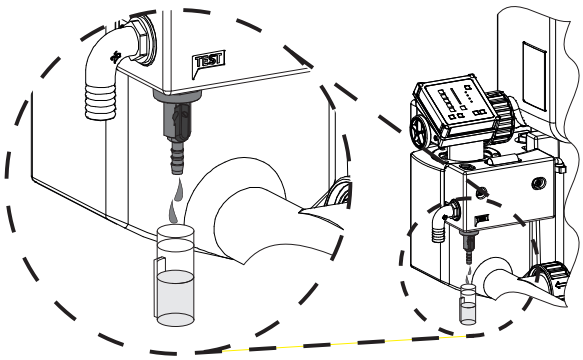
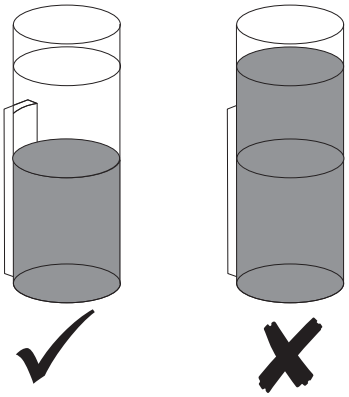
Maintenance	Interval
Turbidity test of wastewater and documenting the result	• Weekly
Visual inspection	• Weekly
Replace the filter cartridges and activated carbon mat	• Mandatory in case of a negative result of the turbidity test • Maximum lifetime of the filter cartridges reached, see section “9.2.3 Querying filter cartridge status” • At least annually
Replace the piston	• Maximum lifetime of the piston reached, see section “9.2.5 Querying piston status” • At least every two years
Replace the solenoid valves	• Maximum service life of solenoid valves; please refer to section “9.2.4 Querying the solenoid valve status” • At least every six years
Leak test	• Recommendation: After all installation and maintenance work on the product

10.3 Maintenance work

For maintenance work to be carried out, the following prerequisites must be fulfilled and the respective preparatory tasks must have been completed.

10.3.1 Turbidity test of the purified condensate

Prerequisites		
Tools	**Material**	**Protective equipment**
• No tool necessary	• No material necessary	**To be worn at all times:** 

Figure	Description
	1. Remove the reference turbidity tube from the holder and fill it with a water sample from the service valve.
	2. Compare the sample with the reference turbidity on the lower half of the reference turbidity tube. **The sample is clearer than the reference turbidity:** → The product is working properly. **The sample is equally or more turbid than the reference turbidity** → Replace the filter cartridges immediately. 3. Document the result of the turbidity test.

NOTICE

High condensate turbidity

If the condensate at the condensate outlet has a high degree of turbidity, clean the product (please refer to section “10.3.5 Cleaning” on page 110).

10.3.2 Replace filter cartridges

INFORMATION	Cancel operation action
	Actions can be cancelled at any time by pressing the Start Menu button. Any changes made are not saved when you cancel.

Prerequisites		
Tools	**Material**	**Protective equipment**
• No tool necessary	• Filter cartridges • Activated carbon mat	**To be worn at all times:**

Preparation work	
1.	Have the required number of new filter cartridges and the activated carbon insert ready to go next to the product.
2.	Remove the plugs from the new filter cartridges' packaging and set them down close to the product.

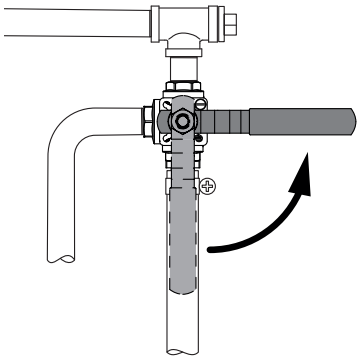
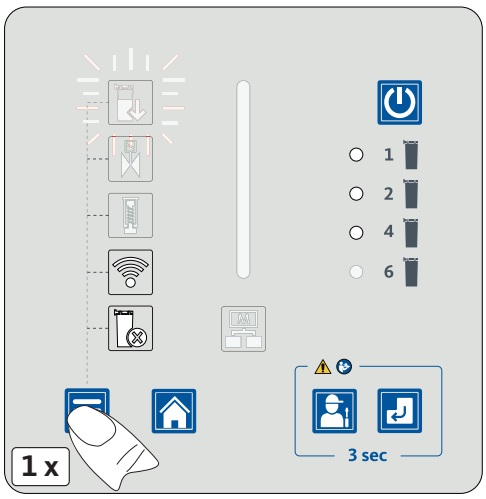
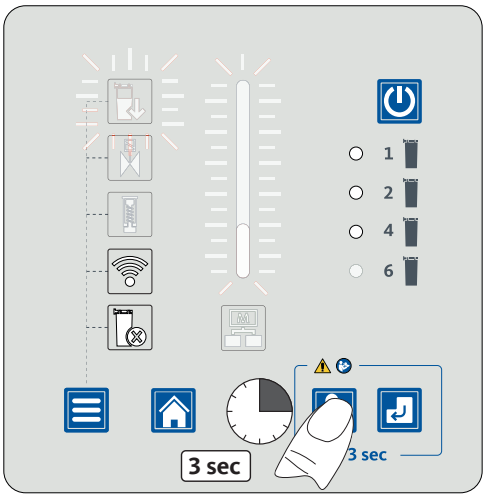
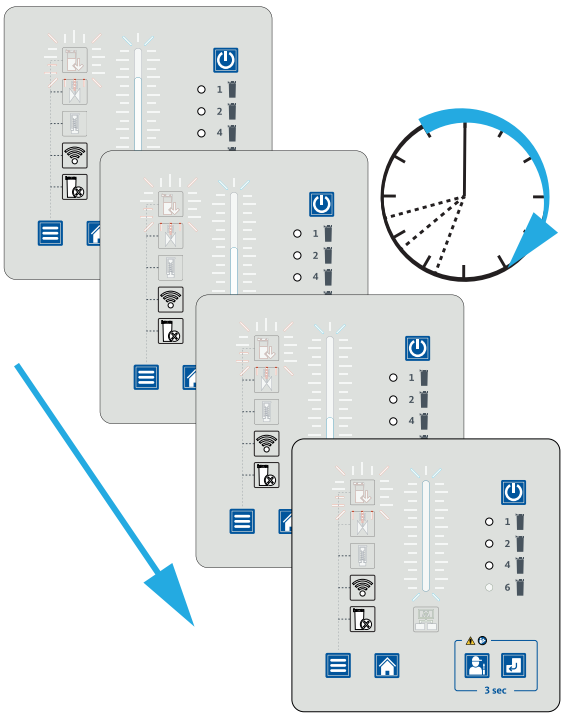
Figure	Description / explanation
	1. Shut off the condensate feed and divert the condensate into a separate container.
	2. Press the menu button once.

Figure	Description / explanation
	The current status of the filter cartridges is displayed. → The FILTER CARTRIDGES status LED will flash red. → The STATUS BAR status LED lights up red. 3. Press and hold the Service button for 3 seconds.
	The discharge process is started. → The piston in the **FRC** will close the condensate inlet from the pressure relief chamber into the **FRC**. → The measuring chamber is supplied with auxiliary air at timed intervals. → The condensate is passed into the filter cartridges. This takes several minutes. → The STATUS BAR status LED flashes blue and indicates the remaining time until the filter cartridge needs to be changed. When the remaining time has elapsed, the discharge process stops. → The STATUS BAR status LED lights up blue. → The measuring chamber is no longer pressurized with auxiliary air.

STATUS BAR status LED	Remaining time
4/4 of the length flashes blue	100%
3/4 of the length flashes blue	75%
2/4 of the length flashes blue	50%
1/4 of the length flashes blue	25%

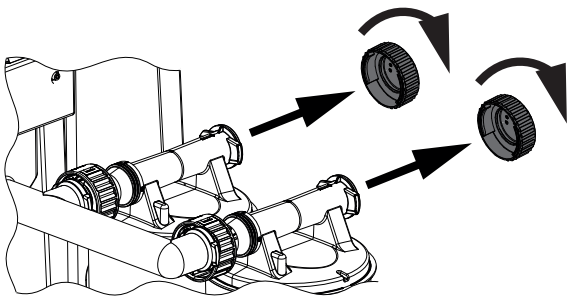
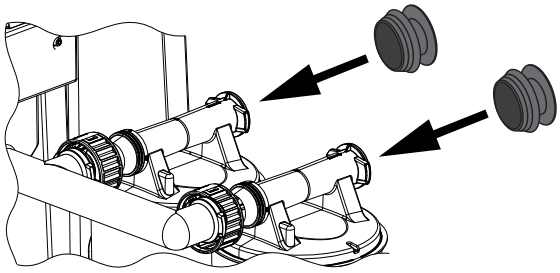
Figure	Description / explanation
	4. Turn the end caps on the filter cartridges anticlockwise and remove them. → Put the end caps to the side, as they will be screwed back on the new filter cartridges.
	5. Seal the filter cartridges with the plugs.

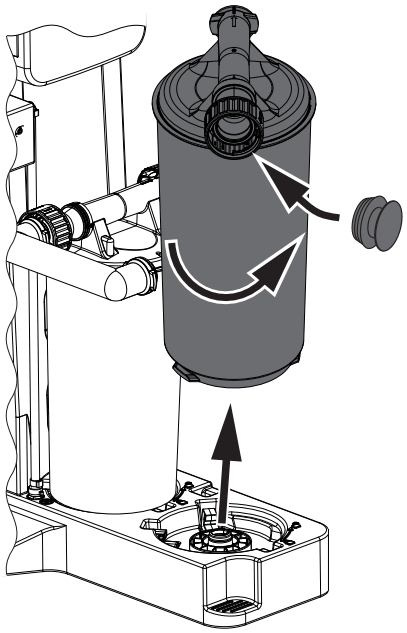
Figure	Description / explanation
CAUTION 	**Personal injury resulting from lifting the complete filter cartridge in an ergonomically incorrect manner** Lifting the full filter cartridge in an ergonomically incorrect manner can result in personal injury. • Lift the full cartridge in an ergonomically correct manner close to your body. • Use two people to lift the full cartridge over obstacles.
	6. Turn the bayonet catch of the filter cartridges anticlockwise and pull it off the connection at the measuring chamber outlet. 7. Starting with the last filter cartridge in the front row, turn the filter cartridges 45 degrees anticlockwise and seal them with the plugs provided. 8. Lift the filter cartridge out of the collector and dispose of it properly (see section “14. Disposal” on page 129). 9. Check the sealing surfaces of the connection at the measuring chamber outlet for damage and dirt. → Remove any dirt. → If there is any damage, contact the manufacturer’s service department (please refer to section “1.1 Contact” on page 5).

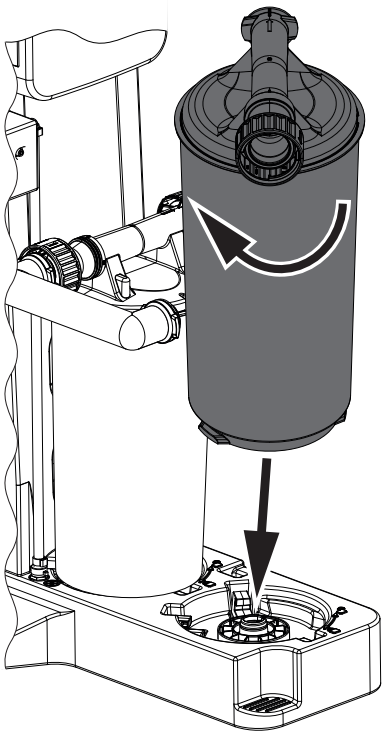
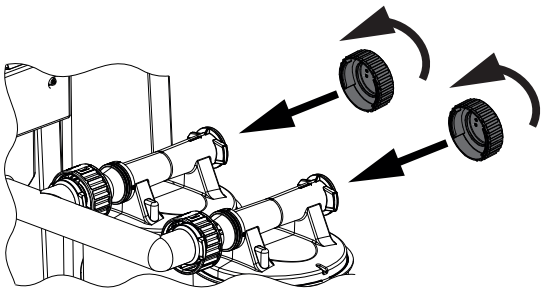
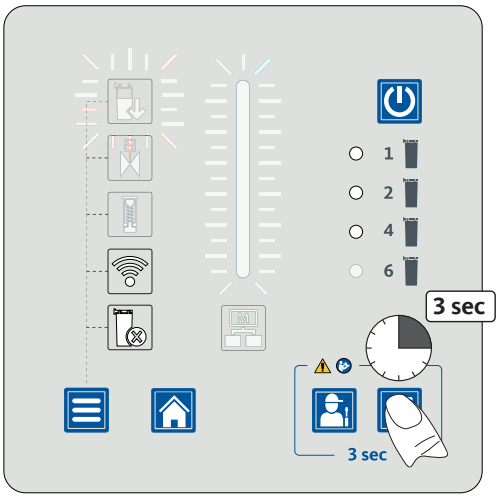
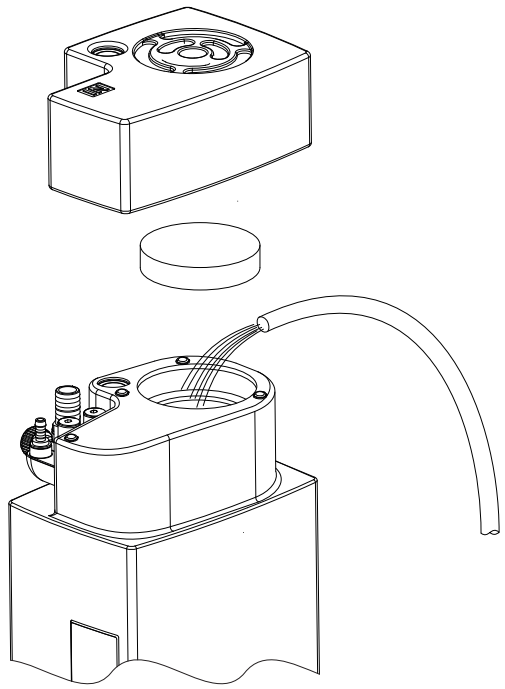
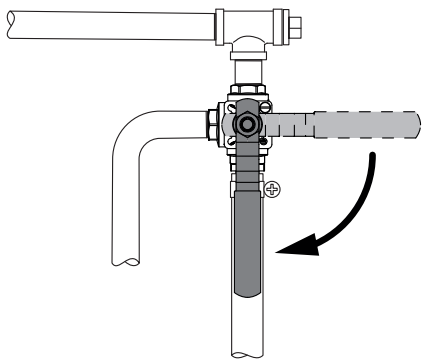
Figure	Description / explanation
NOTICE 	**Filter cartridge insertion** Use of incorrect filter cartridges or incorrect insertion of the filter cartridges can cause damage or leakage to the collector and the filter cartridges. • Before inserting the filter cartridges, check to make sure that the filter cartridge is the right one for the product. → The color of the cap at the bottom of the filter cartridge must be identical to the color of the cap in the collector. • Insert the filter cartridges vertically and carefully into the collector.
	10. Insert the first filter cartridge into the mount on the foot with the bayonet mount facing the measuring chamber outlet. 11. Turn the filter cartridge clockwise all the way. 12. Align the connecting filter cartridge's connection with the connection on the measuring chamber outlet. 13. Slide the bayonet mount over the connection and turn it clockwise as far as it will go. 14. Insert the other filter cartridges into the holders and connect them together using the bayonet catches.
	15. Place the end caps on the last filter cartridge in each row and turn them clockwise all the way.

Figure	Description / explanation
	16. After replacing the filter cartridges, press and hold down the Enter button for 3 seconds. → The piston in the **FRC** will open the condensate inlet from the pressure relief chamber into the **FRC**. → The STATUS BAR status LED lights up green. → The display will switch to the START MENU screen.
	17. Remove the cover from the pressure relief chamber and remove the activated carbon mat from the vent of the pressure relief chamber. 18. Dispose of the activated carbon mat properly (see section “14. Disposal” on page 129). 19. Lift the filter cartridge out of the collector and dispose of it properly (see section “14. Disposal” on page 129). 20. Fill the product with tap water via the vent. → Stop filling as soon as the **FRC** performs a discharge operation. 21. Insert the new activated carbon mat into the vent of the pressure relief chamber and place the cover on the pressure relief chamber.
	22. Slowly open the condensate feed. 23. Check all hoses and connections for leaks (see section “10.3.7 Leak test” on page 116).

10.3.3 Replace the solenoid valves

INFORMATION	Cancel operation action
	Actions can be cancelled at any time by pressing the Start Menu button. Any changes made are not saved when you cancel.

Prerequisites		
Tools	**Material**	**Protective equipment**
• Allen key, 2.5 mm	• SOLENOID VALVES Service-Unit • Absorbent materials	**To be worn at all times:** 

Preparation work	
1.	Provide the required SOLENOID VALVES Service-Unit.

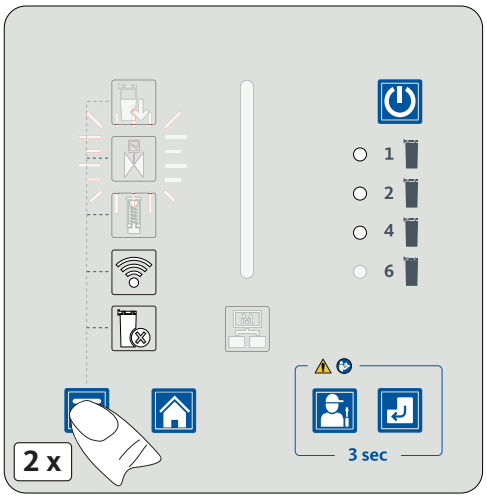
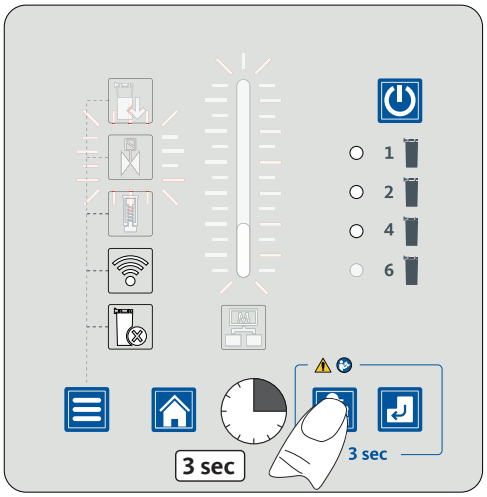
Figure	Description / explanation
	1. Press the menu button twice.
	The current status of the solenoid valves is displayed. → The SOLENOID VALVES status LED flashes red. → The STATUS BAR status LED lights up red. 2. Press and hold the Service button for 3 seconds.

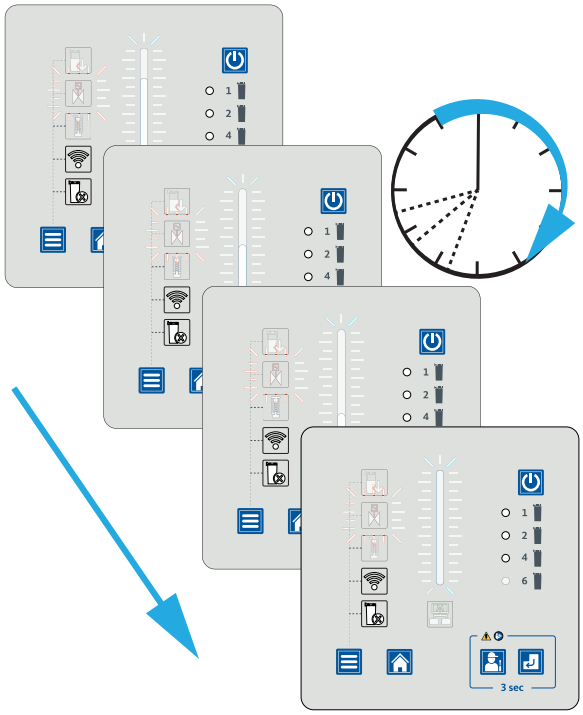
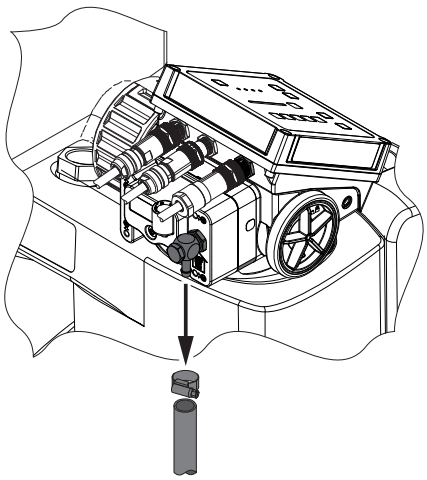
Figure	Description / explanation
	The discharge process is started. → The piston in the **FRC** will close the condensate inlet from the pressure relief chamber into the **FRC**. → The measuring chamber is supplied with auxiliary air at timed intervals. → The condensate is passed into the filter cartridges. This takes several minutes. → The STATUS BAR status LED flashes blue and indicates the remaining time until the service. **STATUS BAR status LED** / **Remaining time** 4/4 of the length flashes blue / 100% 3/4 of the length flashes blue / 75% 2/4 of the length flashes blue / 50% 1/4 of the length flashes blue / 25% When the minimum filling level in the measuring chamber is reached, the discharge process stops. → The piston in the **FRC** will open the condensate inlet from the pressure relief chamber into the **FRC**. → The STATUS BAR status LED is permanently lit blue. → The measuring chamber is no longer pressurized with auxiliary air.
	3. Cut off the compressed air supply and secure it against unintentional opening. 4. Carefully depressurize the compressed air hose at the compressed air connection. 5. Disassemble the compressed air hose.

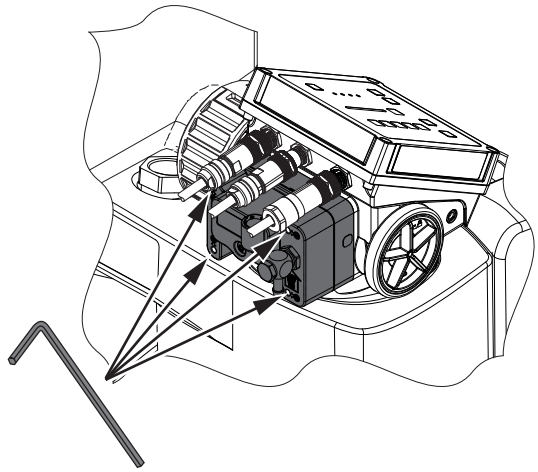
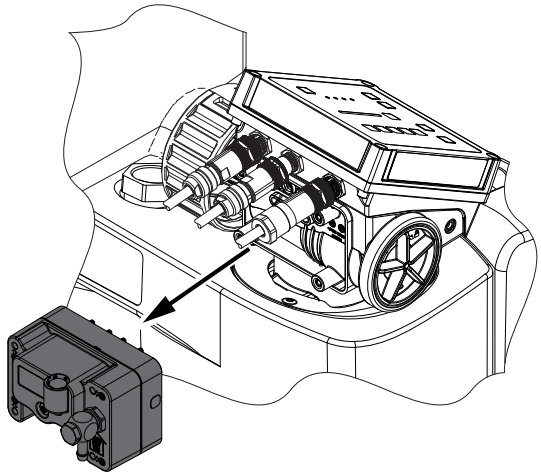
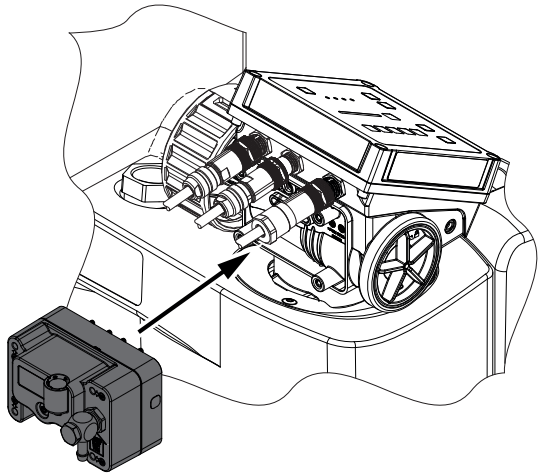
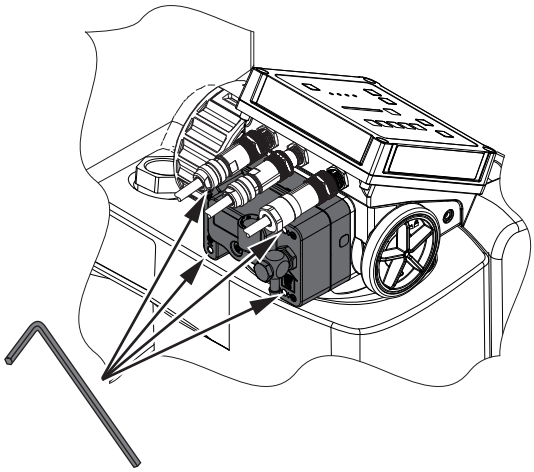
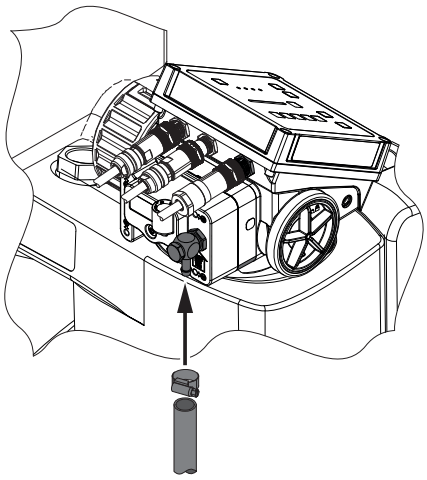
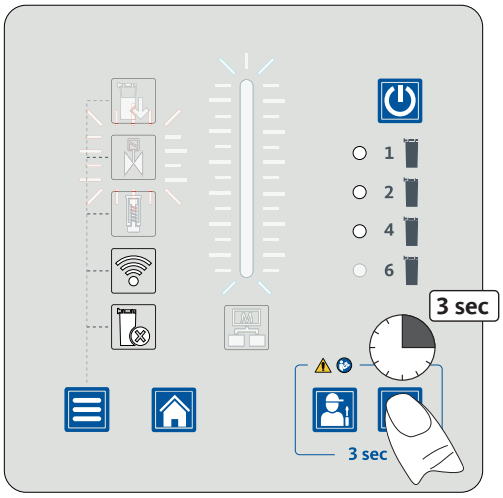
Figure	Description / explanation
	6. Loosen the four socket head cap screws until the SOLENOID VALVES Service-Unit can be removed from the **FRC**. → The 4 hexagon socket screws are secured in such a way that they cannot fall out from the Service-Unit.
	7. Remove the SOLENOID VALVES Service-Unit. 8. Dispose of the removed SOLENOID VALVES Service-Unit properly (see section “14. Disposal” on page 129). 9. Check the sealing surfaces in the **FRC** for damage and soiling. → Remove any dirt. → If there is any damage, contact the manufacturer’s service department (please refer to section “1.1 Contact” on page 5).
	10. Mount the new SOLENOID VALVES Service-Unit and secure it with the 4 hexagon socket screws.

Figure	Description / explanation
	11. Tighten the 4 hexagon socket screws with a tightening torque of 1 Nm ±0.1 Nm (0.74 ft-lb ±0.74 ft-lb).
	12. Install the compressed air connection. 13. Tighten the hose clamp hand-tight. 14. Restore the compressed air supply.
	15. After completing the service on the solenoid valves, press and hold down the Enter button for 3 seconds. → The STATUS BAR status LED lights up green. → The display will switch to the START MENU screen.

10.3.4 Replace the piston

INFORMATION	Cancel operation action
	Actions can be cancelled at any time by pressing the Start Menu button. Any changes made are not saved when you cancel.

Prerequisites		
Tools	**Material**	**Protective equipment**
• Combination pliers with rubber-covered handles	• PISTON Service-Unit • Absorbent materials	**To be worn at all times:** 

Preparation work	
1.	Provide the required PISTON Service-Unit.

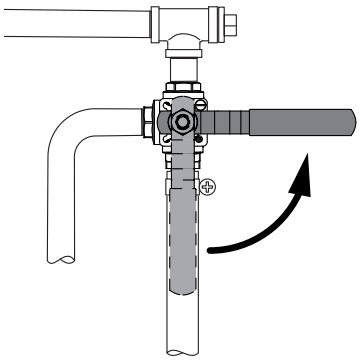
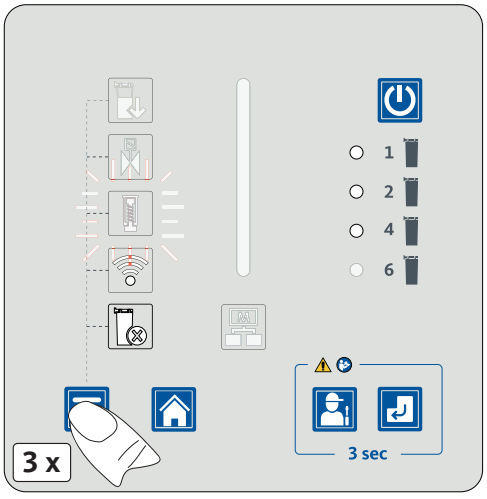
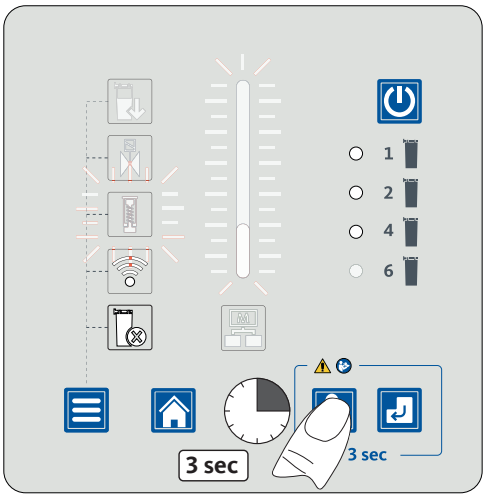
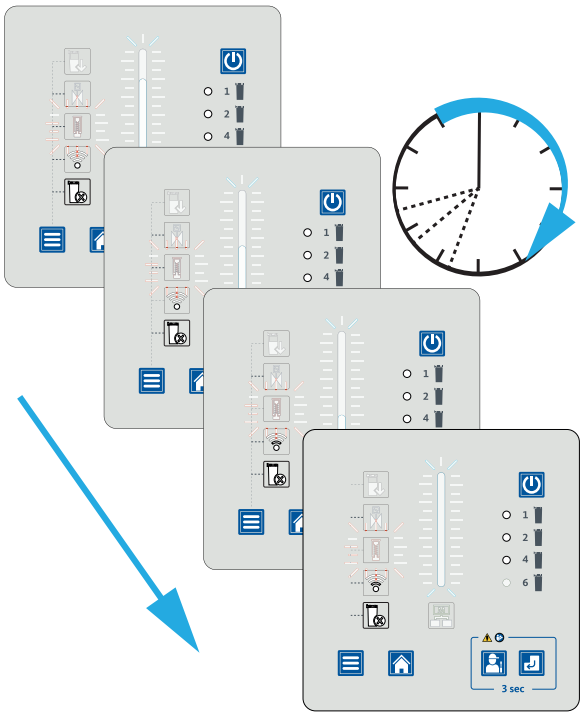
Figure	Description / explanation
	1. Shut off the condensate feed and divert the condensate into a separate container.
	2. Press the menu button three times.

Figure	Description / explanation
	The current status of the piston is displayed. → The PISTON status LED flashes red. → The STATUS BAR status LED lights up red. 3. Press and hold the Service button for 3 seconds.
	The discharge process is started. → The piston in the **FRC** will close the condensate inlet from the pressure relief chamber into the **FRC**. → The measuring chamber is supplied with auxiliary air at timed intervals. → The condensate is passed into the filter cartridges. This takes several minutes. → The STATUS BAR status LED flashes blue and indicates the remaining time until the service. When the minimum filling level in the measuring chamber is reached, the discharge process stops. → The piston in the **FRC** will open the condensate inlet from the pressure relief chamber into the **FRC**. → The STATUS BAR status LED is permanently lit blue. → The measuring chamber is no longer pressurized with auxiliary air.

STATUS BAR status LED	Remaining time
4/4 of the length flashes blue	100%
3/4 of the length flashes blue	75%
2/4 of the length flashes blue	50%
1/4 of the length flashes blue	25%

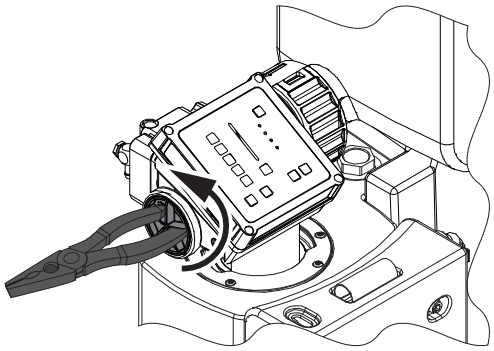
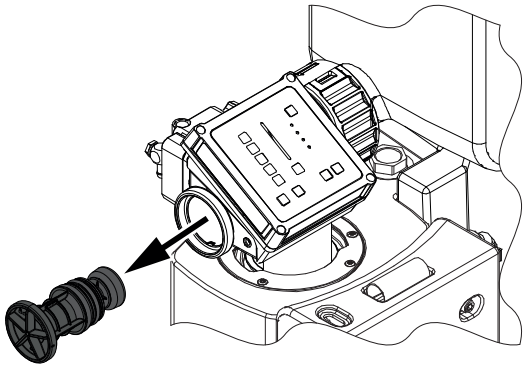
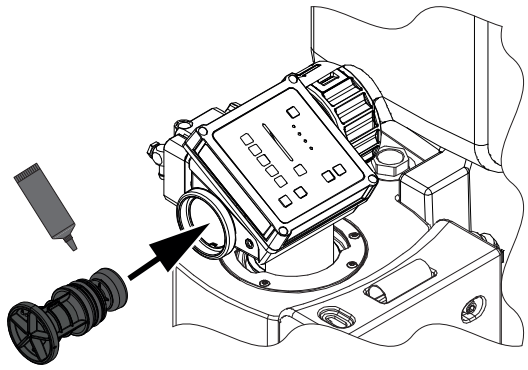
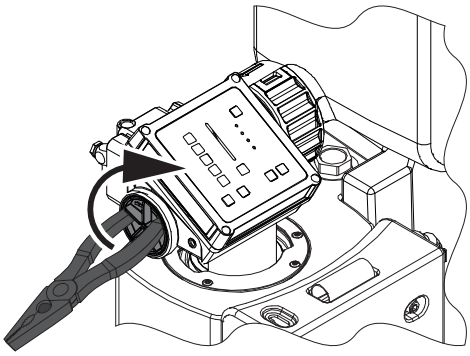
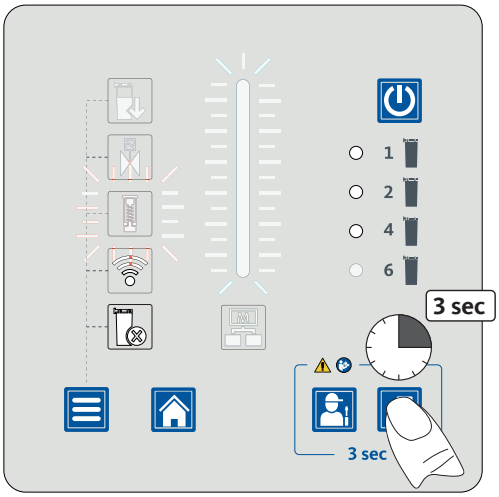
Figure	Description / explanation
	4. Loosen the piston cap counterclockwise and unscrew it completely. → Insert the handle ends of a pair of linesman pliers into the star-shaped handle of the piston cap and carefully turn it counterclockwise.
	5. Pull out the complete PISTON Service-Unit from the **FRC**. → Collect and dispose of leaked or spilled condensate in accordance with the locally applicable legal requirements and regulations. → Dispose of the removed PISTON Service-Unit properly (see section “14. Disposal” on page 129). 6. Check the sealing surfaces in the **FRC** for damage and soiling. → Remove any dirt. → If there is any damage, contact the manufacturer’s service department (please refer to section “1.1 Contact” on page 5).
	7. Lightly lubricate the O-rings of the new PISTON Service-Unit with the supplied Vaseline. 8. Insert the new PISTON Service-Unit into the **FRC**.

Figure	Description / explanation
	9. Screw in the piston cap clockwise as far as it will go. → Insert the handles of a pair of linesman pliers into the star-shaped handle of the piston cap and carefully turn clockwise.
	10. After completing the service on the piston, press and hold down the Enter button for 3 seconds. → The STATUS BAR status LED lights up green. → The display will switch to the START MENU screen. 11. Restore the condensate feed from the condensate collecting line to the pressure relief chamber.

10.3.5 Cleaning

10.3.5.1 Warning notices

DANGER	**Electrical voltage**
	Contact with live components may result in serious injury or death.
	• Do not carry out maintenance or repair work on the product unless it has first been de-energized and locked and tagged out.

CAUTION	**Personal injury caused by the improper use of cleaning agents**
	Improper use of cleaning agents may result in minor injuries and damage to health.
	• Use personal protective equipment. • Use cleaning agents in accordance with the manufacturer's instructions.

CAUTION	**Lifting heavy load**
	Lifting and moving the collector filled with flushing water in an ergonomically incorrect manner may result in personal injury.
	• Lift the collector filled with flushing water in an ergonomically correct manner close to your body. • Depending on the corresponding size and weight, you may need two people to lift and move the collector filled with flushing water.

NOTICE	**Damage due to improper cleaning**
	Improper cleaning can result in damage to components.
	• Flush the product only with non-pressurized water. • Never clean the device with hard or pointed implements. • Do not clean the product with a pressure washer or steam cleaner.

NOTICE	**Observe all local hygiene regulations**
	In addition to the cleaning instructions listed, any regionally applicable or company-specific hygiene regulations must be observed.

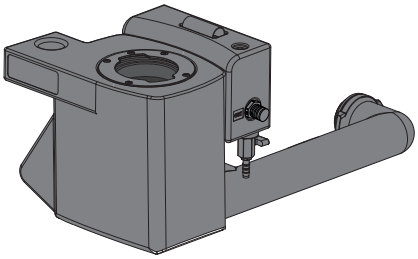
NOTICE	**Improper disposal of cleaning water**
	Do not convey cleaning water containing detergent back into the device. If cleaning water containing detergent enters the device, the corresponding surfactants may result in the filter cartridges not working correctly.
	• Properly dispose of cleaning water in accordance with all locally applicable legal requirements and regulations.

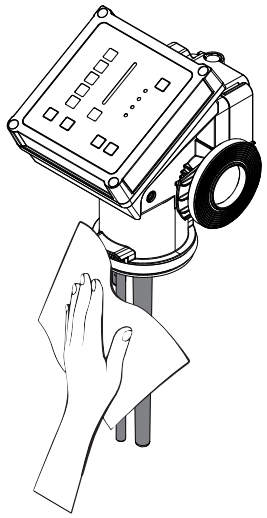
INFORMATION	**Extremely heavy soiling and deposits in the collector**
	If the collector is very heavily soiled with solid deposits and very large amounts of oil, replace it.

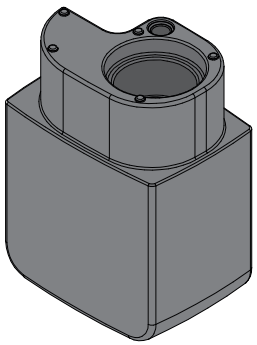
10.3.5.2 Cleaning work

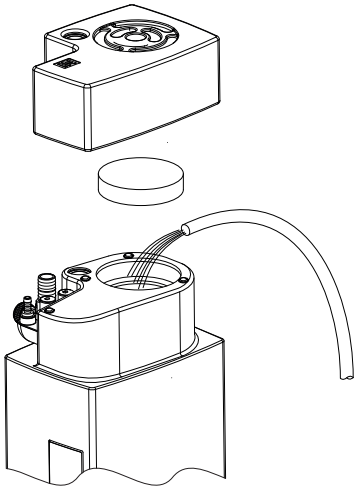
For cleaning work to be carried out, the following prerequisites must be fulfilled and the respective preparatory tasks must have been completed.

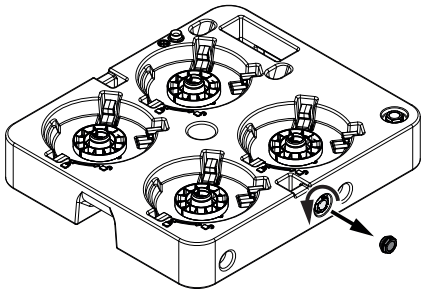
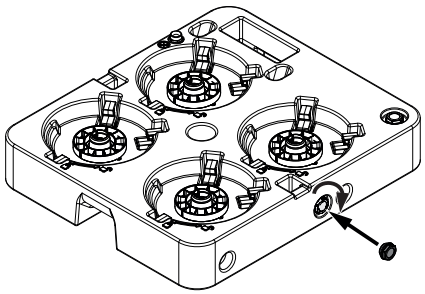
Prerequisites		
Tools	**Material**	**Protective equipment**
If there is heavy soiling: • Collecting container	**If there is mild soiling:** • Warm water • Cotton cloth or disposable cloth **If there is heavy soiling:** • Warm water • Standard dish detergent	**To be worn at all times:** 

Degree of soiling	Figure	Description / explanation
Soiled measuring chamber		**Preparation work:** 1. The product must have been shut down. 2. The assembly you will be cleaning must have been disassembled (please refer to section “13. Disassembly” on page 121). 3. Bring the assembly unit to be cleaned to a washing station with an integrated oil separator.
		Cleaning: • Flush the measuring chamber with warm water.
		Concluding work: 1. Dry the cleaned assembly with a cotton cloth. 2. Take the cleaned and dried assembly to where the product has been installed and install it (please refer to section “6. Installation” on page 57). 3. Put the product back into operation (please refer to section “8. Commissioning” on page 75).

Degree of soiling	Figure	Description / explanation
Soiled FRC control unit		**Preparation work:** 1. The product must have been shut down. 2. The assembly you will be cleaning must have been disassembled (please refer to section “13. Disassembly” on page 121). 3. Bring the assembly unit to be cleaned to a washing station with an integrated oil separator. **Cleaning:** • Carefully wipe the sensors’ sensor tubes clean with a damp cloth. **Concluding work:** 1. Dry the cleaned assembly with a cotton cloth. 2. Take the cleaned and dried assembly to where the product has been installed and install it (please refer to section “6. Installation” on page 57). 3. Put the product back into operation (please refer to section “8. Commissioning” on page 75).

Degree of soiling	Figure	Description / explanation
Soiled pressure relief chamber		**Preparation work:** 1. The product must have been shut down. 2. The assembly you will be cleaning must have been disassembled (please refer to section “13. Disassembly” on page 121). 3. Bring the assembly unit to be cleaned to a washing station with an integrated oil separator. **Cleaning:** • Flush the pressure relief chamber with warm water. **Concluding work:** 1. Dry the cleaned assembly with a cotton cloth. 2. Take the cleaned and dried assembly to where the product has been installed and install it (please refer to section “6. Installation” on page 57). 3. Put the product back into operation (please refer to section “8. Commissioning” on page 75).

Degree of soiling	Figure	Description / explanation
Mildly soiled collector, high water turbidity at condensate outlet		**Preparation work:** • Remove the cover from the pressure relief chamber and remove the activated carbon mat from the vent of the pressure relief chamber. **Cleaning:** • To clean, pour approximately 40 l of tap water in through the vent to flush the system with it. → Collect the corresponding condensate until you get the desired degree of turbidity. → During flushing, keep the water level as high as possible and let the water drain freely. **Concluding work:** 1. Fill the product with tap water via the vent. → Stop filling it as soon as water comes out from the condensate outlet. → Feed the condensate back in through the vent. 2. Insert the activated carbon insert into the pressure relief chamber's vent and install the cover on the pressure relief chamber.

<table>
<tr><th>Degree of soiling</th><th>Figure</th><th>Description / explanation</th></tr>
<tr><td rowspan="3">Heavily soiled collector, deposits and large amounts of oil in collector</td><td rowspan="2">  </td><td>Preparation work:
1. The product must have been shut down.
2. The assembly you will be cleaning must have been disassembled (please refer to section “13. Disassembly” on page 121).
3. Bring the assembly unit to be cleaned to a washing station with an integrated oil separator.</td></tr>
<tr><td>Cleaning:
1. Open the cap (if any) on the collector’s outlet and empty the collector.
→ Collect or siphon off the condensate.
2. Mix tap water with dish detergent and pour it into the outlet.
3. Carefully shake the collector, with the outlet pointing up, until the deposits come loose.
→ Please note that you might need a second person to help with this depending on the collector’s size and weight.</td></tr>
<tr><td>  </td><td>4. Pour fresh water into the collector and let it drain out multiple times until you get the desired cleaning results.
5. Collect the resulting flushing water and dispose of it separately. Close the collector’s outlet with the cap.

Concluding work:
1. Install the product with new cartridges (please refer to section “10.3.2 Replace filter cartridges” on page 96).</td></tr>
</table>

10.3.6 Visual inspection

During the visual inspection, check all components for mechanical damage and leaks. Replace damaged components immediately.

10.3.7 Leak test

A leak test is only possible if the product is completely filled with water.

1. Fill the product with tap water through the vent until the **FRC** performs a discharge operation.
2. Check all hose and other connections for leaks.

Error or fault pattern	Measure
Leaky hose connection	• Tighten the hose clamp. • Replace hardened hose and respective hose clamps.
Bayonet catch leaking	• Check the fit of the seal and correct if necessary. • Check the seal for damage and replace if necessary. • Tighten the bayonet fitting. • Check the seal for damage and replace if necessary.
End cap leaking	• Check the fit of the seal and correct if necessary. • Check the seal for damage and replace if necessary. • Tighten the end cap.

11. Consumables, accessories and spare parts

11.1 Order information

The manufacturer's service team will need the following information when handling inquiries or orders:

- Product name and size (see the type plate)
- Serial number (see type plate)
- Material number and designation of the expansion module (see type plate)
- Material number and designation of the accessory
- Desired number of accessories to be supplied

The contact information for the manufacturer's service team is listed in section "1.1 Contact" on page 5.

11.2 Wear parts

Designation	Material number
Filter cartridge, including two plastic plugs	4051809
SOLENOID VALVES Service-Unit	4058649
PISTON Service-Unit	4058648
Activated carbon mat, pressure relief chamber	4058539

11.3 Accessories

Designation	Material number
QWIK-PURE® iCS 550/**QWIK-PURE® iCS 1100** spill protection basin 900 mm x 800 mm (35.43 in x 31.5 in)	4047643
QWIK-PURE® iCS 2200 spill protection basin 1100 mm x 900 mm (43.31 in x 35.43 in)	4047644
QWIK-PURE® iCS 3300 spill protection basin 1400 mm x 900 mm (55.12 in x 35.43 in)	4058714
Expansion kit, **QWIK-PURE® iCS 550** zu **QWIK-PURE® iCS 1100**	4058554
Expansion kit for turning **QWIK-PURE® iCS 1100** into **QWIK-PURE® iCS 2200**	4058557
Expansion kit for turning **QWIK-PURE® iCS 2200** into **QWIK-PURE® iCS 3300**	4058511
Termination resistor, 5-pin	4056525
High pressure relief chamber	2801292

11.4 Spare parts

Designation	Material number
Pressure relief chamber 25 l (6.6 gal)	4058519
Pressure relief chamber cover	4059531
Pressure relief chamber float	4058544
Condensate inlet, rotatable, including fixing screw	4058538
2.5 l (0.66 gal) **QWIK-PURE® iCS 550** measuring chamber, including clean water tank	4058522
5 l (1.32 gal), **QWIK-PURE® iCS 1100 ... 3300** measuring chamber, including clean water tank	4058515
Foot	4058517
Collector, 1 x 1 filter cartridge	4058532
Collector, 1 x 2 filter cartridges	4058535
Collector, 2 x 2 filter cartridges	4058528
Expansion module, 1 x 2 filter cartridges, **QWIK-PURE® iCS 3300**	4058546
Plug for collector	4058545
Flow regulation controller (**FRC**), control unit**,** Modbus RS485, complete	4058543
Seal kit for **FRC** control unit	4058529
5 ppm reference turbidity tube	4012341
10 ppm reference turbidity tube	4001475
Elbow connector with union nut, reducer fitting and flat gasket	4059172
Fixing screw	4059164
Riser duct	4058552
End cap	4058550
Locking device, foot	4058548
Locking unit, expansion module	4058553
Connecting pipe, expansion modules	4058549
Bayonet insert, collector	4058542
QWIK-PURE® iCS 550 ... 3300 seal kit: • Gasket G1" • Condensate inlet O-ring • Filter cartridge seal • Clean water tank outlet seal • Pressure relief chamber outlet seal • **FRC** control unit seal	4058536
M12 4-pin connector	4055860
NEMA power cord	4056045

12. Removal from service

Personnel
Qualified service technicians (see section “2.3 Target group and personnel” on page 9)

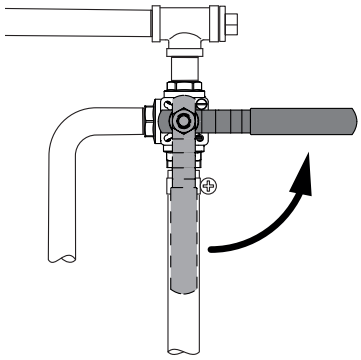
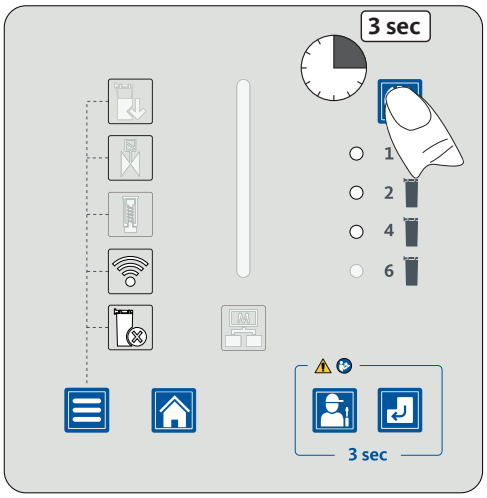
The product must be removed from service for prolonged periods of non-operation, e.g.:

- Repairs to the product or accessories
- Longer standstill of the entire system due to planned work (e.g. conversion work, major repairs, decommissioning of the overall system)

12.1 Warning notices

DANGER	Sudden escape of pressurized fluids
	There is a danger of death or serious personal injury resulting from contact with fast or suddenly escaping fluids or through bursting system parts.
	• Before starting work, depressurize the pressurized system and secure it against unintentional pressurization.

12.2 Removal from service

Figure	Description / explanation
	1. Shut off the condensate feed and divert the incoming condensate into a separate container.
	2. Turn off the **FRC**. Press and hold down the ON/OFF button for 3 seconds. → The **FRC** will switch to standby mode. → All LEDs go out and the STATUS BAR status LED flashes white at regular intervals. 3. Close the compressed air supply and lock and tag it out so that it cannot be opened again.

13. Disassembly

Personnel
Qualified service technicians (see section “2.3 Target group and personnel” on page 9)

13.1 Warning notices

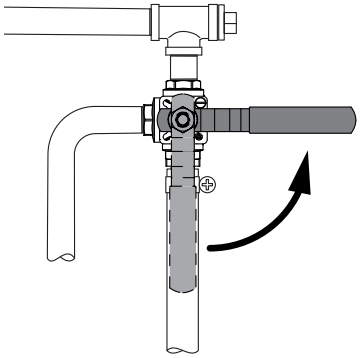
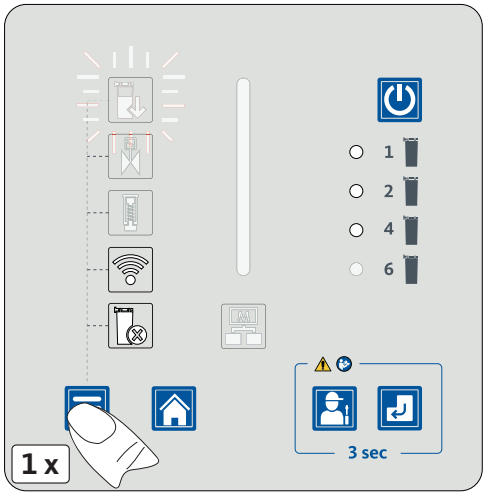
DANGER	Sudden escape of pressurized fluids
	There is a danger of death or serious personal injury resulting from contact with fast or suddenly escaping fluids or through bursting system parts.
	• Before starting work, depressurize the pressurized system and secure it against unintentional pressurization.

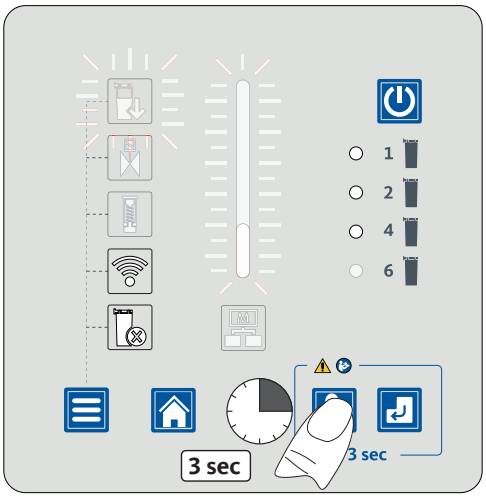
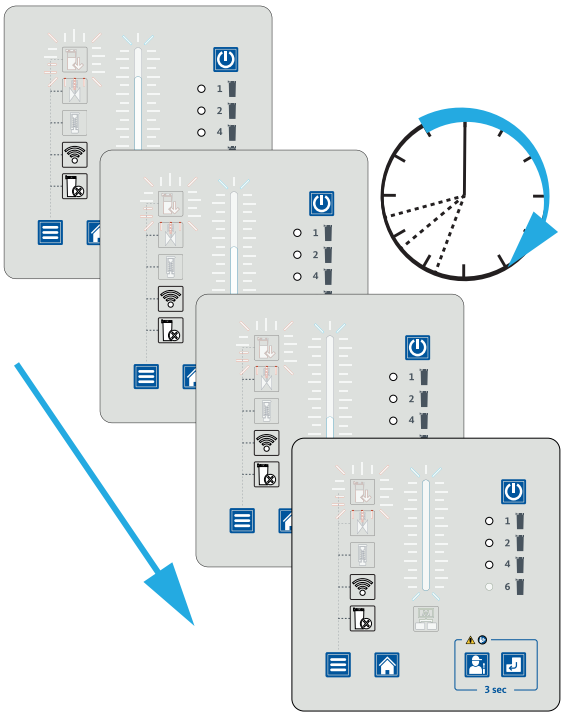
DANGER	Electrical voltage
	Contact with live components may result in fatal or serious injury, as well as functional and operating issues or property damage.
	• Before starting work, de-energize the product and the accessories and lock and tag them out.

13.2 Disassembly steps

For disassembly work to be carried out, the following prerequisites must be fulfilled and the preparatory tasks must have been completed.

Prerequisites		
Tools	**Material**	**Protective equipment**
• Adjustable wrench • Water pump pliers	• No material necessary	**To be worn at all times:** 

Disassembly steps	
Figure	**Description / explanation**
	1. Shut off the condensate flow to the product and divert the incoming condensate into a separate container.
	2. Press the menu button once.

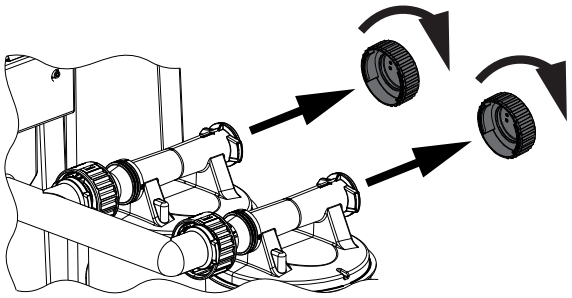
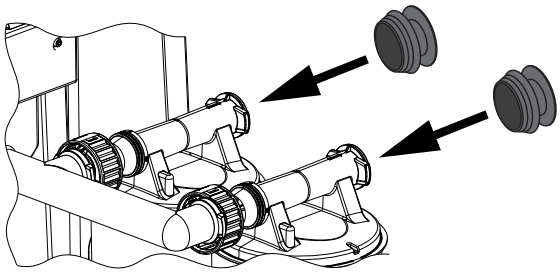
Disassembly steps	
Figure	**Description / explanation**
	The current status of the filter cartridges is displayed. → The FILTER CARTRIDGES status LED will flash red. → The STATUS BAR status LED lights up red. 3. Press and hold the Service button for 3 seconds.
	The discharge process is started. → The piston in the **FRC** will close the condensate inlet from the pressure relief chamber into the **FRC**. → The measuring chamber is supplied with auxiliary air at timed intervals. → The condensate is passed into the filter cartridges. This takes several minutes. → The STATUS BAR status LED flashes blue and indicates the remaining time until the filter cartridge needs to be removed.

STATUS BAR status LED	Remaining time
4/4 of the length flashes blue	100%
3/4 of the length flashes blue	75%
2/4 of the length flashes blue	50%
1/4 of the length flashes blue	25%

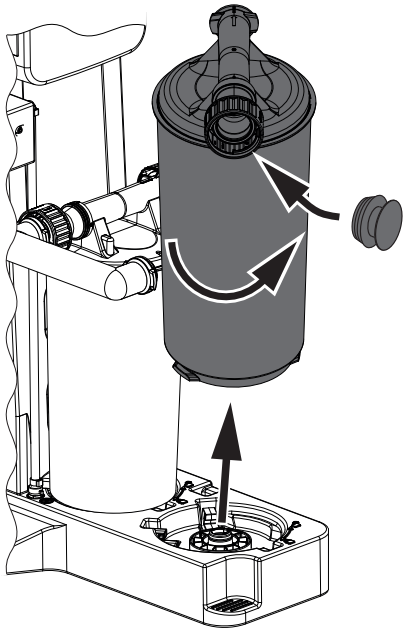
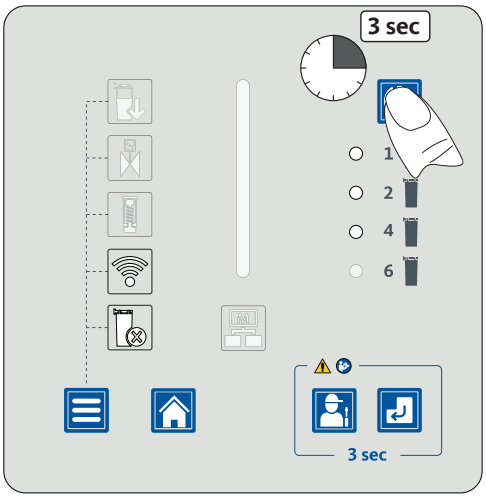
When the remaining time has elapsed, the discharge process stops.

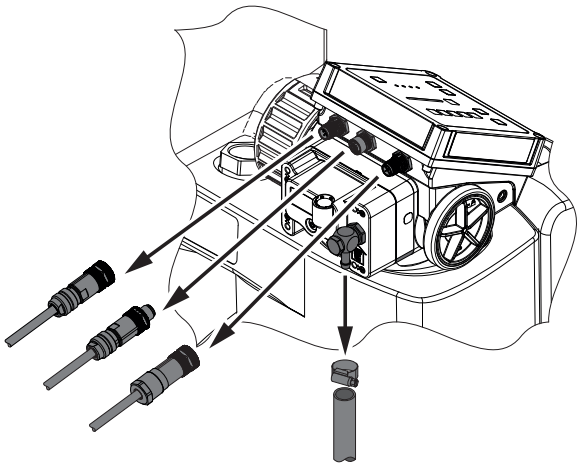
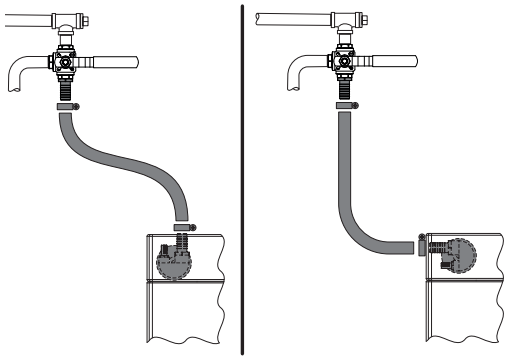
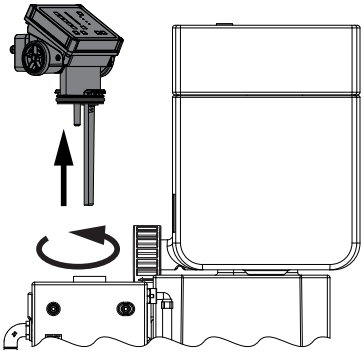
→ The STATUS BAR status LED lights up blue.

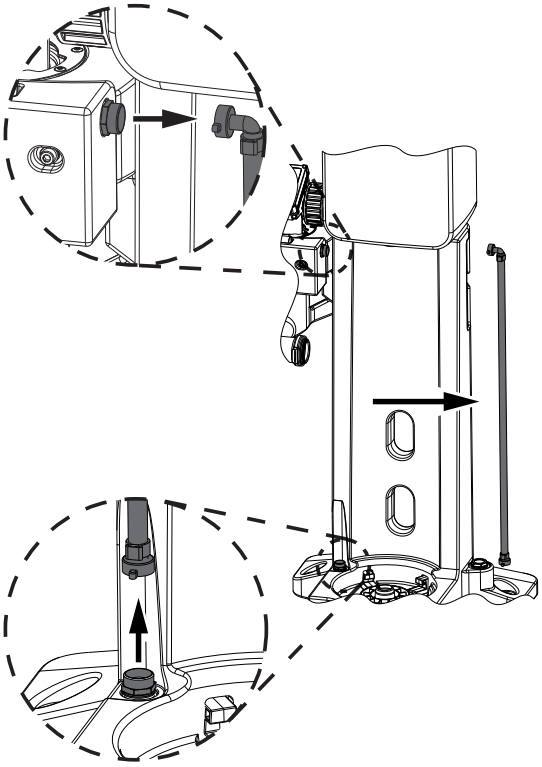
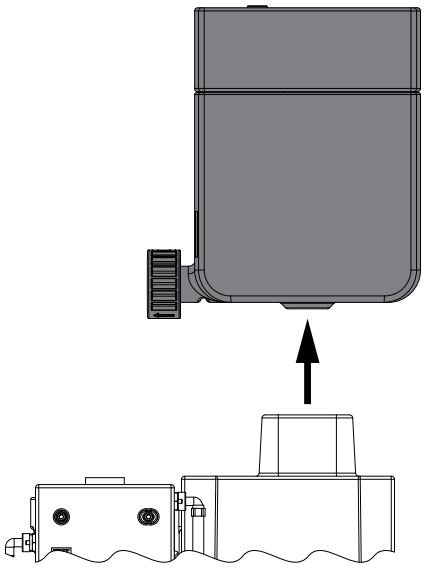
→ The measuring chamber is no longer pressurized with auxiliary air.

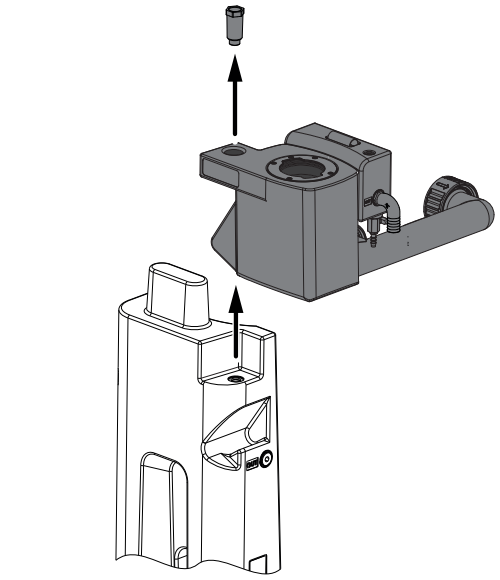
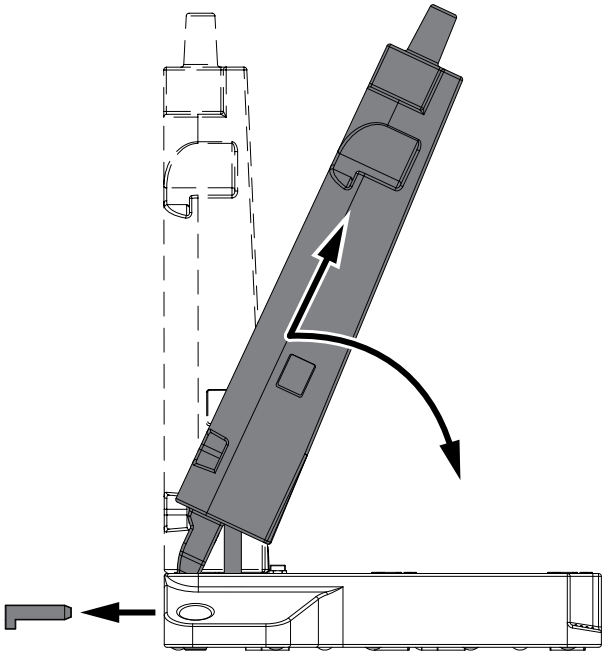
Disassembly steps	
Figure	**Description / explanation**
	4. Turn the end caps on the filter cartridges anticlockwise and remove them. → Dispose of the end caps properly (see section “14. Disposal” on page 129).
	5. Seal the filter cartridges with the plugs.

Disassembly steps

Figure	Description / explanation
CAUTION 	**Lifting heavy load** Lifting the full filter cartridge in an ergonomically incorrect manner may result in personal injury. • Lift the full cartridge in an ergonomically correct manner close to your body. • Use two people to lift the full cartridge over obstacles.
	6. Turn the bayonet catch of the filter cartridges anticlockwise and pull it off the connection at the measuring chamber outlet. 7. Starting with the last filter cartridge in the front row, turn the filter cartridges 45 degrees anticlockwise and seal them with the plugs provided. 8. Lift the filter cartridge out of the collector and dispose of it properly (see section “14. Disposal” on page 129).
	9. **Switching off the** FRC → Press and hold down the ON/OFF button for 3 seconds. → The **FRC** will switch to standby mode. → All LEDs go out and the STATUS BAR status LED flashes white at regular intervals. 10. Cut off the compressed air supply and lock and tag it out so that it cannot be opened again. 11. Carefully depressurize the compressed air hose at the compressed air connection.
DANGER 	**Electrical voltage** Contact with live components may result in fatal or serious injury, as well as functional and operating issues or property damage. • Before starting work, de-energize the product and the accessories and lock and tag them out.

Disassembly steps	
Figure	**Description / explanation**
	12. Cut off the power supply and lock and tag it out. 13. Loosen the union nut of the power supply cable on the **FRC** counterclockwise and remove it from the connection. 14. Loosen the union nuts of the Modbus wiring on the **FRC** counterclockwise and remove them from the connection. 15. Disassemble the compressed air hose.
	16. Remove the hose between the tapping point and the pressure relief chamber.
	17. Remove and clean the **FRC** (please refer to section “10.3.5 Cleaning” on page 110).

Disassembly steps	
Figure	**Description / explanation**
	18. Remove and clean the riser duct.
	19. Empty and remove the pressure relief chamber. 20. Clean the pressure relief chamber (see section “10.3.5 Cleaning” on page 110).

Disassembly steps	
Figure	**Description / explanation**
	21. Disassemble and clean the measuring chamber (see section “10.3.5 Cleaning” on page 110).
	22. Remove the locking device from the foot. 23. Remove the foot from the collector. Make sure to tilt the foot in the direction of the filter cartridge mount. 24. Empty and clean collector. 25. Dispose of the dismantled components properly (see section “14. Disposal” on page 129).

14. Disposal

The product and accessories must be properly disposed of at the end of their useful life, e.g., by a specialized company. Materials such as glass, plastics and some chemical compounds are mostly recoverable, reusable or recyclable.

NOTICE	Improper disposal
	The improper disposal of parts, components, operating and auxiliary materials, and cleaning agents can cause environmental damage.
	• Dispose of all components, parts, operating and auxiliary materials as well as cleaning agents professionally and in accordance with all locally applicable legal requirements and regulations. • Dispose of electrical and electronic components through a specialized disposal company or return them to the manufacturer. • In case of doubt, consult a local disposal company before disposal.

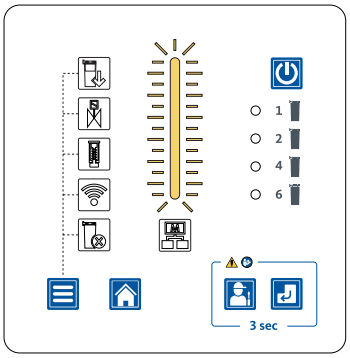
NOTICE	Improper storage
	The improper storage of parts, components, operating materials and auxiliary materials, as well as cleaning agents, can cause environmental damage.
	• Store all components, parts, operating and auxiliary materials as well as cleaning agents properly and in accordance with all locally applicable legal requirements and regulations. • Store used filter cartridges in one spill protection basin only.

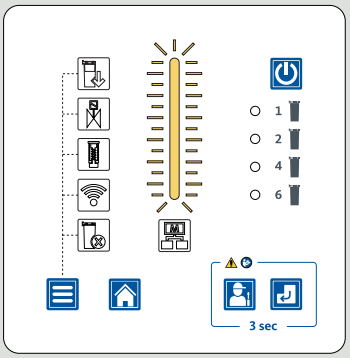
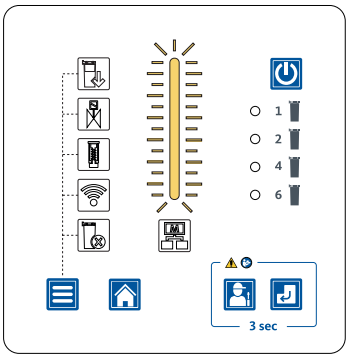
INFORMATION	Disposal of electrical and electronic products
	Electrical and electronic products (EEE) contain materials, components and substances that can be hazardous and harmful to human health and the environment if the waste from electrical and electronic products (WEEE) is not properly disposed of. Electrical and electronic equipment is marked with the crossed-out waste bin symbol. The crossed-out waste bin symbolizes that electrical and electronic products must be collected separately and not disposed of together with unsorted household waste. For more information regarding locally applicable legal requirements and regulations for the recycling of electrical and electronic products, contact regional waste disposal companies or the appropriate authorities.

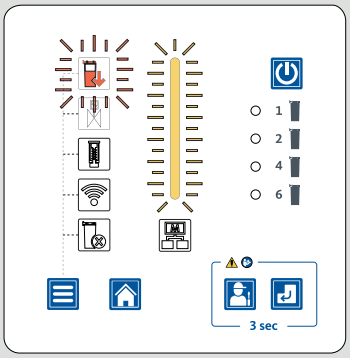
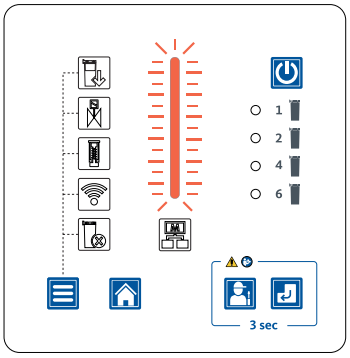
15. Troubleshooting

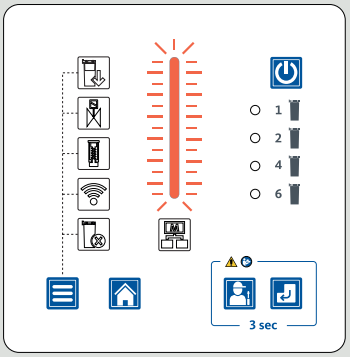
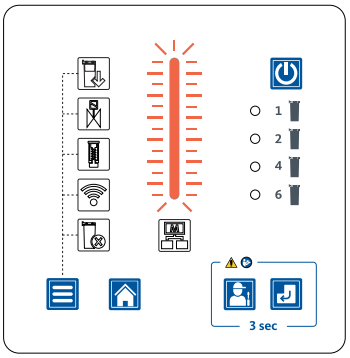
Read the error message with the WLAN function (please refer to section “9.2.6 Activating the WLAN” on page 87) or the Modbus function (please refer to section “3.5 Modbus function” on page 27).

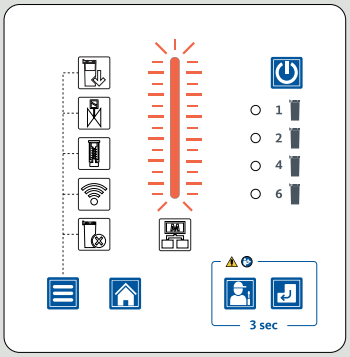
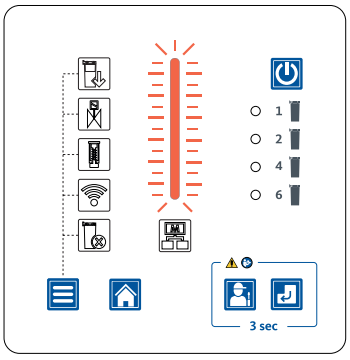
In the event of any malfunctions that are not described, malfunctions that cannot be fixed, or questions, contact the manufacturer’s service department (please refer to “1.1 Contact” on page 5).

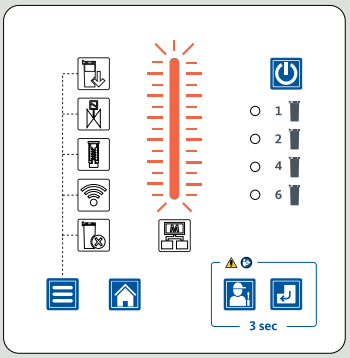
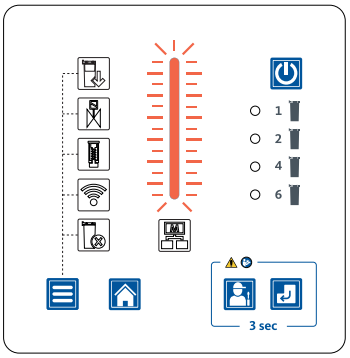
Error or fault pattern	Possible cause	Measure
WARNING 1 High Level (HL) sensor remains covered for too long after a discharge process has been started 	1. Soiled **FRC** sensors	Clean the **FRC** sensors (see section “10.3.5 Cleaning” on page 110)
	2. No compressed air supply	Switch on compressed air
	3. Excessively low compressed air operating pressure	Select correct pressure range (see section “4. Technical data” on page 45)
	4. Filling level far above the sensor after start of **FRC**	Reduce filling level by discharging (see section “9.2.8 Manually starting a discharge operation” on page 90)
	5. Filter cartridges are clogged 6. During the discharge operation, a hissing sound can be heard at the **FRC** pressure relief valves.	Replace filter cartridges (refer to section “10.3.2 Replace filter cartridges” on page 96)
	7. Piston malfunction	Remove PISTON Service-Unit and check whether it is working properly (see section “10.3.4 Replace the piston” on page 106)
	8. Riser duct clogged	Clean or replace the riser duct

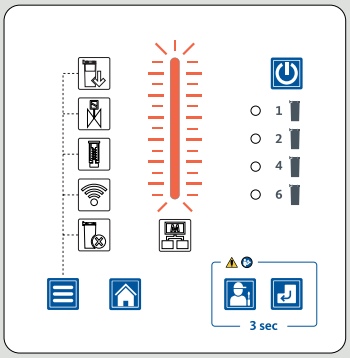
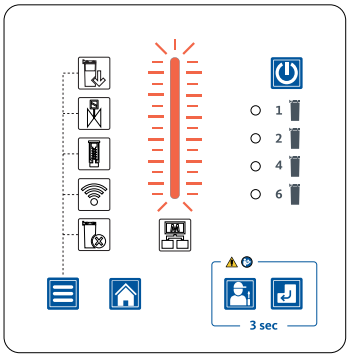
Error or fault pattern	Possible cause	Measure
WARNING 2 High Level Alarm (HLA) sensor remains covered for too long after discharge process has been started 	1. Soiled **FRC** sensors	Clean the **FRC** sensors (see section “10.3.5 Cleaning” on page 110)
	2. No compressed air supply	Switch on compressed air
	3. Excessively low compressed air operating pressure	Select correct pressure range (see section “4. Technical data” on page 45)
	4. Filling level far above the sensor after start of **FRC**	Reduce filling level by discharging (see section “9.2.8 Manually starting a discharge operation” on page 90)
	5. Filter cartridges are clogged 6. During the discharge operation, a hissing sound can be heard at the **FRC** pressure relief valves.	Replace filter cartridges (refer to section “10.3.2 Replace filter cartridges” on page 96)
	7. Piston malfunction	Remove PISTON Service-Unit and check whether it is working properly (see section “10.3.4 Replace the piston” on page 106)
	8. Riser duct clogged	Clean or replace the riser duct
WARNING 3 Illogical sensor values (e.g. High Level (HL) sensor and High Level Alarm (HLA) sensor covered but Low Level (LL) sensor uncovered) 	1. Soiled **FRC** sensors	Clean the FRC sensors (see section “10.3.5 Cleaning” on page 110)
	2. Very large quantity of oil in the measuring chamber due to a large oil inflow (e.g., oil leaking)	Monitor whether the error message disappears after a few discharge cycles. Contact the manufacturer’s service department (please refer to section “1.1 Contact” on page 5)

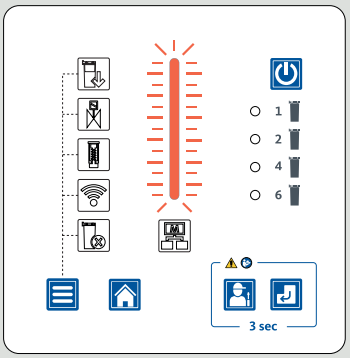
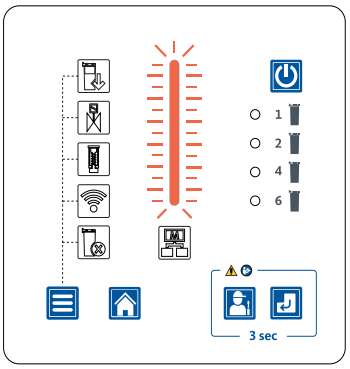
Error or fault pattern	Possible cause	Measure
WARNING 4 Permanently high oil quantity detected in measuring chamber 	1. Filter cartridges can no longer absorb oil	Replace filter cartridges (refer to section “10.3.2 Replace filter cartridges” on page 96)
	2. Permanently high quantity of oil in the measuring chamber due to a large oil inflow (e.g., oil leaking)	Check oil content in condensate inlet
FAULT 1 High Level (HL) sensor remains covered for too long after a discharge process has been started 	1. Soiled **FRC** sensors	Clean the **FRC** sensors (see section “10.3.5 Cleaning” on page 110)
	2. No compressed air supply	Switch on compressed air
	3. Excessively low compressed air operating pressure	Select correct pressure range (see section “4. Technical data” on page 45)
	4. Filling level far above the sensor after start of **FRC**	Reduce filling level by discharging (see section “9.2.8 Manually starting a discharge operation” on page 90)
	5. Filter cartridges are clogged 6. During the discharge operation, a hissing sound can be heard at the **FRC** pressure relief valves.	Replace filter cartridges (refer to section “10.3.2 Replace filter cartridges” on page 96)
	7. Piston malfunction	Remove PISTON Service-Unit and check whether it is working properly (see section “10.3.4 Replace the piston” on page 106)
	8. Riser duct clogged	Clean or replace the riser duct

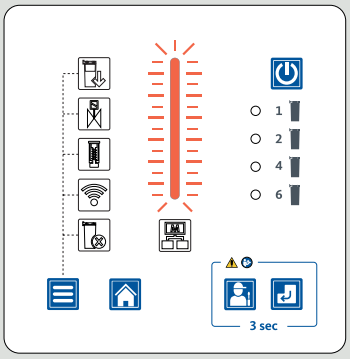
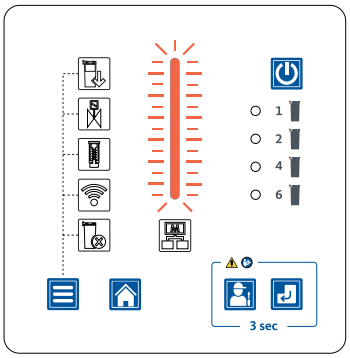
Error or fault pattern	Possible cause	Measure
FAULT 2 High Level (HL) sensor and High Level Alarm (HLA) sensor remain covered for too long after a discharge process has been started 	1. Soiled **FRC** sensors	Clean the **FRC** sensors (see section “10.3.5 Cleaning” on page 110)
	2. No compressed air supply	Switch on compressed air
	3. Excessively low compressed air operating pressure	Select correct pressure range (see section “4. Technical data” on page 45)
	4. Filling level far above the sensor after start of **FRC**	Reduce filling level by discharging (see section “9.2.8 Manually starting a discharge operation” on page 90)
	5. Filter cartridges are clogged 6. During the discharge operation, a hissing sound can be heard at the **FRC** pressure relief valves.	Replace filter cartridges (refer to section “10.3.2 Replace filter cartridges” on page 96)
	7. Piston malfunction	Remove PISTON Service-Unit and check whether it is working properly (see section “10.3.4 Replace the piston” on page 106)
	8. Riser duct clogged	Clean or replace the riser duct
FAULT 3 High Level Alarm (HLA) sensor remains covered for too long after discharge process has been started 	1. Soiled **FRC** sensors	Clean the **FRC** sensors (see section “10.3.5 Cleaning” on page 110)
	2. No compressed air supply	Switch on compressed air
	3. Excessively low compressed air operating pressure	Select correct pressure range (see section “4. Technical data” on page 45)
	4. Filling level far above the sensor after start of **FRC**	Reduce filling level by discharging (see section “9.2.8 Manually starting a discharge operation” on page 90)
	5. Filter cartridges are clogged 6. During the discharge operation, a hissing sound can be heard at the **FRC** pressure relief valves.	Replace filter cartridges (refer to section “10.3.2 Replace filter cartridges” on page 96)
	7. Piston malfunction	Remove PISTON Service-Unit and check whether it is working properly (see section “10.3.4 Replace the piston” on page 106)
	8. Riser duct clogged	Clean or replace the riser duct

Error or fault pattern	Possible cause	Measure
FAULT 4 High Level Alarm (HLA) sensor and High Level (HL) sensor remain covered for too long after a discharge process has been started 	1. Soiled **FRC** sensors	Clean the **FRC** sensors (see section “10.3.5 Cleaning” on page 110)
	2. No compressed air supply	Switch on compressed air
	3. Excessively low compressed air operating pressure	Select correct pressure range (see section “4. Technical data” on page 45)
	4. Filling level far above the sensor after start of **FRC**	Reduce filling level by discharging (see section “9.2.8 Manually starting a discharge operation” on page 90)
	5. Filter cartridges are clogged 6. During the discharge operation, a hissing sound can be heard at the **FRC** pressure relief valves.	Replace filter cartridges (refer to section “10.3.2 Replace filter cartridges” on page 96)
	7. Piston malfunction	Remove PISTON Service-Unit and check whether it is working properly (see section “10.3.4 Replace the piston” on page 106)
	8. Riser duct clogged	Clean or replace the riser duct
FAULT 5 Illogical sensor values (e.g. High Level (HL) sensor and High Level Alarm (HLA) sensor covered but Low Level (LL) sensor uncovered) 	1. Soiled **FRC** sensors	Clean the **FRC** sensors (see section “10.3.5 Cleaning” on page 110)
	2. Very large quantity of oil in the measuring chamber due to a large oil inflow (e.g., oil leaking)	Observe whether the error message disappears after a few discharge cycles

Error or fault pattern	Possible cause	Measure
FAULT 6 Low Level (LL) sensor remains covered for too long after a discharge process has been started 	1. Soiled **FRC** sensors	Clean the **FRC** sensors (see section “10.3.5 Cleaning” on page 110)
	2. Excessively low compressed air operating pressure	Select correct pressure range (see section “4. Technical data” on page 45)
	3. The minimum compressed air operating pressure is being fallen below during operation	Check compressed air volume
	4. Filter cartridges are clogged 5. During the discharge operation, a hissing sound can be heard at the **FRC** pressure relief valves.	Replace filter cartridges (refer to section “10.3.2 Replace filter cartridges” on page 96)
	6. Piston malfunction	Remove PISTON Service-Unit and check whether it is working properly (see section “10.3.4 Replace the piston” on page 106)
	7. Riser duct clogged	Clean or replace the riser duct
FAULT 7 Low Level (LL) sensor becomes free too quickly during discharge 	1. Soiled **FRC** sensors	Clean the **FRC** sensors (see section “10.3.5 Cleaning” on page 110)
	2. Excessively high compressed air operating pressure	Select correct pressure range (see section “4. Technical data” on page 45)
	3. SOLENOID VALVES Service-Unit malfunction (e.g., due to contaminated compressed air)	Remove SOLENOID VALVES Service-Unit and check whether it is working properly (see section “10.3.3 Replace the solenoid valves” on page 102)
	4. Piston assembly defective	Remove PISTON Service-Unit and check whether it is working properly (see section “10.3.4 Replace the piston” on page 106)

Error or fault pattern	Possible cause	Measure
FAULT 8 Oil quantity in the measuring chamber permanently too high 	1. Filter cartridges can no longer absorb oil	Replace filter cartridges (refer to section “10.3.2 Replace filter cartridges” on page 96)
	2. Very high quantity of oil constantly in the measuring chamber due to a large oil inflow (e.g., oil leaking)	Check oil content in inlet
FAULT 9 Oil quantity in the measuring chamber constantly excessive and High Level Alarm (HLA) sensor remains covered for too long after a discharge process has been started 	1. Filter cartridges can no longer absorb oil	Replace filter cartridges (refer to section “10.3.2 Replace filter cartridges” on page 96)
	2. Soiled **FRC** sensors	Clean the **FRC** sensors (see section “10.3.5 Cleaning” on page 110)
	3. No compressed air supply	Switch on compressed air
	4. Excessively low compressed air operating pressure	Select correct pressure range (see section “4. Technical data” on page 45)
	5. Filling level far above the sensor after start of **FRC**	Reduce filling level by discharging (see section “9.2.8 Manually starting a discharge operation” on page 90)
	6. Filter cartridges are clogged 7. During the discharge operation, a hissing sound can be heard at the **FRC** pressure relief valves.	Replace filter cartridges (refer to section “10.3.2 Replace filter cartridges” on page 96)
	8. Piston malfunction	Remove PISTON Service-Unit and check whether it is working properly (see section “10.3.4 Replace the piston” on page 106)
	9. Riser duct clogged	Clean or replace the riser duct

Error or fault pattern	Possible cause	Measure
FAULT 10 Oil quantity in the measuring chamber constantly excessive and Low Level (LL) sensor remains covered for too long after a discharge process has been started 	1. Filter cartridges can no longer absorb oil	Replace filter cartridges (refer to section “10.3.2 Replace filter cartridges” on page 96)
	2. Soiled **FRC** sensors	Clean the **FRC** sensors (see section “10.3.5 Cleaning” on page 110)
	3. Too little pressure	Select correct pressure range (see section “4. Technical data” on page 45)
	4. Pressure drops during discharge	Check compressed air volume
	5. Filter cartridges are clogged 6. During the discharge operation, a hissing sound can be heard at the **FRC** pressure relief valves.	Replace filter cartridges (refer to section “10.3.2 Replace filter cartridges” on page 96)
	7. Piston malfunction	Remove PISTON Service-Unit and check whether it is working properly (see section “10.3.4 Replace the piston” on page 106)
	8. Riser duct clogged	Clean or replace the riser duct
FAULT 11 Constantly excessive oil quantity detected in measuring chamber 	1. Filter cartridges can no longer absorb oil	Replace filter cartridges (please refer to section “10.3.2 Replace filter cartridges” on page 96) and reset the error message (please refer to section “9.2.10 Reset error message” on page 92)
	2. Very high quantity of oil in the measuring chamber constantly due to large oil ingress (e.g., oil breakthrough)	Check oil content in condensate inlet

Error or fault pattern	Possible cause	Measure
FAULT 12 Constantly excessive oil quantity detected in measuring chamber 	1. Excessive amounts of oil have been introduced into the system 2. The system has been run in gravity mode without power for a prolonged period of time	Siphon off the excess oil from the measuring chamber and reset the error message (please refer to section “9.2.10 Reset error message” on page 92)
FAULT 13 Sensor validation check failed 	1. Soiled **FRC** sensors	Clean the **FRC** sensors (see section “10.3.5 Cleaning” on page 110) Restart the **FRC** control unit
	2. Faulty **FRC** sensors	Replace the **FRC** control unit

16. Notes

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