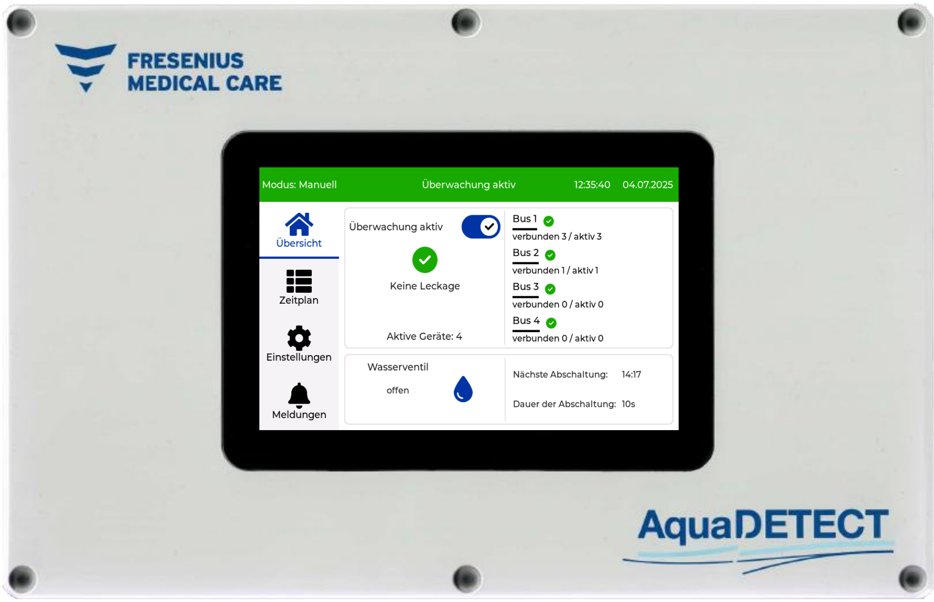
AquaDETECT
Leakage monitoring

User Manual

Software version: 1.0.1

Date of issue: September 2025

CE



STEHA
ELEKTRONIK

Table of contents

1 Important information

1.1 Use of the operating instructions

Device designation

The **AquaDETECT** device type is referred to as the device in the following text.

Identification

The device can be identified by the following information on the cover sheet and, if applicable, on the insert labels:
if available, on the insert labels:
- Software version of the device
- Serial number
- Date of issue of the document

Footer

The footer contains the following information:
- Company
- Device type
- Page number

Representations in the document

The following representations can be used in the document:

Representation	Description
➢ Instruction	Instructions are indicated by an arrow➢ . Instructions must be followed. Example:➢ Perform action.
1. Numbered instructions 2. ... 3. ...	Extensive passages with instructions for action can be numbered. Instructions for action must be carried out. Example: 1. Perform action.

Illustrations	The illustrations used in the documents may differ from the original. If the instructions in the manual differ from the installation instructions, follow the instructions in the manual.
Importance of the instructions	These operating instructions are part of the accompanying documents and are therefore part of the device. It contains all necessary information for using the device. The operating instructions must be studied thoroughly before the device is put into operation.
Changes	Changes to the documents are made in the form of new editions or supplementary sheets. In general, the following applies: Subject to change without notice.
Duplication	Reproduction, even in part, is only permitted with written permission. permission.

1.2 Significance of the warning

Information that alerts the user to the possibility of serious or fatal injury if the measures to prevent the hazard are not observed.

Warning

Type and cause of the hazard

Possible consequences if the hazard occurs.

➢ Measures to prevent the hazard.

The warnings may deviate from the above pattern in the following cases:
– If a warning refers to several hazards.
– If no specific hazards can be assigned to a warning.

1.3 Meaning of the note

Note

Information that alerts the user that the following consequences are to be expected if the instructions are not followed:

– Damage to the device may occur.
– Desired functions may not work or may not work correctly.

1.4 Meaning of the tip

Tip

Information that provides the user with tips for optimal usability.

1.5 Brief description

The system is manufactured according to the state of the art and complies with the provisions of DIN EN 60335-1 (VDE 0700 Part 1):2024-07

1.6 Intended use

1.6.1 Intended use

The **AquaDETECT** leakage monitoring system extends the standard leakage monitoring of the water treatment room to comprehensive leakage monitoring of a dialysis center. This is achieved by up to 55 leakage sensors. Any leaks that occur are detected and reported.

Furthermore, the dialysis water supply systems, dialysis concentrate treatment and dialysis concentrate supply systems connected to the central leakage detection system, as well as pressure boosters or pre-filtration, can be shut down. This prevents damage to the building.

The AquaDETECT system ensures the safe operation of a reverse osmosis system during supply times when no personnel are available to monitor its trouble-free functioning.

1.6.2 Residual risks

None

Note

Defective leakage sensors

The function of the leakage sensors must be checked as part of maintenance work.

1.6.3 Side effects

None

1.6.4 Contraindications

None

1.6.5 User group

The device may only be installed and operated by persons who have the necessary training or knowledge and experience.

Assembly, functional qualification, extensions, adjustments, calibrations, maintenance measures, modifications, or repairs may only be carried out by the manufacturer or by persons authorized by the manufacturer.

By carefully reading these operating instructions, the user acquires all the knowledge necessary for the safe and proper operation of the product. No further prior knowledge or special training is required. However, it is recommended that the instructions be followed carefully to ensure safe and efficient operation.

1.6.6 Repair, Maintenance, Transport

Only original spare parts may be used.

The electronic spare parts catalog must generally be used to identify and order spare parts, measuring equipment, and auxiliary materials.

Transport and storage (see chapter "9 ").

1.7 When working on the device, observe the following

Warning

Risk of injury to users due to improper servicing of the device

Improper servicing can impair the safe functioning of the device.

➢ The service provider responsible for the sale and installation of this device is obliged to ensure in an appropriate manner that commissioning, extensions, adjustments, calibrations, maintenance measures, modifications, or repairs are carried out by sufficiently qualified personnel. Suitable qualifications may be obtained through technical training, courses, or sufficient practical experience in a similar field.

Further information on installation (see chapter 8).

Further information on maintenance measures (see chapter 10).

Only spare parts approved by the manufacturer may be used. The electronic spare parts catalog must always be used to identify and order spare parts, measuring instruments, and auxiliary equipment.

For further information on transport and storage, see chapter 9.

If maintenance is carried out to the prescribed extent and at the specified intervals, safe operation of the device is guaranteed in the intervening period.

In addition, the manufacturer recommends that maintenance measures be carried out at the same intervals to prevent malfunctions of the device due to wear and tear.

1.8 Responsibilities of the responsible organization

Specifications

The responsible organization is responsible for ensuring that the following requirements are met:

- National or local regulations for installation, operation, use, and maintenance must be observed.
- Accident prevention regulations must be observed.
- The device must be in proper and safe condition.
- The operating instructions must be accessible at all times.
- The device may only be operated under the operating conditions specified by the manufacturer.

Training and instruction

The device may only be used by persons who have acquired basic knowledge of its handling by carefully reading the operating instructions and who follow these instructions carefully.

If you have any further questions, please contact your local service department (see chapter 1.12).

- **Further aspects of the responsible organization**

The **AquaDETECT** leakage detection system must be freely accessible from all sides.

The responsible organization is responsible for ensuring that the design values of the **AquaDETECT** leakage detection system are compatible with the requirements of the other components used. These are, in particular, the system components pre-filtration and dialysis machine.

1.9 User responsibility

To report unexpected operation or incidents, first contact your national service provider. (see chapter 1.12).

Warning

Risk of injury due to device defect

If the following defects are found on the device, the measures listed below must be taken.

Defects on the device:

– Mechanical damage
– Defective power cord
– Other defects
– The device does not respond as expected
– Deterioration of performance characteristics

Measures

– The device must be taken out of service.
– The responsible organization or service department must be notified.

1.10 Disclaimer

Warning

Responsibility of the responsible organization

For this device, Chapter 7 contains a list of consumables and accessories that are suitable for this device and can be used safely with it.

The manufacturer of this device cannot guarantee the suitability of consumables and accessories other than those listed for use with this device. The manufacturer of this device cannot make any statements regarding the safety and performance of the device when used with consumables and accessories other than those listed.

If other consumables and accessories are used, their suitability must be checked beforehand. This can be done, for example, by referring to the information in the operating instructions for the consumables and accessories in question.

The manufacturer of this device accepts no liability for damage caused by the use of unsuitable consumables and accessories.

1.11 Warning notices

1.11.1 Basic warning notices

Warning

Repairs may only be carried out by qualified or trained personnel!

Warning

Danger due to unauthorized modifications

Modifications to the device are not permitted!

Warning

Disconnect the power plug before opening the device!

Note

False leakage alarm - avoid bridging the contacts

➢ When installing the sensors, ensure that the contacts are not connected in a conductive manner.

1.11.2 Electrical safety warnings

Warning

Risk of injury from electric shock

If the protective earth connection is missing, an electric shock may occur.

Only connect the device to a power supply with a protective conductor!

Warning

Risk of injury due to electrical voltage

Touching live parts will result in an electric shock.

Disconnect the power plug before opening the device. This disconnects the device from the power supply.

Warning

Specifications for connection to the power supply

When connecting the device to a power supply, the specific national regulations must be observed!

Do not use additional extension cables, multiple plugs/couplings, or multiple sockets.

1.11.3 Hygiene warnings

Surface cleaning

Warning

Please note when cleaning surfaces

Before cleaning the surface of the AquaDETECT system, disconnect the power plug!

Note

Do not use abrasive cleaners, aggressive cleaning agents or solvents!

1.11.4 Building protection

Improper handling of the AquaDETECT system may result in leaks going undetected and causing damage to equipment, installations, and buildings.

The monitoring times must be adjusted by the user to the requirements of the dialysis center. If there are changes to organizational processes, the monitoring plan must be adjusted accordingly.

1.12 Addresses

If you have any questions, please contact your local Fresenius Medical Care service center:

Service National

Fresenius Medical Care

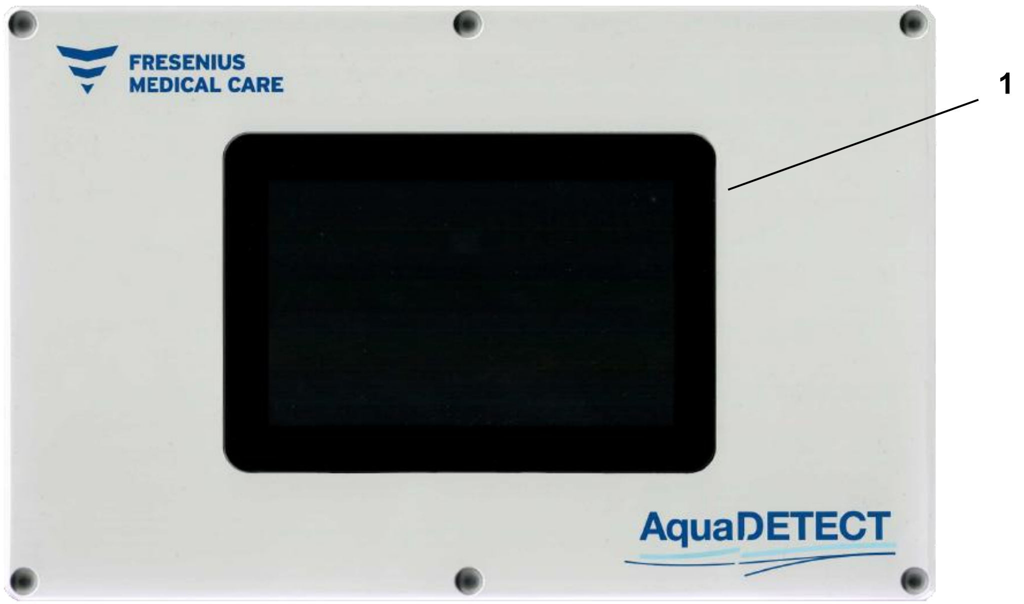
Manufacturer

STEHA Elektronik GmbH
D-63856 Bessenbach
Germany
Phone: +49 (0)6095 / 99 38 86
www.steha.de

2 Device structure

2.1 Front view central leakage detection system

- (Component A)



Legend

Pos	Components
1	Touch display

2.2 Underside view central leakage detection system

- (Component A)

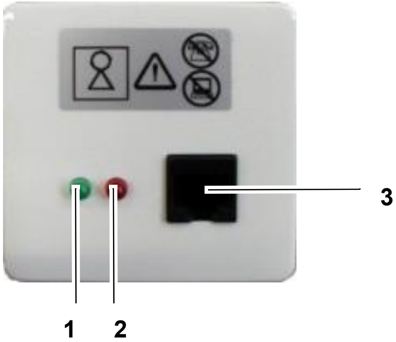
Legend

Pos	Components
1	USB-A port
2	Ethernet port
3	Connection for bus line 1 – 4
4	Connection for bus line 1 – 4
5	Connection for bus line 1 – 4
6	Connection for bus line 1 – 4
7	External control
8	Normally open contact (signal)
9	Normally open contact (signal)
10	Normally open contact (signal)
11	Normally open contact (signal)
12	Normally open contact (signal)
13	Changeover contact (signal/load)
14	Changeover contact (signal/load)
15	Solenoid valve
16	Mains connection (socket C14)

2.3 Leakage detection device

- **(Component B)**

Leakage detection device with RJ-45 socket



Legend

Components	
1	Green LED
2	Red LED
3	Connection for leakage sensor

2.4 Wall mounting frame

- **(Component C, optional)**

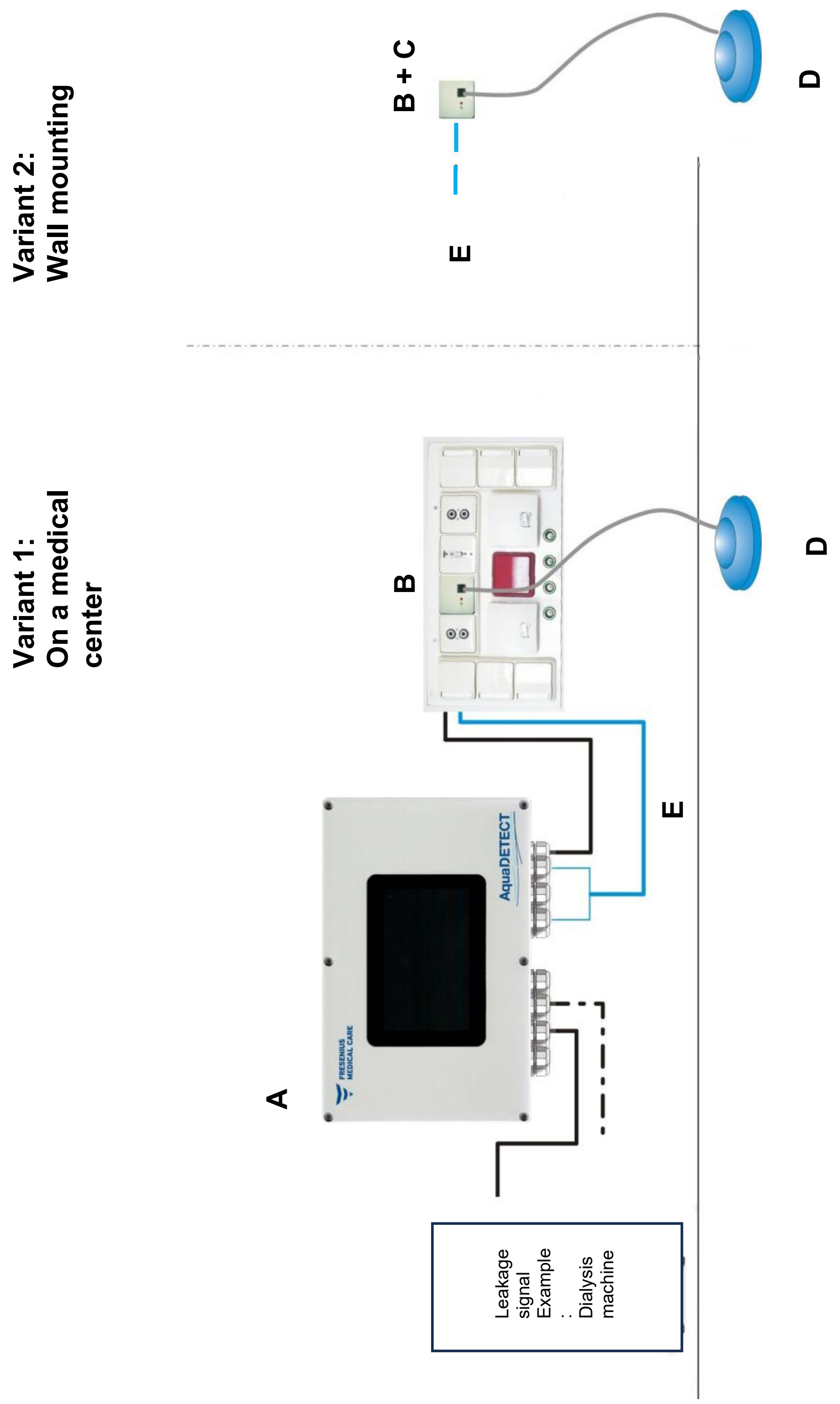
This frame is **only** required **for wall mounting** when using the leakage detection device **B**.

2.5 Leakage sensor with RJ-45 socket

- **(component D)**

Side view

2.6 Overview of the entire system



Legend on the next page

Legend

Pos	Component	Function/description
A	**AquaDETECT central leakage detection system** – Housing – Circuit boards – Cable	Power supply, information processing, control
B	**AquaDETECT leakage detection device** – Leakage detection device **with RJ-45** socket for connecting the leakage sensor	Information processing, signaling of sensor operating status, space addressing
C	**Mounting frame** Required for wall mounting of component B	Cover frame for mounting the leakage detection device on the wall
D	**AquaDETECT point leak sensor** with RJ-45 plug	Detection of leaks
E	**Bus cable**	Power supply and information exchange

3 Operation

3.1 Quick operation

Operating mode

By selecting the sub-item **Settings,** the following programs can be selected in the **Operating mode** menu:
(for a more detailed description, see chapter 3.4.2)

- **Schedule**
- **Manual**
- **External**
- **Test**

➢ The **Save or Cancel** buttons activate the selected operating mode or undo the last selection.

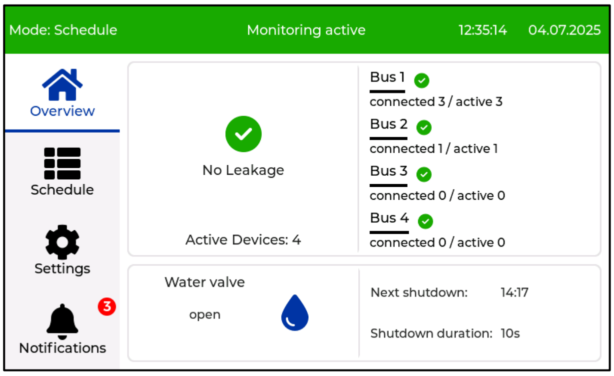
Settings

- **Date & time**
- **Operating mode**
- **Space deactivation**
- **Language**
- **Software**
- **I/O level**
- **Pre-warning delay**
- **Water supply schedule**
- Use the **Save or Cancel** buttons to save the selected setting or undo the last selection.

Acknowledge leakage signal

➢ A leakage signal that has occurred is acknowledged by eliminating the leakage and drying the sensor.

3.2 Menu item: Overview



Leakage monitoring

- Display of the current monitoring status of the leakage sensors
- Display of connected and activated leakage detection devices and leakage sensors

Water valve

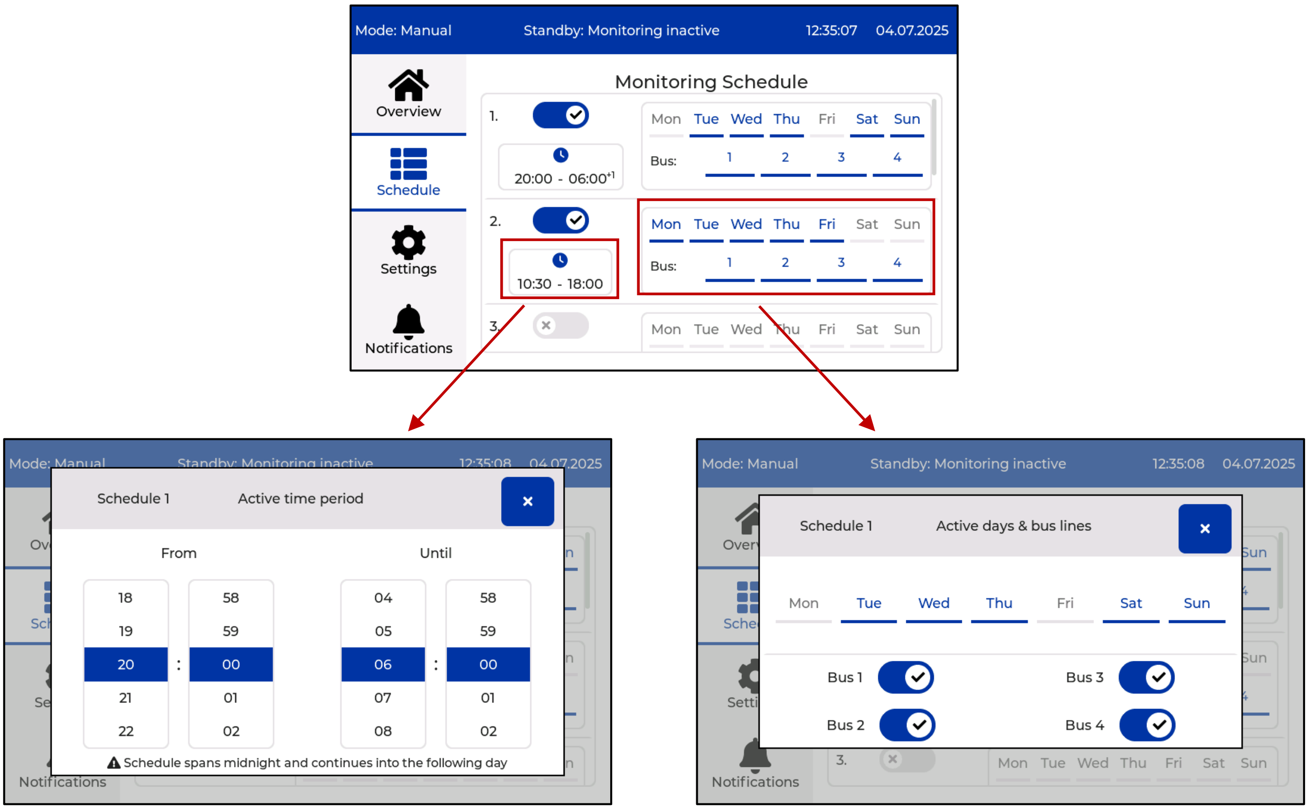
- Display of the status of the water valve
  - Open / closed
  - Fault
- Display of interval shutdown
  - Time of shutdown
  - Switch-off duration

3.3 Menu item: Schedule

Offers 8 different schedules for individual setting of the leakage monitoring.

Each schedule consists of the following **3 elements**:
1) Switch for activating the schedule
2) Display/button for setting the start and stop times for monitoring
3) Display/button for setting the weekdays and bus lines for monitoring

The display elements also function as buttons and open a menu for setting the respective parameters.



Setting the schedules:

1) Monitoring period on a single day
Task: The schedule should ensure monitoring from 10:00 to 18:00 on a Monday.

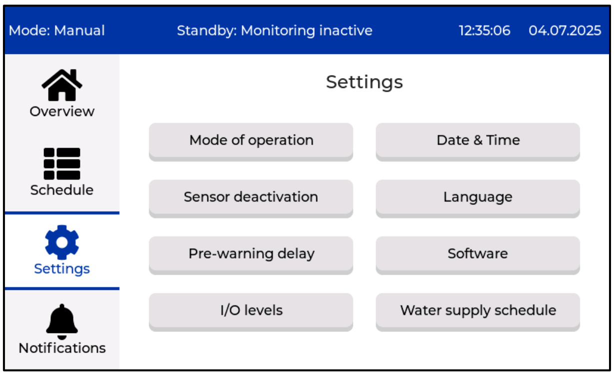
Setting:
Monitoring period: 10:00 - 18:00 **Days**: Monday

2) Monitoring period from the set day to the following day
Task: The schedule should ensure monitoring from Monday 18:00 to Tuesday 10:00.

Setting:
Monitoring period: 18:00 – 10:00[1] **Days**: Monday

Monitoring begins on the set day (Monday) at 18:00 and continues until the following day (Tuesday) at 10:00, even if monitoring is not activated for the following day (Tuesday).

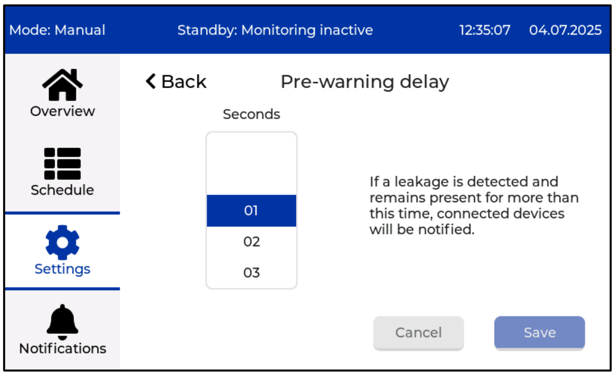
3.4 Menu item: Settings



Under **Settings,** you will find another submenu with the following options:

- **Date & Time**
- **Operating mode**
- **Sensor deactivation**
- **Language**
- **Software**
- **I/O level**
- **Pre-warning delay**
- **Water supply schedule**

3.4.1 Early warning delay



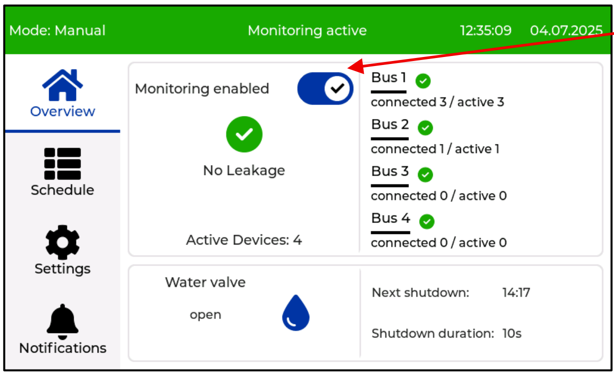
An early warning delay between 1 and 59 seconds (increment: 1 sec) can be set. The early warning delay is the time for which a leakage must be detected before the potential-free contacts switch.

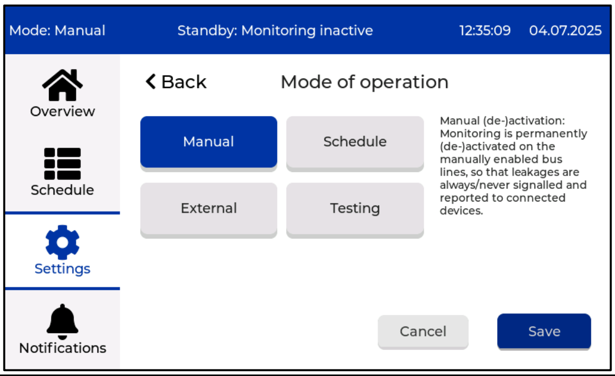
If a leakage is reported for a period shorter than the early warning delay, the potential-free contacts do not switch and the system remains in monitoring mode.

3.4.2 Operating mode

The central leakage detection system offers the following operating modes:

Operating mode*:* ***Manual***





The control element is displayed in **the overview screen**.

Activation

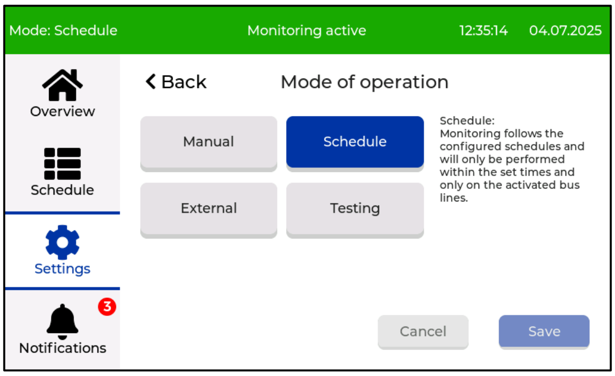
If necessary, the AquaDETECT system can be manually switched to monitoring mode without having to make any changes to the monitoring schedule. In this program, leakage monitoring is active and connected devices are switched off in the event of a leakage via the potential-free contacts.

Deactivation

In the event of a system malfunction, it is possible to manually disarm the entire system.

In this operating mode, the relays of the potential-free contacts do not switch.

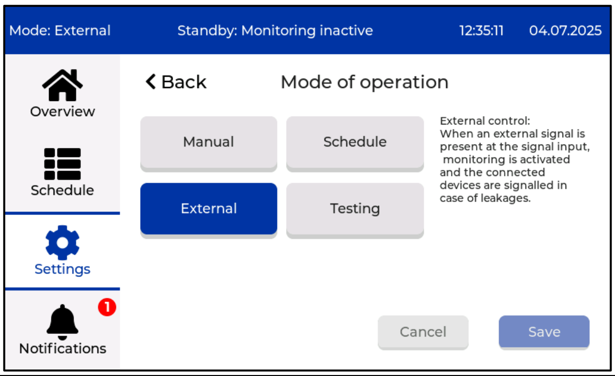
Operating mode*:* ***Schedule***



In schedule mode, leakage monitoring is carried out according to a programmable monitoring schedule. The monitoring interval, the selected weekdays, and the bus lines included in the monitoring can be defined in 8 different schedules, allowing the AquaDETECT system to be adapted to the requirements of the dialysis center.

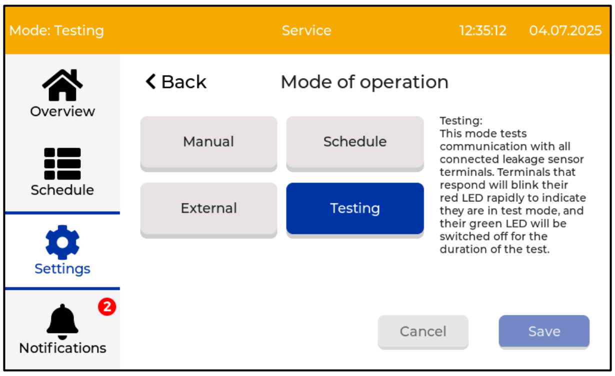
Leakage monitoring takes place outside the set monitoring times, but the connected devices are not switched off via the potential-free contacts in the event of a leakage.

operating mode ***External***



The mode external also allows the leakage monitoring of the **AquaDETECT** to be controlled from a higher-level device by using an external input.

Operating mode*:* ***Test***

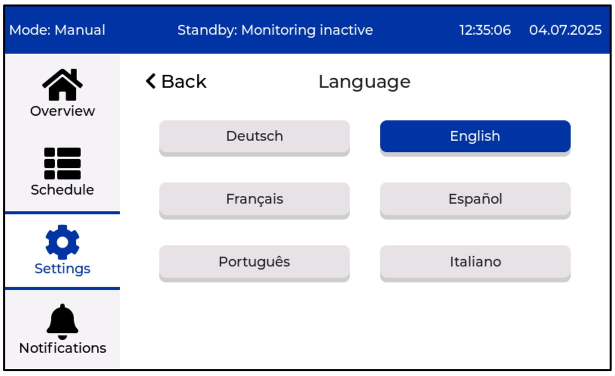


In **test mode**, the central leakage detection system simulates a leakage. By outputting the leakage signal to the **potential-free contacts**, it is possible to check whether connected devices are correctly informed about a leakage. Additionally, the buzzer produces a sound as soon as the testing mode is set.

The connected leakage detection devices are also put into test mode via the bus line and display the following LED light pattern to signal a successful test:

Green LED: off
Red LED: flashing rapidly

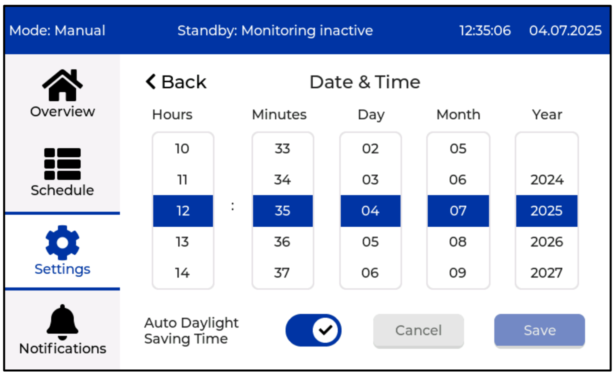
3.4.3 Languages



Language settings are available for the following languages:

Languages
German
English
French
Italian
Portuguese
Spanish

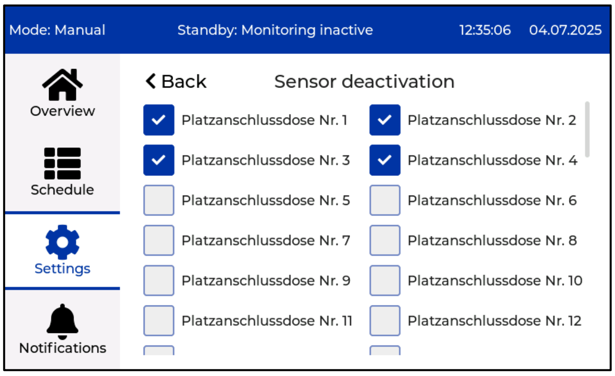
3.4.4 Date & Time



The current date and time can be set or changed in this menu.

Settings in the settings menu	Lower limit	Upper limit	Step width
Year	2025	2059	1
Month	1	12	1
Day	1	31	1
Weekday	Mon	Sun	–
Time	0	23	1
Minute	0	59	1

3.4.5 Sensor deactivation



For service and maintenance work, as well as for changes to the configuration of the AquaDETECT system, it is possible to activate or deactivate individual leakage detection devices.

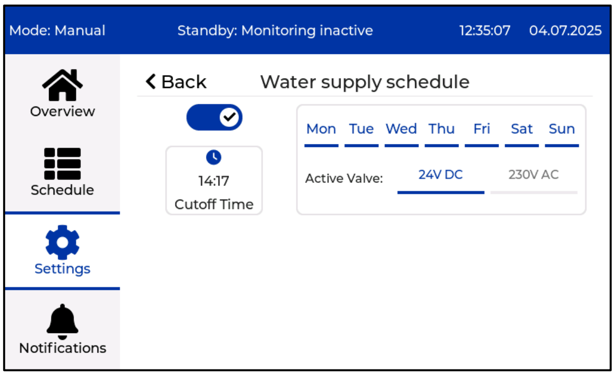
Note

Only leakage detection devices that were detected during the search run when the central leakage detection system was started can be activated or deactivated.

3.4.6 Software

This submenu contains details, the serial number, and further information about the device.

3.4.7 Water supply schedule

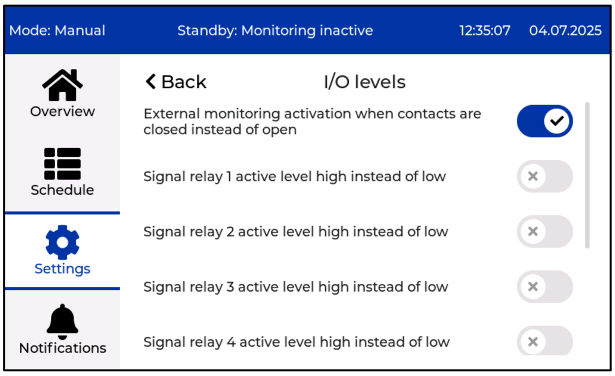


The central leakage detection system is capable of controlling a solenoid valve for the water supply. Depending on the solenoid valve used, a supply voltage of 24 VDC or 230 VAC can be selected, whereby wiring differences must also be taken into account.

To improve the service life of the solenoid valve, the valve should not be left in the open position for long periods of time. Therefore, a switch-off time must be defined for the operation of the solenoid valve at least one day per week, which can be extended to several days depending on user requirements.

The operation of the solenoid valve can be locked or unlocked using the schedule switch.

3.4.8 I/O level



In this submenu, you can influence the processing of the input and output levels of the central leakage detection system. The included functions comprise the input for external monitoring control, the low-power alarm relays, and the high-power alarm relays.

3.5 Menu item: Notifications

This menu documents events during operation in tabular form and makes them accessible to the user. It is also possible to export the recorded data to a USB stick.

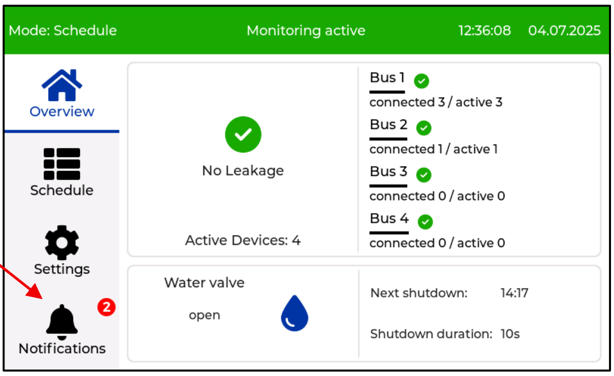
This export is performed automatically as soon as a USB stick is inserted, regardless of whether the "Notifications" menu is open.

Events that are recorded include:

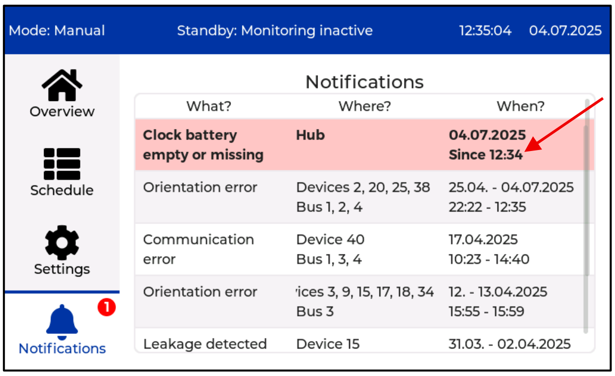
- Change in operating mode
- The system detects one or more error states
- Low charge level of the button cell for time recording
- Problems with the connected peripherals

Error message statuses

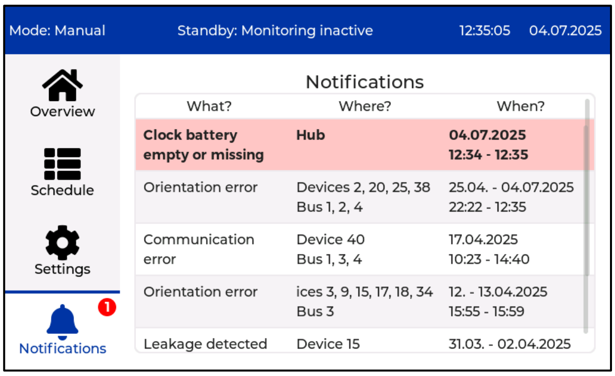
1) Open error messages exist.



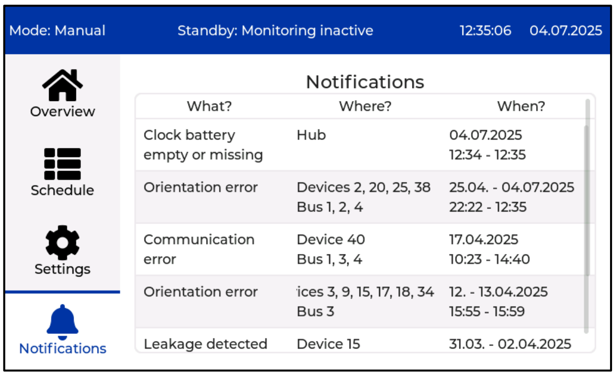
2) Error message has been present since 12:34.



3) Error status was resolved at 12:35 and is no longer active.



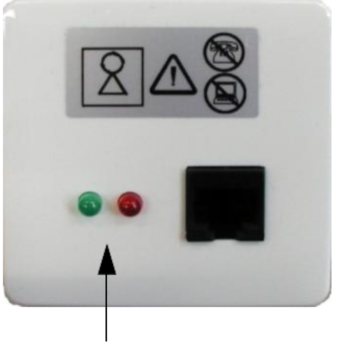
4) Error message can be acknowledged by exiting the menu or tapping on it.



3.6 Signaling

3.6.1 Signaling Leakage detection device

The traffic lights on the leakage detection device each consist of a green and a red LED, which are controlled differently depending on the operating status of the system.



Operating status LEDs

The following 4 operating states are defined for the LEDs:
– LED off
– LED on
– LED flashes slowly (f=1Hz; LED flashes once per second)
– LED flashes quickly (f=3Hz; LED flashes 3 times per second)

LED status		Meaning	Operating mode
Green	Red		
On	Off	- Monitoring active - No errors	- Manual (active) - Schedule - External control (active)
On	On	- Monitoring active - Orientation error	- Manual (active) - Schedule - External control (active)
On	Flashing quickly	- Monitoring active - Leakage detected	- Manual (active) - Schedule - External control (active)
Off	Off	- Device search of the central leakage detection system - Leakage detection device not connected correctly - Leakage detection system not connected to the power supply	NA
Off	On	- Monitoring inactive - Orientation / communication error	- Manual (inactive) - External control (inactive)
Off	Flashing quickly	Test mode active	Test mode
Off	Slowly flashing	Monitoring manual / external inactive	- Manual (inactive) - External control (inactive)
Slowly flashing	Off	- Monitoring inactive - No errors	Schedule (outside monitoring times)
Flashing slowly	On	- Monitoring inactive - Orientation / communication error	Schedule (outside monitoring times)
Slowly flashing	Flashing quickly	- Monitoring inactive - Leakage detected	Schedule (outside monitoring times)
Alternating flashing		Software update / bootloader (see section "3.8 ")	-

3.6.2 Signaling of potential-free contacts

All potential-free contacts of the central leakage detection system are switched immediately after the **test** mode is started and when a leckage signal occurs in all armed operating modes after the pre-warning time has elapsed.

If the system is in **manual** mode **(inactive)**, the potential-free contacts of the central leakage detection system are not switched.

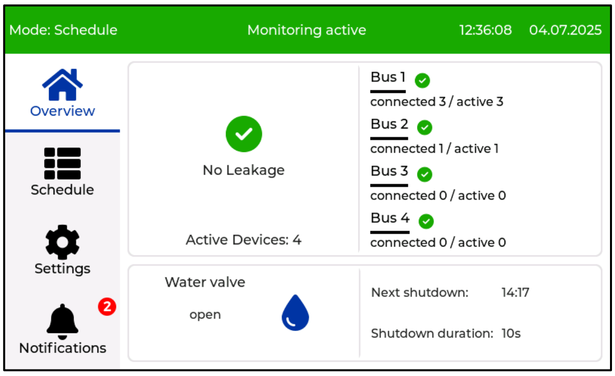
The potential-free contacts on the local connection board switch without delay in every operating state of the AquaDETECT when a leakage signal occurs.

3.6.3 Signaling central leakage detection system

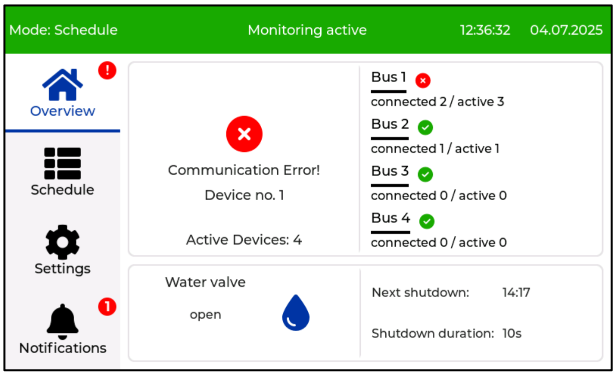
The current status of the central leakage detection system can be viewed in the overview menu. The affected sensor number and bus line are displayed for the user's information. If there are multiple errors or affected sensors, the "Notification" menu must be opened for a detailed overview.

The following 4 system statuses can occur in the overview menu when monitoring is active:

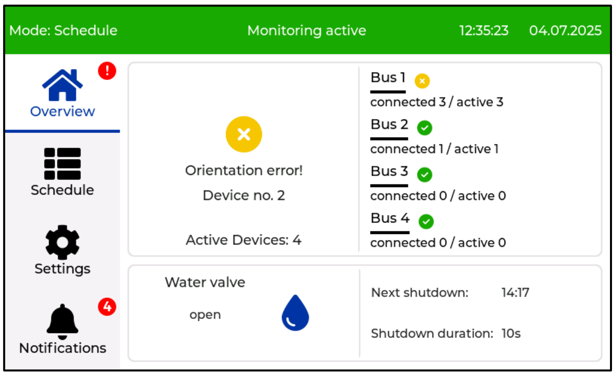
No leakage



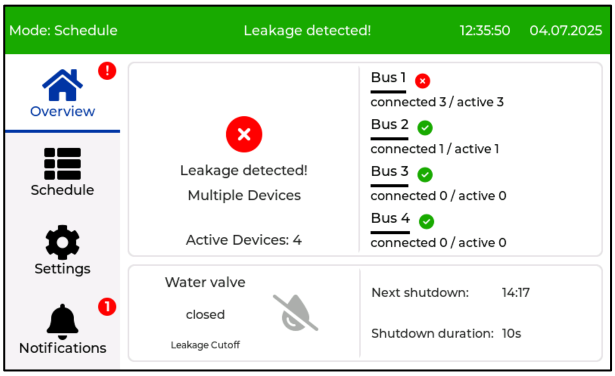
Communication error



Orientation error



Leakage detected



3.7 Behavior in the event of a power failure

In the event of a power failure, all entered data and settings are retained. When power is restored, the system starts in the operating mode it was in before the power failure.

If the time settings cannot be restored after a power failure due to an empty storage battery, set the operating mode to **manual (active)** until the battery was changed.

(The device displays a message when the **memory battery** is **empty**.)

3.8 Software update

3.8.1 Central leakage detection system

Requirements

- A USB stick with sufficient storage space in FAT32 format
- Current update file stored in the root directory of the USB stick

Update process

1) Unplug the power cord of the central leakage detection system
2) Insert the USB stick (see chapter 2.2)
3) Plug in the power plug
4) The central leakage detection system performs the software update when it starts up
5) Once the update has been successfully completed, the USB stick can be removed

Notes

- The update may take several minutes depending on the file size
- If you encounter any problems, please contact your national technical support team

3.8.2 Leakage detection device

The update process for the leakage detection devices is carried out automatically by the central leakage detection system as soon as a software update for the central leakage detection system contains an update for the leakage detection device.

This update takes place via the communication bus and can therefore take between 10 and 30 minutes, during which the green and red LEDs on the leakage detection devices flash alternately to indicate that the update is in progress.

4 Signal processing

Warning

The staff at the dialysis center must be instructed in the proper handling of the system. The system will only function as specified if the leakage detection device and central leakage detection system are checked regularly.

4.1 Leakage signaling

The activated leakage sensors monitor any unwanted water leakage. If a liquid with the required minimum conductivity of 1µS ± 10% is detected at a location, the central leakage detection system triggers a leakage signal after the early warning delay. During and/or after the early warning delay, a message is shown on the display of the central leakage detection system and the red LED on the affected leakage detection device flashes rapidly.

If leakage monitoring is active, the central leakage detection system emits an audible signal and the potential-free contacts switch. In addition, the affected location is shown on the display with the corresponding number. A leakage signal can be cleared by eliminating the leakage or drying the leakage sensor.

- **Detection of liquid (conductivity** ≥ 1µS± **10%) via sensor(s)**

  Leakage detection device Optical signaling (red LED)+ potential-free contact leakage detection device

  Central leakage detection system

  Monitoring inactive:

  Optical signaling (red symbol+ display message)

  Monitoring active:

  – During early warning delay: Optical signaling (red symbol+ display message)

  – After early warning delay: Visual signal (red symbol+ display message) + switch potential-free contacts

4.2 Position signaling

The AquaDETECT system operates as specified thanks to continuous position monitoring of the leakage sensors. A position signal is indicated visually on the central leakage detection system by an orange symbol and an error description.

The position signal is indicated by a red LED on the leakage detection device.

- **Sensor(s) in supine position**

  Leakage detection device Optical signaling (red LED)

  Central leakage detection system Optical signaling (orange symbol+ display message)

4.3 Communication signaling

If no response is received from a registered location due to an error, this is indicated visually on the central leak detection system by a yellow symbol and an error description.

A communication signal is indicated on the location connection board by a red LED.

- **No feedback from sensor(s), e.g. due to cable breakage or similar.**

Leakage detection device	Visual signal (red LED)
Central leakage detection system	Optical signaling (yellow symbol+ display message)

4.4 Battery, clock

When the device is not connected to the mains power supply, the internal clock requires a battery for power. The service life of this battery varies depending on how the device is used and is specified by the manufacturer as at least 3 years under the most unfavorable conditions. The battery voltage is measured to monitor the correct functioning of the device, and an error message is displayed on the device display if the battery charge is insufficient.

The battery only needs to be replaced when the corresponding error message is displayed and can be done using a conventional battery cell.
(The battery type is specified in the spare parts list.)

If the battery is empty, the function of the set monitoring plan is not guaranteed. Until the battery is replaced by qualified or trained personnel, the leakage monitoring must be switched on or off manually (see chapter 3.4.2).

5 Cleaning/disinfection

5.1 Surface cleaning

Warning

User regulations

For all surface cleaning activities, the guidelines, regulations, and safety instructions for the proper handling of cleaning agents apply.

Warning

When using cleaning agents, follow the manufacturer's instructions for use.

When using cleaning agents, please note the following:

– Different cleaning agents must not be mixed together.

5.1.1 Cleaning the device surfaces

Note

Manufacturer's recommendation

When using **ClearSurf:**

– Disinfect surfaces in accordance with the disinfectant manufacturer's instructions.

– If a cleaning agent other than the recommended one is used for cleaning, the manufacturer accepts no liability for any damage to the surfaces.

Note

Aggressive cleaning agents and solvents

– Do not use acetone-based disinfectants!

– Never use solvents, thinners, or chemical cleaning sprays!

– Do not clean the device with harsh disinfectants (e.g., scouring pads or similar).

– The manufacturer recommends **ClearSurf** for surface cleaning.

5.1.2 Perform surface cleaning

!! Disconnect the device from the mains power. !!

- The device surfaces can be cleaned with a mild household cleaner and a damp cloth and water.
- Contamination on the device surface, such as dirt stains and dust, can be removed with **ClearSurf** diluted according to the manufacturer's instructions and a soft cloth.

6 Function

The **AquaDETECT** leakage detection system consists of a central leakage detection system and up to 55 connection boards with leakage sensors, which can be connected to up to 4 bus lines. The bus line, which is designed as a branch line, has a length of up to 350 meters.

An **AquaDETECT** leakage sensor consists of two electrodes to which an alternating voltage is applied. As soon as the electrodes come into contact with a liquid that has a minimum electrical conductivity of 1 µS ± 10%, a current flows. This is detected as a leakage by the leakage detection device. The sensor signals a leakage and the system is switched off.

Maximum configuration of the bus lines	The maximum configuration of the bus lines must not exceed the following values to prevent thermal overload of the central leakage detection system:
Bus 1	Maximum 15 leakage detection devices with 350 m bus cable
Bus 2	Maximum 15 leakage detection devices with 350 m bus cable
Bus 3	Maximum 15 leakage detection devices with 350 m bus cable
Bus 4	Maximum 10 leakage detection devices with 350 m bus cable
	To avoid polarization effects at the boundary layer between the electrode and the liquid, an alternating voltage is applied to the sensor. This prevents electrolytic corrosion of the electrode material.

In addition, the central leakage detection system is able to intervene independently in the water supply by controlling a solenoid valve. If a leakage is detected, the central leakage detection system switches off the connected solenoid valve and thus prevents further liquid from escaping.

7 Consumables, accessories, additional equipment

Warning

Responsibility of the responsible organization

For this device, Chapter 7 contains a list of consumables and accessories that are suitable for this device and can be used safely with it.

The manufacturer of this device cannot guarantee the suitability of consumables and accessories other than those listed there for use with this device. The manufacturer of this device cannot make any statements regarding the safety and performance of the device when used with consumables and accessories other than those listed there.

If other consumables and accessories are used, their suitability must be checked beforehand. This can be done, for example, by referring to the information in the operating instructions for the consumables and accessories in question.

The manufacturer of this device cannot accept any liability for damage resulting from the use of unsuitable consumables and accessories.

Upon request, the local service department will provide information about additional accessories, consumables, and other additional equipment.

7.1 Consumables

No information

7.2 Accessories

Part number	Component
F00013142	AquaDETECT leakage detection device

Item	Component
F00013143	AquaDETECT leakage sensor

7.3 Additional equipment

No information

8 Installation

8.1 Connection requirements

- **Follow valid installation guidelines**

For new installations, follow the applicable installation guidelines.

- **Observe ESD guidelines**

The generally applicable ESD guidelines for the correct handling of sensitive semiconductor assemblies must be observed.

- **Note before commisioning**

– The local service organization of Fresenius Medical Care offers planning and installation of the system.

- **Observe national and local regulations**

– National or local regulations for installation, operation, use, and maintenance must be observed.

– When using Class I equipment, the quality of the protective conductor of the installation is important. Please note that in many countries, national authorities have specified requirements.

8.1.1 Spatial environment

- **Observe local conditions:**

– The installation site must be free of frost and dust.

– The components must not be exposed to direct sunlight for long periods of time.

– The control electronics of the devices must be protected from moisture.

– Access to the power plug must be ensured.

- **Temperature fluctuations**

Temperature fluctuations during transport can lead to condensation forming on live parts. In the event of large temperature differences, allow sufficient time for acclimatization before turning the device is on.

8.2 Important information for commissioning

8.2.1 Before commissioning, note

Qualification of the tester

Commissioning must be carried out by the project manager or a person authorized by him.

Commissioning may only be carried out by persons who are qualified to perform such checks properly due to their training, knowledge, or experience gained through practical work.

Technical

The information on the technical data must be observed.

8.2.2 Carrying out commissioning

Warning

The device may only be commissioned by persons authorized by the project manager after the wiring has been completed.

To prevent malfunctions of the AquaDETECT system or devices in the vicinity, the system may only be commissioned with components approved by the manufacturer.

Commissioning is carried out in the following steps:

1. **Plug in the power plug of the central leakage detection system**
2. **Automatic search for the leakage detection devices**
   (performed at each restart by the central leakage detection system)
3. **Check the detected leakage detection devices in the overview menu**
4. **Check the function of the leakage sensors**
   (check in accordance with annual maintenance sensor check, chapter 10.3)
5. **Check the function of the potential-free contacts**
6. **Check the function of the magnetic valve (if used)**
7. **Check the function of the external input (if used)**
8. **Set the monitoring times for operation in schedule mode**
   (see chapter 3.3)
9. **If necessary, document the setting values / monitoring times**
   (For customer handover)

8.2.3 Further information

Delivery status

Note

The device is not configured in the delivery state.

Scope

The AquaDETECT system is complete upon delivery and is shipped in individual components. The leakage sensors and leakage detection devices are supplied separately. For more info, see the device structure.

Scope of delivery/connection options

The AquaDETECT system can be connected to other devices via the following interfaces.

- **5x normally open contacts (leakage signal)**
- **2x changeover contacts (leakage signal)**
- **1x solenoid valve**
- **External control input**
- **4x bus lines**

For further information regarding individual connection options or space-related installation requirements, please contact the project manager.

Note

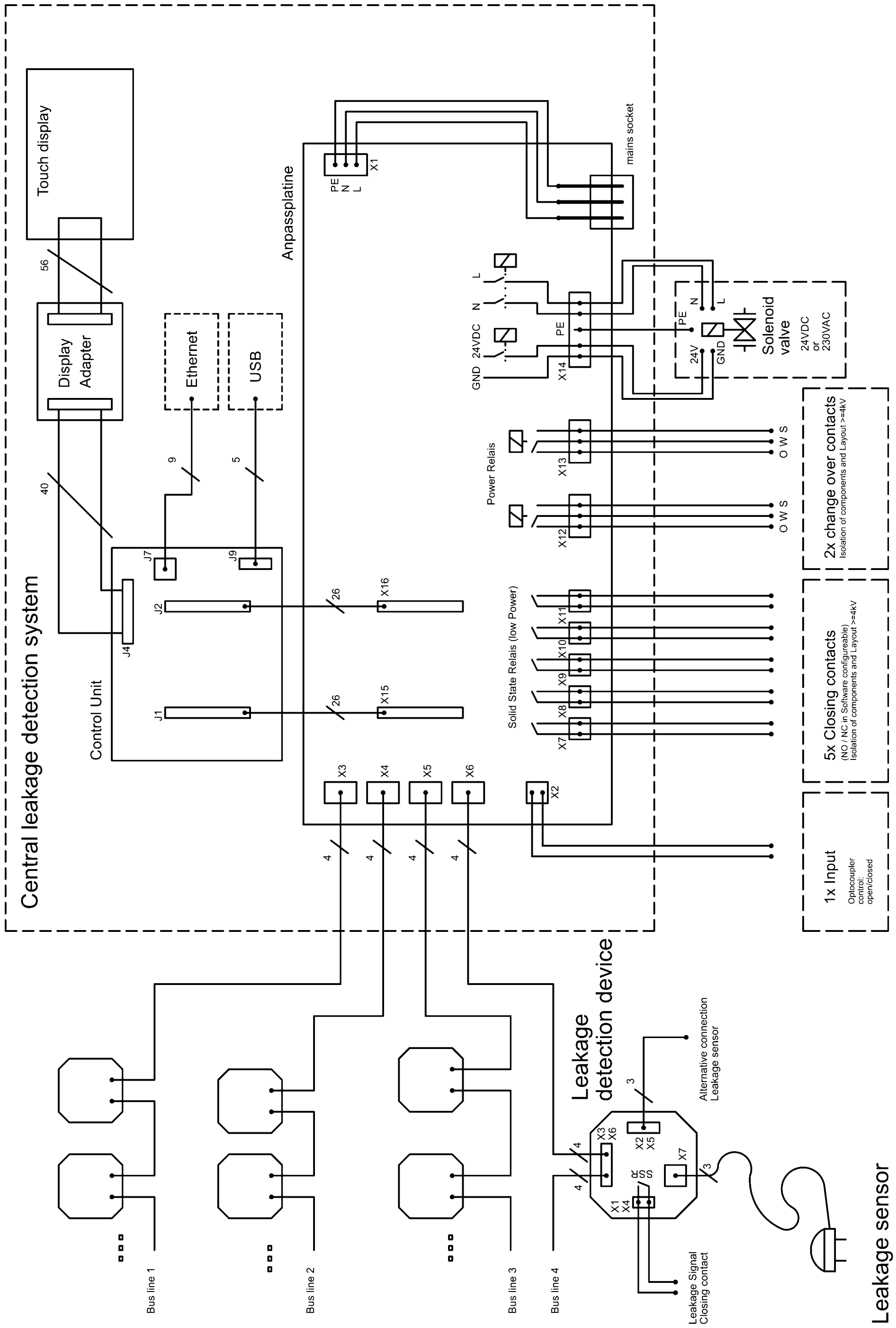
The leakage detection devices must not be connected in a star configuration; they must be connected in series.

Maximum configuration of the bus lines

The maximum configuration of the bus lines must not exceed the following values to prevent thermal overload of the central leakage detection system:

Bus 1	Maximum 15 leakage detection devices with 350 m bus cable
Bus 2	Maximum 15 leakage detection devices with 350 m bus cable
Bus 3	Maximum 15 leakage detection devices with 350 m bus cable
Bus 4	Maximum 10 leakage detection devices with 350 m bus cable

8.3 Circuit diagram



8.4 Installation of central leakage detection system

Warning

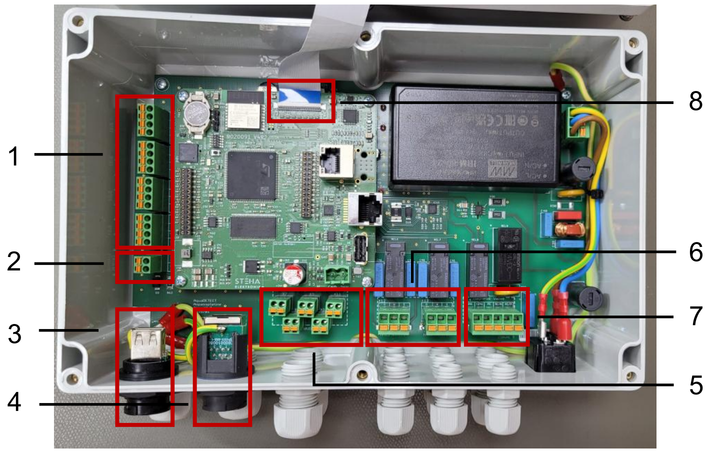
Dangerous electrical voltage inside the housing

When performing installation work on the device, disconnect the power plug to ensure that the device is not live.

Tip

To facilitate installation, the internal connection cables for USB and Ethernet communication can be removed and then reconnected.
(see chapter 8.4.9)

8.4.1 Overview

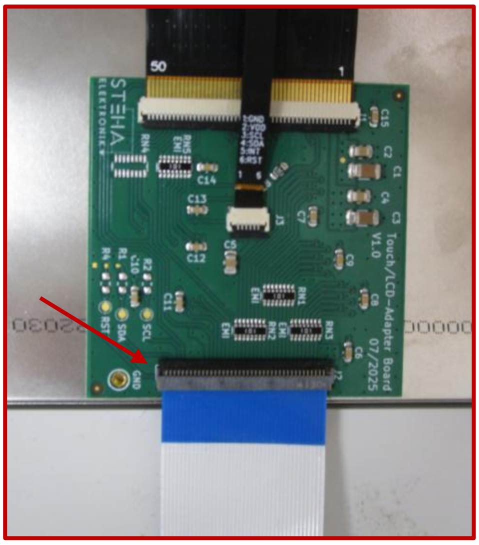


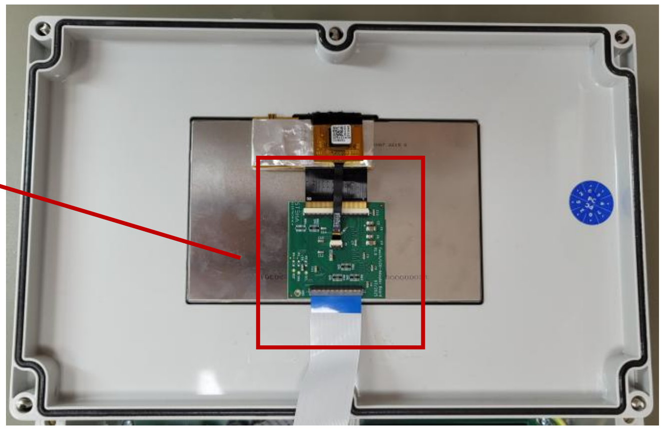
Pos.	Connection	Function
1	Bus lines 1 – 4	Power and data transmission
2	External control	Signal input for monitoring control
3	USB	USB communication
4	Ethernet	Ethernet communication
5	Signaling relays (normally open contacts)	Signals a leakage to peripherals
6	Signaling relays (changeover contacts)	Signals a leakage to peripherals
7	Solenoid valve	Control of a solenoid valve for water supply
8	Display connection	Data transmission touch display

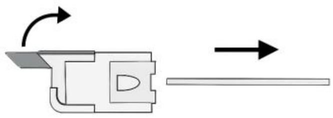
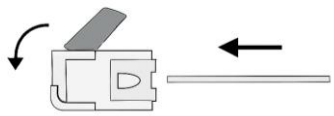
8.4.2 Removing the housing cover

The housing cover is connected to the display via a ribbon cable, which is why the cover must not be lifted abruptly from the housing base when opening the housing.

To install, carefully lift the housing cover upward and disconnect the display cable from the housing cover as follows.



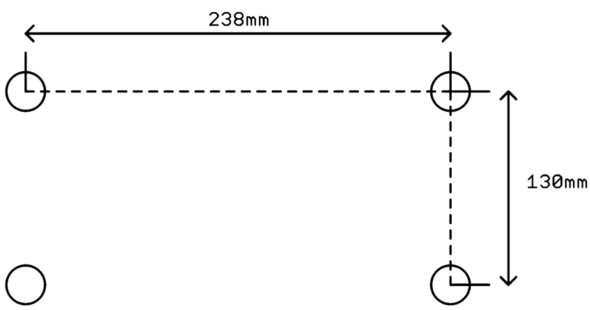


1) Push the clamping bracket upwards and remove the cable.	2) Insert the cable with the contacts facing downwards and close the clamping bracket
	

8.4.3 Wall mounting

For wall mounting, four holes can be drilled to attach the central leakage detection system as shown in the following illustration.

Horizontal distance between drill centers: 238 mm
Vertical distance between drill centers: 130 mm

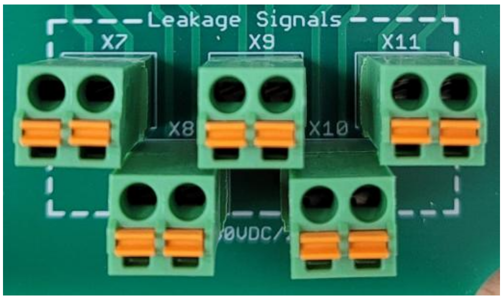


8.4.4 Connection of the potential-free contacts

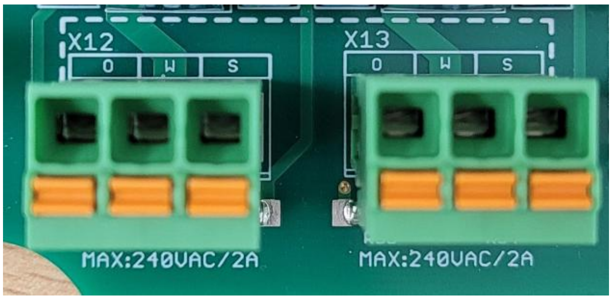
To inform other devices of a leakage, there are 2 types of potential-free contacts on the central leakage detection system:

- **Normally open contacts** (X7 – X11) for digital logic with low power up to 30VDC/200mA
- **Changeover contacts** (X12 & X13) for digital logic and higher loads up to 240 VAC/2 A

Normally open contacts



Changeover contacts



Assembly: Anpassplatine		
Connection	**Function**	**Cable**
X7	**Leakage signal**[1)] - X7.1 – Normally open contact 1 - X7.2 – Normally open contact 2	Control cable 2 x 0.75 mm² Outer diameter 6.0 mm
X	**Leakage signal**[1)] - X8.1 – Normally open contact 1 - X8.2 – Normally open contact 2	Control cable 2 x 0.75 mm² Outer diameter 6.0 mm
X9	**Leakage signal**[1)] - X9.1 – Normally open contact 1 - X9.2 – Normally open contact 2	Control cable 2 x 0.75 mm² Outer diameter 6.0 mm
X10	**Leakage signal**[1)] - X10.1 – Normally open contact 1 - X10.2 – Normally open contact 2	Control cable 2 x 0.75 mm² Outer diameter 6.0 mm
X11	**Leakage signal**[1)] - X11.1 – Normally open contact 1 - X11.2 – Normally open contact 2	Control cable 2 x 0.75 mm² Outer diameter 6.0 mm
X12	**Leakage signal** (changeover contact) - X12.1 – **S** (normally open) - X12.2 – **W** (changeover contact) - X12.3 – **O** (normally closed)	Control cable 2 x 1.5 mm² Outer diameter 6.0 mm
X13	**Leakage signal** (changeover contact) - X13.1 – **S** (normally open) - X13.2 – **W** (changeover contact) - X13.3 – **O** (normally closed)	Control cable 2 x 1.5 mm² Outer diameter 6.0 mm

1) … Normally closed contacts can be set to NC (normally closed) or NO (normally open) in the software.

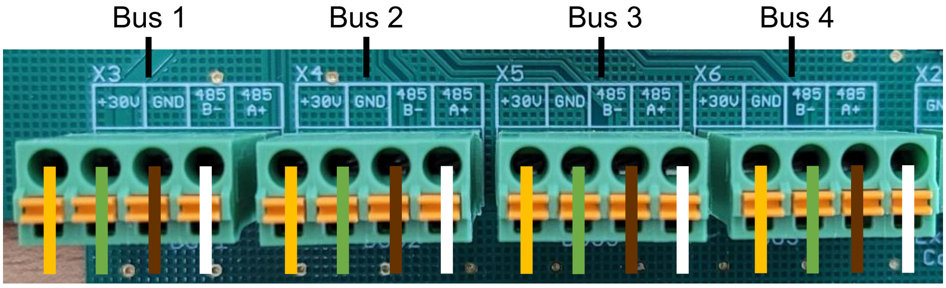
8.4.5 Connection of the bus cables

Data exchange via the bus cables is essential for communication between the leakage detection devices and the central leakage detection system to function properly.

When wiring, make sure that the following maximum specifications for the respective bus cable are not exceeded, as otherwise fault-free operation cannot be guaranteed:

	Maximum number of leakage detection device	Maximum cable length
Bus 1	15	350
Bus 2	15	350
Bus 3	15	350
Bus 4	10	350

A bus line begins at one of the respective connectors X3 – X6 and is continued via the connections on the leakage detection device. (see chapter 8.3 Circuit diagram) A return of the bus line to the central leakge detection system in any form is not permitted.

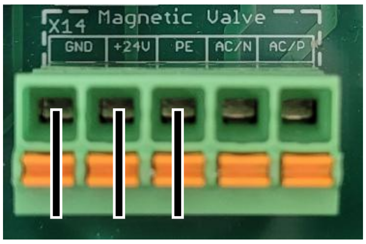


Assembly: Anpassplatine			
Connection	**Function**	**Color**	**Cable type**
X3	**Bus line 1** - X3.1 – RS485 A+ - X3.2 – RS485 B- - X3.3 – GND - X3.4 – 30V	 White Brown Green Yellow	 Telecommunications cable 4 x 2x 0.8 mm² (shielding optional)
X4	**Bus line 2** - X4.1 – RS485 A+ - X4.2 – RS485 B- - X4.3 – GND - X4.4 – 30V	 White Brown Green Yellow	 Telecommunications cable 4 x 2x 0.8 mm² (shielding optional)
X5	**Bus line 3** - X5.1 – RS485 A+ - X5.2 – RS485 B- - X5.3 – GND - X5.4 – 30V	 White Brown Green Yellow	 Telecommunications cable 4 x 2x 0.8 mm² (shielding optional)
X6	**Bus line 4** - X6.1 – RS485 A+ - X6.2 – RS485 B- - X6.3 – GND - X6.4 – 30V	 White Brown Green Yellow	 Telecommunications cable 4 x 2x 0.8 mm² (shielding optional)

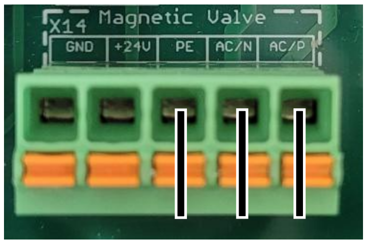
8.4.6 Connection of the solenoid valve

The central leakage detection system can also control an external solenoid valve; the corresponding connections for a 24 VDC and 230 VAC solenoid valve can be found on connector X14.

The connection of a 24VDC solenoid valve is shown in the left-hand diagram (24VDC) and the connection of a 230VAC solenoid valve is shown in the right-hand diagram (230VAC).



24VDC



230VAC

Assembly: Anpassplatine		
Connection	**Function**	**Cable type**
X14	**Solenoid valve** - X14.1 – 230VAC_P - X14.2 – 230VAC_N - X14.3 – PE - X14.4 – 24V - X14.5 – GND	Molded cable 3m, 3 x 0.5 mm² Terminal box

Note

When selecting solenoid valves, observe the maximum power specification
- 230VAC -> 24VA
- 24VDC -> 11W

8.4.7 Connection of the external control signal

This input can be used to control the monitoring status of the central leakage detection system as long as the system is in "External control" operating mode.

Assembly: Anpassplatine		
Connection	**Function**	**Cable**
X2	**Input External control** - X2.1 – Optocoupler cathode - X2.2 – GND	Control line 2 x 0.75 mm² Outer diameter 6.0 mm (recommended)

Note

The normally open contact for using this input must have a voltage resistance of at least 24VDC and allow a current flow of ~20mA.

8.4.8 Connection of the mains input cable (for repair only)

The central leakage detection system is delivered with this connection already included, so this sub-item is for information purposes only and may be used in the event of a repair.

Assembly: Anpassplatine			
Connection	**Function**	**Color**	**Cable type**
X1	**Mains input** - X1.1 – PE - X1.2 – 230VAC_N - X1.3 – 230VAC_P	 Green-yellow Blue Brown	3x1.5 mm

Assembly: Housing			
Connection	**Function**	**Color**	**Cable type**
Power plug	**Mains input** - PE - N - P	 Green-yellow Blue Brown	3x1.5 mm²

8.4.9 USB and Ethernet connection (repair or wiring only)

Assembly: Control board 9020091		
Connection	**Function**	**Cable**
USB (J9)	Updates / Data transfer	USB A (male) <-> USB A (male) 0.15 m
Ethernet (J7)	Network connection	Flat patch cable RJ45 Cat.6a 0.15 m

8.4.10 Connection IEC connector

A C14 IEC power connector is provided for the mains power, which can be connected to a C13 IEC power cable.

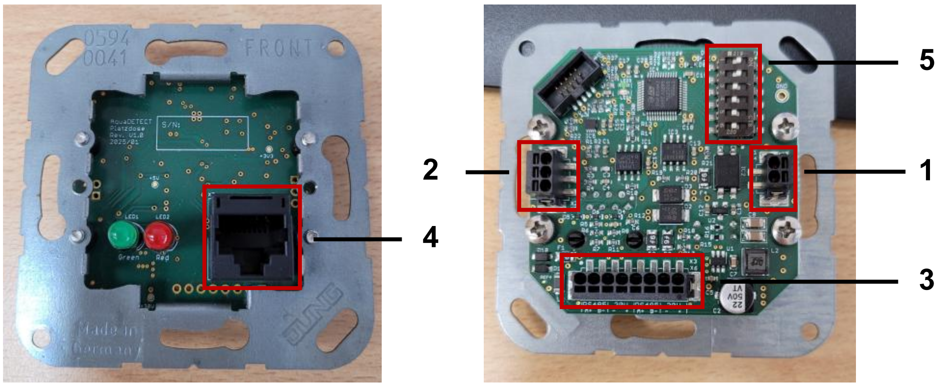
Assembly: Housing		
Connection	**Function**	**Cable**
Power connection	Cold device plug (IEC-60320 C14)	Cold device coupling (IEC-60320 C13)

8.5 Installation Leakage detection device

Note

The central leakage detection system must be disconnected from the mains power before wiring the leakage detection devices to ensure that the bus lines are not live and the electronics are not damaged.

8.5.1 Overview



Legend

Pos	Identifier	Function
1	X1/X4	Normally closed contact for leakage detection
2	X2/X5	Leakage sensor (rear)
3	X3/X6	Bus line
4	X7	Leakage sensor (front)
5	SW1	Set sensor number (bus address)

Note

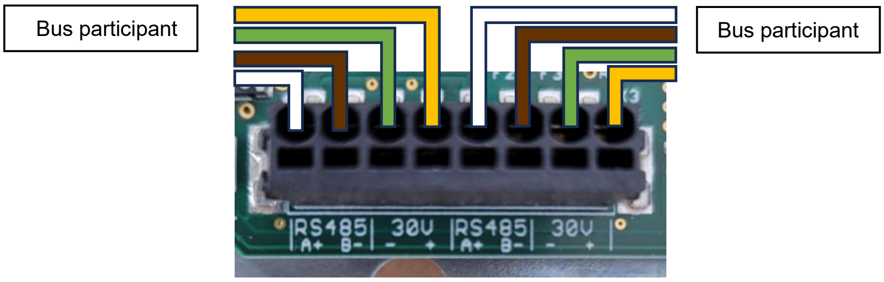
The connection options for the leakage sensor on the front (RJ45) and on the rear (plug connector) share the built-in evaluation electronics.

For this reason, never connect a leakage sensor to both connections.

8.5.2 Connecting the bus cable

Data exchange via the bus cables is essential for communication between the evaluation unit of the leakage sensors and the central leakage detection system to function properly.

The bus line is connected to the leakage detection device as shown in the following figure.



Connection	Function	Color	Cable type
X3/X6	**Bus line** **X3 & X6 identical assignment** - X3/X6.1 – RS485 A+ - X3/X6.2 – RS485 B- - X3/X6.3 – GND - X3/X6.4 – 30V - X3/X6.5 – RS485 A+ - X3/X6.6 – RS485 B- - X3/X6.7 – GND - X3/X6.8 – 30V	 White Brown Green Yellow White Brown Green Yellow	Telecommunications cable 4 x 2x 0.8 mm² (shielding optional)

Note: On the last leakage detection device of a bus line, 4 contacts of connector X3/X6 are not assigned.

8.5.3 Connection for leakage signaling (e.g., call system)

A normally open contact is installed on the leakage detection device, which is closed independently of the central leakage detection system whenever a leakage is detected. This allows a call system or other peripheral devices to be connected if required, provided that the electrical specifications of the output are observed.

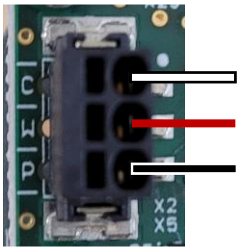
Connection	Function	Color	Cable
X1/X4	**Normally open contact leakage** **X1 & X4 identical assignment** - X1/X4.1 – Normally open contact 1 - X1/X4.2 – Normally open contact 2	NA	NA

Note

The maximum specification for this normally open contact is 30VDC at 50mA.
(Current limitation of a fuse at 50mA)

8.5.4 Connection for alternative connection of the leakage sensor

If you do not want to connect the leakage sensor via the RJ45 plug on the front of the leakage detection device, you can use this input to wire the leakage sensor.



Connection	Function	Color	Cable type
X2/X5	**Leakage sensor** **X2 & X5 identical assignment** - X2/X5.1 – Sensor **C** - X2/X5.2 – Sensor **W** (leakage) - X2/X5.3 – Sensor **P** (position)	 White Red Black	NA

Note

The connection options for the leakage sensor on the front (RJ45) and on the rear (plug connector) share the built-in evaluation electronics.

For this reason, a leakage sensor must never be connected to both connections.

8.5.5 Connection for leakage sensor (type RJ45)

The leak sensor can be easily connected after installation via this RJ45 connection on the front of the leakage detection device.

Connection	Function	Color	Cable
X7	**RJ45 Leakage sensor** - X7.1 – NC - X7.2 – NC - X7.3 – Sensor **C** - X7.4 – Sensor **W** (leakage) - X7.5 – Sensor **P** (position) - X7.6 – NC - X7.7 – NC - X7.8 – NC		Leakage sensor supplied with cable Cable type: Patch cord RJ45 8/4

8.5.6 Bus addressing configuration

Addressing switch DIP switch

The leakage detection device must have a bus address in order to operate the AquaDETECT system. The bus address is set using the switch shown below, which is located on the rear of the leakage detection device.

When setting the bus address, make sure that the least significant bit LSB of the binary number is assigned to switch 1 and the most significant bit MSB of the binary number is assigned to switch 6 (the same applies to switches 2 to 5).

The location addressing is done using dual numbers, which can be found in the following table. A **0** corresponds to the switch setting **OFF**, a **1** to the switch setting **ON**.

Addressing in dual numbers

Bus address	Switch					
	1	**2**	**3**	**4**	**5**	**6**
1	1	0	0	0	0	0
2	0	1	0	0	0	0
3	1	1	0	0	0	0
4	0	0	1	0	0	0
5	1	0	1	0	0	0
6	0	1	1	0	0	0
7	1	1	1	0	0	0
8	0	0	0	1	0	0
9	1	0	0	1	0	0
10	0	1	0	1	0	0
11	1	1	0	1	0	0
12	0	0	1	1	0	0
13	1	0	1	1	0	0
14	0	1	1	1	0	0
15	1	1	1	1	0	0
16	0	0	0	0	1	0
17	1	0	0	0	1	0
18	0	1	0	0	1	0
19	1	1	0	0	1	0
20	0	0	1	0	1	0

Bus address	Switch					
	1	**2**	**3**	**4**	**5**	**6**
21	1	0	1	0	1	0
22	0	1	1	0	1	0
23	1	1	1	0	1	0
24	0	0	0	1	1	0
25	1	0	0	1	1	0
26	0	1	0	1	1	0
27	1	1	0	1	1	0
28	0	0	1	1	1	0
29	1	0	1	1	1	0
30	0	1	1	1	1	0
31	1	1	1	1	1	0
32	0	0	0	0	0	1
33	1	0	0	0	0	1
34	0	1	0	0	0	1
35	1	1	0	0	0	1
36	0	0	1	0	0	1
37	1	0	1	0	0	1
38	0	1	1	0	0	1
39	1	1	1	0	0	1
40	0	0	0	1	0	1

Bus address	Switch					
	1	2	3	4	5	6
41	1	0	0	1	0	1
42	0	1	0	1	0	1
43	1	1	0	1	0	1
44	0	0	1	1	0	1
45	1	0	1	1	0	1
46	0	1	1	1	0	1
47	1	1	1	1	0	1
48	0	0	0	0	1	1
49	1	0	0	0	1	1
50	0	1	0	0	1	1
51	1	1	0	0	1	1
52	0	0	1	0	1	1
53	1	0	1	0	1	1
54	0	1	1	0	1	1
55	1	1	1	0	1	1

Note

If bus addresses are assigned twice, the correct operation of the AquaDETECT system cannot be guaranteed.

9 Transport/storage

9.1 Transport

During transport, the device and its components must be adequately protected against damage (use the manufacturer's original transport packaging if possible).

Note

The system and its components must not be lifted or pulled by the connection cables.

9.2 Storage

9.2.1 Storage conditions

The **AquaDETECT** system must be stored in a well-ventilated room with minimal temperature fluctuations.

Note

Store upright.

Note

Do not store outdoors!

Temperature +5 °C to+ 50 °C

Note

Protect device from frost!

Relative humidity Up to 80% (non-condensing!)

Air pressure 500 hPa to 1150 hPa

9.3 Environmental compatibility/disposal

9.3.1 Information for the responsible organization

The device is taken back in EU member states in accordance with the "Directive on waste electrical and electronic equipment" (WEEE Directive). Local regulations must be observed.

Before returning or disposing of the device, remove all consumables attached to it and disinfect the device in accordance with the manufacturer's instructions (see chapter 5).

9.3.2 Information for recycling and disposal companies

Recycling and disposal companies must observe the following instructions during the dismantling and disposal process:

The device may be contaminated when it is returned. It must be handled accordingly and disinfected in accordance with the manufacturer's instructions before dismantling (see chapter 5).

Batteries must be disposed of properly in accordance with local regulations.

Further information will be provided upon request from disposal companies.

10 Maintenance

10.1 Regular checks of the system status

Note
The status of the leakage sensors must be checked regularly on the central leakage detection system.

10.2 Monthly check

To ensure that the system is functioning as specified, the user must use the **test mode** once a month to check the data communication of all local connection boards. After performing a test, the system must be manually switched back to **schedule mode**.

10.3 Annual check

Legal regulations regarding the electrical safety of the device in the respective country must be observed. These regulations may include annual repeat tests.
(e.g. Germany VDE 702)

Sensor check

Check	**Execution**
Position detection	All sensors are turned upside down. The corresponding position signal is displayed in the "Notification" menu on the central leakage detection system.
Leakage detection:	The early warning delay on the central leak detection system must be set to 1s. Each sensor must be immersed in a glass or bowl containing permeate, with the contacts submerged. The red LED on the leakage detection device must flash and the corresponding leakage must be detected on the central leakage detection system.

(The following template can be used for the sensor test)

Checking the entire system

In addition, a check of the mechanical and functional condition of the entire AquaDETECT system should be carried out, covering a wide range of points.
The necessary test points are recorded in the following WA protocol and can be used to carry out the check.

STEHA ELEKTRONIK	**Sensor test**	**AquaDETECT**
Customer number/customer name:		Inventory number:
Name of tester:		Operating hours:
Software version/options:		

Note: Only check the box for the seat numbers that are in use.

Bus address	Position signal	Leakage signal	Bus address	Position signal	Leakage signal
1	❑OK /❑ FAIL	❑OK /❑ FAIL	**31**	❑OK /❑ FAIL	❑OK /❑ FAIL
2	❑OK /❑ FAIL	❑OK /❑ FAIL	**32**	❑OK /❑ FAIL	❑OK /❑ FAIL
3	❑OK /❑ FAIL	❑OK /❑ FAIL	**33**	❑OK /❑ FAIL	❑OK /❑ FAIL
4	❑OK /❑ FAIL	❑OK /❑ FAIL	**34**	❑OK /❑ FAIL	❑OK /❑ FAIL
5	❑OK /❑ FAIL	❑OK /❑ FAIL	**35**	❑OK /❑ FAIL	❑OK /❑ FAIL
6	❑OK /❑ FAIL	❑❑ FAIL	**36**	❑OK /❑ FAIL	❑OK /❑ FAIL
7	❑OK /❑ FAIL	❑OK /❑ FAIL	**37**	❑OK /❑ FAIL	❑OK /❑ FAIL
8	❑OK /❑ FAIL	❑OK /❑ FAIL	**38**	❑OK /❑ FAIL	❑OK /❑ FAIL
9	❑OK /❑ FAIL	❑OK /❑ FAIL	**39**	❑OK /❑ FAIL	❑OK /❑ FAIL
10	❑OK /❑ FAIL	❑OK /❑ FAIL	**40**	❑OK /❑ FAIL	❑OK /❑ FAIL
11	❑OK /❑ FAIL	❑OK /❑ FAIL	**41**	❑OK /❑ FAIL	❑OK /❑ FAIL
12	❑OK /❑ FAIL	❑OK /❑ FAIL	**42**	❑OK /❑ FAIL	❑OK /❑ FAIL
13	❑OK /❑ FAIL	❑OK /❑ FAIL	**43**	❑OK /❑ FAIL	❑OK /❑ FAIL
14	❑OK /❑ FAIL	❑OK /❑ FAIL	**44**	❑OK /❑ FAIL	❑OK /❑ FAIL
15	❑OK /❑ FAIL	❑OK /❑ FAIL	**45**	❑OK /❑ FAIL	❑OK /❑ FAIL
16	❑OK /❑ FAIL	❑OK /❑ FAIL	**46**	❑OK /❑ FAIL	❑OK /❑ FAIL
17	❑OK /❑ FAIL	❑OK /❑ FAIL	**47**	❑OK /❑ FAIL	❑OK /❑ FAIL
18	❑OK /❑ FAIL	❑OK /❑ FAIL	**48**	❑OK /❑ FAIL	❑OK /❑ FAIL
19	❑OK /❑ FAIL	❑OK /❑ FAIL	**49**	❑OK /❑ FAIL	❑OK /❑ FAIL
20	❑OK /❑ FAIL	❑OK /❑ FAIL	**50**	❑OK /❑ FAIL	❑OK /❑ FAIL
21	❑OK /❑ FAIL	❑OK /❑ FAIL	**51**	❑OK /❑ FAIL	❑OK /❑ FAIL
22	❑OK /❑ FAIL	❑OK /❑ FAIL	**52**	❑OK /❑ FAIL	❑OK /❑ FAIL
23	❑OK /❑ FAIL	❑OK /❑ FAIL	**53**	❑OK /❑ FAIL	❑OK /❑ FAIL
24	❑OK /❑ FAIL	❑OK /❑ FAIL	**54**	❑OK /❑ FAIL	❑OK /❑ FAIL
25	❑OK /❑ FAIL	❑OK /❑ FAIL	**55**	❑❑ FAIL	❑OK /❑ FAIL
26	❑OK /❑ FAIL	❑OK /❑ FAIL			
27	❑OK /❑ FAIL	❑OK /❑ FAIL			
28	❑OK /❑ FAIL	❑OK /❑ FAIL			
29	❑OK /❑ FAIL	❑OK /❑ FAIL			
30	❑OK /❑ FAIL	❑OK /❑ FAIL			

Confirmation of test

Comments on the test:

Date of test:	Signature of the tester:	Tester's stamp:

Assessment of the inspection

The device is approved for its intended use. The inspection sticker is attached to the device.	❑ Yes❑ No	Date of next inspection:
Comments on the assessment:		
Date of assessment:	Signature of a representative of the responsible organization:	Stamp of the responsible organization:

STEHA ELEKTRONIK	**WA protocol**		**AquaDETECT**	
Customer number/customer name:			Inventory number:	
Name of the tester:			Operating hours:	
Software version/options:			Serial number:	
Service report number:				
Device type: AquaDETECT (non-medical device)				
The following checks must be carried out on this device at least every 12 months.				
Cat.	**No**	**Description**	**Measured value/correction value**	**✓/NA**
	1	**General check**		
WA	1.1	Type plates	They must be present and legible.	❑
WA	1.2	Cables and connections of all modules and supply power systems.	Must not show any damage or modifications.	❑
WA	1.3	Setting and display devices and their labels.	They must be undamaged. The labels must be clearly legible.	❑
WA	1.4	Cleaning of all components	The components must be free of dirt.	❑
	2	**Leakage sensors**		
WA	3.	Mechanical condition (including electrodes)	Condition must allow for further safe use.	❑
	3	**Leakage detection device**		
WA	3	Mechanical condition	Condition must allow for further safe use.	❑
WA	3	Function of the LEDs	See table in section 4.6.1	❑/❑
	4	**Central leakage detection system**		
WA	4.1	Mechanical condition	Condition must allow for further safe use.	❑
WA	4.	Function of the display elements	See table in section 4.2	❑
WA	4.3	Function of the solenoid valve	Solenoid valve switches reliably. See section 3.4.7	❑/❑
	5	**Operating parameters AquaDETECT**		
WA	5.1	Check settings	Correspond to customer specifications	❑
WA	5.	Status of sensors	Fault-free	❑
	6	**Signal processing**		
WA	6.1	Sensor in supine position	**Orientation Error** on the display	❑
WA	6	Sensor disconnected	**Orientation Error** on the display	❑
WA	6.	Sensor in permeate (in **manual** mode **(active)**)	**Leakage detected** on the display and switching of the potential-free contacts after the pre-warning time.	❑
	7	**Function test for sensors**		
	7.	**Test** operating mode	Start **test**. Relays must switch.	❑

Confirmation of test		
Comments on the test:		
Date of audit:	Signature of the examiner:	Stamp of the examiner:
Assessment of the test		
The device is approved for its intended use. ❑ Yes❑ No The inspection sticker is attached to the device.		Date of next inspection:
Comments on the assessment:		
Date of assessment:	Signature of a representative of the responsible organization:	Stamp of the responsible organization:

10.4 Replacement of the fuses

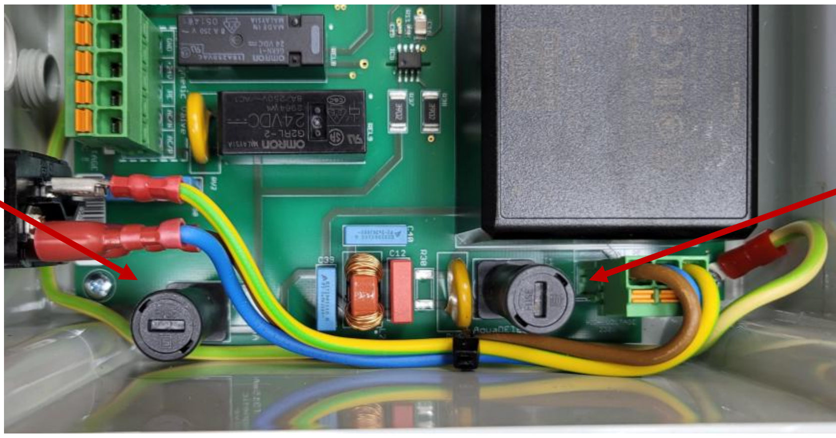
Warning

Dangerous electrical voltage inside the housing

Before performing maintenance work on the device, disconnect the power plug to ensure that the device is not live.

Fuse for the Solenoid valve

Fuse for the AquaDETECT



Fuse holder insert

Operating steps

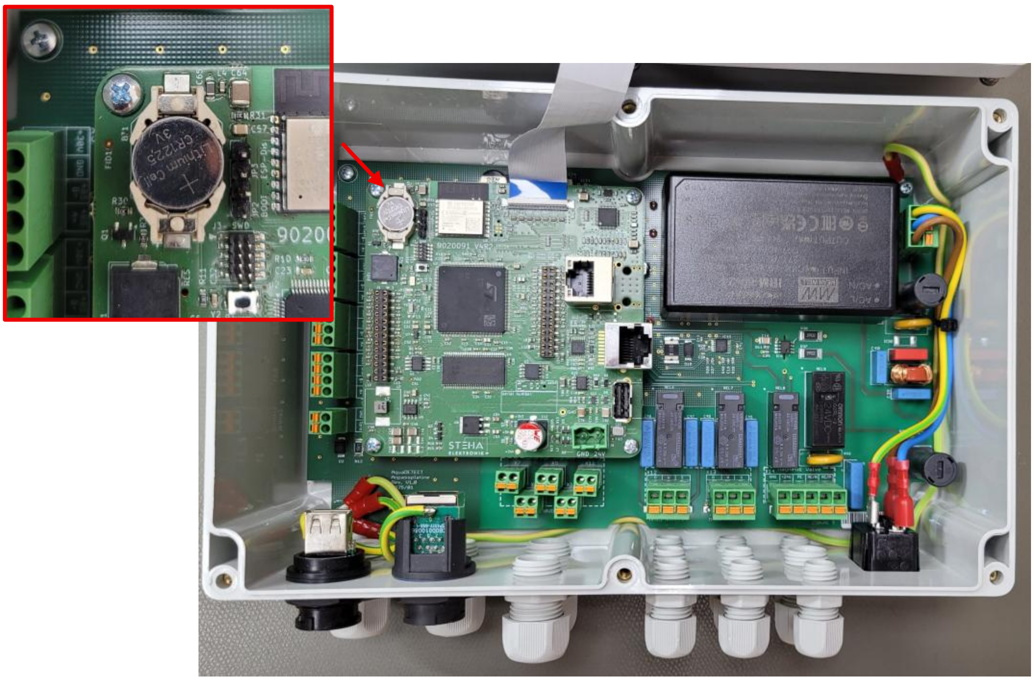
1) Ensure that the device is disconnected from the mains supply (pull the mains plug).
2) Remove the housing cover (be careful with the display cable!).
3) Disconnect the display cable or secure the housing cover to prevent it from falling
4) Identify the defective fuse:
   - SI1 AquaDETECT for entire device T1A
   - SI2 Magnetic Valve for solenoid valve T315mA
5) Order a new fuse cartridge from the digital spare parts catalog
6) Use a screwdriver to unscrew the fuse holder insert
7) Replace the fuse cartridge
8) Screw in the fuse holder insert
9) Reattach the housing cover

10.5 Replace the battery

Warning

Dangerous electrical voltage inside the housing

Before performing maintenance work on the device, disconnect the power plug to ensure that the device is not live.



Work steps

1) Order the correct CR1225 button cell from the spare parts catalog.
2) Disconnect the device from the mains supply (pull out the mains plug)
3) Remove the cover (be careful with the display cable!)
4) Disconnect the display cable or secure the housing cover to prevent it from falling
5) When replacing the button cell, hold the battery holder firmly and carefully remove the battery with your fingers or a suitable plastic tool (lever tool, tweezers)
6) Insert the new button cell
7) Reattach the housing cover
8) Set the time in the software

11 Technical

11.1 Weight

Abmessungen

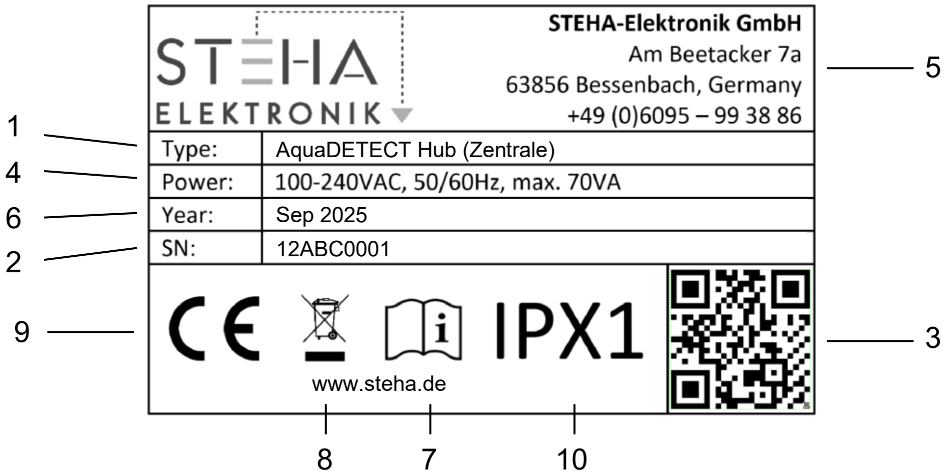
Height	160 mm
Width	250 mm
Depth	90 mm
Weight	approx. 1 kg

- **Device data**

Display	TFT LCD touch display; Resolution 800 x 480 Screen size: 5 inches Display of all system parameters
Language options	German, English, French, Spanish, Italian, Portuguese
Leakage sensors	Connection of up to 55 leakage sensors Arrangement of individual leakage detection devices in series (each with up to 350 m connection cable of type 4 x 2 x 0.8) – **Bus 1**: maximum of 15 leakage detection devices with 350 m bus cable – **Bus 2**: maximum of 15 leakage detection devices with 350 m bus cable – **Bus 3**: maximum of 15 leakage detection devices with 350 m bus cable – **Bus 4**: maximum of 10 leakage detection devices with 350 m bus cable – Switching threshold of the sensors: 1µS (± 10%)
Signaling	Optical and/or acoustic signaling of – leakage signaling – Position signaling – Communication signaling

11.2 Type plate (device identification)

The type plate shown is only a sample. The data specified on the type plate of the device is authoritative.



1 Type designation

2 Serial number

3 QR code: Serial number

4 Connection values

5 Manufacturer and manufacturer's address

6 Year of manufacture

7 Caution, observe accompanying documents

8 Labeling of electrical and electronic equipment (Device must not be disposed of with household waste.)

9 CE marking

10 Protection against liquid ingress: Drip-proof

11.3 Electrical safety

Warning

Risk of injury due to electrical voltage.

Contact with live parts will result in electric shock.

➢ To avoid the risk of electric shock, this device must only be connected to a mains supply with a protective earth conductor.

Type of protection against electric shock
Protection class I

Degree of protection against liquid ingress
IPX1

Degree of contamination
2

Operating altitude
max. 3000 m

Overvoltage category:
Up to the values of overvoltage category II

11.4 Electrical supply

Mains voltage
100–240 V, 50/~ , 50/60 Hz

(The mains voltage, power consumption, and frequency specified on the device's type label are decisive.)

Power
70 VA

External signaling Central leakage detection system
5 solid state relays (SSR) max. 30VDC@200mA designed as normally open contacts

2 switching relays max. AC 240 V, 2 A, designed as changeover contacts

1 connection for solenoid valve max. 230 VAC, 50-60 Hz, 24 VA **or** max. 24VDC, 11W

External signaling Leakage detection device
Leakage detection device Optocoupler 20 mA/24 V protected against short circuit (limited to 50 mA)

Maximum current in the bus line
1 A

Current consumption
Leakage detection device, approx. 8–15 mA

11.5 Fuses

Central leakage detection system:	AquaDETECT:	fuse T1A
	Solenoid valve (230 VAC output):	fuse T315mA

11.6 Operating conditions

Operating temperature range	+5 °C to +40 °C
Relative humidity	up to 80% (non-condensing)
Air pressure	700 hPa to 1150 hPa

11.7 Storage

For further information (see chapter 9).

11.8 External connection options

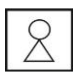
Signal output	5 solid state relays (SSR) max. 30VDC, 200mA, designed as normally open contacts	
	2 switching relays max. AC 240 V, 2 A, CAT II designed as changeover contacts	
Load output	1 output	max. 230 VAC, 50-60 Hz, 24 VA **or** max. 24VDC, 11W

11.9 Storage conditions/transport

For further information (see chapter9)...

12 Definitions

12.1 Symbols

IPX1	Degree of protection against the ingress of foreign bodies and liquids – X: No rating for protection against foreign objects – 1: Protection against vertically falling water drops
~	Alternating current
CE	The CE mark shows that the product meets the current EU guidelines.
	Marking of electrical and electronic equipment (device must not be disposed of with household waste).
SN	Serial number
	Follow the instructions for use
	DIN-watchdog
	Not approved for telephone connection
	Not approved for laptop/network connection
	Before opening: Disconnect the power plug.
	Beware of dangerous electrical voltage

12.2 Certificate

STEHA ELEKTRONIK
Elektronische Industrieausrüstung
STEHA-Elektronik GmbH
Am Beetacker 7a
D-63856 Bessenbach

EU-Konformitätserklärung

EU-Declaration of Conformity

Unternehmen / Hersteller:

STEHA-Elektronik GmbH
Am Beetacker 7A
D-63856 Bessenbach
Deutschland

Gerätebezeichnung:

AquaDETECT
System zur Leckageüberwachung

Das Produkt entspricht den Anforderungen folgender EU-Richtlinien:

- *2014/35/EU* - Niederspannungsrichtlinie (LVD)
- *2014/30/EU* - EMV-Richtlinie
- *2014/53/EU* - Funkanlagen (RED)
- *2012/19/EU* - WEEE-Richtlinie
- *2023/1542/EG* - Batterie-Verordnung
- *2011/65/EU* - RoHS-Richtlinie
- *2006/1907/EG* - REACH-Verordnung

Zur Bewertung der Konformität wurden folgende harmonisierten Normen herangezogen:

- *EN 60335-1*: 2024/07 (Sicherheit von elektrischen Geräten)
- *EN 61000-6-1*: 2019/11 (EMV, Störfestigkeit)
- *EN 61000-6-3*: 2022/06 (EMV, Störaussendung)

Die Konformität zur RoHS-Richtlinie 2011/65/EU ist mit den Ausnahmen 6(c), 7(a) und 7(c)-I gewährleistet.

Der Hersteller übernimmt die alleinige Verantwortung für die Übereinstimmung des Produkts mit den geltenden EU-Vorschriften.

Ort und Datum der Ausstellung: Bessenbach, 05.08.2025

Verantwortlicher (Jan Stanzel, Geschäftsführer)

Stanzel

Unterschrift

Telefon 0 60 95/99 38 86
Telefax 0 60 95/99 38 88
info@steha.de
www.steha.de
VAT ID: DE 132 102 513

Geschäftsführer:
Bernd Bieber, Jan Stanzel
Sitz: Bessenbach HRB 1397
Amtsgericht Aschaffenburg

WEEE-Reg.-Nr.:
DE89467745
Batt-Reg.-Nr.:
DE92777511

Frankfurter Volksbank Rhein/Main
Konto 2 42 86 10 / BLZ 501 900 00
IBAN: DE33 5019 0000 0002 4286 10
BIC: FFVBDEFF

Sparkasse Aschaffenburg
Konto 260 521 / BLZ 795 500 00
IBAN: DE45 7955 0000 0000 2605 21
BIC: BYLADEM1ASA

13 Spare parts

To identify and order spare parts, measuring devices, and accessories, always use the electronic spare parts catalog provided by your service provider.