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## Operating instructions

### CAPBs® sens WQ10



Read instructions before using device!



Observe all safety information!



Keep instructions for future use!

## About these operating instructions

These operating instructions describe the CAPBs sens sensor module. A CAPBs sens cannot be operated without a CAPBs handle. The CAPBs handle and a plugged in CAPBs sens sensor module form a measuring instrument (also referred to as "CAPBs" in these operating instructions). Read and understand the operating instructions for the CAPBs handle which you use together with the sensor module. These operating instructions are part of CAPBs sens sensor module.

- ▶ You may only use the measuring instrument if you have fully read and understood these operating instructions.
- ▶ Verify that these operating instructions are always accessible for any type of work performed on or with the measuring instrument.
- ▶ Pass these operating instructions as well as all other related documents on to all owners of the measuring instrument.
- ▶ If you feel that these operating instructions contain errors, inconsistencies, ambiguities or other issues, contact the manufacturer prior to using the measuring instrument.

These operating instructions are protected by copyright and may only be used as provided for by the corresponding copyright legislation. We reserve the right to modifications.

The manufacturer shall not be liable in any form whatsoever for direct or consequential damage resulting from failure to observe these operating instructions or from failure to comply with directives, regulations and standards and any other statutory requirements applicable at the installation site of the measuring instrument.

## Information on safety

### Safety messages and hazard categories

These operating instructions contain safety messages to alert you to potential hazards and risks. In addition to the instructions provided in these operating instructions, you must comply with all directives, standards and safety regulations applicable at the installation site of the measuring instrument.

Verify that you are familiar with all directives, standards and safety regulations and ensure compliance with them prior to using the measuring instrument.

Safety messages in these operating instructions are highlighted with warning symbols and warning words. Depending on the severity of a hazard, the safety messages are classified according to different hazard categories.



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**WARNING  
WORD**

**Type and source of the hazard are shown here.**

- Precautions to take in order to avoid the hazard are shown here.  
Consequences of failure to observe the instructions are shown here.
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## **Intended use**

These measuring devices are suitable for random sample measuring of the pH value, electrical conductivity and temperature in water or for comparable applications.

When using the measuring instrument, perform all work and all other activities in conjunction with the product in compliance with the conditions specified in the operating instructions, as well as with all directives, standards and safety regulations applicable at the installation site of the product.

## **Predictable incorrect application**

These measuring instruments must never be used in the following cases and for the following purposes:

- Unprotected outdoor use
- Usage in hazardous area/potentially explosive atmosphere:  
If the product is operated in hazardous areas, sparks may cause deflagrations, fires or explosions.
- Use outside of the technical specifications and limit values
- Applications covered by the European Measuring Instruments Directive MID
- Applications which involve hazardous substances unless all applicable safety directive, standards and regulations are met
- Applications which involve special hygienic requirements, such as, but not limited to, the food and beverages industries, pharmaceutical industry, biotechnology industry
- Applications which are used for health-saving or life-saving purposes, such a medical technology

## **Qualification of personnel**

Only appropriately trained persons who are familiar with and understand the contents of these operating instructions and all other pertinent documentation concerning the measuring instrument are authorized to work on and with this measuring instrument. These persons must have sufficient technical training, knowledge and experience and be able to foresee and detect potential hazards that may



be caused by using the measuring instrument. All persons working on and with the measuring instrument must be fully familiar with all directives, standards and safety regulations that must be observed for performing such work.

## Modifications to the CAPBs

Only perform work on and with the measuring instrument which is explicitly described in these operating instructions.

Do not make any modifications to the product which are not described in these operating instructions.

## Usage of spare parts and accessories

Usage of unsuitable spare parts and accessories may cause damage to the product.

- ▶ Use only genuine spare parts and accessories of the manufacturer.

## Specific safety information

### WARNING



### INCORRECT USE OF THE MEASURING INSTRUMENT

- ▶ Perform a risk assessment in view of the planned application, according to an approved risk assessment method.
- ▶ Implement the appropriate safety measures, based on the results of the risk assessment.
- ▶ Implement all safety measures in compliance with the conditions specified in the operating instructions as well as with all directives, standards and safety regulations applicable at the operation site of the measuring instrument and verify that all risks resulting from hazardous substances and all other hazards are excluded when using the measuring instrument.

Failure to follow these instructions can result in death, serious injury and equipment damage.

### ATTENTION USAGE

- ▶ The CAPBs sens WQ10 is not suitable for diagnostic measurements in the medical area!



## Technical specifications

### Approvals, conformities

- EMC Directive - 2014/30/EU
- RoHS Directive - 2011/65/EU
- WEEE Directive 2012/19/EU

### CAPBs sens WQ: water quality

| Parameter  | WQ10   |
|--|--|
| Use  | CAPBs sens sensor module for measurement of water quality (e.g.: heating water, ...)   |
| Measuring principle<br>pH:<br>Conductivity:<br>Temperature:  | pH-electrode<br>EC-electrode<br>NTC  |
| Measuring values<br>pH:<br><br>Conductivity:<br><br>Temperature:<br>Salinity:<br><br>TDS:<br><br>Hardness: | Specify the acidity or basicity of an aqueous solution<br><br>Measures a material's ability to conduct an electric current<br><br>Is used to calculate the reference values to 25°C<br>Derived from the conductivity reading using a conversion factor 0.5<br><br>Total Dissolved Solids, derived from the conductivity reading using an alterable conversion factor (default factor is 0.65)<br><br>Derived from the conductivity reading using different conversion factors<br>deutsche Härte °dH: factor 0.028<br>English Grade °e: factor 0.022<br>French Grade °fH: factor 0.01568<br>Russian Grade °rH: factor 0.0039<br>CaCO3 ppm: factor 0.00157<br>Earth alkali ions mg/l: factor 0.0784<br>Earth alkali ions mmol/l: factor 0.1568 |



| Parameter  | WQ10   |
|--|--|
| Measuring range<br>pH:<br>Conductivity:<br>Temperature:        | 0 ... 14 pH<br>0 ... 50.000 $\mu\text{S/cm}$<br>-5 ... +60 °C  |
| Measuring accuracy<br>pH:<br>Conductivity:<br><br>Temperature: | $\pm 0,01$ pH<br>$\pm 2$ $\mu\text{S/cm}$ (up to 199 $\mu\text{S/cm}$ )<br>$\pm 5$ $\mu\text{S/cm}$ (200 to 499 $\mu\text{S/cm}$ )<br>$\pm 20$ $\mu\text{S/cm}$ (500 to 1999 $\mu\text{S/cm}$ )<br>$\pm 0.2$ mS/cm (2.00 to 19.99 mS/cm)<br>$\pm 0.5$ mS/cm (20.00 to 50.00 mS/cm)<br>$\pm 0.5$ °C |
| Resolution<br>pH:<br>Conductivity:<br>Temperature:             | 0.01 pH<br>1 $\mu\text{S/cm}$<br>0.1 °C  |
| Units<br>pH:<br>Conductivity:<br>Temperature:                  | pH<br>$\mu\text{S/cm}$ , mS/cm<br>°C, °F   |
| Operating temperature  | 0 °C to 40 °C  |
| Storage temperature  | -20 °C to +50 °C   |
| Atmospheric pressure (operation)                               | 800 to 1,200 mbar  |
| Dimensions W x H x D   | 130 x 43 x 36 mm   |
| CAPBs STm hours of operation                                   | Up to 28 hours   |
| Application programs   | EC/pH measurement  |



|   |                   |
|---|-------------------|
| 1 | pH probe          |
| 2 | EC probe          |
| 3 | Temperature probe |



## Operation

### Water sample extraction

Select a location with good flow as the removal point. Allow the water to steadily flow into the measuring beaker at a moderate speed. Before carrying out a new measurement, ensure that the measuring beaker is properly cleaned and wiped dry.

### Measurement

Remove the protective cap from the measuring probe and clean the probe with distilled water. Carefully dry the measuring probe with a paper towel.

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#### WARNING



#### GLASS MEASURING TIP, RISK OF BREAKAGE

- Check the measuring tip of the pH probe for damage after every measurement

Failure to follow these instructions can lead serious injuries.

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#### Calibration procedure:

Pour the probe in the measuring beaker (approx. 20 ml). Immerse the probe approx. 2-3 cm into the measuring beaker and move the electrode to and fro. Air bubbles at the sensor must be removed by fast rotation of the probe. A short visual inspection of the immersed probe by looking through the transparent beaker is recommended. Wait until the measurement is stable, which can take up to 60 seconds. Since the pH value and conductivity are temperature dependent, the measuring results are referenced to 25°C.

Clean the measuring probe with water and a clean towel after every measurement. Wet the protective cap with storage solution before replacing it so that the probe cannot dry out.

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#### ATTENTION PROBE STORAGE

- The probe must never be stored in a dry condition, without the protective cap or in a different liquid. This can lead to destruction of the electrode or erroneous measurements.
  - Top up the pH electrolyte solution in the protective cap at regular intervals, but at least every 2 months, and immediately after loss of liquid in order to prevent the cap from drying out. Any normal commercial 3.5 molar potassium chloride solution can be used as the pH electrolyte solution.
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## Calibration

### pH probe

Recalibration of the pH probe is required if the probe has not been used for a long time, or erroneous values are measured in a reference liquid. It is advisable to calibrate the probe at least every 2 weeks.

The pH probe is calibrated to two measurements. For this reason, a small bottle containing pH 4.00 calibration solution and a small bottle containing pH 7.00 calibration solution are required. The calibration is carried out using the respective beaker, since the calibration solutions would otherwise be contaminated.

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#### WARNING



#### NOTES CONCERNING CALIBRATION CHEMICALS

- ▶ Check the measuring tip of the pH probe for damage after every measurement

Non-compliance with these instructions can lead to serious injuries.

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#### Calibration procedure:

First shake the small bottle containing the calibration solution vigorously. Then pour the calibration solution into the measuring beaker (approx. 20 ml). Immerse the pH probe into the calibration solution. Rotate the electrode a little and wait until the measurement stabilizes. Follow the calibration instructions of the measurement device.

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#### ATTENTION INCORRECT CALIBRATION

- ▶ During calibration it is important that the probe does not touch the plastic of the measuring beaker.
  - ▶ Dispose of the calibration solution after use. Under no circumstances must it be reused for calibration.
  - ▶ Air bubbles at the sensor must be removed by fast rotation of the probe. A short visual inspection of the immersed probe by looking through the transparent beaker is recommended.
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Repeat the procedure with the second calibration solution.





## Conductivity probe

The conductivity probe must be recalibrated if the probe has not been used for a long time, or erroneous values are measured in a reference liquid. It is advisable to calibrate the probe at least every month.

The conductivity probe is calibrated to one measurement per measuring range. For this reason, a small bottle containing a 1413  $\mu\text{S}/\text{cm}$  calibration solution is required for the low measuring range, and a small bottle containing a 12.88  $\text{mS}/\text{cm}$  solution for the high measuring range. The calibration is carried out using the measuring beaker, since the calibration solution would be contaminated.

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### WARNING



### NOTES CONCERNING CALIBRATION CHEMICALS

- Check the measuring tip of the pH probe for damage after every measurement

Non-compliance with these instructions can lead to serious injuries.

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First shake the small bottle containing the calibration solution vigorously. Then pour the calibration solution into the measuring beaker (approx. 20 ml). Quickly close calibration bottle, because with open cover the calibration solution ages rapidly and then is no longer usable. Immerse the conductivity probe into the calibration solution. Rotate the probe a little and wait until the measurement stabilizes. Follow the calibration instructions of the measurement device.

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### ATTENTION INCORRECT CALIBRATION

- During calibration it is important that the probe does not touch the plastic of the measuring beaker.
  - Dispose of the calibration solution after use. Under no circumstances must it be reused for calibration.
  - Air bubbles at the sensor must be removed by fast rotation of the probe. A short visual inspection of the immersed probe by looking through the transparent beaker is recommended.
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## Changing probes

The device must be switched off. Do not touch the plug contacts of the device.

1. To remove a probe, unscrew and completely remove the probe collar.
2. Gently rock the probe from side to side, pulling it downwards, until it disconnects from the CAPBs.
3. To attach a probe, carefully plug the probe into the meter socket (note that the electrode connector is keyed, ensuring proper connection).
4. Tighten the probe collar firmly enough to make a good seal (a rubber gasket seals the probe with the CAPBs).



|   |                 |
|---|-----------------|
| 1 | pH / EC probe   |
| 2 | Probe collar    |
| 3 | CAPBs sens WQ10 |

After changing a probe, the device must be re-calibrated.

## Accessories and replacement parts

- Replacement combination probe (pH and conductivity) including gel storage cap
- Storage cap
- Calibration solution

## Storage

Store the device in a dry location away from solvents.



## Maintenance

The measuring instrument does not contain any parts that can be serviced or repaired by the customer.

Prior to performing a measurement, perform a visual inspection of the CAPBs for visible damage. Do not use damaged measuring instruments.

- Clean the measuring instrument after each use. Use a dry, lint-free cloth for cleaning.
- Use a slightly wetted cloth to remove pollution that cannot be removed with a dry cloth.
- Do not use cleaning agents for cleaning.

The CAPBs measuring instrument must be serviced by the manufacturer or an authorised service point at regular intervals. The service intervals depend, among other things, on the legal requirements and regulations.

## Troubleshooting

Repairs may only be performed by specially trained, qualified staff.

| Problem                                       | Possible reason                           | Repair  |
|---|---|---|
| Display device shows no measurement values    | Sensor inoperative                        | ► Exchange sensor   |
| Display device shows wrong measurement values | Wrong calibration                         | ► Make new calibration like described in the chapter "Calibration."   |
| Display device shows wrong measurement values | Dirty sensor / air bubble at the sensor   | ► Clean the sensor like described in the chapter "Maintenance" / Rotate the sensor quickly in the calibration solution to remove the air bubble |
| Calibration error                             | Calibration solution contaminated or aged | ► Take new calibration solution   |
| Calibration error                             | Air bubble at the sensor                  | ► Rotate the sensor quickly in the calibration solution to remove the air bubble  |

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## Decommissioning, disposal



Dispose of the product in compliance with all applicable directives, standards and safety regulations.

Electronic components and batteries must not be disposed of together with the normal household waste.

## Warranty

See our terms and conditions at [www.afriso.com](http://www.afriso.com) or your purchase contract for information on warranty.

## Addresses

The addresses of our worldwide representations and offices can be found on the Internet at [www.systronik.com](http://www.systronik.com).