**OPERATING MANUAL**

ba75740e04 11/2016

SenTix® 20, 21, 21-3, 22
SenTix® 41, 41-3, 42
SenTix® RJD
SenTix® Sp
SenTix® Sur

# SenTix®

pH ELECTRODES WITH POLYMER AND GEL ELECTROLYTE

WTW
a xylem brand

# Technical data

## *General data*

| Model | Reference electrolyte | Junction | NTC | Special features |
|---|---|---|---|---|
| SenTix® 20 | Gel | Fiber | No | Plastic shaft |
| SenTix® 21 | Gel | Fiber | No | Plastic shaft |
| SenTix® 21-3 | Gel | Fiber | No | Plastic shaft |
| SenTix® 22 | Gel | Fiber | No | Plastic shaft |
| SenTix® 41 | Gel | Fiber | Yes | Plastic shaft |
| SenTix® 41-3 | Gel | Fiber | Yes | Plastic shaft |
| SenTix® 42 | Gel | Fiber | Yes | Plastic shaft |
| SenTix® RJD | Polymer | Split ring | Yes | Glass shaft |
| SenTix® Sp | Polymer | Hole | No | Electrode for cut-in measurements |
| SenTix® Sur | Polymer | Split ring | No | Electrode for surface measurements |

## *Measurement and application characteristics*

| Model | pH measuring range | Allowed temperature range | Membrane resistance at 25 °C | Typical application |
|---|---|---|---|---|
| SenTix® 20 | 0 ... 14 | 0 ... 80 °C | < 1 GOhm | Field |
| SenTix® 21-1 | 0 ... 14 | 0 ... 80 °C | < 1 GOhm | Field |
| SenTix® 21-3 | 0 ... 14 | 0 ... 80 °C | < 1 GOhm | Field |
| SenTix® 22 | 0 ... 14 | 0 ... 80 °C | < 1 GOhm | Field |
| SenTix® 41 | 0 ... 14 | 0 ... 80 °C | < 1 GOhm | Field |
| SenTix® 41-3 | 0 ... 14 | 0 ... 80 °C | < 1 GOhm | Field |
| SenTix® 42 | 0 ... 14 | 0 ... 80 °C | < 1 GOhm | Field |
| SenTix® RJD | 2 ... 13 | 0 ... 80 °C | < 600 MOhm | Laboratory |
| SenTix® Sp | 2 ... 13 | 0 ... 80 °C | < 400 MOhm | Laboratory / foods |
| SenTix® Sur | 2 ... 13 | 0 ... 50 °C | < 1 GOhm | Laboratory |

## *Shaft dimensions, shaft material, electrical connection*

| Model | Shaft | | | Electrical connection | | |
|---|---|---|---|---|---|---|
| | Length [mm] | Ø [mm] | Material | Electrode connection | Meter connection | Cable length |
| SenTix® 20 | 120 | 12 | PPE/PS | S7 plug-in connector | depending on S7 cable*** | |

| Model | Shaft | | | Electrical connection | | |
|---|---|---|---|---|---|---|
| | Length [mm] | Ø [mm] | Material | Electrode connection | Meter connection | Cable length |
| SenTix® 21-1 | 120 | 12 | PPE/PS | Fixed cable | DIN* | 1 m |
| SenTix® 21-3 | 120 | 12 | PPE/PS | Fixed cable | DIN* | 3 m |
| SenTix® 22 | 120 | 12 | PPE/PS | Fixed cable | BNC | 1 m |
| SenTix® 41 | 120 | 12 | PPE/PS | Fixed cable | DIN*+banana | 1 m |
| SenTix® 41-3 | 120 | 12 | PPE/PS | Fixed cable | DIN*+banana | 3 m |
| SenTix® 42 | 120 | 12 | PPE/PS | Fixed cable | BNC+banana | 1 m |
| SenTix® RJD | 120 | 12 | Glas | Fixed cable | DIN*+banana | 1 m |
| SenTix® Sp | 65/25** | 15/5** | PPE/PS | S7 plug-in connector | depending on S7 cable*** | |
| SenTix® Sur | 120 | 12 | Vidrio | S7 plug-in connector | depending on S7 cable*** | |

*Coaxial plug according to DIN 19262
**Stage geometry
***Connection cable not included in the scope of delivery of the combination electrode (see WEAR PARTS AND ACCESSORIES)

# Commissioning, measuring, calibration

**Commissioning**

Prepare the electrode for measuring as follows:

- Remove the watering cap from the electrode tip. Possible salt deposits in the area of the watering cap do not affect the measuring characteristics and can easily be removed with deionized water.

Please keep the watering cap. It is required for the electrode to be stored. Always keep the watering cap clean.

- SenTix® 2x, SenTix® 4x and SenTix® Sp: Remove any gas bubbles behind the pH membrane by shaking. With all other electrodes, gas bubbles behind the pH membrane are not a problem.
- Connect the electrode to the meter.
- Calibrate the electrode according to the operating manual of the meter and observe the following rules while doing so:

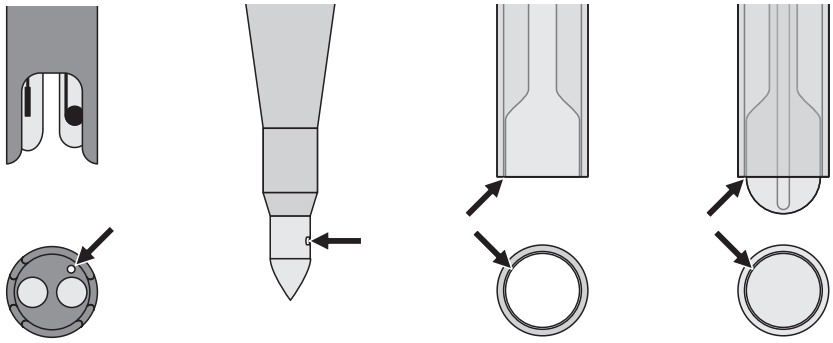
**Calibration and measurement: General rules**

- Avoid the displacement of any solution (sample or buffer solution) from one measurement to the next by taking the following measures:
  - Shortly rinse the calibration and sample beakers with the solution the

beakers are to be filled with next.

– Between measurements, rinse the electrode with the solution that follows. Alternatively, you can also rinse the electrode with deionized water and then carefully dab it dry.

- To measure in aqueous solutions, it is recommended to immerse the electrode in a vertical or slightly tilted position.
- Observe the correct depth of immersion and make sure the contact between the junction and test sample is thorough. The junction is in the area of the bottom end of the shaft (see arrow).



SenTix® 2x
SenTix® 4x

SenTix® Sp

SenTix® Sur

SenTix® RJD

**Caution:**
**Only the shaft part of the electrode may be immersed!**

- For measurements in aqueous solutions, provide approximately the same stirring conditions for measuring as for calibrating.

**Subsequent calibrations**

The frequency of subsequent calibrations depends on the application. Many meters provide an option where you can enter a calibration interval. After the calibration interval has expired, the meter will automatically remind you of the due calibration.

# Storage

**During short measuring breaks**

Immerse the electrode in reference electrolyte (KCl 3 mol/L, $Ag^+$ free). Prior to the next measurement, shortly rinse the electrode with the test sample or deionized water.

Prevent contact of the pH membrane to the beaker bottom to avoid scratches on the pH membrane.

**Overnight or longer**

Put the clean electrode in the watering cap that is filled with reference electrolyte (KCl 3 mol/L, $Ag^+$ free).

***NOTE***
**pH electrodes must not be stored dry or in deionized water. The electrode could be permanently damaged by this. If the liquid in the watering cap has dried up, condition the electrode in reference electrolyte (KCl 3 mol/L, Ag+ + free) for at least 24 hours.**

During longer storing periods, salt sediments may develop on the watering cap. They do not affect the measuring characteristics and can easily be removed with deionized water when the electrode is put into operation again.

# Aging

pH electrodes are consumables. Every pH electrode undergoes a natural aging process. With aging, the responding behavior becomes slower and the electrode slope and asymmetry change. Moreover, extreme operating conditions can considerably shorten the lifetime of the electrode. These are:

- Strong acids or lyes, hydrofluoric acid, organic solvents, oils, fats, bromides, sulfides, iodides, proteins
- High temperatures
- High changes in pH and temperature.

The warranty does not cover failure caused by measuring conditions and mechanical damage.

# Maintenance and cleaning

**Cleaning**

Remove water-soluble contamination by rinsing with deionized water. Other types of contamination have to be removed as follows while the contact time with the detergents should be kept as short as possible:

| Contamination | Cleaning procedure |
|---|---|
| Fat and oil | Rinse with water containing household washing-up liquid |
| Lime and hydroxide deposits | Rinse with citric acid (10 % by weight) |

Hydrofluoric acid, hot phosphoric acid and strong alkaline solutions destroy the glass membrane.

**After cleaning**

Rinse the electrode with deionized water and condition it in reference electrolyte solution for at least 1 hour. Then recalibrate the electrode.

# Wear parts and accessories

| Description | Model | Order no. |
|---|---|---|
| Reference electrolyte solution 250 mL (KCl 3 mol/L, $Ag^+$ free) | KCl-250 | 109 705 |
| Connection cable S7 plug-in connector/DIN, 1 m | AS/DIN | 108 110 |
| Connection cable S7 plug-in connector/DIN, 3 m | AS/DIN-3 | 108 112 |
| Connection cable S7 plug-in connector/BNC, 1 m | AS/BNC | 108 114 |
| Plastic arming for SenTix® pH electrodes | A pHLab/K | 903 841 |

# Disposal

At the end of its operational lifetime, the electrode must be returned to the disposal or return system statutory in your country (electronic waste). If you have any questions, please contact your supplier.

# What can Xylem do for you?

We're a global team unified in a common purpose: creating innovative solutions to meet our world's water needs. Developing new technologies that will improve the way water is used, conserved, and re-used in the future is central to our work. We move, treat, analyze, and return water to the environment, and we help people use water efficiently, in their homes, buildings, factories and farms. In more than 150 countries, we have strong, long-standing relationships with customers who know us for our powerful combination of leading product brands and applications expertise, backed by a legacy of innovation.

**For more information on how Xylem can help you, go to xyleminc.com.**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