OPERATING MANUAL

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SenTix® 940(-P)
SenTix® 940-3
SenTix® 945(-P)
SenTix® Top 940

MultiLine® IDS

SenTix® (Top) 94x(-P)

pH ELECTRODE WITH GEL ELECTROLYTE OR POLYMER ELECTROLYTE

WTW
a xylem brand

1 General information

Automatic sensor recognition

The sensor electronics with the stored sensor data are in the connecting head of the electrode. The data include, among other things, the sensor type and series number. In addition, the calibration data are stored in the sensor with each calibration and the calibration history is recorded (the last 10 calibrations). The data is recalled by the meter when the sensor is connected and is used for measurement and for measured value documentation.

Storing the calibration data in the sensor ensures that the correct slope and asymmetry are automatically used if the sensor is operated with different meters. On the other hand, different calibrated sensors can be used with one meter without the need to recalibrate.

The digital transmission technique guarantees the failure-free communication with the meter even with long connection cables. The sensor firmware can be updated via the meter.

2 Commissioning, measuring, calibration

2.1 Commissioning

Scope of delivery

- Electrode SenTix® (Top) 94x(-P)
- Operating manual

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.

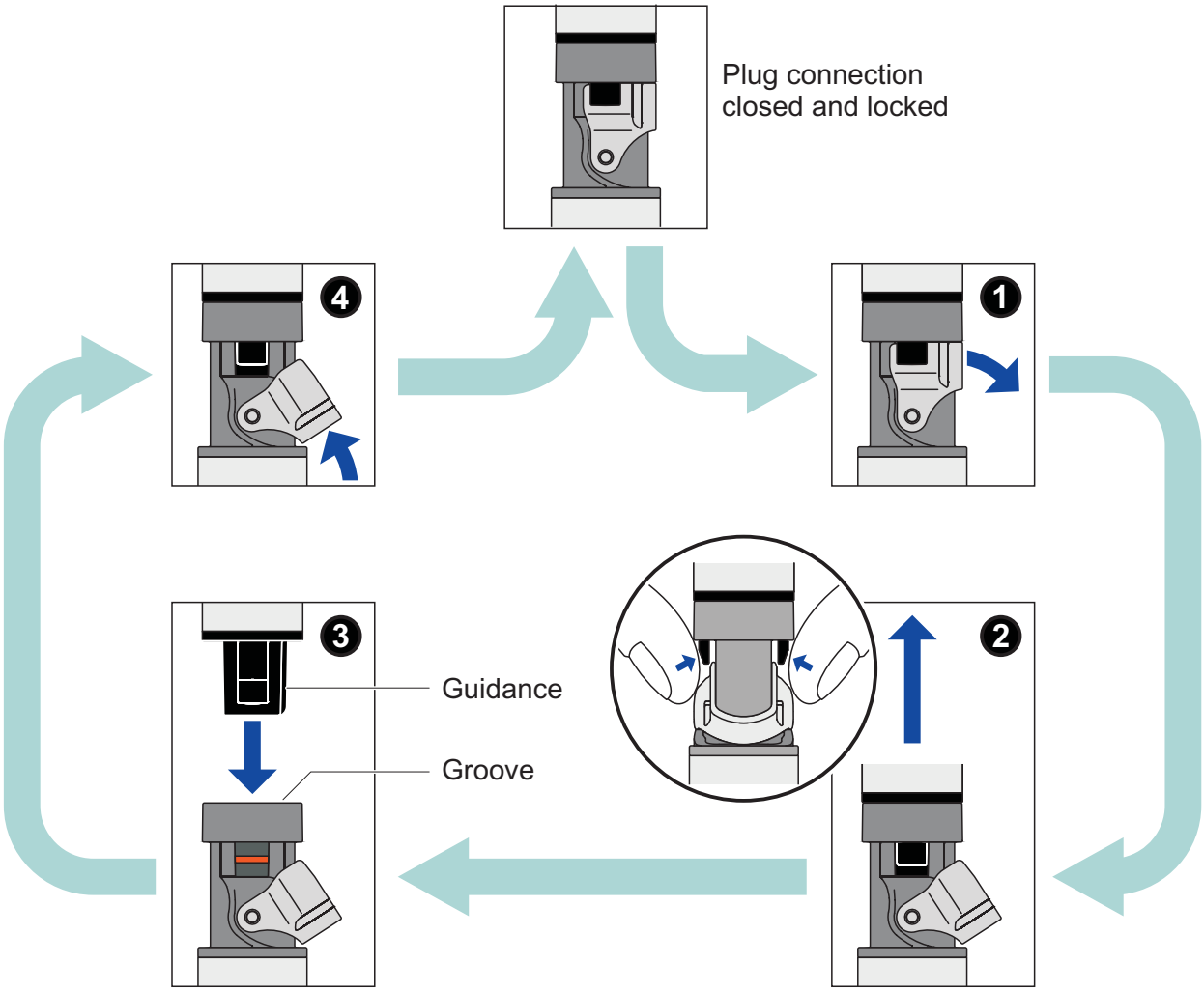
- Remove any gas bubbles behind the pH membrane by shaking.
- Connect the electrode to the meter.

SenTix® (Top) 94x	– via the sensor cable to a free IDS connector on the meter
SenTix® ... -P	– via a connecting cable (accessory) to a free IDS connector on the meter or – wireless via an IDS WLM-S adapter (accessory) to a WLM-capable meter Accessories for the connection of the SenTix® (Top) 94x-P sensor to the meter: See chapter 7 WEAR PARTS AND ACCESSORIES. Opening and closing the IDS plug connection, see section 2.2 OPENING AND CLOSING THE IDS PLUG CONNECTION.

- Calibrate the electrode according to the operating manual of the meter and observe the following rules while doing so.

2.2 Opening and closing the IDS plug connection

This section only applies to IDS plug variants SenTix® ... -P.



Opening the plug connection

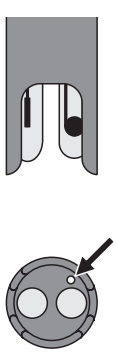
- If necessary, clean the plug connection.
- Open the locking device (step 1).
- Use your thumb and index finger to press the clips of the connector together, and pull the connector out of the plug (step 2).

Closing the plug connection

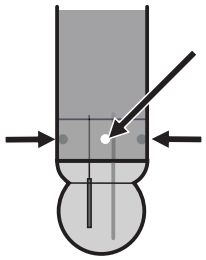
- Make sure that the plug connection is completely dry and clean.
- Align the guidance of the connector with the groove in the plug and insert the connector in the unlocked plug until it catches (step 3).
- Close the locking device (step 4).

2.3 Calibration and measurement: General rules

- Avoid the carryover 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® 940**(**-P**)**
SenTix® Top 940



SenTix® 945**(**-P**)**

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.

3 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.

Do not scratch 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.

4 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.

5 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)

NOTE
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 elec-

trolyte solution for at least 1 hour. Then recalibrate the electrode.

6 Technical Data

Measurement

pH measuring range	0.000 ... 14.000
Allowed temperature range	● SenTix® 94x(-P): 0 ... 80 °C ● SenTix® Top 940: -5 ... 100 °C

Accuracy of the IDS measuring technique

Measured parameter	Accuracy (± 1 digit)
pH	± 0.004
U [mV]	± 0.2
T [°C]	± 0.1

General features

Reference electrolyte	● SenTix® 94x(-P): Gel ● SenTix® Top 940: Polymer
Junction	● SenTix® 940**(**-P**)**: Fiber ● SenTix® 945**(**-P**)**: 3 x Ceramic ● SenTix® Top 940: Hole
Temperature sensor	Integrated NTC 30 (30 kΩ at 25 °C / 77 °F)

Connection cable

Lengths	● SenTix® 940: 1,5 m ● SenTix® 940-3: 3 m ● SenTix® (Top) 94x ... -P: see section 7 WEAR PARTS AND ACCESSORIES ● SenTix® Top 940: 1,5 m
Diameter	4.3 mm
Smallest allowed bend radius	Fixed installation: 20 mm Flexible use: 60 mm
Plug type	Socket, 4 pins

Shaft dimensions, material

Shaft length	120 mm
Shaft diameter	12 mm
Shaft material	● SenTix® 940(-P): PPE/PS ● SenTix® 945(-P): Glass ● SenTix® Top 940: PEEK

	IDS plug	● Synthetic materials: Glass fiber reinforced Noryl, TPU, TPC-ET, POM, PVC, PEEK, PBT ● O-ring: FPM ● Contacts goldSenTix® (Top) 94x-Plated
IDS plug	Connection type	4 pole, watertight plug connection with lock, reverse polarity protected

Storage With watering cap; filled with KCl 3 mol/L, Ag^+ free

7 Wear parts and accessories

Maintenance equipment

Description	Model	Order no.
Reference electrolyte solution 250 ml to fill the watering cap (KCl 3 mol/l, Ag^+-free)	KCl-250	109 705

Connection cable SenTix® ... -P - meter

Description	Model	Order no.
IDS connection cable, 1.5 m	AS/IDS-1.5	903 850
IDS connection cable, 3 m	AS/IDS-3	903 851
IDS connection cable, 6 m	AS/IDS-6	903 852
IDS connection cable, 10 m	AS/IDS-10	903 853
IDS connection cable, 15 m	AS/IDS-15	903 854
IDS connection cable, 20 m	AS/IDS-20	903 855
IDS connection cable, 25 m	AS/IDS-25	903 856
IDS connection cable, 40 m	AS/IDS-40	903 857
IDS connection cable, 60 m	AS/IDS-60	903 858
IDS connection cable, 100 m	AS/IDS-100	903 859

Radio connection SenTix® ... -P - meter

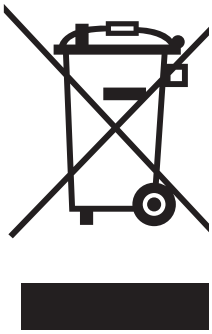
Description	Model	Order no.
WLM capable IDS meter + radio module for IDS meter	see Internet	
Radio module for plug head sensor	IDS WLM-S	108 141

General accessories	Description	Model	Order no.
	Plastic arming for SenTix® (Top) 94x(-P) pH electrodes	A pHLab/K	903 841

8 Disposal

Handle and dispose of all waste in compliance with local laws and regulations.

EU only: Correct disposal of this product — WEEE Directive on waste electrical and electronic equipment



This marking on the product, accessories or literature indicates that the product should not be disposed of with other waste at the end of its working life.

To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate these items from other types of waste and recycle them responsibly to promote the sustainable reuse of material resources.

Waste from electrical and electronic equipment can be returned to the producer or distributor.

Xylem |ˈzīləm|

1) The tissue in plants that brings water upward from the roots;
2) a leading global water technology company.

We're a global team unified in a common purpose: creating advanced technology solutions to the world's water challenges. Developing new technologies that will improve the way water is used, conserved, and re-used in the future is central to our work. Our products and services move, treat, analyze, monitor and return water to the environment, in public utility, industrial, residential and commercial building services settings. Xylem also provides a leading portfolio of smart metering, network technologies and advanced analytics solutions for water, electric and gas utilities. 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 with a strong focus on developing comprehensive, sustainable solutions.

For more information on how Xylem can help you, go to www.xylem.com.

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