SenTix® ORP-T 900(-P)

MultiLine® INTELLIGENT **I** DIGITAL **D** SENSORS **S**

SenTix® ORP-T 900(-P)

ORP ELECTRODE

WTW

a **xylem** brand

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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. The data are recalled by the meter when the sensor is connected and are 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 being recalibrated.

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.

# Commissioning, measuring, checking

Commissioning

Scope of delivery

● Electrode SenTix® ORP-T 900-P or SenTix® ORP-T 900

● Operating manual

Commissioning

Prepare the electrode for measuring as follows:

● Open the refilling opening for the reference electrolyte solution. Depending on the model, the stopper of the refilling opening is an elastomer stopper or a slider.
The refilling opening must always be open during measurement!

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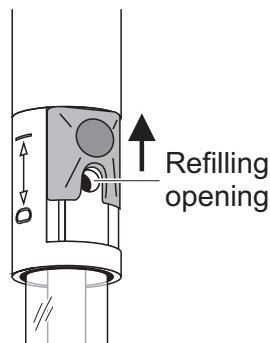
● Remove the watering cap from the electrode tip. Possible salt deposits in the area of the watering cap do not affect the measuring characteristics and can easily be removed with deionized water.

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

● Connect the sensor to the meter.

The sensor is immediately ready to measure.

| SenTix® ORP-T 900	– via the sensor cable to a free IDS connector on the meter
SenTix® ORP-T 900-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® ORP-T 900-P sensor to the meter: See chapter WEAR PARTS AND ACCESSORIES. Opening and closing the IDS plug connection, see section OPENING AND CLOSING THE IDS PLUG CONNECTION.

● Measure with the electrode according to the operating manual of the meter and observe the following rules while doing so:

Opening and closing the IDS plug connection

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

Plug connection
closed and locked

Guidance

Groove
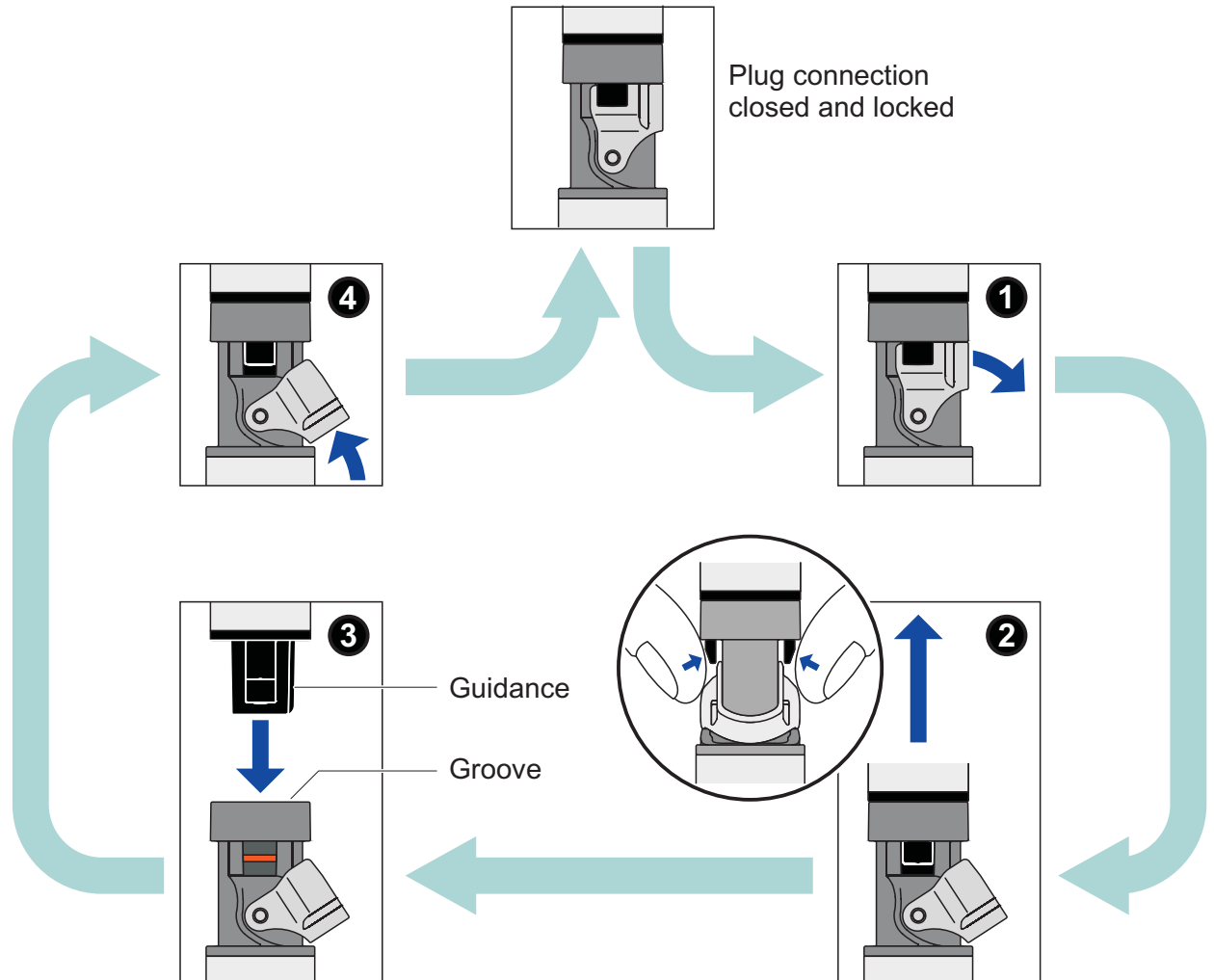
Opening the plug connection	• If necessary, clean the plug connection
	• Open the locking device (step 1)
	• Use your thumb and index finger to press the clips of the connector together, and pull the connector out of the plug (step 2).
Closing the plug connection	• Make sure that the plug connection is perfectly dry and clean.
	• Align the guidance of the coupling to the groove in the plug and insert the coupling into the unlocked plug up to the stop (step 3)
	• Close the locking device (step 4)

Measuring: General rules

- Make sure the refilling opening for the reference electrolyte solution is open.

- Avoid the carryover of sample solution from one measurement to the next as follows:

  – Shortly rinse the 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.

- Immerse the electrode in the solution in a vertical or slightly tilted position.

- Make sure the immersion depth is correct. The junction must be completely submersed in the solution. The junction is in the area of the bottom end of the shaft (see arrow).
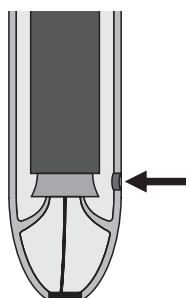
SenTix® ORP-T 900(-P)

At the same time, the level of the reference electrolyte must be at least 2 cm above the level of the solution.

Conversion to normal hydrogen electrode

$$U_H = U_{Meas} + U_{Ref}$$

with: U_H = ORP, referring to the normal hydrogen electrode

U_{Meas} = Measured ORP

U_{Ref} = Voltage of the reference system compared to the normal hydrogen electrode

U_{Ref} is temperature dependent and can be taken from the following table (see also DIN 38404-6):

T (°C)	U_{Ref} [mV] SenTix® ORP-T 900(-P)	T (°C)	U_{Ref} [mV] SenTix® ORP-T 900(-P)
0	+224	35	+200
5	+221	40	+196
10	+217	45	+192

T (°C)	U$_{Ref}$ [mV] SenTix® ORP-T 900(-P)	T (°C)	U$_{Ref}$ [mV] SenTix® ORP-T 900(-P)
15	+214	50	+188
20	+211	55	+184
25	+207	60	+180
30	+203		

Storage

During short measuring breaks

Immerse the electrode in the reference electrolyte with the refilling opening open.

electrode	Reference electrolyte	Model (see page 10)
SenTix® ORP-T 900(-P)	3 mol/l KCl, Ag$^+$free	KCl-250 (250 ml)

Prior to the next measurement, shortly rinse the electrode with the test sample or deionized water.

Overnight or longer

Insert the clean electrode into the watering cap filled with reference electrolyte and shut the refilling opening.

> 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

ORP electrodes are consumables. Every ORP electrode undergoes a natural aging process. 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

During operation, a small amount of reference electrolyte leaks through the junction from the electrode into the test sample. If the level of reference electrolyte becomes too low with time, refill it through the refilling opening.

Refilling the reference electrolyte

Refilling is very easy using a dropping bottle. Proceed as follows:

● Cut off the tip of the dropping bottle at a right angle until the opening in the tip can be seen

● Open the refilling opening of the electrode

● Press the tip of the dropping bottle into the refilling opening while turning it slightly

● Pump several small quantities of the reference electrolyte into the stem using the dropper bottle

● Pull the dropping bottle out of the refilling opening while turning it slightly as necessary.
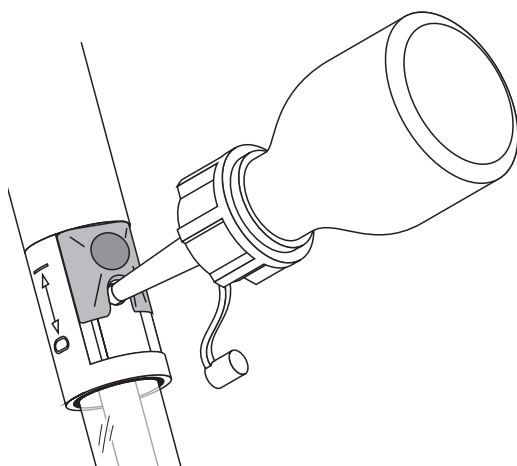
Cleaning

Remove water-soluble contamination by rinsing with deionized water. Remove other contamination as follows:

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)
Protein	Immerse in pepsin cleaning solution PEP/pH for approx. 1 hour. <u>Note:</u> Make sure the level of the reference electrolyte is above that of the cleaning solution.

After cleaning

Rinse the electrode with deionized water.

Technical data

Measurement and application characteristics	mV measuring range	- 1250.0 ... + 1250.0
	Allowed temperature range	0 ... 100 °C (32 ... 212 °F)
	Typical application	Laboratory

Accuracy of the IDS measuring technique	Measured parameter	Accuracy (± 1 digit)
	U [mV]	± 0.2
	T [°C]	± 0.1

General data	Reference electrolyte	3 mol/l KCl, Ag⁺free
	Junction	Ceramic
	Electrode material and shape	Platinum / circle
	Shunt conduction element	Ag/AgCl

Connection cable	Lengths	SenTix® ORP-T 900: 1.5 m SenTix® ORP-T 900-P: 1.5 / 3 / 6 / 10 / 15 / 25 / 40 / 60 / 100 m
	Diameter	4.3 mm
	Smallest allowed bend radius	Fixed installation:20 mm Flexible use:60 mm
	Plug type	Socket, 4 -Ppoles

Shaft dimensions, material	Shaft length	120 mm
	Shaft diameter	12 mm
	Shaft material	Glass
	IDS plug	• Plastic parts: Glass fiber reinforced Noryl, TPU, TPC-ET, POM, PVC, PEEK, PBT • O-ring: FPM • Contacts gold-plated

IDS plug	Connection type	4-P-pin, watertight plug connection with locking device, reverse polarity protected

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

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
	-PORP buffer solution for checking ORP electrodes U_H = 427 mV, bottle of 250 ml	RH 28	109 740
	Pepsin cleaning solution, 3 bottles of 250 ml each	PEP/pH	109 648

General accessories	Description	Model	Order no.
	Plastic armoring for SenTix® ORP-T 900(-P) pH electrodes	A pHLab/K	903 841

Connection cable SenTix® ORP-T 900 - 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
	Blind plug for IDS plug (Sensor)	BPO/IDS 900	908 371
	Blind plug for IDS socket (Cable)	BPI/IDS 900	908 370

Radio connection SenTix® ORP-T 900-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

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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