

SenTix<sup>®</sup> ORP-T 900(-P)

SenTix<sup>®</sup> Rx-T 900

SensoLyt<sup>®</sup> ORP 900-P



# SenTix<sup>®</sup> ... / SensoLyt<sup>®</sup> ...(-P)

ORP ELECTRODE



a xylem brand



# 1 General information

## Automatic sensor recognition

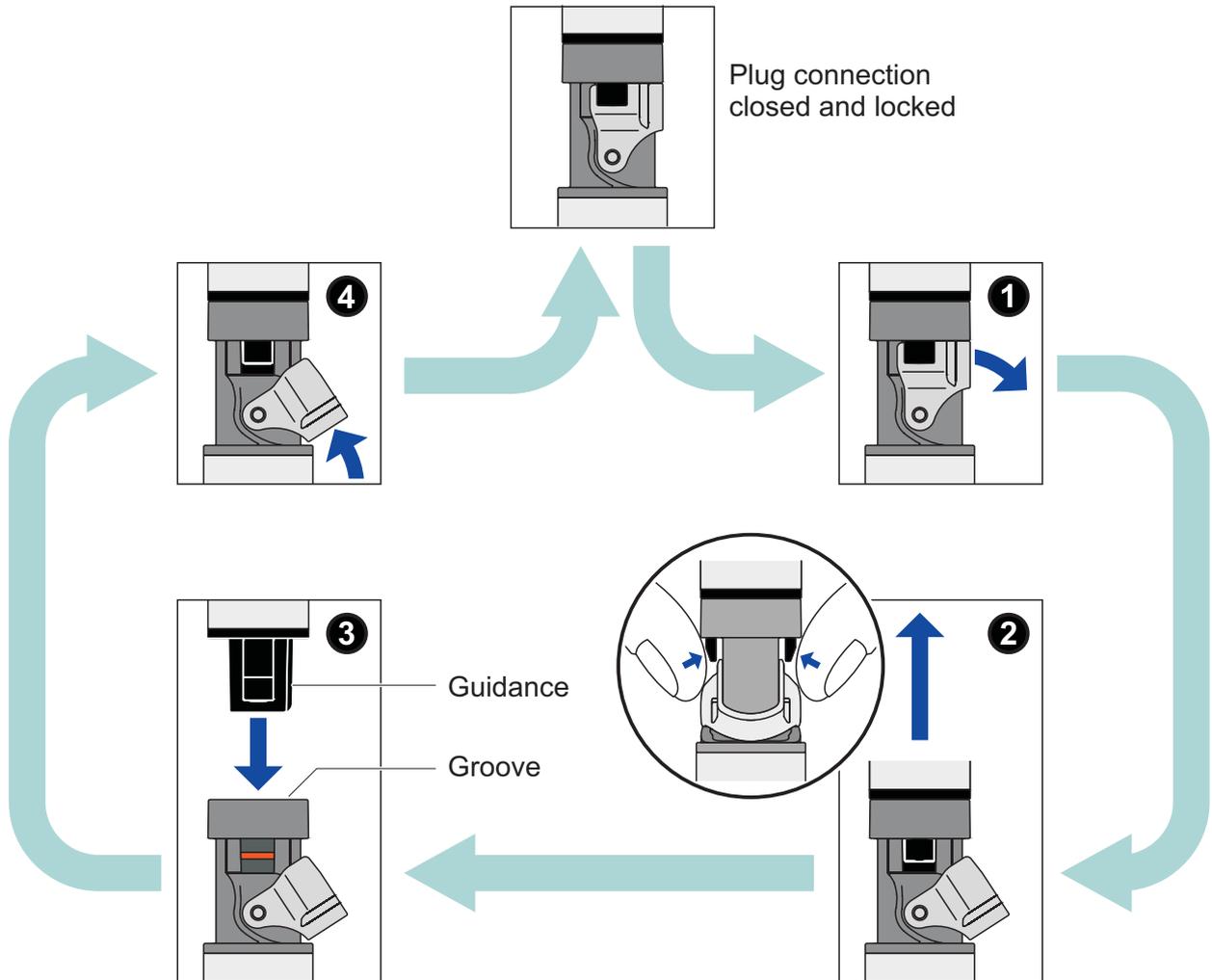
The sensor electronics with the stored sensor data are in the connecting head of the electrode. The data include, among other things, the sensor type and series number. The data are recalled by the meter when the sensor is connected and are used for measurement and for measured value documentation.

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, checking

### 2.1 Opening and closing the IDS plug connection

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

## 2.2 Commissioning

### Scope of delivery

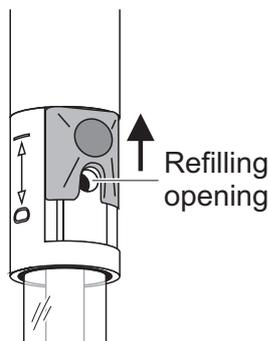
- Electrode SenTix® ... / SensoLyt® ...(-P)
- Operating manual

### Commissioning

Prepare the electrode for measuring as follows:

- SenTix® ORP-T 900(-P):  
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!**



- 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 SenTix® Rx-T 900	– via the sensor cable to a free IDS connector on the meter
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SenTix® ORP-T 900-P SensoLyt® ORP 900-P	– via a connecting cable (accessory) to a free IDS connector on the meter
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or

– wireless via an IDS WLM-S adapter (accessory) to a WLM-capable meter

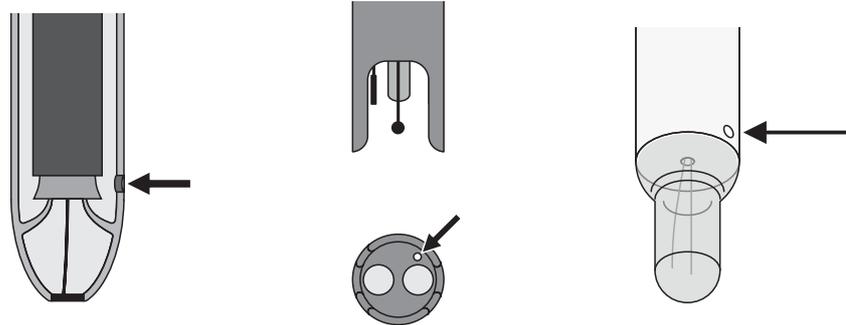
Accessories for the connection of the SenTix® ...-P / SensoLyt® ...-P sensor to the meter: See chapter 7 WEAR PARTS AND ACCESSORIES.

Opening and closing the IDS plug connection, see section 2.1 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:

### 2.3 Measuring: General rules

- SenTix® ORP-T 900(-P):  
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 submerged in the solution. The junction is in the area of the bottom end of the shaft (see arrow).



SenTix® ORP-T 900(-P)    SenTix® Rx-T 900

SensoLyt® ORP 900-P

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

Minimum immersion depth:  
25 mm

**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

**SenTix® ...(-P)**

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

T (°C)	$U_{Ref}$ [mV] SenTix® ...(-P)	T (°C)	$U_{Ref}$ [mV] SenTix® ...(-P)
0	+224	35	+200
5	+221	40	+196
10	+217	45	+192
15	+214	50	+188
20	+211	55	+184
25	+207	60	+180
30	+203		

**SensoLyt® ORP 900-P**

$U_{Ref}$  depends on the reference system and temperature and can be taken from the following table (see also DIN 38404-6 for the system Ag/AgCl/saturated KCl):

T (°C)	U <sub>Ref</sub> [mV] SensoLyt® ORP 900-P	T (°C)	U <sub>Ref</sub> [mV] SensoLyt® ORP 900-P
0	+221	35	+187
5	+216	40	+181
10	+212	45	+176
15	+207	50	+171
20	+202	55	+165
25	+197	60	+160
30	+192		

### 3 Storage

#### During short measuring breaks

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

electrode	Reference electrolyte	Model (see page 12)
SenTix®... / SensoLyt®...(-P)	3 mol/l KCl, Ag <sup>+</sup> 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.

#### NOTE

**Do not store the electrode dry or in deionized water.  
The electrode could be permanently damaged by this.**



- SenTix®... / SensoLyt®...(-P):  
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.
- SenTix® ORP-T 900(-P):  
During longer storing periods, salt sediments may develop on the watering cap and on the refilling opening. 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

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.

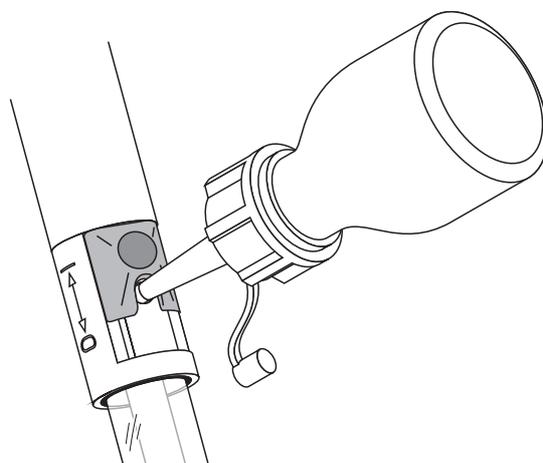
The warranty does not cover failure caused by measuring conditions and mechanical damage.

## 5 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 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.



### Refilling the reference electrolyte (SenTix® ORP-T 900(-P))

**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.

## 6 Technical data

<b>Measurement and application characteristics</b>	mV measuring range	- 1250.0 ... + 1250.0
	Allowed temperature range	<ul style="list-style-type: none"> <li>● SenTix® ORP-T 900(-P): 0 ... 100 °C</li> <li>● SenTix® Rx-T 900: -5 ... 80 °C</li> <li>● SensoLyt® ORP 900-P: 0 ... 60 °C</li> </ul>
	Typical application	<ul style="list-style-type: none"> <li>● SenTix® ORP-T 900(-P): Laboratory</li> <li>● SenTix® Rx-T 900: Field</li> <li>● SensoLyt® ORP 900-P: Field / Depth measurement</li> </ul>
<b>Accuracy of the IDS measuring technique</b>	Measured parameter	Accuracy (± 1 digit)
	U [mV]	± 0.2
	T [°C]	± 0.1
<b>General data</b>	Reference electrolyte	<ul style="list-style-type: none"> <li>● SenTix® ORP-T 900(-P): 3 mol/l KCl, Ag+-free</li> <li>● SenTix® Rx-T 900: Gel</li> <li>● SensoLyt® ORP 900-P: Polymer</li> </ul>
	Junction	<ul style="list-style-type: none"> <li>● SenTix® ORP-T 900(-P): Ceramic</li> <li>● SenTix® Rx-T 900: Fiber</li> <li>● SensoLyt® ORP 900-P: Hole (2 x)</li> </ul>

	Electrode material and shape	<ul style="list-style-type: none"> <li>● SenTix® ORP-T 900(-P): Platinum / circle</li> <li>● SenTix® Rx-T 900: Platinum / Pin</li> <li>● SensoLyt® ORP 900-P: Platinum ring</li> </ul>
	Shunt conduction element	Ag/AgCl
	Minimum immersion depth	see section 2.3 MEASURING: GENERAL RULES
	Temperature sensor	Integrated NTC 30 (30 kΩ at 25 °C / 77 °F)
	Response time $t_{99}$ of the temperature sensor	<ul style="list-style-type: none"> <li>● SenTix® ...(-P): &lt; 30 s</li> <li>● SensoLyt® ORP 900-P: &lt; 130 s</li> </ul>
	Allowed pH range of the measuring medium	<ul style="list-style-type: none"> <li>● SenTix® ...(-P): 0 ... 14</li> <li>● SensoLyt® ORP 900-P: 4 ... 12</li> </ul>
<b>Connection cable</b>	Lengths	<ul style="list-style-type: none"> <li>● SenTix® ORP-T 900: 1.5 m</li> <li>● SenTix® Rx-T 900: 1,5 m</li> <li>● SenTix® ORP-T 900-P: see section 7 WEAR PARTS AND ACCESSORIES</li> </ul>
	Diameter	4.3 mm
	Smallest allowed bend radius	Fixed installation: 20 mm Flexible use: 60 mm
	Plug type	Socket, 4 -Ppoles
<b>Shaft dimensions, material</b>	Shaft length	120 mm
	Shaft diameter	12 mm
	Shaft material	<ul style="list-style-type: none"> <li>● SenTix® ORP-T 900(-P): Glass</li> <li>● SenTix® Rx-T 900: PPE/PS</li> <li>● SensoLyt® ORP 900-P: Glass</li> </ul>
<b>IDS plug</b>	Connection type	4-P-pin, watertight plug connection with locking device, reverse polarity protected
	Material	<ul style="list-style-type: none"> <li>● Plastic parts: Glass fiber reinforced Noryl, TPU, TPC-ET, POM, PVC, PEEK, PBT</li> <li>● O-ring: FPM</li> <li>● Contacts gold-plated</li> </ul>
<b>Storage</b>	With watering cap; filled with KCl 3 mol/L, Ag <sup>+</sup> free	

Pressure range at temperature	Temperature	Allowed overpressure
SensoLyt® ORP 900-P	0 °C (32 °F)	1000 kPa (10 bar)
	20 °C (68 °F)	1000 kPa (10 bar)
	30 °C (86 °F)	500 kPa (5 bar)
	40 °C (104 °F)	300 kPa (3 bar)
	60 °C (140 °F)	100 kPa (1 bar)

The electrodes meet the requirements according to article 3(3) of the directive 97/23/EC ("pressure equipment directive").

## 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 <sup>+</sup> -free)	KCI-250	109 705
	-PORP buffer solution for checking ORP electrodes U <sub>H</sub> = 427 mV, bottle of 250 ml	RH 28	109 740
	Pepsin cleaning solution, 3 bottles of 250 ml each	PEP/pH	109 648

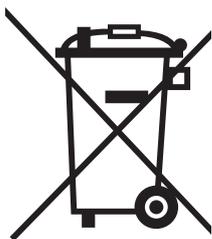
Connection cable SenTix®...-P / SensoLyt®...-P - meter	Description	Model	Order no.
	IDS connection cable, 1.5 m	AS/IDS-1.5	903 850
	IDS connection cable, 3 m	AS/IDS-3	903 851
	IDS connection cable, 6 m	AS/IDS-6	903 852
	IDS connection cable, 10 m	AS/IDS-10	903 853
	IDS connection cable, 15 m	AS/IDS-15	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

<b>Radio connection</b>	<b>Description</b>	<b>Model</b>	<b>Order no.</b>
<b>SenTix® ...-P / SensoLyt® ...-P - meter</b>	WLM capable IDS meter + radio module for IDS meter	see Internet	
	Radio module for plug head sensor	IDS WLM-S	108 141
<b>General accessories</b>	<b>Description</b>	<b>Model</b>	<b>Order no.</b>
	Plastic armoring for SenTix® ... / Sen- soLyt® ...(-P) pH electrodes	A pHLab/K	903 841
<b>SensoLyt® ORP 900-P General purpose accessories</b>	<b>Description</b>	<b>Model</b>	<b>Order no.</b>
	Armoring without protective hood	A 925-P	903 838
	Armoring with plastic protective hood	A 925-P/K	903 839
	Armoring with steel protective hood	A 925-P/S	903 840

## 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 |'zīləm|

- 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](http://www.xylem.com).**



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