OPERATING MANUAL

ba75741e04 12/2023

SenTix® ORP
SenTix® Ag
SenTix® Rx

SenTix®

ORP ELECTRODES

WTW
a xylem brand

Technical data

General data

Model	Reference electrolyte	Electrode material and shape	Junction
SenTix® ORP	3 mol/l KCl, Ag^+-free	Platinum / Round piece	Ceramic
SenTix® Ag	2 mol/l KNO_3 + 0.001 mol/l KCl	Silver / Cylinder cap	Ceramic
SenTix® Rx	Gel	Platinum / Pin	Fiber

Measurement and application characteristics

Model	Allowed temperature range	Typical application
SenTix® ORP	0 ... 100 °C	Laboratory
SenTix® Ag	-5 ... 100 °C	Laboratory / Argentometry
SenTix® Rx	-5 ... 100 °C	Field

Shaft dimensions, shaft material, electrical connection

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

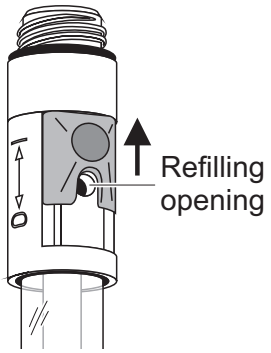
* Connection cable not included in the scope of delivery of the combination electrode

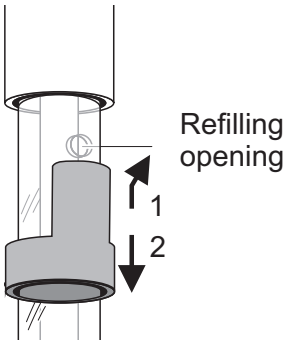
Commissioning, measuring, testing

Commissioning

Prepare the electrode for measuring as follows:

- SenTix® ORP and SenTix® Ag: 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!





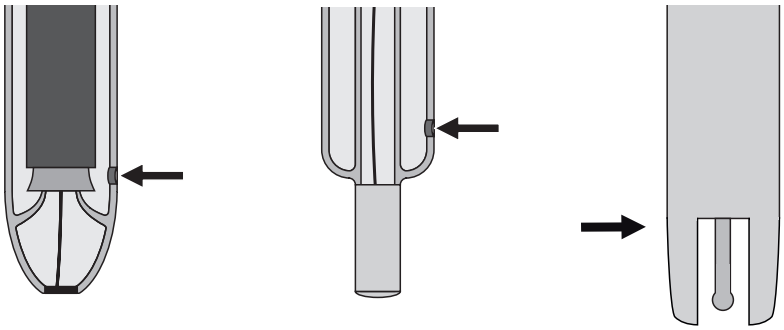
- Remove the watering cap from the electrode tip. Possible salt deposits in the area of the watering cap do not affect the measuring characteristics and can easily be removed with deionized water.

Please keep the watering cap. It is required for storing the electrode. Always keep the watering cap clean.

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

General rules for measuring

- SenTix® ORP and SenTix® Ag: Make sure the refilling opening for the reference electrolyte solution is open.
- Avoid displacement of the sample solution from one measurement to the next by taking the following measures:
  - Briefly rinse the calibration beakers with the solution the beakers are to be filled with next.
  - Between measurements, rinse the electrode with the solution specified below. 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 SenTix® Ag SenTix® Rx

SenTix® ORP, SenTix® Ag and SenTix® Rx: The level of the reference electrolyte must be at least 2 cm above the level of the solution.

Conversion to the standard hydrogen electrode potential

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

where: U_H = ORP voltage, relative to the standard hydrogen electrode

U_{Meas} = measured ORP voltage

U_{Ref} = voltage of the reference system relative to the standard hydrogen electrode

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

T (°C)	U_{Ref} [mV]		T (°C)	U_{Ref} [mV]	
	SenTix® ORP	SenTix® Rx		SenTix® ORP	SenTix® Rx
0	+224	+221	35	+200	+187
5	+221	+216	40	+196	+181
10	+217	+212	45	+192	+176
15	+214	+207	50	+188	+171
20	+211	+202	55	+184	+165
25	+207	+197	60	+180	+160
30	+203	+192			

Storage

During short measuring breaks

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

Electrode	Reference electrolyte	Model (see page 8)
SenTix® ORP, SenTix® PtR, SenTix® Au	3 mol/l KCl, Ag^+-free	KCl-250 (250 ml)
SenTix® Ag	2 mol/l KNO_3 + 0.001 mol/l KCl	ELY/ORP/AG (250 ml)

Prior to the next measurement, briefly 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 storage periods, salt deposits 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
- Great changes in pH and temperature.

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

Maintenance and cleaning

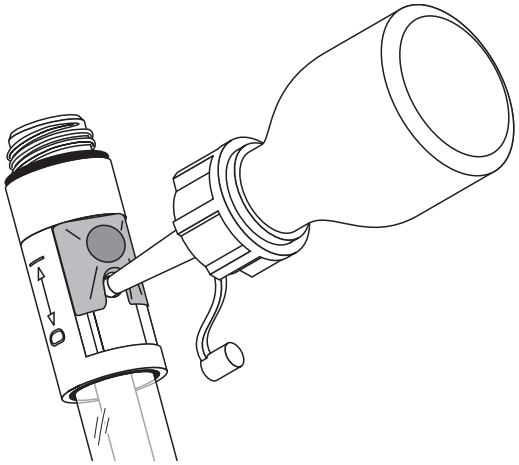
During operation, a small amount of reference electrolyte leaks through the junction from the electrode into the test sample. If the level of reference electrolyte becomes too low with time, refill it through the refilling opening.

Refilling reference electrolyte (SenTix® ORP and SenTix® Au)

Refilling is very easy using a dropper bottle. To do so, 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 dropper 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 dropper bottle out of the refilling opening while turning it slightly if necessary.



Refilling reference electrolyte (SenTix® Ag)

The special ELY/ORP/AG reference electrolyte is required for the SenTix® Ag. To refill, open the refilling opening and fill the reference electrolyte into the stem using a suitable pipette.

Cleaning (SenTix® ORPIL, SenTix® Ag, SenTix® Au)

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

Cleaning (SenTix® PtR)

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)

After cleaning Rinse the electrode with deionized water.

Wear parts and accessories

Description	Model	Order no.
Reference electrolyte solution 3 mol/l KCl, Ag^+-free (250 ml)	KCl-250	109 705
Reference electrolyte solution 2 mol/l KNO_3 + 0.001 mol/l KCl (250 ml)	ELY/ORP/AG	109 735
ORP 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	PEP/pH	109 648

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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