

# SensoLyt<sup>®</sup> combination electrodes

<b>pH combination electrodes</b>	<b>Order number</b>
SensoLyt <sup>®</sup> SE*	109 100
SensoLyt <sup>®</sup> SEA	109 115
SensoLyt <sup>®</sup> SEA-HP	109 118
SensoLyt <sup>®</sup> EC*	109 102
SensoLyt <sup>®</sup> ECA	109 117
SensoLyt <sup>®</sup> DW*	109 103
SensoLyt <sup>®</sup> DWA	109 119
<b>ORP combination electrodes</b>	<b>Order number</b>
SensoLyt <sup>®</sup> Pt*	105 412
SensoLyt <sup>®</sup> PtA	109 125

\*without armoring

Operating manual

## Fields of application

Electrode	Application area
<b>SensoLyt® SE/SEA</b> pH combination electrode	Measurements in moderately or heavily loaded waste water and in emulsions, suspensions and media that contain protein and sulfide.
<b>SensoLyt® SEA-HP</b> pH combination electrode	Measurements in moderately or heavily loaded waste water and in emulsions, suspensions and media that contain protein and sulfide. To be used under increased pressure and temperature conditions.
<b>SensoLyt® EC/ECA</b> pH combination electrode	Measurements in municipal and normally charged waste water.
<b>SensoLyt® DW/DWA</b> pH combination electrode	Measurements in drinking water.
<b>SensoLyt® Pt/PtA</b> ORP combination electrode	Measurements in waste water, emulsions, suspensions and media that contain protein and sulphide.

## Assembly



### Note

Prior to installing the electrode in an armature, lubricate the two O rings of the armature with the grease provided.

## Calibrating, measuring



### Note

See operating manual of the meter.



### Note

Take off the watering cap when you want to calibrate or measure.

## Cleaning

Contamination	Cleaning
Gross contamination at the junction	Carefully brush off contamination under running water using a soft toothbrush
Membrane contamination	Splash the electrode with water, then blot it dry using a moist paper towel (do not rub).
Fat, oil, protein-containing coatings and similar substances	Remove with household washing-up liquid

## Conversion to standard hydrogen electrode (Sensolyt® Pt/PtA only)

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

with:  $U_H$  = ORP, referring to the standard hydrogen electrode

$U_{\text{Meas}}$  = Measured ORP

$U_{\text{Ref}}$  = Voltage of the reference system compared to the standard hydrogen electrode

$U_{\text{Ref}}$  depends on the reference system and temperature and is given in the following table (see also DIN 38404-6 for the system, Ag/AgCl/saturated KCl):

T (°C)	$U_{\text{Ref}}$ [mV] Sensolyt® combination electrodes	T (°C)	$U_{\text{Ref}}$ [mV] Sensolyt® combination electrodes
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		

## Maintenance / regeneration (SensoLyt® Pt/PtA only)

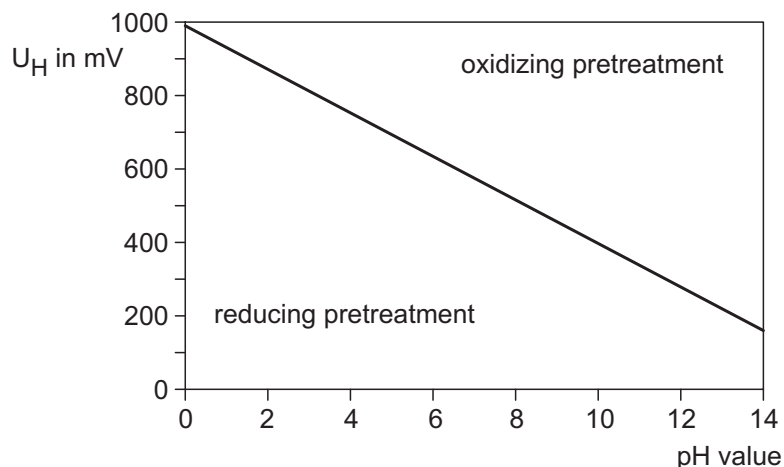
### First-time activation during installation and as required

For first-time activation, use the activating powder provided with the SORT/RH reagent set. Use a paper towel to gather a small amount of activating powder. Using moderate pressure, press the activating powder against the moist (but not dripping) platinum electrode from two opposite sides and turn the electrode to and fro several times. Activation happens mainly due to abrasion. Then remove the adherent remains of activating powder under running water with a soft brush (e.g. toothbrush).

### Activation during very long set-up times

When changing from oxidizing to reducing test solutions and vice versa this can result in set-up times that can take significantly more than an hour. In this case pretreatment (activation) of the platinum surface can shorten the set-up time. The type of pretreatment (reducing or oxidizing) is based on the pH value and the ORP voltage ( $U_H$ ) of the test solution where the latter must be estimated for the first measurement.

The type of pretreatment can then be determined using the following diagram where  $U_H$  refers to the normal hydrogen electrode:



#### Oxidizing pretreatment

Immerse the platinum electrode for two to three days in a sulfuric Clorina solution. Clorina powder for producing the solution is included in the SORT/RH reagent set.

Note: The junction must not be immersed in the Clorina solution (see figure below)!

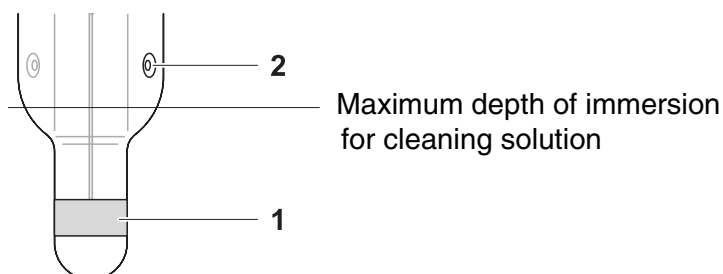
#### Reducing pretreatment

When the electrode is ready for the test immerse it in the RH 28 ORP buffer solution and wait for a stable measured value.



**Note**

The platinum electrode (1) should be completely covered during the pretreatment but the electrode must not be immersed in the solution up to the reference system with the hole junction (2) (see following figure).



**Note**

Detailed information on activating platinum electrodes, such as how to produce the Clorina solution, is given in the WTW application report entitled REGENERATING ORP ELECTRODES. The application report is included in the SORT/RH reagent set.

**Accessories**

**General accessories**

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

**Technical buffer solutions for SensoLyt® pH electrodes**

Description	Model	Order no.
pH 4.01 (1 liter)	TEP 4	108 700
pH 7.00 (1 liter)	TEP 7	108 702
pH 10.00 (1 liter)	TEP 10*	108 704
pH 10.01 (1 liter)	TEP 10 Trace*	108 703

\* See operating manual of the meter

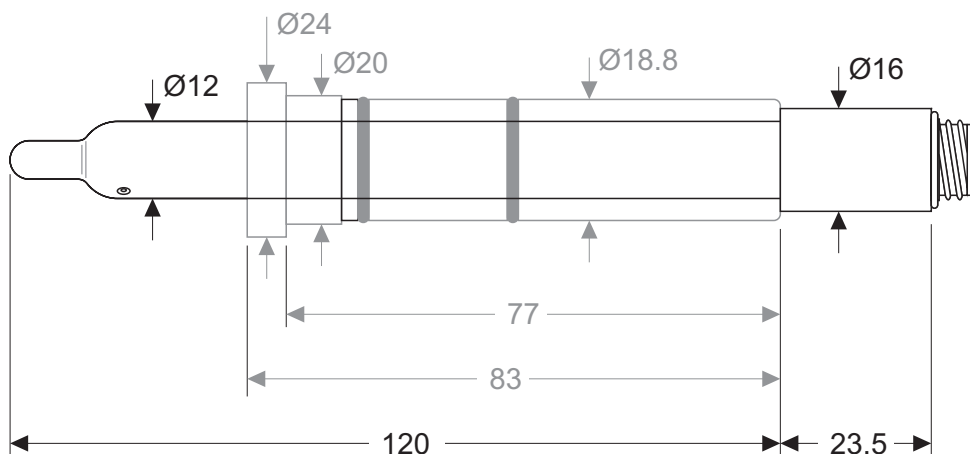
**Accessories for SensoLyt® Pt/PtA**

Description	Model	Order no.
Reagent set for regenerating ORP platinum electrodes, comprising 10 g activation powder and 30 g Clorina powder	SORT/RH	109 730
ORP buffer solution (250 ml)	RH 28	109 740

## Technical data

<b>pH measuring range</b>	SensoLyt® SE/SEA SensoLyt® EC/ECA	pH 2 ... 12	
	SensoLyt® SEA-HP	pH 4 ... 12	
	SensoLyt® DW/DWA	pH 0 ... 14	
<b>ORP measuring range</b>	SensoLyt® Pt/PtA	-2000 ... 2000 mV (pH application range pH 4 ... 12)	
<b>Pressure range at temperature (armored electrodes only)</b>	SensoLyt® SEA SensoLyt® ECA SensoLyt® DWA SensoLyt® Pt/PtA	<u>Temperature</u>	<u>Allowed overpressure</u>
		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)	
SensoLyt® SEA-HP	0-60 °C (32-140 °F)	1000 kPa (10 bar)	
All SensoLyt® combination electrodes meet the requirements of article 3 (3) of the directive 97/23/EC ("Pressure equipment directive").			
<b>Measuring electrode</b>	SensoLyt® Pt/PtA	Platinum ring	
	All except for SensoLyt® Pt/PtA	Glass	
<b>Reference electrolyte, junction</b>	SensoLyt® SE/SEA SensoLyt® SEA-HP SensoLyt® Pt/PtA	Gel polymer solid electrolyte; 2-hole junction	
	SensoLyt® EC/ECA	Gel electrolyte; 1-hole junction	
	SensoLyt® DW/DWA	Modified gel electrolyte; ceramic junction	
	<b>Shunt conduction element</b>	Ag/AgCl	
<b>Connection</b>	Plug-in system (S7)		
<b>Minimum immersion depth</b>	25 mm		

**Dimensions**



**Weight** Unarmored: approx. 44 g  
 Armored: approx. 65 g

<b>Materials</b>	Shaft	Glass
	Armoring	SensoLyt® SEA-HP: POM All other types: PVC-U
	Connection head	PPS-GF40
	O-rings	FPM (Viton)
	Watering cap	PE

**Storage** With watering cap, filled with KCl 3 mol/l, Ag<sup>+</sup> free

**Disposal** Residual waste

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