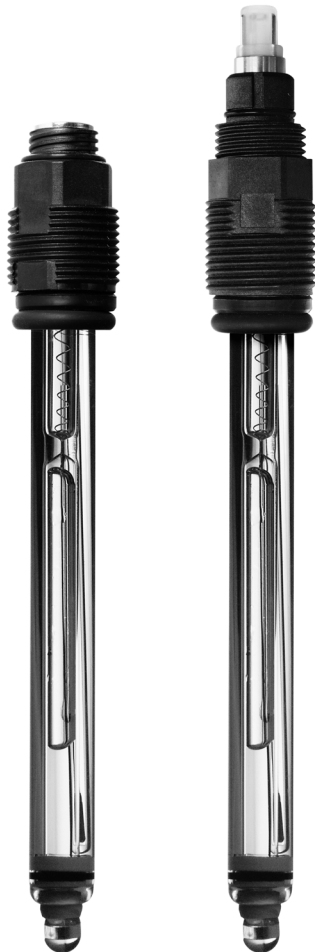


OPS162

Redox Electrode

For standard applications in process and environmental technology with dirt-repellent PTFE diaphragm



Application

- Long-term monitoring and limit monitoring of processes with stable process conditions
 - Paper industry
 - Power plants (e.g. flue gas washers)
 - Incineration plants
- Water treatment
 - Drinking water
 - Boiler feed water
 - Cooling water
 - Well water
 - Pure water

Your benefits

- Robust electrode requiring low maintenance thanks to large, dirt-repellent PTFE ring diaphragm
- Application under pressures of up to 6 bar (87 psi) without counterpressure thanks to gel electrolyte
- Long service life thanks to metal lead
- Suitable for temperatures from -15 to +110 °C (5 to 230 °F)
- Various measuring elements for application in oxidising and reducing media
- Three lengths available: 120, 150 and 225 mm (4.72, 5.91, 8.86 inches)
- Rugged TOP68 plug-in system for reliable transfer of measured values

Function and system design

Measuring principle

Redox measurement

The redox potential is a unit of measurement for the state of equilibria between oxidising and reducing components of a medium. Redox potential is measured similarly to the pH value. A platinum or gold electrode is used instead of pH-sensitive membrane glass. Analog to the pH measurement, an integrated Ag/AgCl reference system is used as a reference electrode.

pH measurement

The pH value is used as a unit of measurement for the acidity or alkalinity of a liquid medium. The membrane glass of the electrode supplies an electrochemical potential which is dependent upon the pH value of the medium. This potential is generated by the selective penetration of H⁺ ions through the outer layer of the membrane. An electrochemical boundary layer with an electric potential forms at this point. An integrated Ag/AgCl reference system serves as reference electrode.

The transmitter converts the measured voltage into the corresponding pH value using the Nernst equation.

Important properties

- **Low maintenance**

The dirt-repellent PTFE ring diaphragm of the OPS162 prevents blocking and assures long-time stability and accuracy.

- **Long service life**

The metal lead offers better protection from electrode poisons and guarantees a considerably longer service life.

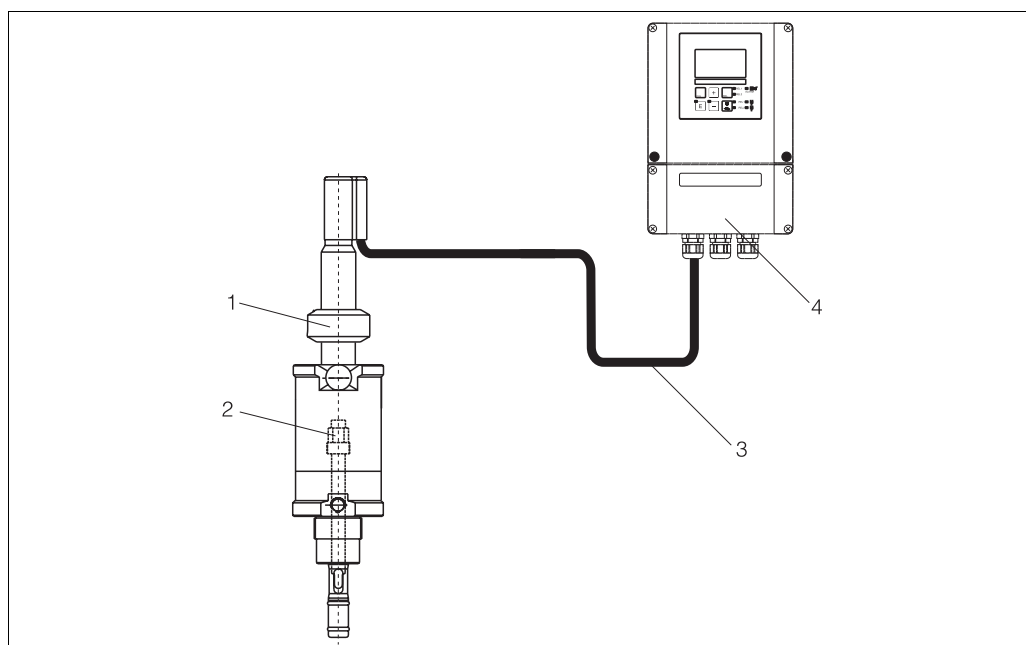
- **Easy connection**

The electrodes are connected via a GSA plug-in head or the water proof TOP68 plug-in system (IP 68).

Measuring system

A complete measuring system comprises:

- OPS162 redox electrode
- transmitter, e.g. OPM223/253
- special measuring cable, e.g. OPK9
- immersion, flow or retractable assembly, e.g. OPA933



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Measuring system for measurement of redox potential

- 1 Retractable OPA933 assembly
- 2 OPS162 redox electrode
- 3 OPK9 special measuring cable (for electrodes with TOP68 plug-in head)
- 4 OPM253 transmitter

Input

Measured variables Redox potential

Measuring range -1500 ... 1500 mV



Caution!
Please note the process operating conditions.

Installation

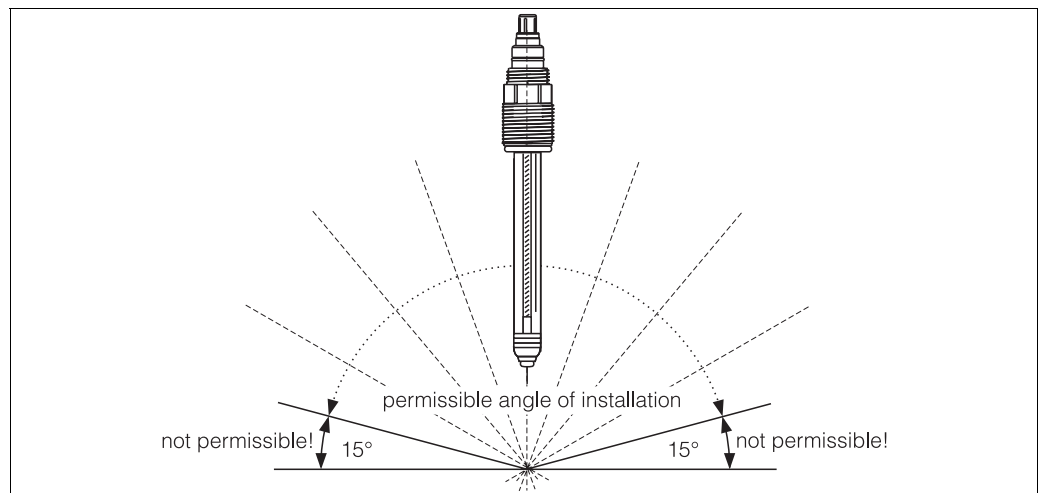
Installation instructions



Do not install the electrode upside down. The inclination angle must be at least 15° from the horizontal. A smaller inclination angle is not permitted as such an inclination results in air cushion forming. This might interrupt the contact of redox measuring element and reference.

Achtung!

- Make sure that the assembly's threaded connection for the electrode is clean and well running before installing the electrode.
- Hand tighten the electrode (3 Nm)! (Given value only applies to installation in OPA assemblies)
- Make sure to follow the installation instructions in the operating instructions of the used assembly.



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Electrode installation; installation angle min. 15° from the horizontal

Environment

Ambient temperature



Caution!
Danger of frost damage
Do not use the electrode at temperatures below -15 °C / 5 °F.

Storage temperature 0 ... 50 °C / 32 ... 122 °F

Ingress protection IP 67 with GSA plug-in head (with closed plug-in connection)
IP 68 with TOP68 plug-in head (1 m / 3.28 ft water column, 50 °C / 122 °F, 168 h)

Process

Process temperature -15 ... 110 °C / 5 ... 230 °F

Process pressure 0 ... 6 bar / 0 ... 87 psi

Application

- Gold electrode
for oxidising media, e.g. cyanide oxidation, nitrite oxidation, ozone measurement, hydrogen superoxide measurement
- Platinum electrode
for reducing media, e.g. chromate reduction, chlorine dosing in swimming pools



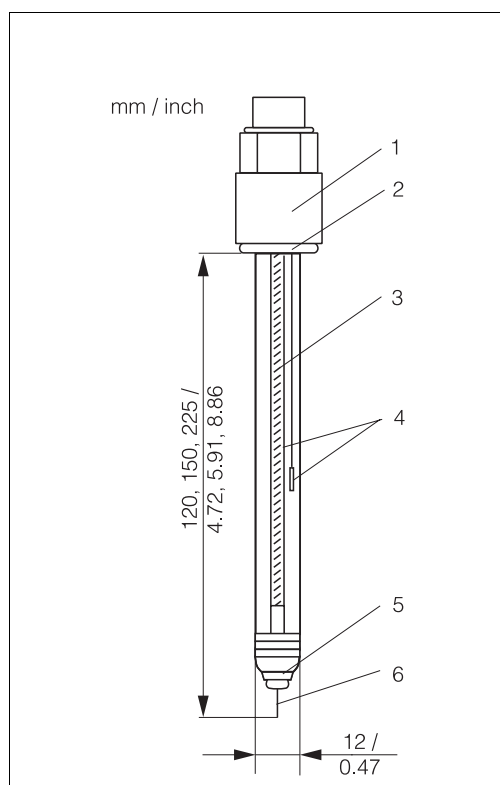
Caution!

Danger of damage to the electrode

Never use the electrode in applications outside the given specifications!

Mechanical construction

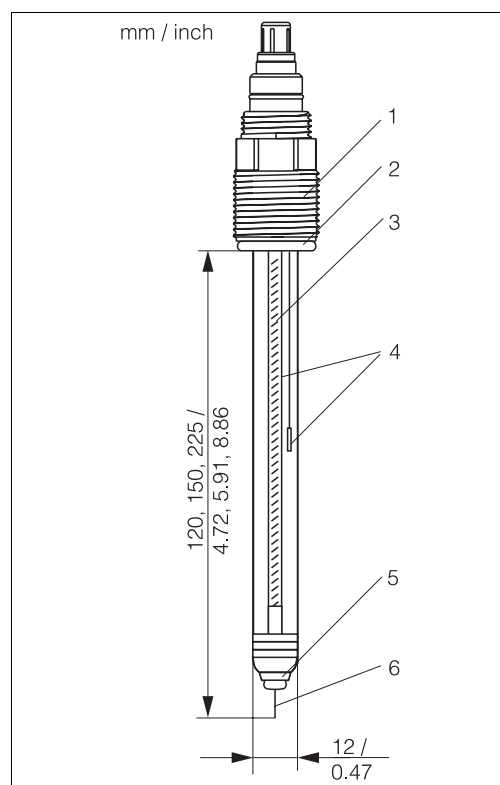
Design, dimensions



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OPS162 with GSA plug-in head

- 1 GSA plug-in head, Pg 13.5
- 2 EPDM O-ring
- 3 Electrolyte
- 4 Ag/AgCl lead
- 5 PTFE diaphragm
- 6 Gold pin or platinum ring



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OPS162 with TOP68

- 1 TOP68 plug-in head, Pg 13.5
- 2 EPDM O-ring
- 3 Electrolyte
- 4 Ag/AgCl lead
- 5 PTFE diaphragm
- 6 Gold pin or platinum ring

Weight	0.1 kg / 0.2 lb.	
Material	Electrode shaft	glass, suitable for processes
	Redox measuring element	platinum ring or gold pin
	Metal lead	Ag/AgCl
	Diaphragm	ring-shaped Teflon® diaphragm
Process connection	Pg 13.5	
Plug-in heads	GSA plug-in head Pg 13.5 ESA plug-in head Pg 13.5, TOP68, 6 bar / 87 psi NSA laboratory connector	
Electrolyte	Gel electrolyte 3 mol/l KCl, AgCl free	

Ordering information

Product structure	Electrode type			
		0	Standard type	
	Measuring surface			
		NAO	Gold pin	
		PAO	Platinum ring	
	Shaft length			
	2	120 mm / 4.72"		
	3	150 mm / 5.91"		
	4	225 mm / 8.86"		
Type of head				
	GSA	Plug-in head Pg 13.5		
	ESA	Plug-in head Pg 13.5, TOP68		
	NSA	Laboratory connector		
OPS162-				complete order code

Accessories

Assemblies

- OPA450
Manually operated retractable assembly for pH/redox electrodes, for installation of 120 mm / 4.72" electrodes in tanks and pipes,
- OPA933
Compact retractable stainless steel assembly, for the installation in tanks and pipes, manual or pneumatic operation;
- OPA935
Compact retractable plastic assembly, for the installation in tanks and pipes, manual or pneumatic operation;
- OPA111
Plastic immersion and installation assembly, for open and closed tanks;
- OPA250
Flow assembly for pH and redox measurement

Buffer solutions

- Technical buffer solutions for redox electrodes
- +225 mV, pH 7, 100 ml (0.026 US gal.); order no. OPY 3-0
 - +468 mV, pH 0, 100 ml (0.026 US gal.); order no. OPY 3-1

Measuring cables

- OPK9 special measuring cable
For pH-/redox electrodes with TOP68 plug-in head
- OPK1 special measuring cable, with double screen and potential matching line
For pH-/redox electrodes with GSA plug-in head
- OPK3 special measuring cable
For pH-/redox electrodes with GSA and NSA plug-in heads



