

Differential ORP electrode

Differential ORP electrodes Mod.225 are designed for ORP measurements in very difficult applications where standard ORP electrodes cannot work because the reference electrode life would be too short. Mod.225 sensor is made of a PP or PVDF body which includes the measuring electrode, the reference electrode and the salt bridge, the temperature sensor, the solution ground contact and the electronic circuit for signal standardization.

These sensors are fully interchangeable with any other ORP electrode and are suitable to be used with any ORP meter.

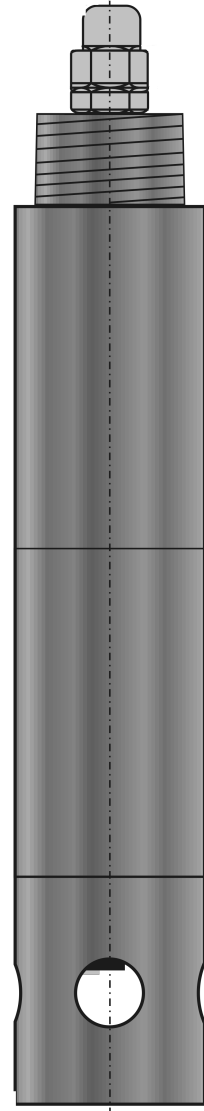
An economically interesting solution is the use of these sensors in conjunction with our standard ORP meter Mod.uP03.

Typical applications for differential ORP electrodes are all those processes including fouling or fatty substances that would deposit on the reference electrode making the measurement impossible. Another typical application is on processes containing substances that react with traditional reference electrodes destroying them, such as Hg^{++} , Pb^{++} , Cu^{++} , ClO_4^- , Ag^+ , Br^- , I^- , CN^- , S^{2-} ions. The reference electrodes used in differential ORP electrodes are not subject to the negative effect that stray currents have on inner metal electrodes of traditional reference electrodes. In all these applications, where traditional electrodes would have a short life, the differential ORP electrodes assure long term reliability with almost no maintenance requirements.

Examples of processes where the differential ORP electrodes are the best choice: wastewater treatment plants, process including fouling suspended solids, processes including poisoning substances, processes with high amounts of sulphides, flocculation and coagulation, scrubbers, galvanic processes, surface treatments, processes for heavy metal treatment.

Advantages

- **This sensor is insensitive to interfering chemical substances**
- **Long operating life even in presence of fouling or fatty substances**
- **This sensor can replace any other ORP sensor**
- **Suitable for the connection to any type of ORP PLC or to a voltmeter**
- **PP or PVDF body (Stainless steel on demand)**
- **PVDF porous diaphragm**
- **Suitable for direct immersion installation**
- **Temperature sensor included**
- **Solution ground contact included**



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Operating principle and realization

Mod.225 is a differential ORP electrode, PP or PVDF body (Stainless Steel upon request), suitable for direct immersion installation. The measuring electrode can be made of gold, platinum or silver, the reference electrode is included inside the body and is immersed into the salt bridge, separated from it by a glass membrane. The large area porous diaphragm is made of PVDF.

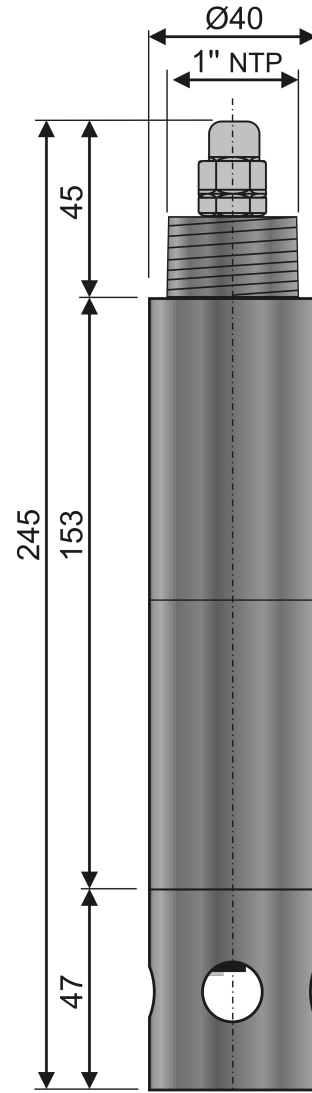
The sensor includes the solution ground contact and the temperature sensor, Pt100, for temperature indication.

An electronic circuit included in the sensor and self powered by an integral battery (interchangeable) transforms the signal from the electrodes into a standard, low impedance signal ± 2000 mV or $0 \div 1$ V (signal from Pt100 is a resistance signal in Ohm): this makes the Mod.225 sensor perfectly interchangeable with any other ORP electrode; it also can be connected to any ORP meter and also directly to a PLC or to a voltmeter.

The electrode is supplied c/w integral cable, standard length 5 m, 6 mm diameter, shielded for a better signal protection.

The cable shield is connected to the metal sheath of the Pt100 temperature sensor so that connecting it to the ground of the instrument the solution in measure results grounded also (this is essential for the good operation of each analyser).

For immersion installations require the immersion probe Mod.SI0V, available in various materials and different lengths.



Calibration & Maintenance

ORP electrodes do not require any calibration. Standard ORP solutions are however available to check the ORP measuring chain.

Technical Specifications

Type of electrode:.....	combined for ORP
Electrode body:.....	PP or PVDF (SS upon request)
Materials at contact:.....	PP, PVDF, Au,Pt or Ag, stainless steel
Measuring electrode:.....	platinum, silver, gold or annular platinum electrode
Electrolyte:	KCl gel, 3,3 M
Salt bridge:.....	KCl gel , 3,3 M
Porous diaphragm:.....	annular, PVDF
Measuring range:.....	-2000÷+2000 mV
Response time:.....	5 sec. to reach 90% of the measure
Temperature sensor:.....	Pt100
Solution ground contact:.....	included
Signal generated:.....	ORP: either ± 2000 mV or $0 \div 1$ V low impedance
.....	Temperature: signal in ohm from Pt100
Power supply:	2 alkaline batteries (included) type N, 1,5 V, 800 mA/h, replaceable
Battery operative life:	approximately 10 years (electrode consumption is 10 uA).
.....	Batteries can be replaced by the user when depleted
Immersion installation:	immersion depth 250 mm;
.....	for higher immersion depths an immersion fitting is separately supplied (request Mod.SI0V)
Operating temperature limits:.....	$0 \div 80$ °C (PP) $0 \div 100$ °C (PTFE)
Operating pressure limits:.....	5 bar @ ambient temperature
Cable:.....	integral, standard 5 m
Dimensions :	$\varnothing 40$ mm, l.245 mm

N.B. Differential electrodes are also available in the version for the measure of pH: Contact Your supplier for technical information.

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Order code breakdown

	225	x	x	x	x
Differential ORP electrodes	225				
Metal					
Reserved		A			
Gold		B			
Silver		C			
Platinum		D			
Platinum, annular		E			
Body construction material					
Reserved			0		
Polypropylene			1		
PVDF			2		
Special execution			9		
Type of output signal					
Reserved				A	
± 2000 mV				B	
0±1 V				C	
Cable and connector					
Integral cable, 5 m					1
Integral cable, 10 m					2
Integral cable, 15 m					3
Special execution					9

WIRING DIAGRAM DIFFERENTIAL ORP ELECTRODES

Color	uP Terminal	Function
white	2	Signal, ORP
black (or grey)	5	Common, ORP
yellow	13	Signal Pt100
blue	14	Return Pt100
red (or pink)	15	Return Pt100

