

Application	:	Online measurement of pH/ORP in leaching/Neutralizing /Precipitation Tanks by immersion. Sensing (pH/ORP) electrodes will remain submerged in the mechanically agitated tanks.
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Specification of pH & ORP electrodes

	pH Electrodes	ORP Electrodes
Application	Online pH measurement of Uranium slurry @ 55 to 60 deg. C	Online ORP measurement of Uranium slurry @ 55 to 60 deg. C
Junction Type	Flat, PTFE	Flat, PTFE
Body Material *	PPS, PTFE, Ryton	PPS, PTFE, Ryton
Measurement Range	Described Below in Table- 1	0 to 2000 mV
Maximum temperature (deg. C)	60	60
Maximum pressure (bar)	Atmospheric	Atmospheric
Drift (/Week)	< 3mV	< 3mV
Offset @ 7pH	+/- 20 mV	NA
Slope	56 to 61 mV/pH	NA
Accuracy	+/- 0.02 pH	+/- 1% of Full scale
Repeatability	+/- 0.05 pH	+/- 1% of Full scale
Temperature Sensor	Inbuilt temperature sensor Pt-100	Not required
Process Condition	Described Below	
Process connection	With Suitable Electrode Holder (As per spec. attached)	
Signal Output cable	5 conductor tinned PTFE insulated wire (plus 2 isolated shield) cable with jacket	2 conductor tinned PTFE insulated wire (plus 2 isolated shield) cable with jacket
Cable length	Atleast 5 Mtr, Optional 10 Mtrs	Atleast 5 Mtr, Optional 10 Mtrs

Make: Polymetron, HACH, Eutech, Thermofisher, Emerson, Rosemount, Sensorex, Forbes Marshall

Specification of pH & ORP Electrode Holder

Application	:	Holding the pH/ORP Electrode in a mechanically agitated tank containing acidic Uranium Slurry of 1.3 to 2.2 pH at 50 to 60 deg. C
Material	:	Stainless Steel 316
Design	:	Barrel type with provision of Electrode terminals to come out from top in sealed condition.
Body Thickness	:	2.6 mm
Length of Holder	:	2 meters
End Connection	:	One End 2" flanged (ANSI 150), other end suitable as per Electrode supplied
Process Condition	:	As per Table - 1

* Bidder May offer most suitable material for our application, chemical composition and process condition is mentioned below.



Table 1 :Process Condition

	Area →	Leaching	Tailings	ETP
pH Range	:	1.2 to 2.5 pH	1.8 to 11.5 pH	6.0 to 12.0 pH
Reagents	:	Sulphuric Acid (98%), Pyrolusite Slurry	Lime Stone slurry & Lime Slurry	Lime Slurry & Barium Hydroxide
Temperature	:	50 to 60 deg. C	Ambient+10°C	Ambient
Pressure	:	Atmospheric	Atmospheric	Atmospheric
Fluid	:	Slurry as mentioned in Table -2	Slurry	Liquor
Density	:	1.4 to 1.6 Kg/Liter	1.4 to 1.6 Kg/Liter	1.0 to 1.2 Kg/Liter
Flow Rate	:	200 to 250 M ³ /Hr	200 to 250 M ³ /Hr	150 to 180 M ³ /Hr

Table 2: Composite of Uranium Ore Slurry

1	Quartz: 33 to 65%
2	Chlorite: 21 to 42%
3	Magnetite: 2 to 4%
4	Other Opaque: 1 to 8%
5	Apatite: 3 to 7%
6	Tourmaline: 0.1 to 1.8%
7	Sulphate: 12000 to 18000 PPM
8	Chloride: 2 to 3 gpl
9	Uranium Slurry containing 60 to 70% solid (Size (-) 200 mesh: 75 to 80%)

Special Terms & Condition:

1. pH/ORP electrodes having only analog output shall be accepted. Offer having proprietary communication protocol between electrodes and transmitter shall be rejected
2. Delivery in two lots of equal quantity (1st lot between 30 to 45 days of receipt of purchase order, 2nd lot after 6 month of 1st lot)
3. Guarantee Period: Six month from date of shipment or Five month from the date of installation which ever is earlier.
4. Vendor has to provide free replacement of the only those electrodes which are not having any physical damage but failed during the guarantee period. Deviation in this regarding will result in rejection of the offer.
5. Dispatch details: Bidder shall mention the Sl. No. of Electrodes supplied along with its manufacturing date in their dispatch document.
6. Performance Bank Guarantee: Bidder shall submit PBG of 10% amount of the ordered valve within 15 days of receipt of Purchase order, failing which Purchase order is liable to be cancelled.

pH/ORP Electrodes and Electrodes shall be procured from one vendor only to ensure dimensional compatibility of both the items and therefore combined price of Electrodes (pH/ORP) and Electrode Holder shall be deciding factor for L1 bidder.

