

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	: As per Table-1	0 to 2000 mV
Maximum operating temperature (deg. C)	: 60	: 60
Maximum pressure (bar)	: Atmospheric	Atmospheric
Drift (/Week)	: < 3mV	< 3mV
Offset @ 7pH	: +/- 20mV	NA
Slope	: 56 to 61 mV/pH	NA
Accuracy	: +/- 0.02pH	+/- 1% of Full scale
Repeatability	: +/- 0.05pH	+/- 1% of Full scale
Temperature Sensor	: Inbuilt temperature sensor Pt-100	Not required
Process Condition	: As per table-2	
Process connection	: Screwed ends 3/4" NPT male thread	
Signal output cable	: 5 conductor Tinned PTFE insulation wire (plus 2 isolated shield) cable with jacket	2 conductor Tinned PTFE insulation wire (plus 2 isolated shield) cable with jacket
Cable length	: 5 Mtrs. , 10 Mtrs.	5 Mtrs. 10 Mtrs.

* bidder may offer more suitable material for our application, chemical composition and process condition is mentioned below

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

Specification of pH/ORP Electrode Holder

Application	:	Holding the pH/ORP electrode in a mechanically agitated tank containing acidic slurry of 1.3 to 2.2 pH at 60 deg. C
Material	:	Stainless steel 316 grade
Design	:	Barrel type 2 piece design with provision of electrode cable to come out from top in sealed condition
Wall thickness	:	2.6 mm
Length of the holder	:	2 meters
End connection	:	One end flanged (ANSI 150), other end 3/4" NPT female thread
Process Condition	:	As per TABLE -1

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TABLE-1: PROCESS CONDITION

	Leaching	Precipitation	Tailings	ETP
pH Range	: 1.2 to 2.5 pH	2.5 to 6.8 pH	1.8 to 12 pH	6.0 to 12 pH
Reagents	: Sulphuric acid (98%), pyrolusite slurry	Milk of lime, Magnesia, Ammonia, Hydrogen peroxide	Lime stone slurry, Milk of lime	Barium Hydroxide, Milk of lime
Temperature	: 50 to 60 deg. C	Ambient	Ambient + 10deg. C	Ambient
Pressure	: Atmospheric	Atmospheric	Atmospheric	Atmospheric
Fluid	: Slurry as mentioned in Table-2	Solution	Slurry as mentioned in Table-2	Liquor
Density	: 1.4 to 1.6 Kg/ liter	1.15 to 1.3 Kg/ liter	1.4 to 1.6 Kg/ liter	~1.0 Kg/ liter
Flow rate	: 200 to 250 cub.M/Hr	80 to 150 cub.M/Hr	200 to 250 Cub.M/Hr	150 to 180 cub.M/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 to80%)

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 4 lots of equal quantity (1st lot within 45 days of receipt of purchase order, 2nd lot after 90 days of 1st lot, 3rd lot after 90 days of 2nd lot, Final lot after 90 days of 3rd lot.
3. Guarantee period: Six months from date of shipment or five months from date of installation, whichever 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 regard will result in rejection of their offer.
5. Dispatch details: Bidder shall mention the Sl. No. of electrode supplied along with its manufacturing date in the dispatch document.
6. Performance Bank guarantee: Bidder shall submit PBG of 10% of the ordered value within 15 days of receipt of P>O, failing which purchase order is liable to be cancelled.
7. L-1 bidder will be decided by the combined price of pH/ORP electrode and holder.

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