

# PERMANENT REFERENCE ELECTRODE

## GENERAL

The effectiveness of the Cathodic Protection system (Sacrificial or Impressed Current) is measured by means of reference electrode. The protective potentials can be measured by installing the permanent reference electrode. It can be permanently installed near the structure.

Permanent Reference Electrode are available in variety of sizes and shapes to suit the various structures, onshore application, for pipeline, tank, vessel etc. VTS can supply bare or pre-packaged (in cotton bag) with low resistivity backfill materials such as bentonite, gypsum and sodium sulphate.

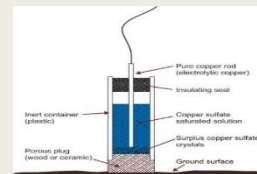
Permanent Reference Electrode are usually supplied with factory connected XLPE/PVC anode tail cable, the type of cable connection can be changed as per client requirement.

## TYPES OF REFERENCE ELECTRODE

### Copper/Copper sulphate reference electrode (CSE)

CSE are most commonly used Reference Electrode for measuring potentials of underground metallic structure and also those in contact with fresh water. CSE consists of a copper rod, immersed in copper sulphate saturated solution held in a non-metallic tube, a porous plug is provided at the bottom. The copper ions in the solution prevent corrosion of the copper rod and stabilize the reference electrode.

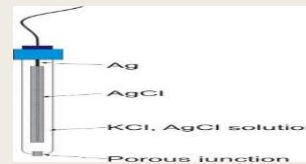
STD SIZE	200 MM DIA X 300 MM LONG
Lead Wire	XLPE/PVC or as per client
Material	ABS
Stability	+ or - up to 5% tolerance
Operating Temperature	0 to 55 deg C



### Silver Chloride (SSC)

Silver Silver Chloride (Ag/AgCl) reference electrodes are commonly used for potential measurement in sea water applications. SSC consists of a silver element in contact with Ag/AgCl solution held in a non-metallic tube, a porous plug is provided at the bottom.

STD SIZE	25 MM DIA X 150 MM LONG
Lead Wire	XLPE/PVC or as per client
Material	ABS
Stability	+ or - up to 5% tolerance
Operating Temperature	0 to 55 deg C



### Zinc Reference Electrode

Zinc potentials are relatively stable, therefore sometimes Zinc is used as a reference electrode. The potentials of Zinc can change as per the environment condition, Zinc is treated as a pseudo reference electrode. For underground application, Zinc is pre-packaged in a cotton bag filled with backfill materials as used for sacrificial anodes; they are made from high-purity Zinc materials. Note:- Zinc is not stable at high temperature.

STD SIZE	BURIED TYPE	BARE TYPE
Lead Wire	Zinc Rod dia. 30x200 mm long, Pkd Size 150x300 mm long	Zinc Rod dia. 30x200 mm long Pkg Size dia. 100x 250mm long
Material	Cotton Bag	Bare Zinc
Stability	+ or - up to 10 mV	+ or - up to 10 mV
Op. Temp.	0 to 55 deg C	0 to 55 deg C

