

## Combined Potential | Current Measurement Electrode Installation

### Installation Procedures

The LD250 units are calibrated under laboratory conditions before despatch and a calibration certificate for the reference electrode is issued with each unit.

### Pre – Installation Functional Check

The purpose of this procedure is to check that the electrode potential is stable. Prepare a solution of 3% salt solution; 30g of sodium chloride (salt) per 1 Lt of water. Remove the cap from the electrode and soak the tip of the electrode in the solution for a [minimum of 2 hours](#) and [maximum of 3 hours](#)



After soaking the electrode measure the potential using a calomel electrode (SCE) with a digital voltmeter at 10mohm and 1000mohm input impedance with the SCE connected to the positive/common terminal and record the results. The potentials should be steady and in the range +/- 20mv of the calibrated values. A satisfactory alternative to using a saturated calomel electrode would be to check the soaking electrode potentials against each other or use one extra electrode as a test electrode. Once the electrode is checked it should be removed from the solution, the cap carefully replaced and it should be installed within 48 hours.

### Installation Procedure

Prior to installation make a record of the electrode number and remove the red cap. The units should be buried in a conductive backfill alongside the steel structure taking care to ensure good contact with the reference electrode and coupon and avoiding physical damage.

### LD 250 Ag/AgCl combined electrode and coupon Installation Guidance

The ground conditions where the LD250 electrode/coupon will be installed should be assessed prior to finalising the installation procedure. Generally the LD250 does not need to be encased within a gypsum/bentonite backfill, as long as good compaction is achieved around the various measurement frits and the steel coupon. In many circumstances it may be desirable not to use a backfill. The LD250 is designed to work without a gypsum/bentonite backfill.

Each corrosion-monitoring coupon should be fitted with the appropriate length of 3 core steel armoured cable (client or contractor supply). All coupons shall be connected to the same procedure and use the same colour coding. There are 3 cables. One reference electrode cable and two cables connected to the coupon steel to enable 'instant off' potential measurements. Wherever possible the reference electrode cable should be coloured blue. The integral connection area at the coupon end shall be encapsulated with two-pack epoxy resin moisture sealant ( Scotchcast 810 from 3M) after securely connecting the supplied LD250 cable tail to the armoured cable length. The cable connections shall be well embedded within the resin. These shall be pre-assembled prior to the monitoring probe/coupon installation. The serial or ID number of each electrode/coupon should be recorded as to its location.

### Storage tanks

The coupons should be located underneath one side of the area where base plates have been removed and be located approximately 100mm beneath existing undisturbed plates. The probes should be positioned facing down at an angle of approximately 45 degrees. Good compaction of sand and the native backfill must be ensured around the four electrode measurement frits and to the metal surface of the coupon. Locations and installation to be verified and checked on site by a responsible CP specialist. The cables shall be permanently and uniquely identified and laid in a narrow trench, and run to the external measurement cabinet, where terminations shall be made and these shall be carefully uniquely identified and permanently labelled.

### Pipelines

The Corrosion-monitoring coupons should be installed approximately 100mm from the pipe and be positioned between mid-pipe level and invert. The probes should be positioned facing down at an angle of approximately 45 degrees. Good compaction of the pipe backfill must be ensured around the four electrode measurement frits and to the metal surface of the coupon. Locations and installation to be verified and checked on site by a responsible CP specialist. The 3 core armoured cable shall be terminated at the test box. The cables shall be permanently and uniquely identified and laid in a narrow trench, to the test box, where terminations shall be made and these shall be carefully uniquely identified and permanently labelled.

Prior to installation the Ag/AgCl electrode shall be checked with respect to a newly charged Cu/CuSO<sub>4</sub> electrode and the value and polarity recorded. This shall be compared with the electrode calibration as supplied by the manufacturer. This potential check shall be repeated after the electrode/coupon is in position. The copper/copper sulphate cell shall be placed as close as possible to the Ag/AgCl electrode during this calibration. (saturated Cu/CuSO<sub>4</sub> is approximately +75mV with respect to SCE, saturated calomel electrode)