

Copper/Copper Sulfate Reference Electrode with Coupon

Saturated Copper/Copper Sulfate (Cu/CuSO₄) gel reference electrode for Cathodic Protection systems, featuring a terracotta casing, complete with a double-insulated copper cable



GENERAL INFORMATION

• Dimensions	240 x 150 mm (LxØ)
• Weight	Approx. 8 kg
• Cable (electrode with integrated coupon)	Standard: FG16R16 0.6/1kV, 2x4mm ² , others on request.
• Installation	Natural soils with low chloride content (<200 ppm)
• Temperature Range	0 - 60°C
• Storage Period	Indefinite if stored dry and away from light.
• Operating Life	30 years from installation.

Saturated Copper/Copper Sulfate gel reference electrodes (CSE) with a polarization coupon ("plate") are used as sensors for reading the polarization values of buried metallic structures where cathodic protection is applied, in cases where it is desired to evaluate the polarization

level in correspondence with possible damage to the protective coating of the structures or where there is a need to evaluate the magnitude of ohmic drops through the electrolyte.

INSTALLATION

Before proceeding with installation, it is necessary to indelibly identify and mark the cable (for electrodes with a separate coupon) or conductor (for electrodes with an integrated coupon) of the electrode and the coupon so that they can be easily distinguished. In the case of integrated coupons, it may be necessary to use a multimeter as an ohmmeter or continuity tester.

Before installation, the user must check for potential damage to the terracotta casing and discard any damaged electrodes.

The electrodes must be installed inside the trench in the position indicated on the reference project design. A maximum distance of 15 m from the outer surface of the protected structures is usually specified. Trenches for the installation of reference electrodes must be free of stones and various debris. The electrodes must be in contact with natural soil having overall characteristics as similar as possible to those of the soil in which the monitored structures are installed.

After installation, the trench must be backfilled with selected, debris-free soil. The soil should be lightly pressed and compacted. It is recommended to pour an adequate amount of drinking water into the trench in multiple stages during backfilling to enhance soil compaction.

When interpreting measurements, it must be considered that once installation is complete, if the cathodic protection is not active, the coupon surface will begin to oxidize progressively! For the same reason, when using electrodes with coupons, it is recommended to record the periods during which the cathodic protection system remains inactive.

USE OF CSE ELECTRODES WITH COUPONS

The reference electrode cable must be electrically isolated from the monitored structure and any other direct or alternating voltage source. Any electric current passing through the reference electrode can cause significant polarization and distort readings. Cathodic potentials, i.e., the electrical potential differences between the electrode and the monitored structure, must be measured exclusively using a high-impedance voltmeter $> 10\text{M}\Omega$.

The measurement of potentials net of ohmic drops can be performed by measuring the potential difference between the electrode and the coupon immediately after interrupting the electrical continuity between the coupon and the structure to be protected.