

MODEL LD15

LD15 Silver / Silver Chloride / 0.5M KCl Reference Electrode



ANTICIPATED SERVICE LIFE

30+ years

UNIT SIZE

85mm long x 15mm dia

INTERFACE

> 175 mm²

CHEMISTRY

Silver / Silver Chloride / 0.5M KCl

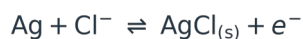
OVERVIEW

The LD15 is a long life silver/silver chloride/0.5M KCL reference electrode for permanent installation in atmospherically exposed concrete structures. It is not suitable for submerged seawater or splash zones where we recommend using our RB15 manganese dioxide reference electrode. The essential components are silver metal, silver chloride, soluble silver ions and chloride ions.

Ag, AgCl(s), Cl⁻, Ag⁺

ELECTROCHEMISTRY

A sparingly soluble salt, silver chloride, is in equilibrium with a saturated solution of this salt which precipitates in the course of electrolysis. The reversible electrode reaction consists of silver ions going into solution and then combining with the chloride ions to form silver chloride. Thus its potential is determined by the following reactions:



The potential is dependent on temperature and the concentration of chloride ions in accordance with the following equation:

$$E = E_0 - \frac{RT}{F} \ln[\text{Cl}^-]$$

Where E₀, R, F and T are the standard potential, gas constant, Faraday Constant and temperature respectively. The reaction has been proved to obey these equations in solutions with pH's of between 0 and 13.5. The potential is however very sensitive to traces of bromide ions which make it more negative.

The electrode element has been prepared by electrolytic precipitation of silver chloride onto silver metal. This has then been embedded in a mortar containing a known concentration of chloride ions and an anti-drying agent. The housing consists of a white nylon barrel, white nylon inserts, and a cable gland rated at IP68.

TECHNICAL SPECIFICATIONS

ELEMENT TYPE	Silver/silver chloride. ~ 1.2g pure silver.
POTENTIAL	Nominally -20mV ±10mV wrt saturated calomel electrode (SCE) at 20°C.
DRIFT	+/-3mV in 24 hours. Typically less than +/-10mV expected in 20 years .
DIMENSIONS	85mm long x 15mm diameter.
HOUSING	White nylatron barrel and inserts with IP68 cable gland.
CABLE	XLPE/XLPE or XLPE/PVC 2.5mm ² , blue/blue. These electrodes can be supplied without cable for cable to be attached on site.
EXPECTED LIFE	More than 30 years at a leakage current of 1µA will result in the loss of 0.7 grams of silver. The functional life of the electrode will most likely to be determined by the life of the associated cables.
