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TYPE WE300 Ag/AgCl 0.05M KCl

LOW ION REFERENCE ELECTRODE FOR USE IN POTABLE WATER

The silver/silver chloride (Ag/AgCl) elements in all Silvion electrodes are manufactured using a "unique" and advanced technique that results in a porous silver matrix. The matrix is then coated with precise quantities of silver chloride to ensure:

1). HIGH RELIABILITY;
2). HIGH STABILITY;
3). GREATER ACCURACY;
4). INCREASED LIFE PERFORMANCE.

NOTE:
For electrodes suitable for use in fresh water of high resistivity we ensure that the pre-determined chloride ion concentration (0.05 Molar) around the element is maintained by using an inert electrolyte compatible with the silver/silver chloride element. Ionic continuity to the environment is via a micro porous sintered disc. Since the chloride concentration of the internal electrolyte is similar to or slightly above that of the electrolyte in which the potential measurements are made, leaching of the chloride ions from the electrode over time is reduced. Thus, variations in the potential of the electrode from diffusion of chloride ions into the surrounding electrolyte are reduced.

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OUTER CASING

MATERIALS	Acetal body with porous ceramic sintered disc and nylon cable gland
DIMENSIONS	Length: 207mm (230mm w/ gland); Diameter: 35mm
CERAMIC DISC DIAMETER	20mm
WEIGHT (W/O CABLE)	300g

SILVER CHLORIDE ELEMENT

MATERIALS	Silver compounds are 99.90% pure
DIMENSIONS	Length: 50mm (+/- 2mm); Section: 5mm x 5mm
SURFACE AREA	Geometric: 10cm^2; Real: 500cm^2

ELECTROLYTE Inert electrolyte with 0.05 Molar KCl

PERFORMANCE DATA (See N.B. below for details)

Vs STANDARD HYDROGEN ELECTRODE @25^{0}C	+300mV
IUPAC* GUIDELINES IN 0.5M KCL SOLUTION Vs SCE @ 25^{0}C	+50mV
HISTORIC DNV GUIDELINES IN 0.5M KCL SOLUTION Vs SCE @20^{0}C.	-50mV
ACCURACY	+/-10mV
STABILITY (POTENTIAL DRIFT AT CONSTANT TEMP AND ENVIRONMENT)	+/- 1mV (24 Hrs) @ 5µA load
TEMP COEFFICIENT	-0.42mV/^{0}C
TEMP RANGE	-5 to 70^{0}C
INTERNAL RESISTANCE	Less than 500 Ohms
THEORETICAL DESIGN LIFE	30 years @ 0.1µA load

QA/QC

All our electrodes are fully tested, calibrated and supplied complete with a calibration certificate. They are individually identified with a unique serial number to ensure full traceability. All dimensions +/-1mm unless otherwise stated.

WARRANTY

Our reference electrodes are fully warranted against defects in materials and workmanship for six months from the date of receipt. We will replace/ refund any defect units within this period, but we require the unit(s) for examination to determine any fault.

N.B. Under no circumstances should the reference electrode be connected directly to the structure or the electrode will self-discharge and cease to operate. The minimum input impedance for the voltmeter used to measure the structure to electrolyte potential should be 10 MOhm.

In published literature, potential values for common reference electrodes used in Corrosion are measured with respect to a Standard Hydrogen Electrode (SHE) at 25^{0}C and are shown as a positive value. However, historical DNV guidelines have required Ag/AgCl electrodes to have a potential within the range of -46mV +/- 10mV against a Saturated Calomel Electrode (SCE) at ambient temperatures in a low chloride ion solution (0.745% (0.1M) NaCl or KCl solutions). The DNV guidelines had been based on the value measured when the SCE electrode is connected to the positive terminal of the voltmeter and the Ag/AgCl electrode connected to the negative terminal. Silvion Ltd quote reference electrode potential values in this data sheet using both the electrode connection arrangement originally adopted by DNV giving a negative potential measurement and currently used by *International Union of Pure and Applied Chemistry (IUPAC) which gives a positive potential measurement. It should be noted that the polarity of the reference electrode connection affects the polarity of the potential measurement that is obtained, but not its magnitude.