

MN15 Reference Electrode

Description

The MN15 is a long life manganese dioxide based reference electrode used to measure steel potentials in reinforced concrete and steel framed structures. The purpose of the MN15 is to measure the effectiveness of impressed current and galvanic cathodic protection systems and to monitor steel corrosion activity.

The MN15 reference electrode comprises a core of manganese oxides housed in a polyethylene double walled tube which is capped with a cementitious plug to enhance contact with the host material. The connection from the MN15 reference electrode is incorporated into an epoxy filled IP68 gland to maintain long term integrity.

The MN15 operates as a solid state electrode and does not require the addition of aggressive materials, such as chloride salts to facilitate operation.



Features

- Chloride free
- Exceptional polarisation characteristics
- Compatible cementitious measurement interface
- Compact design
- Supplied electrode potentials $\pm 20\text{mV}$

Application

A suitable location for the electrode must be identified, which avoids contact with any steel in the structure; BS EN 12696:2000 offers guidance on the positioning of reference electrodes used in the monitoring of cathodic protection systems.

Prior to installation, the MN15 electrode must be soaked in water for a minimum of 2 hours and a maximum of 24 hours.

The MN15 reference electrode is typically installed into a pre-drilled hole of dimensions 130 x 30 mm. The hole should be soaked with water prior to insertion of the embedding mortar. The MN15 electrode should then be pushed into the embedding mortar to ensure complete coverage of the unit and elimination of air voids. A minimum cover of 20 mm should be achieved.

Advantages

- Long life (>50years)*
- No release of aggressive salts
- Reliable long term performance
- Highly stable potential when current is drawn from the electrode
- Simple installation
- Accurate potential measurement
- Cost effective

Technical Data

The operation of the MN15 reference electrode is based on the reduction of manganese (IV) oxide within the electrode body.

The resulting potential of the MN15 electrode is +402 mV versus the standard hydrogen electrode or +160 mV versus the saturated calomel electrode (SCE).

*Dependant on local site conditions, including chloride concentration, concrete properties, humidity and temperature

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At a typical leakage current of 1µA the MN15 electrode offers a lifetime of more than 50 years.

The MN15 reference electrode operates as a 'solid state' electrode which does not allow the loss of aggressive activating species into the parent concrete.

The polarisation characteristics of the MN15 electrode are summarised below;

Applied current for 30 seconds (µA)	Potential shift (mV)
0.1	0.0
1.0	0.1
10.0	0.5

The MN15 electrode benefits from a highly stable potential when current is drawn from the electrode. This property means that the MN15 can easily tolerate current being drawn from the measurement surface without losing its reference potential.

The MN15 electrode is capped with a formulated cementitious plug which offers compatibility with the host concrete. This will minimise the potential for loss of contact following installation.

Each MN15 electrode is provided with a calibration certificate.

Product Data

Size: 70 mm x 16 mm diameter
Shelf life: 12 month
Packaging: Supplied in boxes of 10 units
Storage: Store dry

Specification Clause

The reference electrode shall be a manganese dioxide reference electrode used to determine steel potential in reinforced concrete and steel framed structures.

Limitations

The MN15 reference electrode must be soaked in water prior to application for a minimum of 2 hours and a maximum of 24 hours.

The resistivity of the embedding mortar used during the installation of the MN15 electrode should not exceed 20 kΩ/cm.

Health and Safety

It is good practice to wear gloves and eye protection at all times when handling the product. Do not open or swallow the contents. In the unlikely event that the contents of the electrode should come into contact with the skin or eyes, immediately rinse with water and seek medical help.

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