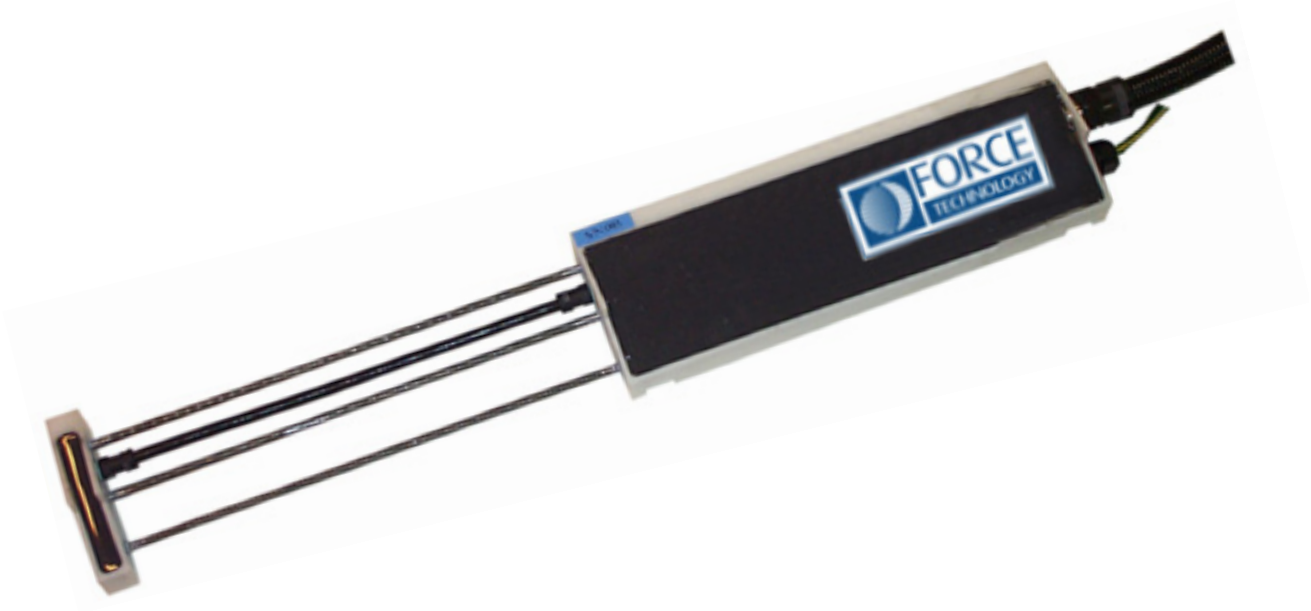
Corrosion Monitoring of Rebar (Reinforcement) in Concrete

ER-3 Concrete



Features and advantages

Many concrete structures suffer from rebar (reinforcement) corrosion caused by carbonation and/or ingress of chloride ions. Rebar corrosion with delamination, cracking or spalling of the concrete causes time-consuming, interruptive and costly repairs.

The ER-3 Concrete has three sensor elements placed at increasing concrete cover depths, which detect the progress of carbonation and/or chloride ingress. Hence, the ER-3 Concrete reveals imminent rebar corrosion before it actually occurs.

Measurements at regular intervals show trends and give early warning. Preventive repairs to avoid rebar corrosion may then be carried out, saving time and money. In addition, the inconvenience of noise, dust and possible reduced function of the structure can be avoided.

ER-3 Concrete

The 3 sensor elements each have an exposed part and a corresponding reference part cast in a rubber material. Comparative measurements between the exposed and protected parts indicates the concrete corrosivity at the three cover depths.

The ER-3 Concrete features:

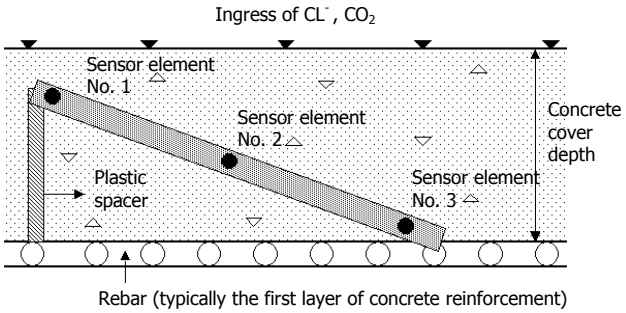
- Multiple sensor elements placed at increasing cover depths which detect the progress of corrosive environment.
- The sensor elements are made from similar steel rebars as used in the concrete structure.
- Accurate readings at regular intervals give rate of corrosion.
- Simple measurement procedure.
- Reference elements to compensate for any temperature changes.
- Can be tailor made to fit special requirements as regards size, shape and number of sensor elements.

Installation

The ER-3 Concrete is suitable for corrosion monitoring of the rebar in any concrete structure. The probe should be installed prior to concrete casting to ensure homogenous concrete quality to the surrounding mass.

The ER-3 Concrete is fixed to the rebar with plastic strips and spacers to achieve the required distance between the sensor elements and concrete surface. Each sensing element is connected to the rebar at one point to achieve the same potential level.

The concrete casting must be carried out with caution near the probe and its cable. Use of vibrator is not advised here. The cable must be carefully routed to a waterproof termination box.



Monitoring

Measurements should be taken on a regular basis depending on the structure. The measurements may be carried out manually, automatically or online.

As a leading provider of corrosion monitoring equipment and software, FORCE Technology Norway AS may take the responsibility for the monitoring program and provide status reports at given intervals including graphical plot of all recorded measurements to date and recommendations for any actions if required.

General specification

Ordering part number	13019-Lxx (xx = cable length in meters)
Size without cables	1050 mm x 140 mm x 25 mm (LxWxThickness)
Length of probe elements	1000 mm
Diameter of probe elements	8 mm
Number of sensor elements	3
Sensor element spacing	50 mm
ER probe material	Ordinary steel reinforcement
Operating environment	Concrete
Operating temperature	-40°C to +60°C (-104°F to +140°F)
Measuring device	Multicorr MkII (for manual measurements) MultiLog (for automated measurements)
Cable quality	PFSP 500 V
Connection type	Cable to terminal rails. From terminal rails optional 6pin Amphenol connector
Accuracy of measurement	0.05 mm for a 1000 mm long element with a diameter of 8 mm.*

*) Accuracy improves with increasing element length and with decreasing element diameter.

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