

# CorroRisk probe - installation instructions



Figure 1. CorroRisk probes mounted on bridge pillar

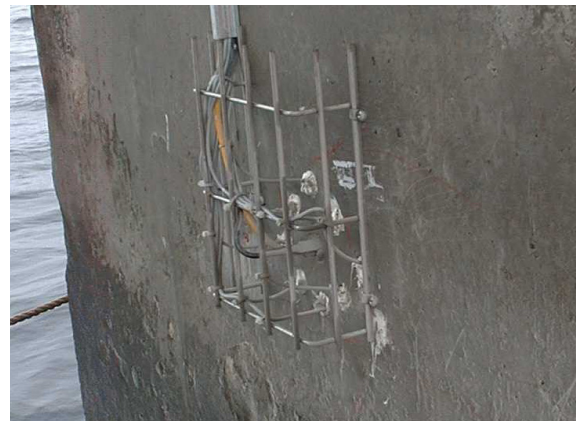


Figure 2. CorroRisk mounted on bridge pillar and covered with latticework

## Application

The CorroRisk probe has been developed for use on existing concrete structures. The probe ensures that reinforcement corrosion can be predicted in good time before the actual initiation. The planning of the necessary maintenance can be optimised and the result is a lower cost of repair and fewer traffic obstructions.

The CorroRisk probe is recommended to be used in all types of existing concrete structures, especially in aggressive corrosive environments and where visual inspection is difficult. This could e.g. be pillars in seawater (Figure 1), bridge decks, multi-storey car parks exposed to de-icing salt and various structures in swimming pools.

CorroWatch is recommended for new structures. It is installed before casting the concrete.

## Structure

The CorroRisk probe consists in the standard version of 4-8 measuring electrodes and 1 combi-electrode. The electrodes are made of the same material as the reinforcement. The combi-electrode consists of a titanium net and a reference electrode (ERE20), which has been de-veloped earlier for use in concrete structures.

## Measuring method

Initial corrosion is discovered when threshold values of the potentials or current have been exceeded.

The potential of the equilibrium is measured between the combi-electrode and the individual electrodes in the concrete cover.

## Installation

The CorroRisk is usually mounted in the cover layer between the concrete surface and the outer reinforcement layer. The electrodes are mounted in different but well-defined depths in the cover layer. All electrodes are mounted in a circle around the combi-electrode. The electrodes are supplied with a coaxial cable, which on the concrete surface is protected by a latticework. The cables are lead to a monitoring box, and e.g. a data logger (Figure 2 and 3).

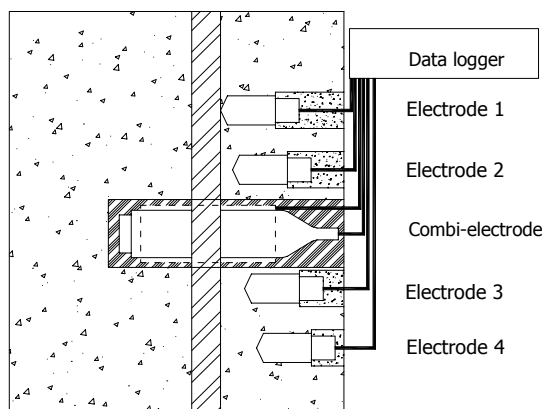


Figure 3. Sectional view of the mounted CorroRisk probe

## Mounting guide - step by step

**To avoid later misinterpretation of readings because of e.g. dust always use disposable gloves when mounting the measuring electrodes.**

### 1. Control on receipt

The standard version of the CorroRisk probe is supplied with:

- 4-8 measuring electrodes:  $\varnothing 12,3$  mm, 20 mm long with a coaxial cable, 2 m long
- Combi-electrode:  $\varnothing 20$  mm, 100 mm long with a black/yellow 2-screed cable
- Special drill:  $\varnothing 12$  mm
- Filler grout and protective lattice
- Templet for marking of drilling holes.

Check that the CorroRisk probe has not been damaged during shipment. The 4-8 measuring electrodes have been placed in tight gel-bags. Cable and the cable connection must not show any signs of damage. Also check that the combi-electrodes are intact.

### 2. Preparations before mounting CorroRisk probe

To obtain the best use of the probe results we recommend that an EKP-examination is conducted. After having evaluated the corrosion conditions, the locations where the probe is to be placed are pointed out. The reinforcement shall be located and the cover layer shall be noted. It must be ensured that combi-electrode and measuring electrodes do NOT touch the reinforcement.

### 3. Mounting

To avoid rust formation the gel bags with electrodes should not be opened until just before mounting. Press the templet against the surface and mounting points are marked. Then holes of the desired depths are drilled (Figure 3). For mounting the electrodes a  $\varnothing 15$  mm drill is used for the depth A. With the  $\varnothing 12$  mm drill another 20 mm is drilled (Figure 4). For the combi-electrode is used a 100 mm,  $\varnothing 25$  mm, deep hole. The holes shall be totally clean and the exact depth shall be measured and noted (it would be advantageous to gather the dust for later analyses of

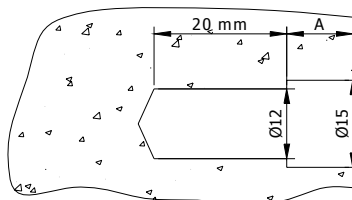


Figure 4. Guide in drilling holes for electrodes

Use the disposable gloves to take out the electrodes from the gel bags and screw the mandrel into the thread. Place the electrode in the hole and knock it down as deep as possible. Replace the mandrel with the cable connection and tighten it.

The hole for the combi-electrode shall approximately be filled half with newly mixed mortar with low resistance, preferably weakly expanding. This could be Konbextra GP from FOSROC, which should be mixed according to the supplier's directions. Afterwards the electrode is vibrated manually into the hole until it is tight (Figure 3). The hole shall be filled with mortar. Close to the CorroRisk probe a connection to the reinforcement shall be established.

### 4. Protection of electrodes

Holes for electrodes shall be refilled with the included silicon. The little protective hood on the cable is pushed into the silicon, after which the silicon shall be straightened clean and in level with the concrete surface. It must be ensured that the silicon is tight both around the cable and the concrete.

### 5. Cables

We recommend that the cables are protected by a lattice and perhaps also by cable trays/pipes (Figure 2). It is possible to extend the cables with suitable screened cables, and the type depends on the level of noise and mechanical influence.

### 6 Marking

When several CorroRisks have been installed, it is important to mark the individual cables so that no doubt arises as to which probe each cable belongs.

### 7. Termination of mounting

A measuring monitor is placed at an accessible place and all cables are directed hereto. The terminating mounting may take place via a terminal board or directly to a data logger. When choosing materials for this task it is important to consider any risks of moisture impacts and vandalism. We recommend to leave a box of dehydrating agent in the monitoring box.

### 8. Check of installation

By a multi meter the combi-electrode is alternately connected to each electrode. The potential is measured and must not float more than 1 mV/minute, 1 hour after the installation.



Further information:

Oskar Klinghoffer, tel. (direct) +45 43 26 72 55, osk@force.dk

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FORCE Technology Netherlands B.V.  
Tel. +31 71 523 5212  
FORCE Technology Russia  
Tel. +7(812) 326 80 92

FORCE Technology USA Inc.  
Tel. +1 713 975 8300  
FORCE Technology Canada Inc.  
Tel. +1 403 286 0606  
FORCE Technology Brazil Ltda.  
Tel. +55 21 2610 7400

FORCE Technology Norway AS  
Claude Monets allé 5  
1338 Sandvika, Norway  
Tel. +47 64 00 35 00  
Fax +47 64 00 35 01  
info@forcetechnology.no  
www.forcetechnology.no

FORCE Technology Sweden AB  
Tallmätargatan 7  
721 34 Västerås, Sweden  
Tel. +46 (0)21 490 3000  
Fax +46 (0)21 490 3001  
info@forcetechnology.se  
www.forcetechnology.se

FORCE Technology  
Headquarters  
Park Allé 345  
2605 Brøndby, Denmark  
Tel. +45 43 26 70 00  
Fax +45 43 26 70 11  
force@force.dk  
www.force.dk