EuropCorr® Two Inch Corrosion Probes

Electrical Resistance (ER) Probes

FLUSH ER PROBE STRIP TYPE ELEMENT

FLUSH ER PROBE "V" TYPE ELEMENT

The Electrical Resistance (ER) probes utilize the relatively simple principle of an increase in electrical resistance produced by a decrease in the section thickness of a metallic conductor. The increase in electrical resistance of a corroded element is measured in relation to that of a corresponding shielded reference element. The uncorroded reference element also serves to compensate for the effects of temperature changes on resistance. ER corrosion probes have been widely applied in oil and gas industry.

ER corrosion probes have been made to replace "intelligent" coupons, facilitating a simple corrosion measurement without the need to remove the coupon from service at certain period. ER measurements are usually regarded as relatively insensitive; the probes generally do not respond rapidly to a change in corrosive conditions/ change in corrosion rate. Sensitivity can be improved by decreasing the element thickness but only by compromising the overall probe life. Probe life corresponds to half of the probe element thickness by corrosion (tubular or strip element designs). For wire elements, the life span corresponds only to a quarter diameter loss. ER probes can be used in a wide range of environments and especially used in low conductivity and non aqueous conditions, where the use of the electrochemical techniques are generally unsuitable.

Caution: Conductive deposits such as iron sulfide or carbonaceous material on the probe elements will obviously distort the readings. The former is particularly relevant in sour oil/gas systems and certain forms of microbial corrosion, such as SRB attack.

EuropCorr® offers a wide range of high quality ER probes:

Flush/Projecting Probes (strip or "V" type element):

Flush element probes are available where it is particularly necessary to monitor localized wall effects, or where protrusion into the line would cause damage to the probe; for example, during pigging operations.

The benefit of using this type of probe is that the element seal material is GLASS instead of traditional epoxy used for standard probes. The use of the glass seal material prevents deterioration of the element seal in most environments thus improving the probe life quite considerably.

Flush Probes are available both with fixed and adjustable length. The shape of measuring element can be strip type or "V" type, can be positioned flush with the inner surface of the pipe or vessel to avoid interference for pigging lines.

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The EuropCorr® ER probes have 6 pin Amphenol connector, supplied with probe packing and probe o-ring, probe diameter 32mm, can be used with both two inch high pressure mechanical and hydraulic system, standard probes are designed for mounting through EuropCorr® hollow plug assembly.

ER WIRELOOP & TUBULAR PROBE

ER ADJUSTABLE & SPRIAL PROBE

Spiral Probes:
designed for long life under extreme conditions in oil and gas systems where a larger measurement surface area is desired and a shorter penetration into the pipe is required. This element geometry provides greater strength for high or turbulent flow environments and has a greater resistance to iron sulfide bridging. Due to a larger probe diameter, a shield is not required. The higher intrinsic resistance of this element design improves the reading resolution and the capability to measure low corrosion rates.

Tubular Probes:
The tubular probe element is comprised of a thin walled tube. Resistance readings from the sensing element are relative to a non-corroding reference element sealed within the probe body. Three probe designs utilizing elements of varying thickness permit usage in diverse situations. They provide a large surface area for measurement, have the fastest dynamic response to temperature transients, and are the least susceptible to the effect of any conductive deposits (such as Iron Sulfide) where present. Protective shields for the tubular element are available to protect the sensitive tubular element.

Wireloop Probes:
These elements are generally more economical and available in a wider range of alloys than for other element forms. The element is comprised of a thin solid single length of wire, which overcomes any requirement of welding the element. Resistance readings from the sensing element are relative to a non-corroding reference element sealed within the probe body. The wire loop design is highly sensitive and performs well in locations subject to electrical or system noise. Element thickness offers longer probe life compared to other types. Two sizes of elements are available to suit requirements regarding sensitivity and desired probe life.

Selecting the correct probe sensitivity is very important to get the best results from your corrosion monitoring program in the most cost-effective manner possible. A sensitive probe will respond more quickly to process upsets than one with a greater span, but the element will corrode away and require replacement more quickly. Longer life elements are recommended when corrosion rates are medium to high and the objective of the program is to ensure that corrosion stays within acceptable limits rather than to rapidly detect process behaviour.

Probe length will be calculated by us based on the following information provided by the client:

- Position: access fitting position and monitoring position (TOL, MOL & BOL)
- Type of access fitting: Hydraulic or Mechanical system and flareweld or flanged
- Dimensions: pipeline size and wall thickness, additionally for flanged fitting: gasket gap and nozzle height (distance from top face of flange to external of pipe wall)

ORDERING INFORMATION:

Probe Type	Element Type/Length	Element Thickness	Part No.
Flush Element	Fixed Strip	0.10mm / 4mils	351021
		0.25mm / 10mils	351022
		0.50mm / 20mils	351023
	Adjustable Strip	0.10mm / 4mils	351024
		0.25mm / 10mils	351025
		0.50mm / 20 mils	351026
	Fixed “V” Type	0.10mm / 4 mils	351027
		0.25mm / 10 mils	351028
		0.50mm / 20 mils	351029
	Adjustable “V” Type	0.10mm / 4 mils	351030
		0.25mm / 10 mils	351031
		0.50mm / 20 mils	351032
Tubular Element	T10 / 57mm	0.25mm / 10mils	351013
	T20 / 79mm	0.50mm / 20mils	351014
	T40 / 110mm	1.00mm / 40mils	351015
	T80 / 150mm	2.00mm / 80mils	351016
Spiral Element	S2	0.50mm / 20mils	351017
	S4	1.00mm / 40mils	351018
Wire loop Element	W40 / 32mm	1.00mm / 40mils	351019
	W80 / 32mm	2.00mm / 80mils	351020

Available length intervals for adjustable probes:

A1: 055 - 075 mm
A2: 065 - 085 mm
A3: 085 - 115 mm
A4: 110 - 150 mm
A5: 150 - 190 mm
A6: 190 - 230 mm
A7: 230 - 270 mm
A8: 270 - 310 mm
A9: 310 - 350 mm
A10: 350 - 390 mm

Spare Parts	Part No.	Material
Probe packing	350001	PTFE
Probe o-ring	300008	Viton
Protective shield for tubular probe T10	350003	SS
Protective shield for tubular probe T20	350004	SS

Pressure rating: 6000 PSI (420 BAR)
Temperature rating: +220°C, high temperature probes are available on request
Meets NACE MR0175/ISO15156
ER probes are manufactured from A182 F316L with an AISI 1018 mild steel element.
Probe bodies and elements are available in alternative materials upon request.