

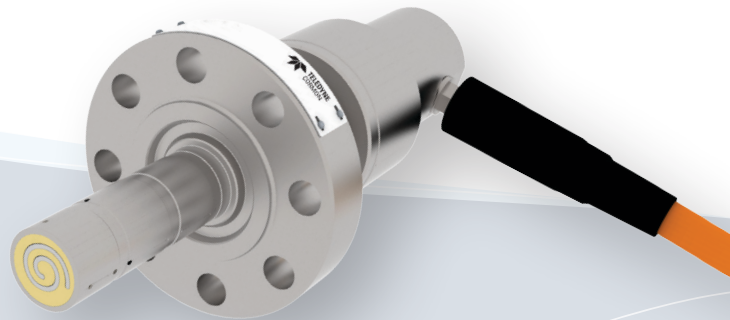
# Corrosion Sensor

Dependable and accurate measurement of metal loss within a high integrity mechanical package for subsea corrosion monitoring – Utilizes proprietary CEION® technology

The sensors are rated to 15KSI at the maximum operating temperature. The design of the unit includes secondary penetrator sets between process fluid and seawater.

The Corrosion sensor utilizes Teledyne Cormon's proprietary CEION® technology to provide extremely high accuracy metal loss detection. This data is output in real time in engineering units simplifying system integration.

The real time nature of the metal loss data from this sensor allows the adoption of a proactive corrosion management policy. Benefits can include a reduction in the use of inhibitor dosing during operation as well as reductions in the corrosion allowance at the design stage. Real-time monitoring of corrosion should play a key part in any operator's maintenance and reliability program, improving both safety and reliability across the life of the asset.



*Cormon Corrosion Sensor*

## PRODUCT FEATURES

- Very high resolution and fast response sensors to detect internal corrosion derived metal loss in subsea equipment
- Developed specifically for high pressure and high temperature environments in deep water applications with units deployed globally
- Optional pressure and temperature capsule can greatly increase the data available from the unit
- Real-time data available from instrument in engineering units, allowing pro-active Sand Management Strategy
- Teledyne Marine can provide in-house turnkey systems including sensor, cable and interconnect, reducing procurement complexity, project risk and lead times



**TELEDYNE MARINE**  
Everywhereyoulook™

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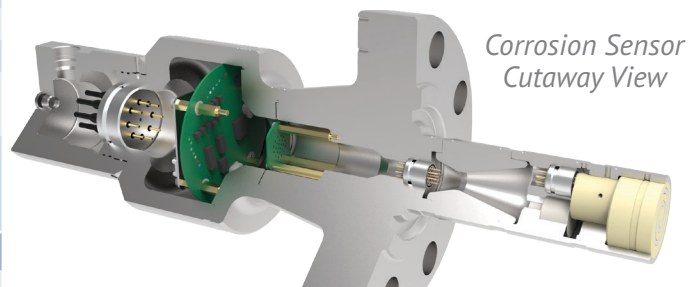
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## TECHNICAL SPECIFICATIONS

GENERAL SPECIFICATIONS	
Metal loss measurements	Corrosion
Design life	>25 years
Design pressure	10KSI or 15KSI*
Hydrostatic test pressure	Design pressure x 1.5
Ambient operating temperature	-20 to 70°C
Design temperature range**	-45 to 177°C
Design depth	3000m
Hyperbaric test pressure	345bar
Paint Options	Standard sensor is unpainted. Optional Norsok M-501 System 7B or 7C paint systems available
Design codes and standards	API 6A / 17D, ASME IX, ISO 13628-6, NACE MR-0175 , all metallic wetted material supplied with 3.1 traceable certification***
MECHANICAL SPECIFICATIONS	
Mechanical interface	API 6A 2 1/16
Seal groove	BX152
Weight in air	23kg (add 4 kg for 15K) (Probe weight only)
Flange material	10K: Duplex UNS S31803 with Inconel 625UNS N06625 cladding in process wetted area 15K: Super Duplex UNS S32760 with Inconel625 UNS N06625 cladding in process wetted area
Electronics Housing material	316L SS
Primary & Secondary Penetrators	Glass-to-Metal, Inconel 625 (EB Welded)
Probe Neck Material	Inconel 625
Termination Shell material	316L SS
Probe diameter	50mm (51.5mm with optional PT)
Probe length	Selectable between 100 and 300mm (150 and 300mm With Optional PT)
ELECTRICAL SPECIFICATIONS	
Supply Voltage	24VDC (18V min, 30V max)
Current consumption	<50mA @24VDC
In-rush	120% max operating current averaged over 500ms
Output signal	CANbus (CiA443, SIIS Level 2), MODbus RTU over RS485



Corrosion Sensor and Nautilus 12-Way Jumper



Corrosion Sensor Cutaway View

CEION® MEASUREMENT	
Sensing element	Spark eroded spiral
Element material	Carbon Steel*
Element thickness	8mm
Element life	7mm
Resolution	200nm
Time to Detection at 0.1mmpy	<18 hours
PRESSURE MEASUREMENT (OPTIONAL)	
Sensing element	Piezoresistive silicon sensor
Measurement range	0 – 10KSI or 0 – 15KSI
Over-pressure	Max pressure x 1.5
Accuracy	+/- 0.1% CR
Drift	+/- 0.02% CR per annum @180°C
TEMPERATURE MEASUREMENT (OPTIONAL)	
Sensing element	Pt100
Calibrated temperature range	-40 to 180°C
Accuracy	+/-0.5C (-30°C to 130°C) +/-1.0° (<-30°C or >130°C)
Drift	+/- 0.1% CR per annum

\*Other non-standard options are available upon request, but may incur additional engineering charges.

\*\* The design temperature range is limited by the penetrator qualified temperature range, the temperature de-rating of the flange material, and the ambient temperature reached by the electronics. The last two points will depend on the insulation thickness and can be assessed using computational analysis on a project-by-project basis if required.

\*\*\* Optional 3.2/3.2 intent traceable certification for process wetted and pressure retaining materials available.