# "ECHO-EC"

EROSION & CORROSION DETECTOR

Erosion-corrosion has been rated in the top five most prevalent forms of corrosion damage in the oil and gas industry and defined as accelerated corrosion following the removal of surface films. Erosion in oil and gas production systems is mainly due to the presence of sand along with liquid and gas.

It is associated with production velocities and is the most severe when production velocities are high. Since erosion is caused by mechanical forces occurring on the metal surface, erosion can be difficult to control. To address this industry problem ESP Safety has developed Echo-EC Erosion-Corrosion Detector
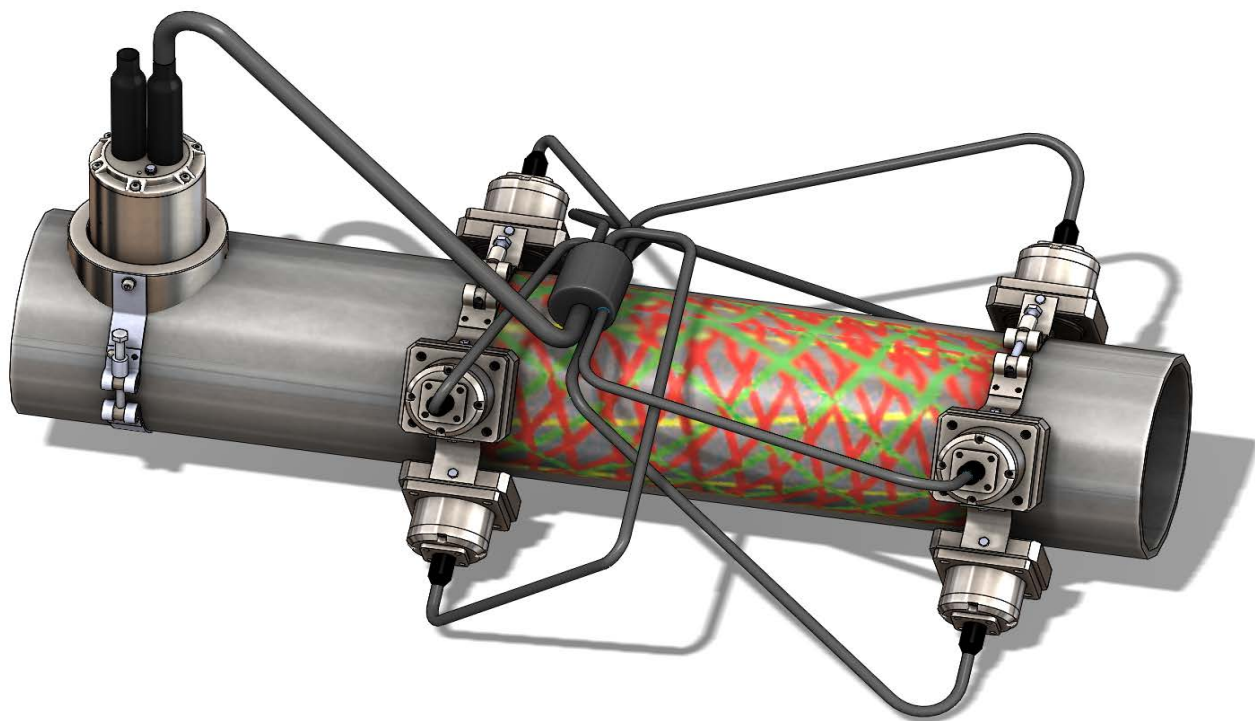
Benefits Include:

- » Onshore and Subsea Application
- » Self-Diagnostic function inbuilt
- » Real time measurement
- » Inbuilt digital signal processing unit
- » Inbuilt event Archive
- » Non-intrusive clamp-on type mounting

- » Industry Standard Outputs
- » Dedicated Software
- » Ultrasonic Acoustic technology
- » Internationally certified for "Ex d" and "Ex ia"
- » Minimum resolution 0.001" (0.025mm)
- » Excellent external noise immunity

Monitor Entire Pipelines:

The software which is provided by ESP for use with the Echo system is incredibly easy to view and use by the operator for viewing particle production, trends and analyzing the data received.

Feature Include:

• Monitor entire pipelines, multiple systems configuration allows up to 10 km live pipeline monitoring.

• Real time data & Historical Trends

• Non Intrusive mounting above and below ground pipeline sections can be monitored. No shutdowns required.

• Low power consumption allows battery powered operations for difficult to access areas of assets. Wireless communication modes are also available to support operators for data collection.

• Live wall thickness data available and alarm level setting to ensure notification is given if any critical thickness level is breached.

Non Intrusive Mounting:

One of the devices greatest benefits is that it is non intrusive clamp on type.

Meaning no cutting, welding or shutting down a process is required in order to install it.

Simply clamp it on to the pipe, via means of metals clamps or in case of a subsea installation, place it in a funnel and you are ready to go.

Live Pipeline Monitoring

The ECHO-EC detector has a dedicated software that allows the user to visualize real time status across the entire pipeline. The same can be scaled from single point or segment of your selection, up to the entire pipeline.

Visualizing the rates of erosion and better understanding the location which are facing the most degradation, and further enabling you to increase your asset integrity and to plan preventive maintenance and replacement activities as per your schedule.
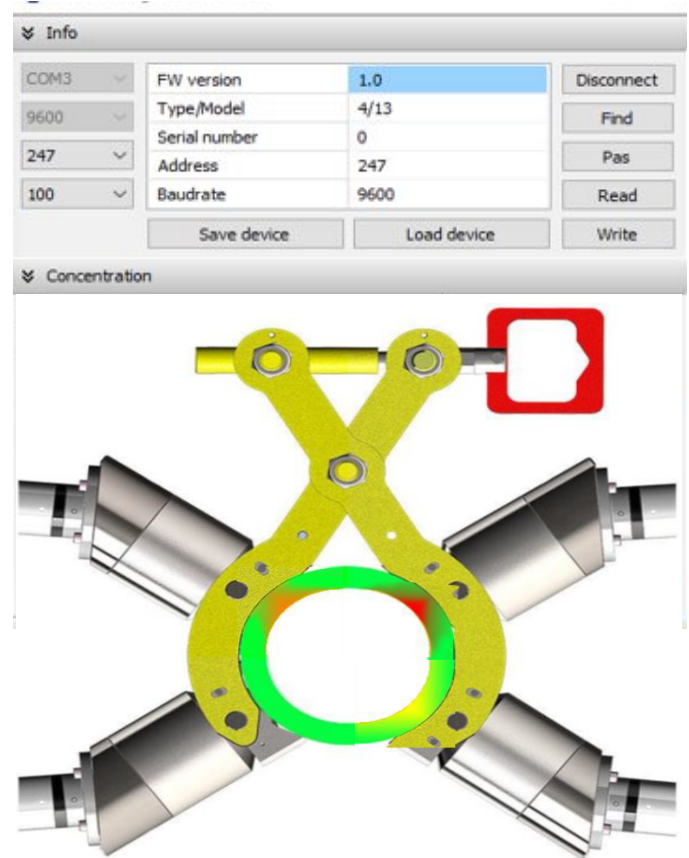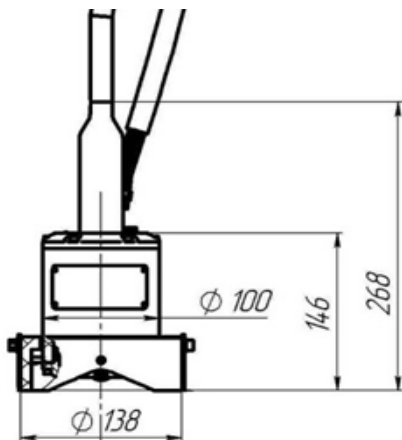

Subsea Monitoring

The detector is available in 2 version, topside and subsea. The subsea detector is designed for operation of up to 30 years, the detection modules can withstand depths up to 4500 meters, and pressures up to 40 Mpa. For further specification of subsea detector, please request information separatley.

Specification:

Principle of operation	Passive accoustic
Sensor type	Ultrasonic Accoustic
Pipe Size	> 3 inch OD (76 mm)
Measurement time interval	Continuous Live
Time Scale	- Day - Quater - Week - Year - Month
Units of Measurement	- Wall Loss (mm/cm) - Corrosion Rate (%) - Wall Thickness
Minimum Particle Size	$\geq 10\ \mu m$ (gas) $\geq 20\ \mu m$ (oil)
Resolution	0.001" (0.025mm)
Accuracy	± 0.1mm
Electrical Specification	
Input Power	24 VDC (18 to 32 VDC)
Power Consumption	<4W (monitoring module)
Outputs	- 4-20mA, - Configurable Relays (alarm, fault) - RS-485 (ModBus RTU) - Wireless Options (HART, others)
Event archive (inbuilt)	Up to 90 days based on 5 s averaging interval
Local Indication	3 colour LED (normal, alarm, fault)
Self-diagnostics sensitivity function	Yes
Humidity	up to 100 %
Operating Temperature Range	-40°C to +85°C
Ingress Protection	IP66/IP68
Explosion Proof Mark	1Ex db IIC T4 Gb/ 0Ex ia IIC T6 Ga
Mechanical Characteristics	
Dimensions	5.75" x Ø 3.94" (146 mm x Ø 100 mm)
Cable Entry	1 Cable Entry 3/4" NPT / (2 entries upon request)
Enclosure material	SS316/ Aluminum

a) Detector Dimensions

b) Mounting Base Dimensions