ESP Asset Integrity

ECHO-EC

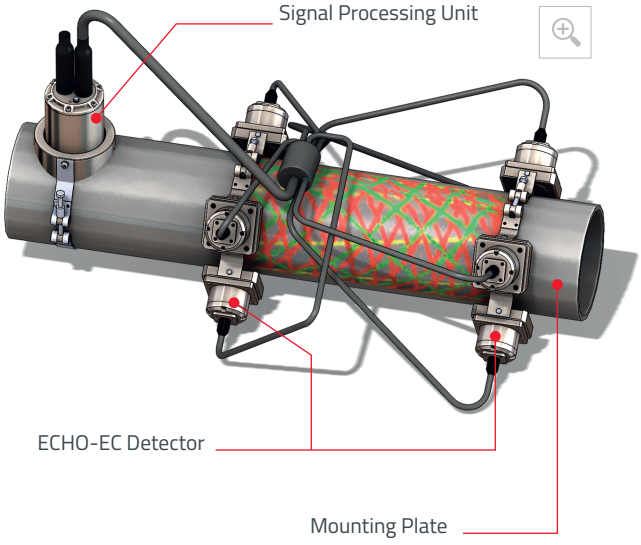
EROSION-CORROSION DETECTOR

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**.

The **Echo-EC** monitors the condition of pipes and provide information about its erosion corrosion rate in various applications. **Echo-EC** uses a group of ultrasonic sensors to detect wall thickness by pulse-echo method. The quantity of sensors in a system varies from 4 to 32 pcs. The output signals from **Echo-EC** ultrasonic sensors are transmitted directly to a control system for online data monitoring via Modbus RS-485 communication protocol. Being the next generation of smart instruments Echo uses advanced digital signal processing algorithms to provide reliable, high-resolution data to operator. This allows users to plan preventative measures, optimize use of corrosion inhibitors, calculate the remaining lifetime of pipeline, monitor weld/HAZ on pipe, verify and calibrate inspection pigs and provide information about critical areas between inspection surveys.

The **Echo-EC** non-intrusive device can be easily tied into any existing system or implemented into new pipeline installation.

ESP Safety's erosion corrosion detector is recommended to be installed in combination with our sand detector to minimize sand intrusion (the main cause of erosion corrosion), detect early signs of corrosion and extend life of pipelines.



Applications


WELDS


HEATED WELD ZONES


PIPELINE BENDS/ELBOWS


PIPELINE T-JOINTS


VESSELS/TANKS

Features and Benefits

ENHANCED ACOUSTIC SENSITIVITY

Combination of superb sensing element, digital signal processing algorithm with advanced filtering techniques allow device to measure wall thickness at high resolution.

MAXIMUM RELIABILITY

Rigorous self diagnostics, data averaging and use of filtering techniques provide fail to safe reliable operation.

LOW MAINTENANCE COST

Echo requires minimum maintenance on site, which makes it an easy choice for operator.

LONG SERVICE LIFE

The life expectancy for the Echo-EC is 30 years.

NON-INTRUSIVE MOUNTING

The installation is very simple and easy, no need in cutting or welding and shutting down a process. The Echo-EC system comes with mounting frame which is attached to the pipe. This design provides a secure fit while maintaining pipeline integrity.

REAL-TIME DATA

On wall loss reduces need for PIG inspection activities.

US / CALIFORNIA- HEADQUARTERS | ESP Asset Integrity

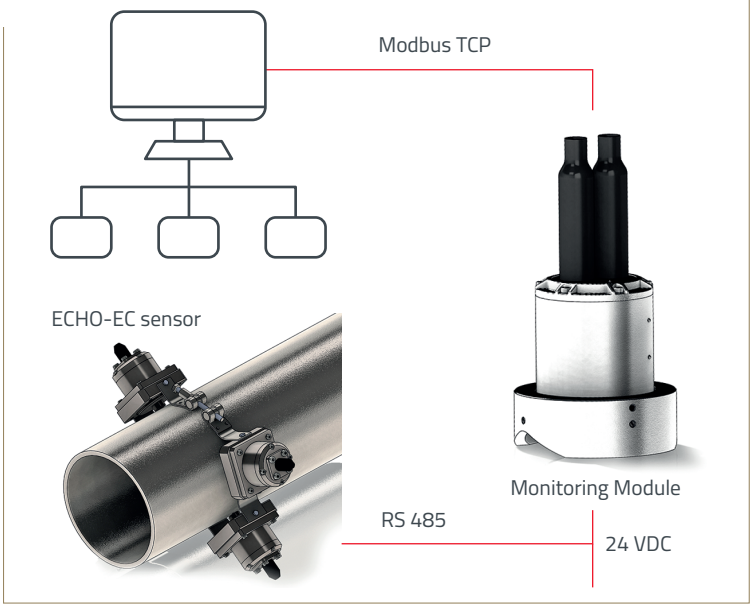
555 N. First Street | San Jose, CA 95112 Ph: +1-408-886-9746 | Fx: +1-408-886-9757 | www.esp-assetintegrity.com | info@esp-assetintegrity.com

ESPAsset Integrity

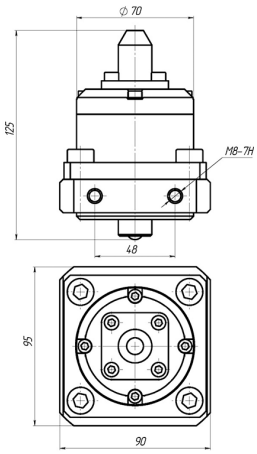
ECHO-EC

EROSION-CORROSION DETECTOR

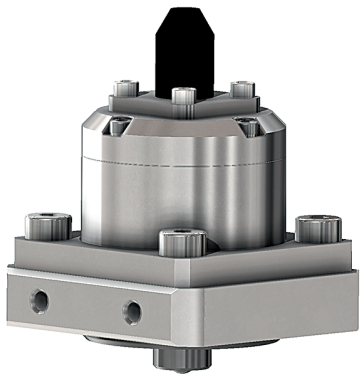
DATA COMMUNICATIONS



ECHO-EC Detector Dimensions (mm)



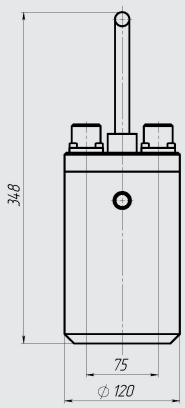
ECHO-EC sensor

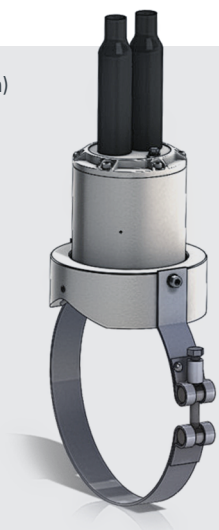


OPERATIONAL CHARACTERISTICS

Principle of Operation	Passive acoustic
Frequency Range	5 - 10 MHz
Units of measurement	Wall loss (mm/ inches), corrosion rate (%)
Calibration	Factory calibrated, no field calibration required
Resolution	0.001" (0.025mm)
Minimum Pipe Diameter	> 3" OD (76 mm)
Pipe Size Coverage Area	32 ft² (3 m²)
Wall Thickness	3 – 50 mm (0.1 -2 inches)
Pipe Material	Metal Alloys
Pipe Coating	Any, no need to remove coating
Type of Pipelines	Oil, gas, multiphase, water
Operating Temperature	-60° C to +85° C (-76° F to 185° F)
Pipe Surface Temperature	-100° C to +290° C (-148° F to 554° F)
Storage Temperature	-50° C to +50° C (-58° F to 122° F)
Design Life	30 years

Monitoring Module Dimensions (mm)





MECHANICAL CHARASTERISTICS

Dimensions	Monitoring Module 5.9" x Ø 3.9" (150 mm x Ø100 mm) ECHO EC sensor 2" x 4" x 5" (50 mm x 95 mm x 125 mm)
Material	Stainless Steel 316L
Weight	Monitoring Module 6 lbs (3 kg) ECHO EC Sensor 1 lb (0.5 kg)

ELECTRICAL CHARACTERISTICS

Input Voltage	+24 VDC (Nominal) +18 to 32 VDC Battery Operated by Request
Power Consumption	≤ 4W for the monitoring module ≤ 5V for the EC sensor
Output Signals	Wireless HART Digital RS-485 Modbus RTU
ATEX rating	1Ex d IIC T4 Gb, 0Ex ia IIB T4 Ga
North America Rating	Class I, Div. I, Group A,B,C,D T4 Class I, Zone 0, Group IIB T4
IP rating	IP 66 / 68