COSASCO®

# Sand Probe Erosion Detection System

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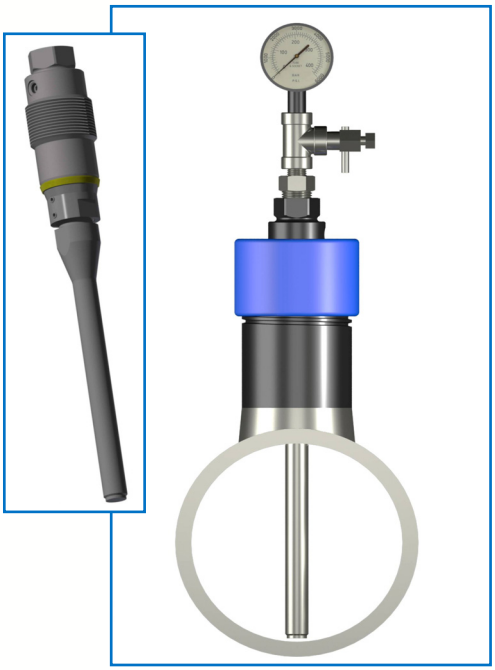

## Features

- **Early Detection of Erosion**
- **Removable Under System Pressure**
- **Meets NACE MR0175**
- **New and Improved Robust Design for High Velocity Flows**
- **Compatible with Standard 2” Access Fittings**

Sand production in oil and gas producing wells can cause rapid erosion and wear of top side equipment such as chokes, valves, and flow-lines. The areas that can experience the most severe effects of erosion are immediately downstream of a choke, outer diameters of bends, reducers, misaligned flange joints and pipe T joints.

Early detection of erosion is key to prevent serious damage and to prevent safety risks from potential leaks or malfunction of process equipment. The Sand Probe is a sacrificial tube inserted into the flow and can be used as an early warning (safety) device for alerting the operator that a critical metal loss (erosion) has occurred due to the effects of sand or solids erosion in the flow.

Cosasco Sand Probes were developed as a simple and robust means of detecting significant erosion in high velocity flow lines. This new design replaces the older NPT sacrificial tube and side T access fitting system. The advantages are that the side T fitting and injection nut/seal assembly is no longer required and the new probe design offers a more robust probe with a more reliable mechanical connection. The modified hollow plug assembly allows online retrieval to be achieved.

The sensing portion of the Sand Probe is basically a reinforced sacrificial tube made from corrosion resistant material (SS316). The probe is connected to a hollow plug assembly which contains a needle valve that isolates the pressure in the event of the tube being eroded. This allows the external gauge assembly to be removed for live retrieval of probe using a Cosasco retrieval tool. The Sand Probe can be to be used in any standard Cosasco 2” Access Fitting Assembly.

In use, providing there is sufficient flow velocity, the effect of sand or solids will eventually erode through the Sand Probe sacrificial tube portion, exposing the sealed system to the working pressure of the line. The pressure is then directed through ports in the Hollow Plug and through a nipple to register upon a Pressure Gauge Assembly.

Alternatively, the gauge can be replaced by a pressure switch to provide a pneumatic or electrical signal to the well control room.

ACCESS UNDER PRESSURE ANY TIME ANY PLACE

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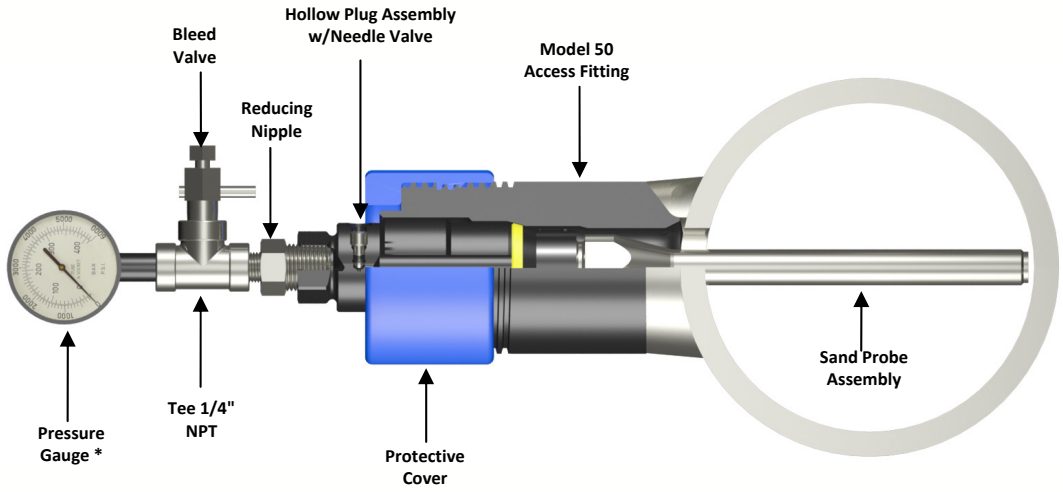
# Sand Probe Erosion Detection System

## System Overview

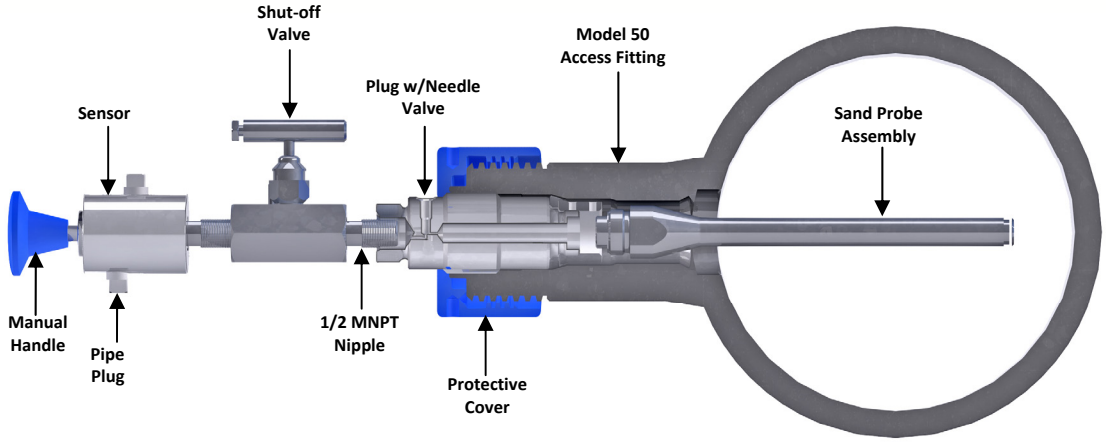
The following diagrams show all the components required to make up a sand monitoring system.

**Sand Erosion Detection System w/Pressure Gauge Assembly**




**Sand Erosion Detection System w/Remote Alarm/Shut-off Pressure Assembly**

(Electrical Sensor option available, consult factory)




## Application

To obtain a complete, functional sand erosion detection system, a pressure sensing assembly is necessary for transmission of pressure from the sacrificial tube to a pressure sensing/recording device. This can be achieved by a pressure gauge or a pneumatic or electric switch/ sensor.

The standard Cosasco Sand Probe (sacrificial tube portion) is 5/8” (15.9 mm) OD and a wall thicknesses of 0.035" (0.889mm), other tube thickness can be provided.

Cosasco's sacrificial sand probe concept requires that the midpoint of the sacrificial tube is placed approximately 60% into pipeline diameter (ID). This placement allows for maximum theoretical sand impingement at center-of-line where product flow velocity could be greatest, yet also allows for heavier suspended particles riding slightly lower in the flow stream to also contact the sacrificial tube. Consideration should be given the sand probe location. Experience has shown that the worst case erosion can occur immediately downstream of a change of flow direction - especially immediately downstream of a choke, outer bend radius of an elbow or pipe T section. Sand distribution normally returns to the approximate middle of the flow stream about ten pipe diameters downstream of an elbow. Consult Cosasco for assistance.

# Sand Probe Erosion Detection System

## Ordering Information

| Sand Erosion Detection System w/Pressure Gauge Assembly (Required Parts) | |
|---|---|
| **Access Fitting Assemblies** | 2" Flarweld, Buttweldolet, Socketweld, NPT, Flange (See individual datasheets for detailed ordering information) |
| **Hollow Plug Assembly with Needle Valve** | PN: 551036 (See chart below for ordering information) |
| **Pressure Gauge Assembly (0-6000PSI)** | PN: 743035-Y (Y=Pressure Range, consult factory for other pressure range options, omit Y for standard 0-6000 PSI) |
| **Protective Cover with Hole** | PN: 740113 |

| Sand Erosion Detection System w/Remote Alarm/Shut-off Pressure Assembly (Required Parts) | |
|---|---|
| **Access Fitting Assemblies** | 2" Flarweld, Buttweldolet, Socketweld, NPT, Flange (See individual datasheets for detailed ordering information) |
| **Hollow Plug Assembly with Needle Valve** | PN: 551036 (See chart below for ordering information) |
| **Remote Sensor Alarm/Shut-Off Assembly**** | PN: 127752 |
| **1/2 MNPT Nipple** | PN: 200044 |
| **Protective Cover with Hole** | PN: 740113 |

## Hollow Plug Ordering Chart

| Model | Hollow Plug Assembly w/Needle Valve |
|---|---|
| 551036 | Hollow Plug Assembly |

| Code | Material |
|---|---|
| 1 | 316/316L Stainless Steel |
| 3 | Hastelloy C-276 |
| 4 | Nitronic 60 |
| 5 | Carbon Steel |
| 6 | Inconel 625 |
| 7 | 2205 Duplex |

| Code | Seal Material |
|---|---|
| 1 | Teflon |
| 2 | Vespel |
| 3 | Nitronic 60 |

**551036 — 1 — 1** ← **Example**

## Sand Probes Ordering Chart

| Model | Sand Probe |
|---|---|
| 641006 | Sacrificial Sand Probe |

| Code | Element Alloy: SS316 Standard, consult factory for other available Elements. |
|---|---|
| XXXXXX | Enter UNS Number |

| Code | Length |
|---|---|
| XX.XX | Order Length 1.00" to 24.00" (.25" increments) |

**641006 — S31600 — 5.00** ← **Example**

### How to Order

1. Sacrificial Sand Probe (to determine appropriate Sand Probe size, consult factory).
2. If live probe retrieval is not required, select standard Hollow Plug Assembly (w/o needle valve). PN: 550100-1-1
3. **Electrical Switch option available, PN: 129439-X3

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ISO 9001:2008
Certificate No. FM 19694

Sacrificial-Sand-Probe-DS rev-
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