

**Instrumentation for Offshore
Applications**




THE CHALLENGES

TODAY'S MARKET DEMANDS COMPLEX PROCESSES THAT COMPLY WITH STRINGENT REGULATIONS GOVERNING UPSTREAM APPLICATIONS

That is why our engineers are dedicated to understanding the complexity and ever changing oil and gas processes.

We have developed NACE MR0175/ISO1516-2009 compliant gauges, seals, transducers and switches designed to perform in wellheads, offshore rigs and shale fields. These instruments are also designed to meet the latest industry standards and regulations:

- ATEX, CE, UL and FM approved explosion/flame proof transducers
- ATEX, CE, UL, CSA, FM and IECEx approved explosion/flame proof, SIL 3 capable switches
- 316 SS corrosion and ingress resistant enclosures



At Ashcroft, we go beyond manufacturing. We are here to help you find the best instrument or assembly for your process.

Our team has extensive experience working to counter the potential effects of stress corrosion cracking in sour environments. We will engineer custom solutions to perform in processes where pressure spikes and pulsation can occur to meet unique installation requirements. Together we will determine the best instrumentation for your applications, as we did in the following case studies.

1109 Gauge Assembly

Products: 1109 Pressure Gauges
 510 (XHP) All Welded Diaphragm Seal
 Pressure Limiting Valve

Failure Mode: Gauge must meet strict
 specifications and corrosion resistance

Process Media: Chemical injection, oil and gas

Maximum Pressure: up to 10,000 psi

The Problem:

An engineering company was awarded a contract to provide front end engineering design for an offshore tension leg platform (TLP) located under 3,500ft of water. During their review, they discovered that the requirement for ASME compliant gauges had not been met. Also, the gauges did not meet the unusually stringent overpressure requirements designated for the platform. The company was also bearing the expense of prohibitively high cost Monel® pressure limiting valves due to direct contact with corrosive media.

The Solution:

To fulfill platform requirements, Ashcroft offered the ASME compliant 4½" 1109 solid front gauge. With an optional 316L stainless steel case, the gauge was well suited to the salt spray environment, while the addition of the **PLUS!™** Performance option kept the pointer stable despite process vibration.

The gauge was isolated from the corrosive media by a 510 diaphragm seal with Monel® wetted parts. The pressure limiting valve was relocated between the diaphragm seal and the gauge, isolating it from the corrosives as well. As a result, a 316 stainless steel valve could be used in place of the Monel® version, substantially lowering the cost of the assembly.

The platform now operates with the required ASME compliant pressure measurement instruments, and safely resists damage caused by corrosive media and salt spray. The new selection and configuration of component devices also lowered the cost of the assembly.



1109 Pressure Gauge, PLV and 510 (XHP) Diaphragm Seal

1109 SPECIFICATIONS

Accuracy:	±0.5% of span (ASME B40.100 Grade 2A)
Dial Size:	4½"
Process Connections:	¼ NPT or ½ NPT
Pressure Ranges:	Per diaphragm seal rating

1109 WETTED MATERIALS

Tube:	316L SS
Process Connection:	316L SS

1109 NON-WETTED MATERIAL

Case:	300 Series SS, 316 SS (OPT.)
Ring:	300 Series SS, 316L SS (OPT.)
Pressure Relief Back:	300 Series SS, 316L SS (OPT.)

PRESSURE LIMITING VALVE

Wetted Materials:	316L SS, 316Ti SS and 304 SS
Max. Pressure Rating:	14,500 psi
Max. Temperature Rating:	175°F (80°C)

510 (XHP) ALL WELDED DIAPHRAGM SEAL

Max. Pressure Rating:	10,000 psi at 212°F (100°C)
Bottom Housing:	316L SS, Hastelloy® C276, or Monel®
Diaphragm:	316L SS, Hastelloy® C276, or Monel®
Fill Fluid:	Silicone

1259 Mounting

Products: 1259 Pressure Gauge

Failure Mode: Gauge must be mounted on a pipe

Process Media: Crude Oil

Operating Pressure: 10 and 16 Bar

The Problem:

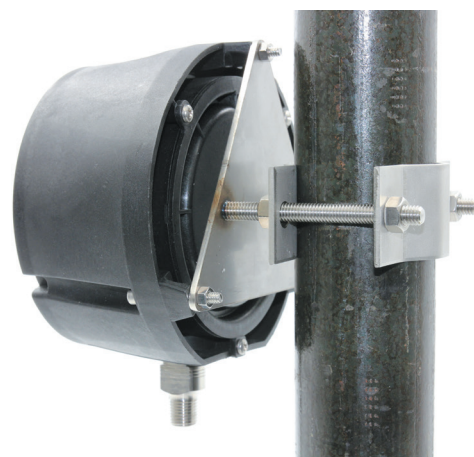
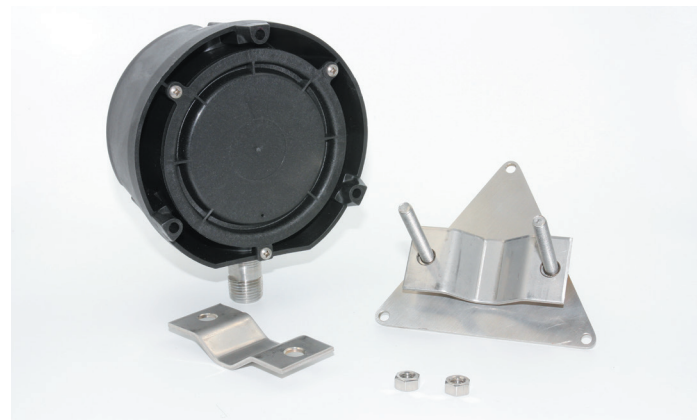
A floating production, storage and offloading vessel (FPSO) was working 200 miles offshore. These vessels pump up to 150,000 barrels per day from existing wells, and store the oil onboard. Oil is then transferred to shuttle tankers. The Ashcroft® 1259 pressure gauge was the specified instrument to measure the pressures on discharge pumps. Due to the unusual location of the pressure port and the effects of the machinery, the gauge needed to be remotely mounted on a 2" pipe located ten feet away from the pressure source.

The Solutions:

Stainless steel hardware was specially engineered by Ashcroft to adapt the 1259 gauge to a pipe mount configuration. Stainless steel brackets were then designed to allow the gauge to be safely and securely clamped to the 2" pipe for remote reading.



1259 Pressure Gauge Mounting



1259 SPECIFICATIONS

Accuracy: $\pm 0.5\%$ of span (ASME B40.100 Grade 2A)

Dial Size: 4½"

Process Connections: ¼ NPT or ½ NPT

Pressure Ranges: Vacuum, compound, 15 to 20,000 psi

1259 WETTED MATERIALS

Tube: 316L SS or Monel®

Process Connection: 316L SS or Monel®

MOUNTING BRACKET

Material: 300 Series SS

1209 PRESSURE GAUGE



FEATURES

- Solid front case design with full pressure relief back
- **PLUS!**[™] Performance
- 316L SS case and ring

SPECIFICATIONS

Accuracy:	±0.5% of span (ASME B40.100 Grade 2A)
Dial Size:	4½"
Ranges:	Vacuum, compound, 20,000 psi
Weather Protection:	IP65 hermetically sealed
Process Connection:	¼ NPT or ½ NPT

WETTED MATERIALS

Tube:	316L SS
Process Connection:	316L SS

NON-WETTED MATERIAL

Case:	316L SS
Ring:	316L SS
Pressure Relief Back Cover:	316L SS

2008 PRESSURE GAUGE



FEATURES

- Corrosion resistant SS case
- Case welded mounting flange
- True Zero[™]
- High burst pressures

SPECIFICATIONS

Accuracy:	±1.6% of span
Dial Size:	63mm (2½")
Ranges:	Vacuum, compound, 15 to 15,000 psi
Weather Protection:	IP65 and NEMA 4 for water and dust ingress
Process Connection:	¼ NPT

WETTED MATERIALS

Tube:	316L SS
Process Connection:	316L SS

NON-WETTED MATERIAL

Window:	Polycarbonate
Case:	304 SS or 316L SS
Ring:	304 SS or 316L SS

T5500 & T6500 PRESSURE GAUGE



Accuracy:	±1.0% of or ±0.5% of span (OPT.) (EN 837-1, Class 1)
Sizes:	100mm (4") or 160mm (6")
Ranges:	Vacuum, compound, 15 to 15,000 psi
Weather Protection:	IP66
Connections:	¼ NPT or ½ NPT
Wetted Materials:	316L SS or Monel
Case Material:	304 SS or 316L SS (OPT.)
Ring and Back Cover:	304 SS or 316L SS (OPT.)
Case Style:	T5500: Open Front T6500: Solid Front

1009 PRESSURE GAUGE



Accuracy:	±1.0% of span (dry) ±1.5% of span (liquid filled)
Sizes:	2½" or 3½"
Ranges:	1009SW: Vacuum, compound, 15,000 psi
Weather Protection:	IP65 or IP54
Connections:	¼ NPT or ½ NPT
Wetted Materials:	SW: 316L SS
Case Material:	304 SS or 316L SS (OPT.)
Ring:	304 SS or 316L SS (OPT.)
Case Style:	Open Front

5503 DIFFERENTIAL PRESSURE GAUGE



Accuracy:	±1.6% of span (EN 837-1, Class 1.6)
Sizes:	100mm (4") or 160mm (6")
Ranges:	0-30 IWD to 300psi
Static Pressure:	1450 psi, 3625 psi or 5801 psi
Connections:	¼ NPT or ½ NPT
Wetted Materials:	316L SS, Viton O-Ring
Case Material:	304 SS or 316L SS
Ring:	304 SS or 316L SS
Case style:	Open Front

1279 PRESSURE GAUGE & DIAPHRAGM SEAL



Accuracy:	±0.5% of span (ASME B40.100, Grade 2A) (Gauge)
Size:	4 ½"
Ranges:	Per diaphragm seal ratings
Connections:	¼ NPT or ½ NPT
Wetted Parts:	Diaphragm and bottom housing
Case Material:	Phenolic
Ring & Pressure Relief Back Cover:	Polycarbonate (Meets UL94V-0)
Case Style:	Solid Front

2198 MICROTUBE™ SIPHON

FEATURES

- For working pressure up to 5,000 psi
- For process temperature up to 800°F (427°C)
- Compatible with many process media
- For use with gauges, switches, transducers and diaphragm seals



SPECIFICATIONS

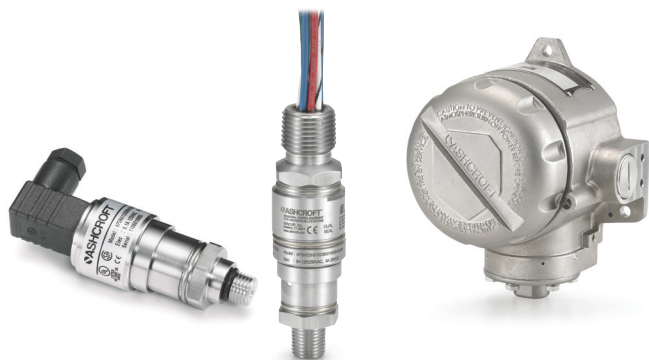
Process Connection:	¼ NPT, ½ NPT, G ¼ B or G ½ B
Instrument Connection:	¼ NPT Female, ½ NPT Female, G ¼ B Female or G ½ B Female
Wetted Material:	316L SS
MAWP:	5,000 psi at 800°F (427°C)

DF FLUSH FLANGED DIAPHRAGM SEAL



Connection Style:	Flanges, flush diaphragm
Process Connection:	ASME 1, 1½, 2, 3, or 4 NPS
Instrument Connection:	¼ or ½ NPT Female
Flange Ratings:	ASME 150, 300, 600, 900, 1500, 2500
Flange:	Raised face or ring joint
Added Tolerance:	±0.5% typical
Wetted Components:	Diaphragm
Non-Wetted Components:	Top housing and flange: 316L SS

SIL CAPABLE SWITCHES



A-SERIES SWITCHES

B-SERIES SWITCHES



SPECIFICATIONS

Accuracy: **A-series:** ±2.0% of span; **B-series:** ±1.0% of span

Ranges: **A-series:** Vac to 15,000 psi; **B-series:** Vac to 3,000 psi

Weather Protection: **A-series:** IP67, NEMA 6
B-Series: IP66, NEMA 4X

Explosion Proof: **A-Series:** IP67, NEMA 4X, 7, 9
B-Series: IP66, NEMA 7, 9

Approvals: **Watertight:** **A-Series:** UL, CSA, CE, CRN, SIL 3 Capable, RoHS
B7 Series: FM, CSA, CE, CRN, SIL 3 Capable, RoHS

Explosion Proof: **A-Series:** FM, UL, CSA, ATEX, IECEx, CE, CRN, SIL 3 Capable, RoHS2
B-Series: UL, CSA, ATEX, IECEx, Dual Seal, CE, FM, SIL 3 Capable, RoHS2

Wetted Materials: **Sensing Element:** **A-Series:** 316L SS
B-Series: Buna-N, Viton®, Teflon®, 316 SS or P-Monel®

A2X AND A4 TRANSDUCERS



A2X TRANSDUCER



A4 TRANSDUCER



Accuracy: ±0.25%, ± 0.50% or ±1.00% of span

Ranges: 15 to 7,500 psia, 1.5 to 10,000 psig or compound to 100 psig

Output: **A2X:** 4-20 mA, 0-5, 0-10, 1-5, 1-6
A4: 4-20 mA

Connections: ¼ NPT or ½ NPT

Wetted Materials: Diaphragm: 316L SS or 17-4 pH SS
Process Connection: 316L SS

Approvals: **A2X:** Explosion/flame proof, cUL, ATEX, CE, FM (for intrinsically safe 4-20 mA output only)
A4: Intrinsically safe/non incandive, CSA, FM, CE

EI AND EL THERMOMETERS



Accuracy: ±1.0% of span

Sizes: 2", 3" or 5"

Ranges: -80°F to 1,000°F (-50°C to 500°C)

Weather Protection: IP66, NEMA 4X

Connections : ¼ NPT, ½ NPT, plain or pointed plain

Wetted Materials: 316L SS or 304 SS

Case Material: 304 SS or 316L SS

Mounting: EI: Everyangle™, Rear or Lower
EL: Everyangle™ (Liquid Filled)

THERMOWELLS



Process Connections: Threaded
Socket Welded
Weld-In
Flanged
Van Stone

Connections: ½ NPSM or ½ NPT Male

Wetted Materials: 304 SS, 316 SS and others

Shank Style: Straight, Tapered or Stepped

Bore Sizes: 0.260" or 0.385"

ACCESSORIES



Types

- Siphons
- Pressure Limiting Valves
- Needle Valves
- Capillaries
- Multiport Valves and More...

