MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

BENTLY NEVADA

165855-11

ARMORED CYLINDER PRESSURE TRANSDUCER

Used with the applicable 3500 System configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

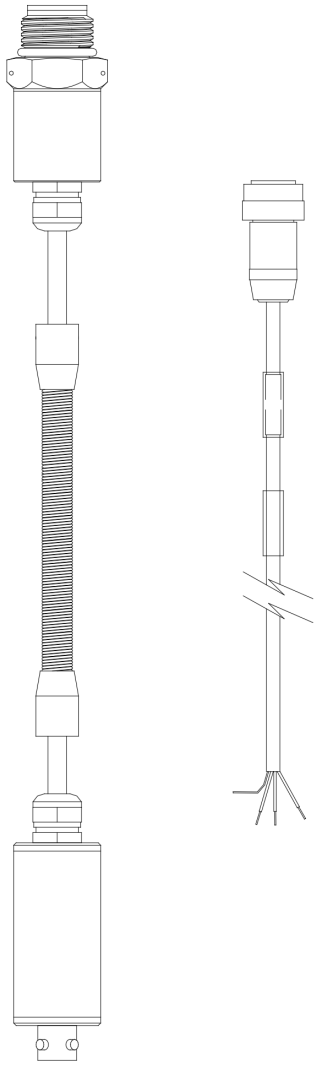
Source: Bently Nevada 166815 Rev. L p. 5 and Rev. M pp. 1-4, 7

165855 Cylinder Pressure Transducer

Datasheet

Cordant™

166815 Rev. M



Description

The Cylinder Pressure System consists of the 165855 Cylinder Pressure Transducer and the 146824 Interconnect cable. It is intended for measuring the cyclic absolute pressure changes inside a reciprocating compressor cylinder. This transducer is an integral part of a Reciprocating Compressor Condition Monitoring and Asset Management System when utilized with our 3500/77M Cylinder Pressure Monitor and System 1 Plant Asset Management Software.

The Cylinder Pressure Transducer has a robust design for high reliability in harsh chemical environments. The unique, patent-pending design also allows the transducer to continue to provide an accurate pressure reading, even after being continually cycled over large pressure gradients for an extended period of time. The transducer can also withstand over-pressure situations caused by application upsets without diaphragm degradation, returning to normal operation when the operating pressure returns to the transducer's specified operating pressure range. The Cylinder Pressure Transducer is also designed to meet NEMA 4X and IP67 conditions for moisture ingression.

The wetted surface of the transducer is typically installed into an isolation valve or similar pressure indicator port on the compressor. A special adapter is usually required to provide a seal between the pressure indicator port and the transducer (such as the 166393 adapter). The electronics portion of the Cylinder Pressure Transducer is separated from the wetted surface by 1 metre of cable. The electronics must be secured on or near the compressor for optimal performance.

Baker Hughes

Each pressure sensor will be shipped with pressure-temperature compensation data in order to optimize the measurement. Inputting the supplied data points into the 3500/77 Cylinder Pressure Monitor can minimize the operating temperature effects on the transducer.

Specifications

Cylinder Pressure Transducer System

Operation outside the specified limits will result in false or inaccurate readings.

Transducer Characteristics	
Measurement Range	0 to 100/ 250/ 500/ 1000/ 2500/ 5000/ 10,000 psia 0 to 6.8/ 17/ 34.5/ 69/172/ 345/ 689 bar
Proof (Over) Pressure	1.5X Full Scale
Burst Pressure	3X Full Scale (2X FS on 689 bar/ 10,000 psia units)
Full Scale Output	10 ± 0.3 Vdc
Zero	0.5 ± 0.1 Vdc
Power Supply	18 to 30 Vdc
Max. Current	< 15 mA
Compensated Temperature	-40 to 85° C -40 to 185° F
Thermal Zero Shift	-1.0 to +2.0 (for 6.8 and 17 bar/ 100 and 250 psia) %FS -0.5 to +1.5 (for all other pressure ranges) Note: Within compensated temperature range.
Thermal Sensitivity Shift	See Graphs and Figures on page 7.
Linearity, Hysteresis, Repeatability	£ ±0.3 %FS
Frequency response	0Hz to 5500 Hz ± 1 dB
Operating Temperature	-40 to 85 (electronics housing) °C -40 to 150 (sensor head) °C -40 to 185 (electronics housing) °F -40 to 302 (sensor head) °F
Overvoltage Category	II

Physical & Environmental

Outdoor Use: Standard installation for these sensors is in a protected enclosure with wiring protected in conduit. Splash boots can be added for additional protection if needed by customer's requirements.

Weight	250 g (0.55 lbm) Sensor Head 150 g (0.33 lbm)
Dimensions	See diagram
Materials	Gold plated, per MIL-G-45204 Type III Grade A, C-276 welded to a 316L stainless steel body. (patent pending)
Humidity	95% condensing on exposed surfaces excluding connector
Body	Designed to meet IP67
Operating Temperature	Dependent upon O-ring material Hifluor: -26°C to 150 °C (-15 °F to 302 °F) Ethylene Propylene: -40°C to 150 °C (-40 °F to 302 °F)
Pressure Media	Fluid media compatible with C-276 and either Hifluor or Ethylene Propylene o-ring material (common media below)
Pollution Degree	2
Maximum Use Altitude	2000 meters above sea level

Sensor, adapters, isolation valves, or sealing rings that are not compatible with process gases will corrode and fail. This failure may result in gas leaks, fire, explosion, or projectiles. To prevent corrosion and failure, verify that all components are compatible.

O-rings

The o-ring utilized must be compatible with the type of gas or fluid that the transducer will be operated in. Consult your local representative for additional assistance.

Hifluor (black)	Hydrogen sulfide, sulfuric acid, butane, fuel oil, petroleum oil, turbine oil, propane, propylene, butylenes, and natural gas.
Ethylene Propylene (purple)	Ammonium hydroxide, anhydrous ammonia
Mounting Torque	68 N-m (50 lbf-ft)

Accessories

29660-01	Mounting clamp for electronics housing
166393-01	¾-14 NPT Adapter
166393-02	½-14 NPT Adapter
04500022	ADH Dow 4 Elec Ins Comp 4cc Tub
3500/77M	Cylinder Pressure Monitor

Notes

1. 165855 designed to mate per SAE J1926. Transducer does not seal pressure sufficiently if not mated per SAE J1926.
2. Transducer diaphragm may become damaged upon contact with any foreign object. Care must be taken to protect diaphragm during handling and installation to help ensure proper performance.
3. O-ring must be adequately lubricated with supplied Parker Super-O-Lube prior to installation.
4. Depending upon application, acoustic resonance may occur. For specific details on acoustic resonance and indicator valves, contact your local sales or service representative for more information.
5. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

It is highly recommended that an isolation valve be used in conjunction with the 165855 Cylinder Pressure Transducer. Valve materials must be compatible with sour gas environments.

For more information about installing and maintaining this product, refer to the Cylinder Pressure Transducer User Guide (document 166820).

Graphs and Figures

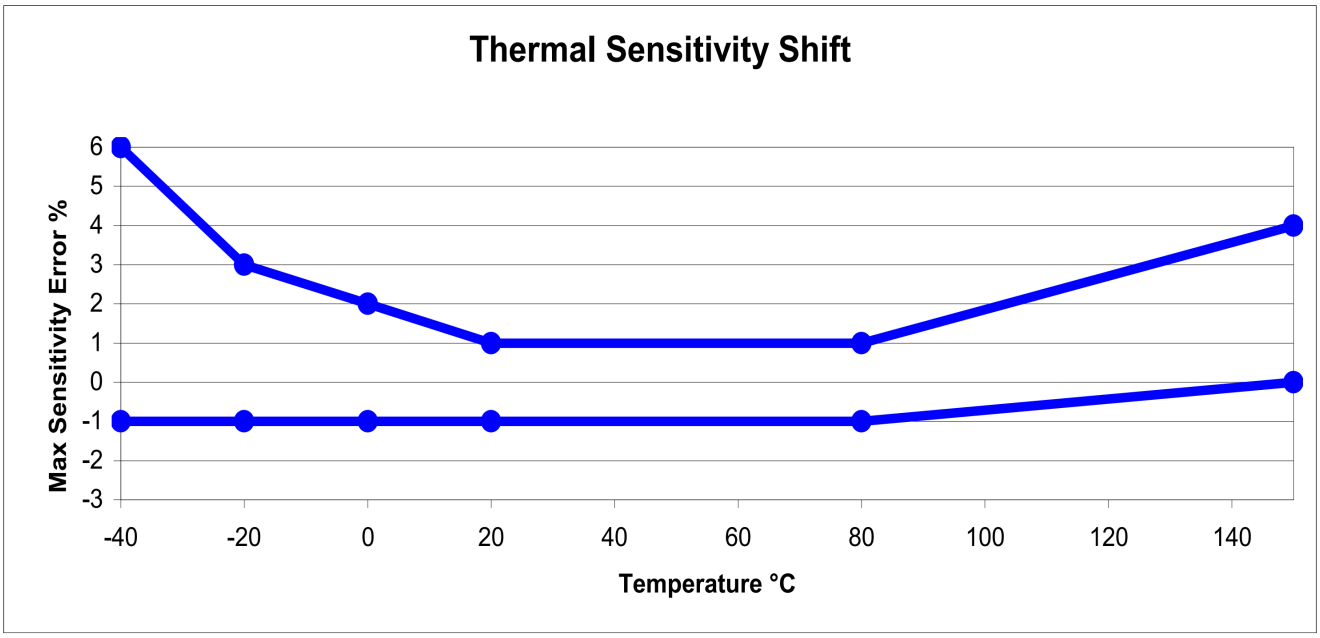
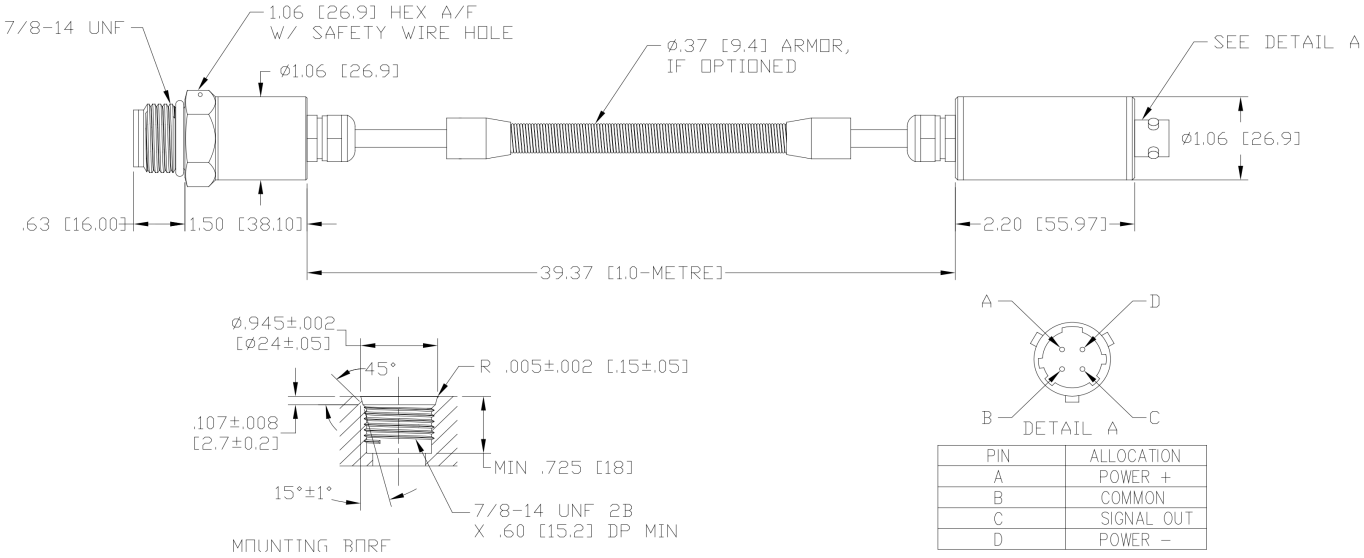


Figure 1: Typical Thermal Sensitivity Shift



PIN	ALLOCATION
A	POWER +
B	COMMON
C	SIGNAL OUT
D	POWER –

Figure 2: 165855-AA Cylinder Pressure Transducer and Bore per SAE J1926