

165855 Cylinder Pressure Transducer

Bently Nevada* Asset Condition Monitoring

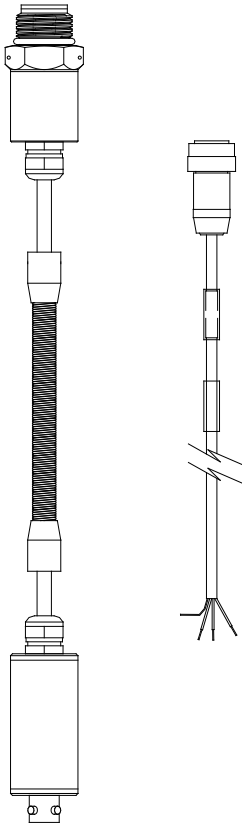
Description

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 ingress.

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.

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 diagram

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

Physical & Environmental

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)

Specifications and Ordering Information
Part Number 166815
Rev. H (08/12)

Pressure Media:

Fluid media compatible with C-276 and either Hifluor® or Ethylene Propylene o-ring material (common media below)

O-rings:

Note: 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)

EMC Directives

Electrostatic Discharge:

EN 61000-4-2, Criteria B

Radiated Susceptibility:

EN 61000-4-3, Criteria A

Conducted Susceptibility:

EN 61000-4-6, Criteria A

Electrical Fast Transient:

EN 61000-4-4, Criteria B

Surge Capability:

EN 61000-4-5, Criteria A

Magnetic Field:

EN 61000-4-8, Criteria A

Patents

Components or procedures defined in this patent apply to this product.

Ordering Information

165855 Cylinder Pressure Transducer

(All transducers have 7/8-14 UNF thread and are supplied with North American and ATEX approvals.)
165855-AXX

A: Pressure Range Option

01	0 to 6.8 bar (0 to 100 psia)
02	0 to 17 bar (0 to 250 psia)
03	0 to 34.5 bar (0 to 500 psia)
04	0 to 69 bar (0 to 1,000 psia)
05	0 to 172 bar (0 to 2,500 psia)
06	0 to 345 bar (0 to 5,000 psia)
07	0 to 689 bar (0 to 10,000 psia)
11	0 to 6.8 bar (0 to 100 psia) w/ armor
12	0 to 17 bar (0 to 250 psia) w/ armor
13	0 to 34.5 bar (0 to 500 psia) w/ armor
14	0 to 69 bar (0 to 1,000 psia) w/ armor
15	0 to 172 bar (0 to 2,500 psia) w/ armor
16	0 to 345 bar (0 to 5,000 psia) w/ armor
17	0 to 689 bar (0 to 10,000 psia) w/ armor

146824 Cylinder Pressure Transducer Cable

146824-AXXXX

A: Length Option

0010	10 ft (3 m)
0025	25 ft (7.6 m)
0050	50 ft (15.2 m)
0100	100 ft (30.5 m)
0200	200 ft (61.0 m)
0300	300 ft (91.4 m)
0400	400 ft (121.9 m)
0500	500 ft (152.4 m)
1000	1,000 ft (304.8 m)

Hazardous Area Approvals

CSA/NRTL/C


A/Ex ia IIC Class I Zone 0
Class I, Div. 1
Groups A, B, C, D
T4 @ Ta = -40 °C to +85 °C

A/Ex nA IIC Class I Zone 2
Class I, Div 2, Groups A,B,C,D
T4 @ Ta = -40 °C to +85 °C

*Certification
Number*


1553221

ATEX

 II 1 G
Ex ia IIC T4
T4 @ Ta = -40°C to +85°C
(-4°F to +150°F)

*Certification
Number*

LCIE 04 ATEX 6031X

 II 3 G
Ex nA II T4
T4 @ Ta = -40°C to +85°C

*Certification
Number*

LCIE 04 ATEX 6032X

IECEX

IECEX CSA 10.0014
EX ia IIC T4 Ga
Ex na IIC T4 Gc
IP67
T4 = -40 °C ≤ Ta ≤ +85 °C

Brazil

Ex ia IIC T4 Ga
DNV 12.0101C
Ex ic IIC T4 Gc
DNV 12.0102x
-40°C ≤ Ta ≤ +85°C

Accessories

29660-01

Mounting clamp for electronics housing

166393-01

¾-14 NPT Adapter

166393-02

½-14 NPT Adapter

166820

Cylinder Pressure Manual


161838

2cc Parker Super-O-Lube®

3500/77M

Cylinder Pressure Monitor

Notes

-  165855 designed to mate per SAE J1926. Transducer will not seal pressure sufficiently if not mated per SAE J1926.
- 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.
- O-ring must be adequately lubricated with supplied Parker Super-O-Lube prior to installation.
- 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.
- 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.

Specifications and Ordering Information
Part Number 166815
Rev. H (08/12)

Graphs and Dimensional Drawings

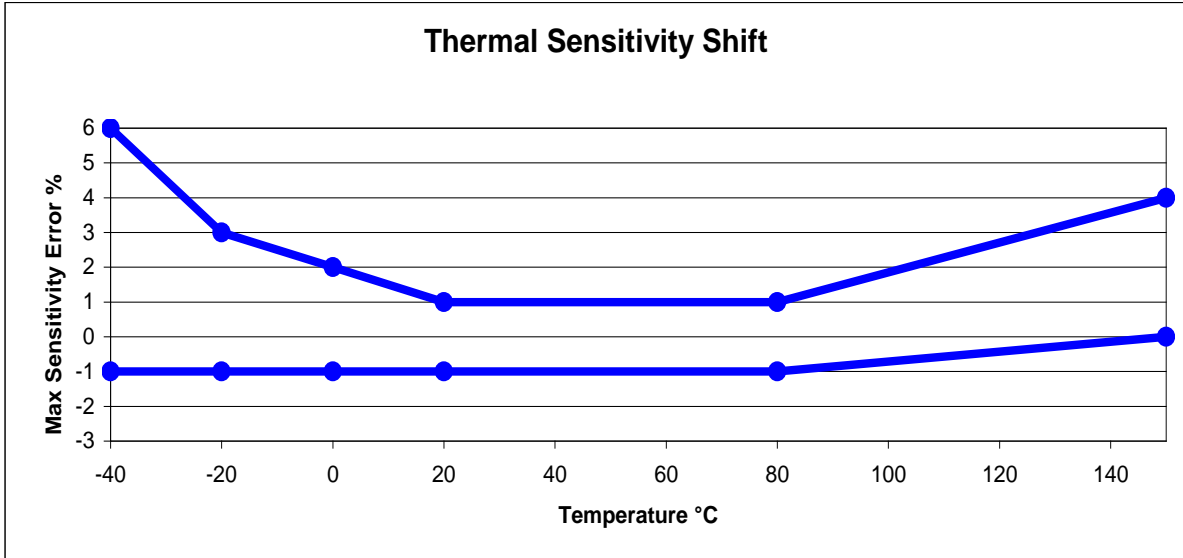


Figure 1. Typical Thermal Sensitivity Shift

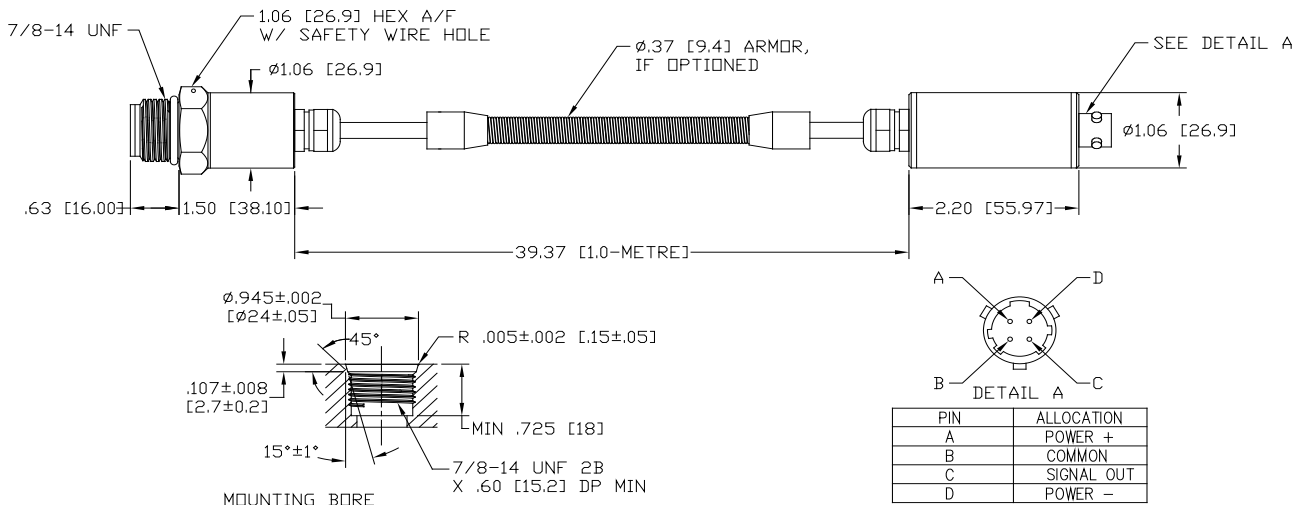


Figure 2. 165855-AA Cylinder Pressure Transducer and bore per SAE J1926

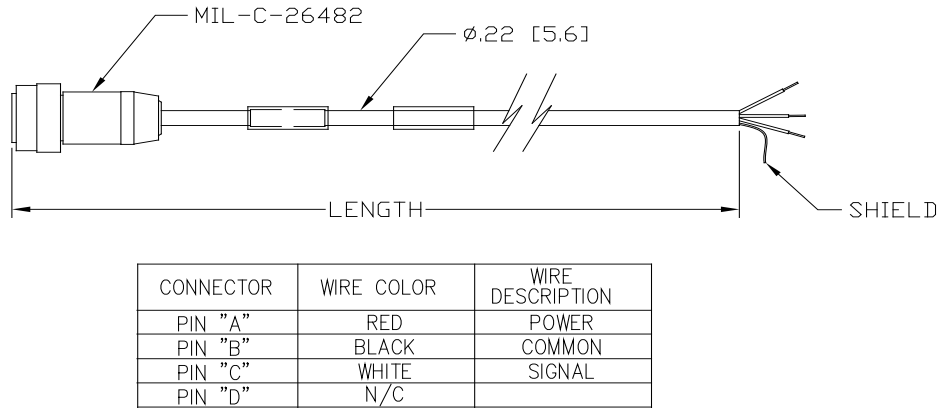
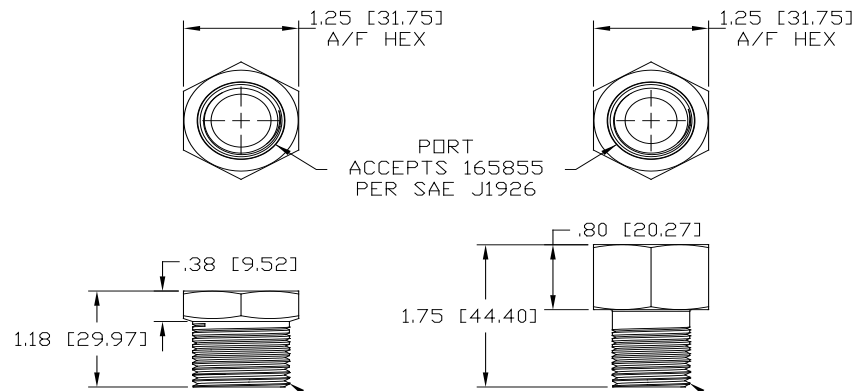


Figure 3. 146824-AAAA Cylinder Pressure Cable



Adapter notes:

1. The 166393-AA adapter is rated to 345 bar (5,000 psi) per ASME B31.1.
2. When exceeding 345 bar (5,000 psi), the 166393-AA is not recommended. In applications exceeding 345 bar (5,000 psi), direct mounting of the 165855 transducer per SAE J1926 is highly recommended.

Figure 4. 166393-AA Adapter

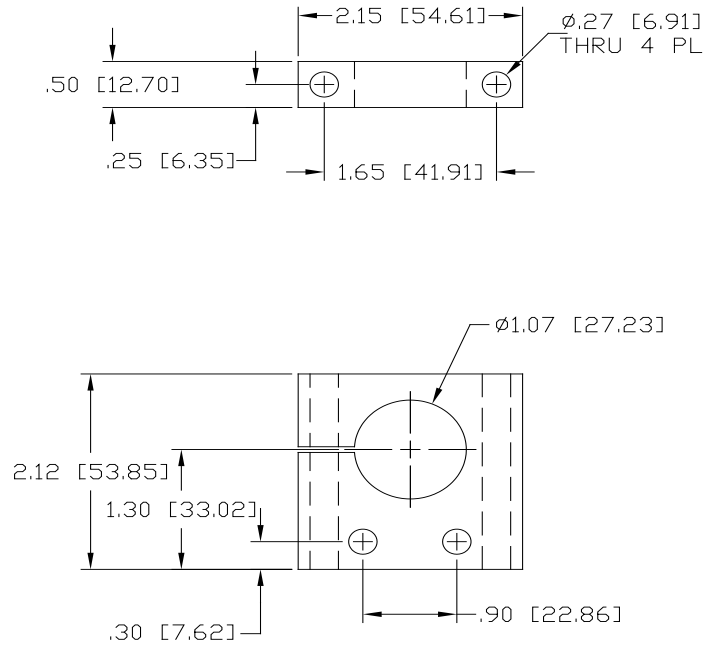


Figure 5. 29660-01 Mounting Clamp, use with M6 or ¼-20 (not supplied)

* Denotes a trademark of Bently Nevada, Inc., a wholly owned subsidiary of General Electric Company.

Hifluor® is a trademark of Parker Hannifin Co.

Parker Super-O-Lube® is a registered mark of Parker Hannifin Corporation, O-ring Division

CSA® is a registered mark of CSA-International

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1631 Bently Parkway South, Minden, Nevada USA 89423

Phone: 775.782.3611 Fax: 775.215.2873

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