Pressure Sensor

A6082E

General Operation Manual

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GENERAL DESCRIPTION

A transducer is a device, which provides a usable output in response to a specified physical condition. In the case of a pressure transducer, the usable output is an electric signal and the specified physical condition is an application of pressure.

Pressure transducers are able to convert applied pressure to an electric signal through various technologies. The technology used in the A6082 series of pressure transducers is inorganically bonded strain gauge.

The model A6082E Pressure transmitter is a complete pressure measurement device for use in on-line reciprocating compressor monitoring systems. These transmitters are ideally designed to be incorporated in head-end and crank-end indicator ports. Using the specifically designed transmitters, the C-Guard system is capable of producing on-line continuous PT/PV pressure traces.

PRINCIPLE OF OPERATION

The A6082 pressure sensor provides a standard two-wire current loop output and has been designed for harsh environments.

MACHINE CONNECTION

Indicator cocks allow pressure measurement inside the cylinder, and thus are required on any compressor cylinder requiring pressure measurements.

Install a full-opening valve with a ½" NPT connector for the sensor. A straight-through port of 1/8" diameter or larger is acceptable in a valve. Restricted port valves such as needle valves are not desirable for compressor analysis, as they dampen higher frequencies.

We recommend a Whitey Valve with PEEK material for easy shutoff and removal of the sensor for calibration and replacement.

Cylinders must be drilled and tapped into the clearance volume (for compressors, both the head end and crank end), where the piston will not cover the opening.

The sensor requires five (5) inches minimum clearance in line with the end of the valve so as to leave enough room to install and remove.

Keep the connection as short as possible. Avoid using elbows if at all possible. Elbows may obstruct the pressure flow into the sensor.

CALIBRATION

To calibrate the sensor, a deadweight tester must be used to simulate full scale pressure on the sensor. The following steps will should be followed.

STEP 1: Remove the sensor from the compressor indicator port.

Caution: *Make sure the pressure is removed from the sensor prior to removing.*

STEP 2: Unscrew the connector assembly from the sensor body. This is done by placing the sensor 7/8 hex flats into a vise and grasping the flats of the connector assembly and turning. There are approximately five turns.

STEP 3: Attach cable to sensor and connect per figure 1 making sure to observe proper polarity.

Caution: *Reversing the polarity may cause permanent damage to the sensor.*

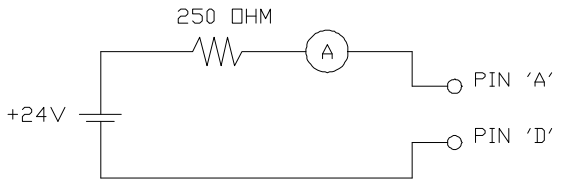


Figure 1

STEP4: Adjust ZERO pot until 4.00 mA is displayed on meter. Refer to Figure 2 for ZERO and SPAN pot locations.

STEP5: Place sensor on deadweight tester and apply full scale pressure. Adjust SPAN pot for 20.00mA on meter.

Repeat steps 4 and 5 once more to verify zero and full scale. Reassemble the sensor.

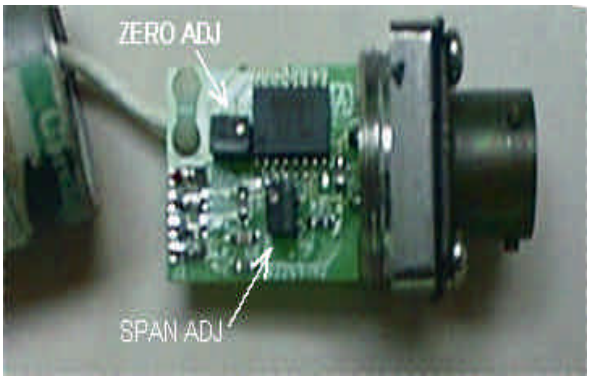


Figure 2

CONNECTIONS

The C-Guard accepts two pressure sensors, one for the

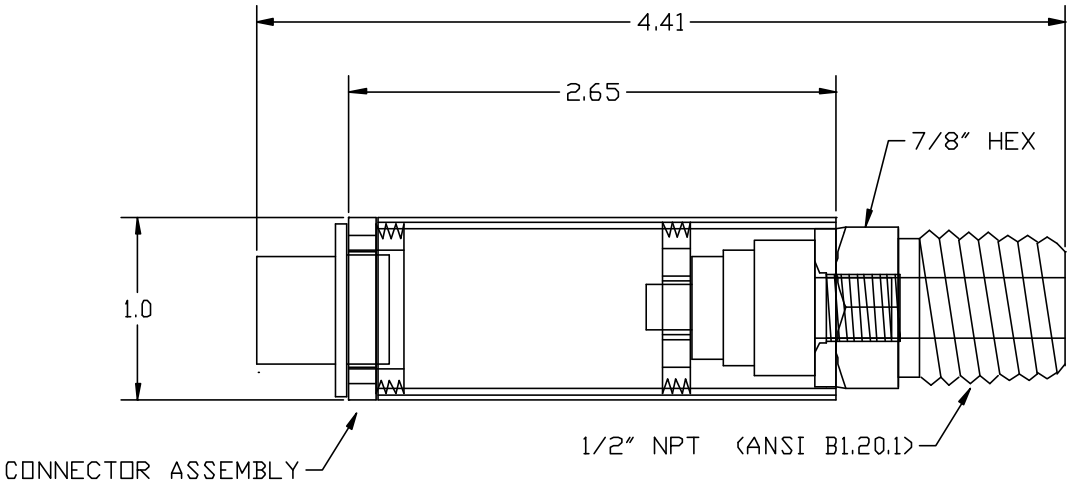
head-end and one for the crank-end of the cylinder.

Note: *Make sure to connect the head-end (HE) to the input marked HE PRESS and the crank-end to the input marked CE PRESS.*

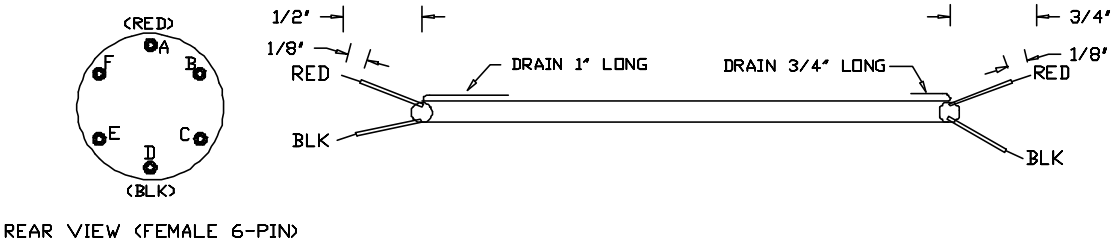
If the sensors are reversed, the calculations preformed on the pressure signal will be incorrect and will lead to erroneous information.

The pressure sensor cable diagram is shown at the end of the manual. Connect pin 'A' of the 6 pin connector to the plus (+) input of the C-Guard and pin 'D' of the 6 pin connector to the minus (-) input of the C-Guard.

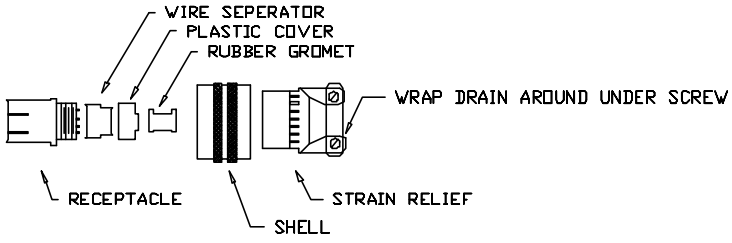
The sensor should be connected using shielded twisted pair cable. In some instances, a flexible metal hose can be placed over the cable to provide extra mechanical protection near the sensor.



MECHANICAL DRAWING



REAR VIEW (FEMALE 6-PIN)



CABLE DRAWING (Typical)

SPECIFICATIONS

ENVIRONMENTAL

Temperature Range:
Operating: -65EF to +250EF
Shock Limit:
5,000g pk

ELECTRICAL

Output:
4-20 mA
Frequency Response:
DC to 5KHz
Power:
+15 to +45 VDC
Case Isolation:
$>10^8$ ohms
Calibration Accuracy:
+/- 1/0% / 100 EF
Zero Temperature Compensation:
+/- 1/0% / 100 EF
Span Temperature Range:
+/- 1/0% / 100 EF

MECHANICAL

Size(hex x height):
1.0in dia x 4.41in long
Weight:
5 oz
Mounting Thread:
1/2 NPT male thread
Mounting Torque:
Maximum 15 ft-lb
Case Material:
316 Stainless steel
Connector Type:
MS3106A/Top (6 pin)
Cycle Life:
3.5 Billion cycles
Maximum Pressure Rating:
7238 PSI

APPROVALS

Intrinsic Safety Specification:

Independently rated for Class I, Div 1, Groups A,B,C,D per the following specifications:

Intrinsically Safe & Associated Apparatus for Use in Class I, II, and III Division 1, Hazardous (Classified) Locations - UL 913

Intrinsically Safe and Non-Incendive Equipment for Use in Hazardous Locations- CAN/CSA C22.2 No 157-92

Electrical Equipment for Use in Class I and Class II, Division 2, and Class III Hazardous (Classified) Location UL 1604

Non-incendive Electrical Equipment for Use in Class I, Division 2 Hazardous Location- CSA C22.2 No. 213-M1987

ORDERING INFORMATION

A6082E-XX Where:

XX	= pressure range
01	100 PSI
02	300 PSI
03	500 PSI
04	1000 PSI
05	2000 PSI
06	5000 PSI
07	200 PSI

(Note: mating connector P/N is Windrock P/N 00500023)