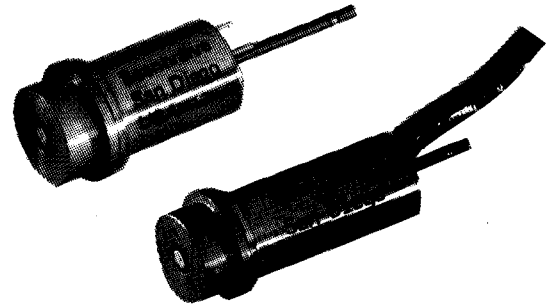




Features

- High accuracy (0.06% B.S.L.)
- High overpressure capability
- Temperature compensated
- Available in ranges 10 inch H₂O thru 0 - 500 psid
- Maximizes Scanivalve scanning speeds



PDCR24 (top), PDCR23 (bottom)
Pressure Transducers

General Description

Genuine Scanivalve Pressure Transducers represent the ultimate technology for transducers used in a pressure scanning application. Scanivalve engineers have eliminated short-comings found in other Scanivalve compatible transducers, enabling users to upgrade the performance of previously purchased Scanivalves.

The PDCR transducer technology is a 4 arm strain gage bridge diffused into a single crystal silicon diaphragm. This state-of-the-art pressure transducer gives the user the following benefits.

1. High accuracy of $\pm 0.06\%$ B.S.L. (Best Straight Line) including non-linearity and hysteresis on 1 psid and up.
2. Over pressure of 4X rated pressure or 750 psi maximum without damage or calibration shift.
3. Temperature compensation minimizes zero and span shifts to less than $\pm 0.02\%$ F.S. per degree C for 2.5 psid and up.

The single silicon diaphragm also affords a demonstrated fatigue life in the billions of cycles. The diaphragm is incorporated into the nose of the transducer to minimize "traveling volume"* and yet prevent possible zero shift should oil migrate into the transducer cavity.

Applications

The PDCR23 (integral cable) and PDCR24 (pin connector version) are compact, flush mounted differential pressure transducers. They are specifically designed for use in all standard Scanivalves.

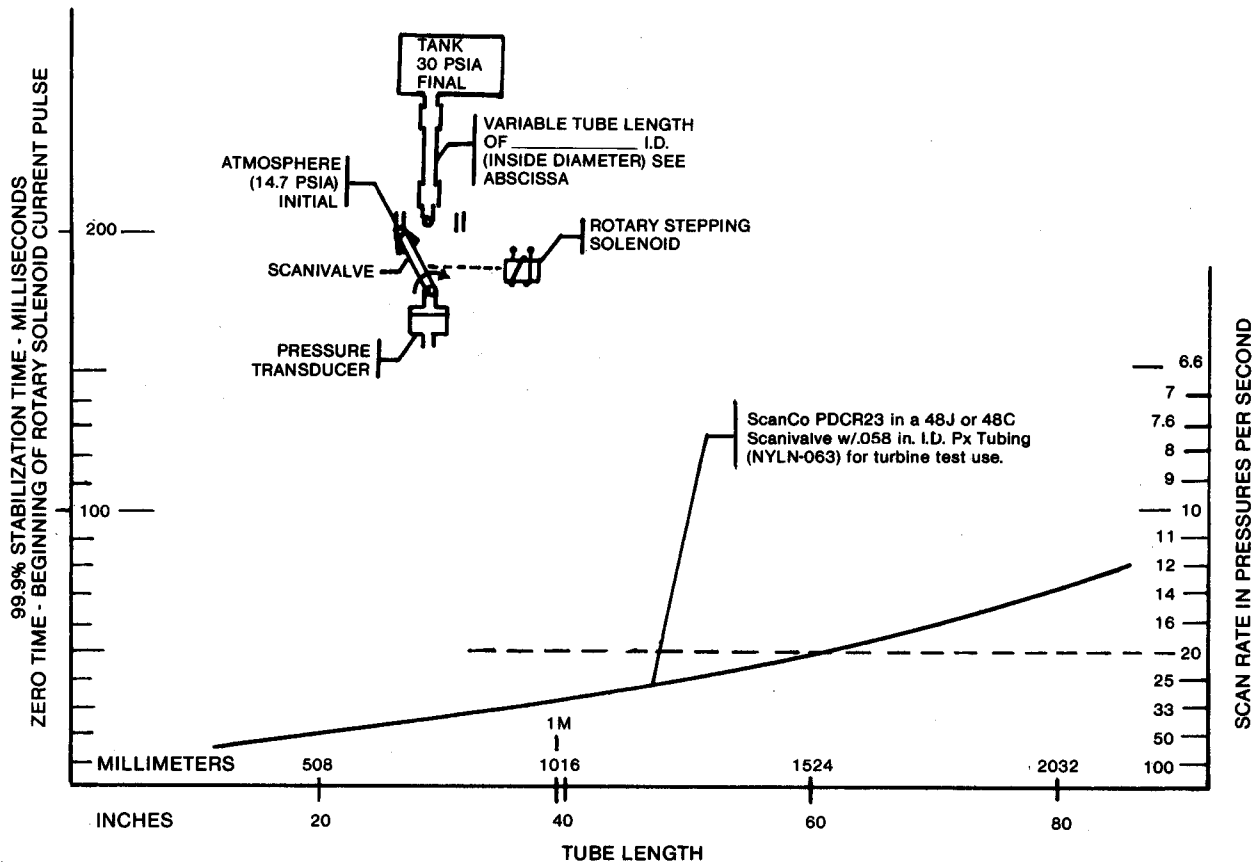
The reference side of sensor can be evacuated for absolute pressure measurements.

Several "Scanivalve compatible" pressure transducers are currently available from various manufacturers. Important differences exist between these transducers and care must be taken to select the proper type. Scanivalve's line of pressure transducers have been developed specifically for pressure scanning service to eliminate the need for a specialized fitting procedure and maximize Scanivalve scanning speed.

These models may also be used as an individual pressure transducer. The use of our ZVPA (Zero Volume Pressure Adaptor) allows the PDCR to be connected to .063 inch or .125 inch flexible tubing.

*Traveling volume is the volume within a rotary Scanivalve that must change pressure when scanning from one input to the next. This volume is the primary factor in determining the scan rate attainable in a particular system.

Typical Transducer Settling Time



Scanivalve Speed

Scanivalves equipped with genuine Scanivalve transducers may be used at scan rates to 20 ports/sec. dependent upon tube size and tube length. See stabilization time curve above.

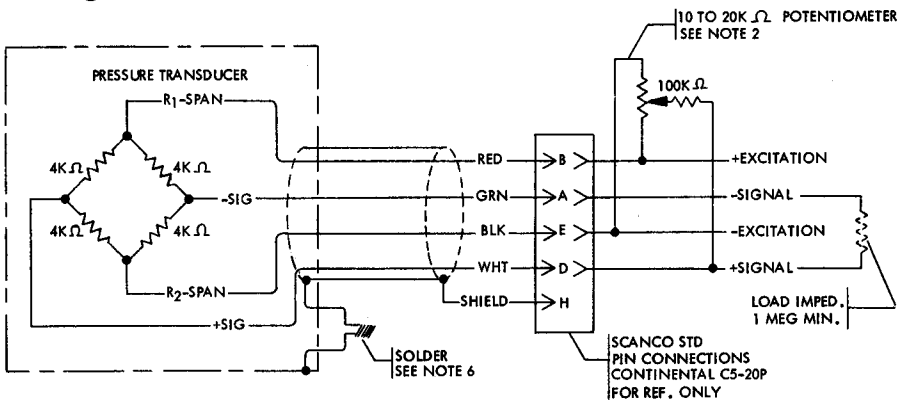
Scan rates can be adversely affected by long lengths of small diameter input tubes. The figure above shows that 1 meter of NYLN-063 (.058 inch I.D.) tubing is the maximum length for $\pm 0.1\%$ data at scanning speeds of 20 pressures/second.

When long line lengths are required, such as those typically used in turbine testing, the above graph no longer applies. Tube lengths required for these applications could be 100 - 200 feet which makes the above graph appear to be impractical.

The Scanivalve Systems, Model SSS, DSS and MSS have been designed to overcome the small diameter long line length restriction.

These models have .058 inch I.D. tubing connecting the Scanivalve to the pressure input panel and it is always kept less than 1 meter in length. Our recommendation is for $\frac{1}{4}$ inch Nylon tubing (.187 inch I.D.) to go from the pressure input panel to the turbine test stand. Because the first meter of this $\frac{1}{4}$ inch nylon tubing contains more than 1000 times the "traveling volume" of the Scanivalve, this volume acts as a storage volume which supplies the inflow for the "traveling volume." This technique (using $\frac{1}{4}$ inch input tubing adjacent the input panel) circumvents the 1 meter tubing limit shown in figure above.

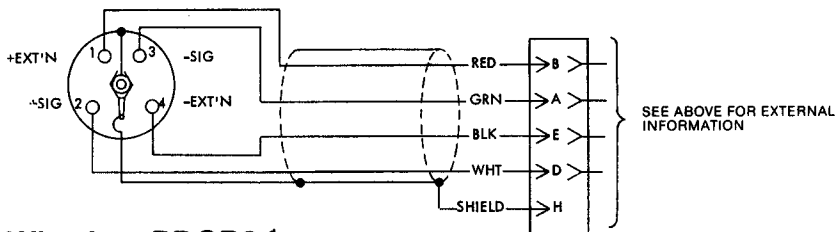
Bridge Circuit



Notes:

1. Current consumption at rated excitation is less than 3ma.
2. Zero offset (normally less than 3mv) can be adjusted using a potentiometer connected as shown.
3. For positive R_{cal} insert calibration resistor between GRN and BLK. For negative R_{cal} insert calibration resistor between WHT and BLK.
4. The Ref. pressure tubulation is grounded to the pressure transducer case.
5. At rated 12v excitation
6. Cable shield is grounded at factory.

Wired as PDCR23



Wired as PDCR24

Accessories For Use With PDCR Transducers

1. Signal Conditioners

SCSG2/±5V/VG:

12vdc excitation supply plus 0 - 5 volt variable gain output

SCSG2/4 - 20ma:

12vdc excitation supply plus 4 - 20ma output

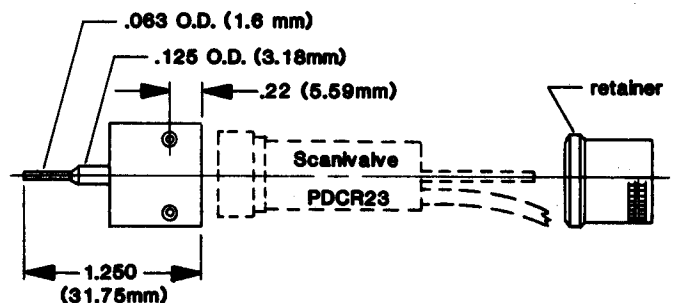
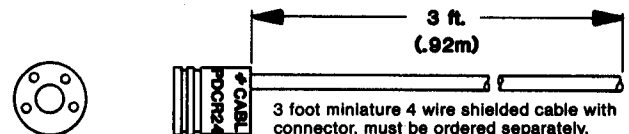
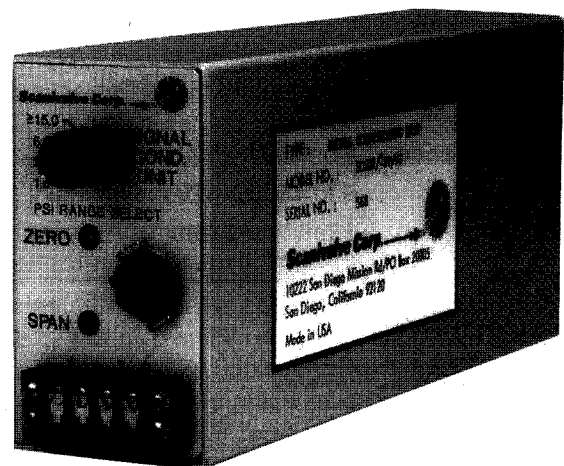
SCSG2/mv:

12vdc excitation supply, but no amplified signal (mv output)

2. Pressure Transducer Cable for Model PDCR24 only. ScanCo No. CABL PDCR24

3. Stand-alone Adapter

ScanCo No. ZVPA/06-12 Zero Volume Transducer Adapter has the same 0.5 inch transducer cavity used in all Scanivalves. It is used to connect vinyl or nylon tubing to plus side of the diaphragm. A model with a purge feature is also available. (ScanCo. No. ZVPA/Purge).



Specifications

Pressure Ranges: ±10 inch H₂O, 20 inch H₂O, 1, 2.5, 5, 15, 50, 100, 200, 500 psid.
Contact factory for intermediate ranges.

Transducer Element: Four-arm strain gage bridge diffused into a single crystal silicon diaphragm

Static Accuracy: 10 inch H₂O[†] ±0.30% F.S.
(Worst Case) 20 inch H₂O[‡] ±0.15% F.S.
1 psi ±.12% F.S.
2.5 - 500 psi ±0.06% F.S.

Maximum Overpressure: 10 inch, 20 inch H₂O 10 psi
(No Damage) 1 psi 15X F.S.
2.5 psi 10X F.S.
5 psi and up 4X F.S.
or 750 psi max.

Maximum Line Pressure: 250 psi

Plus Side Pressure Media: Fluids compatible with silicon dioxide, stainless steel & epoxys

Reference Side Pressure Media: Dry, non-corrosive gas

Plus Side Internal Volume: 0.0004 in³ (cubic inches)

Reference Side Internal Volume: 0.01 in³ (cubic inches)

Output Impedance: Nominal 4000 ohms

Excitation: 9 to 15vdc, 12vdc nominal

Zero Offset: ±3mv maximum

Full Scale Output: 10 inch 25mv
(Note 5) 1 psi, 20 inch H₂O 17.5mv
2.5 psi 25mv
5 psi 50mv
10 psi and up 75mv

Operating Temperature Range: -40 to +100°C

Compensated Temperature Range: +10 to +40°C

Thermal Zero Shift: 10 inch H₂O ±0.08% F.S./°C

20 inch H₂O, 1 psi ±0.05% F.S./°C

2.5 - 500 psi ±0.02% F.S./°C

Thermal Sensitivity Shift: 10 in., 20 in. H₂O ±0.05% F.S./°C
1 - 500 psi ±0.02% F.S./°C

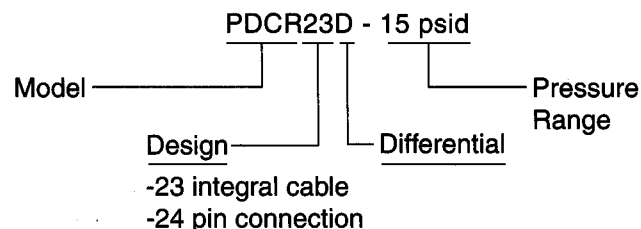
Shock: 1000 g's for 1 ms on any 3 axes

Acceleration: 0.005% FSO/g for 5 psi decreasing to .0003% FSO/g for 1000 psi

Sensitivity: to .0003% FSO/g for 1000 psi

Natural Frequency: Typical >35kHz

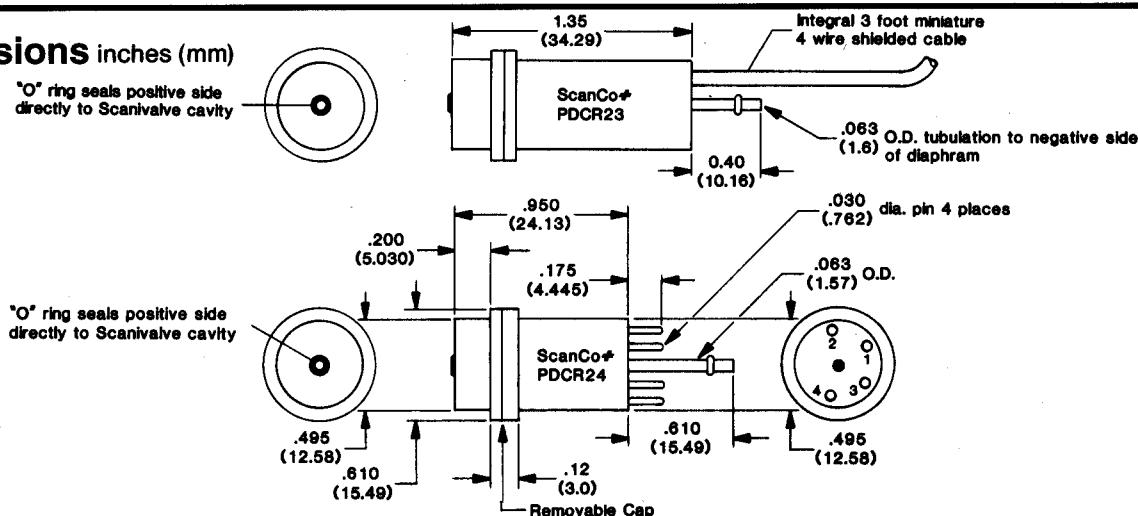
Ordering Information:



[†]10 inch H₂O = 25.4 cm H₂O = .36127 psi

[‡] 20 inch H₂O = 50.8 cm H₂O = .72254 psi

Dimensions inches (mm)



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