

**Druck**



**PDCR 800 SERIES**

## General Purpose Pressure Transducers

### Type PDCR 800 Series

High Accuracy

$\pm 0.1\%$  BSL for ranges to 900 psi

Negligible hysteresis and  
repeatability

Excellent overpressure capability

*Greater than 4 times rated pressure*

Good thermal stability

$\pm 1.5\%$  total error band  $-5^{\circ}$  to  
 $+175^{\circ}\text{F}$

Customized versions available



PDCR 800 Series

# PDCR 800 SERIES

Every PDCR 800 transducer is based on a high performance pressure sensor (core) which has subsequently been completed for a specific application by the addition of an electron beam welded pressure connector and an electrical connector assembly. The core itself is an accurate pressure transducer incorporating a high integrity silicon diaphragm and titanium module, a pcb assembly and advanced compensation techniques which give excellent performance over extended temperature ranges. The final assembly is electron beam welded and encapsulated. These cores are produced in large quantities and following automatic calibration over the whole temperature range and to three times the nominal pressure range all the data is stored in the computer data base.

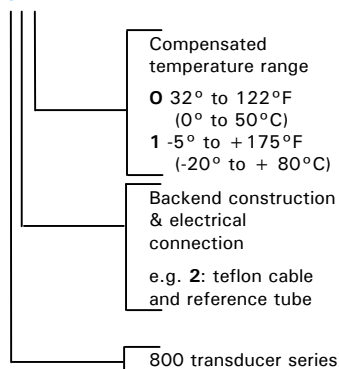
The benefits are a high performance to cost ratio series of the transducers listed below, including the core which can be selected and adapted in many different ways and supplied on short delivery.

## Type number and specification

PDCR 800/801 - Basic core  
PDCR 810/811 - General purpose  
PDCR 820/821 - General purpose  
PDCR 830/831 - Depth  
PDCR 860/861 - Integral connector

This type numbering system denotes the following details:-

### PDCR 8XX



Please refer to temperature effects, ordering information, assembly diagram and installation drawings to fulfill your requirements.

## STANDARD SPECIFICATIONS

### Operating pressure ranges

1, 2.5, 5, 10, 20, 30, 50, 100, 150, 200, 300, 500 and 900 psi gauge.

Other pressure units may be specified e.g., ins.  $H_2O$ , kPa, etc.

Absolute, differential and sealed gauge transducers are available.

For higher ranges refer to PDCR 610/9000 data sheets.

### Negative pressure

All transducers will accurately respond to pressures below gauge (negative pressures) and will operate with a vacuum applied. The reference side of the PDCR 82X is suitable for pressures up to 30 psig.

### Overpressure

The rated pressure range can be exceeded by the following multiples causing negligible calibration change:-

10 x for 1 and 2.5 psi ranges

6 x for 5 psi range

4 x for 10 psi range and above.

Reference side: 30 psi maximum

For higher differential pressures refer to PDCR 10/L/900 data sheets.

### Burst pressure

In excess of 10 x rated pressure.

### Positive pressure media

Fluids compatible with quartz and titanium.

### Reference pressure media

Dry, non-corrosive, non-conducting gases.

For liquid pressure media on reference, refer to PDCR 120/WL data sheet.

### Conducting pressure media

When operating with a conducting pressure media use a fully floating system or ground the +Ve supply.

If this method is not practicable please refer to PDCR 900 data sheet.

### Transduction principle

Integrated silicon strain gauge bridge.

### Excitation voltage

10 Volts @ 5mA nominal.

### Output voltage

17mV for 1 psi range

25mV for 2.5 psi range

50mV for 5 psi range

100mV for 10 psi range and above.

The above outputs are for 10 Volts and are proportional to excitation voltage.

For amplified outputs please refer to PDCR 130/135 data sheet.

### Common mode voltage

Typically + 6.5 Volts with respect to the -Ve supply at 10 Volts excitation.

### Output impedance

2000 ohms nominal.

### Load impedance

Greater than 100K ohms for quoted performance.

### Resolution

Infinite.

### Combined non-linearity, hysteresis and repeatability

±0.1% B.S.L. for all ranges.

### Zero offset

±3mV maximum.

### Span setting

± 10mV maximum. Units of the same range are matched to closer than ± 3mV.

### Operating temperature range

-5° to +175°F (-20° to +80°C) standard.

This temperature range can be extended from -65°F (-54°C) to 250°F (120°C) for PDCR 82X and PDCR 86X.

### Temperature effects

#### PDCR 8X0

±0.5% total error band 32° to 122°F (0° to 50°C) for 2.5 psi ranges and above.

±0.7% total error band 32° to 122°F (0° to 50°C) for 1 psi range.

N.B. PDCR 830 ±0.3%, 30° to 86°F (-2° to +30°C)

#### PDCR 8X1

±1.5% total error band -5° to +175°F (-20° to +80°C) for 2.5 ranges and above.

For -65° to +250°F (-54° to +125°C) temperature range please refer to manufacturer.

Typical thermal zero and span coefficients of ±0.009%/°F (±0.015%/°C)

### Natural frequency

28 kHz for 5 psi increasing to 360 kHz for 500 psi.

For more detailed information please refer to manufacturer.

### Acceleration sensitivity

0.006% F.S./g for 5 psi decreasing to

0.0002% F.S./g for 500 psi.

### Mechanical shock

1000g for 1ms half sine pulse in each of 3 mutually perpendicular axis will not affect calibration.

### Vibration

Response less than 0.05% F.S./g at 30g peak 10Hz-2kHz, limited by 0.5 in. double amplitude (MIL-STD Proc 514.2-2 Curve L).

### Weight

3.5 oz nominal.

### Electrical Connection

#### PDCR 81X, 82X

3 ft. integral cable supplied

#### PDCR 83X

3ft. Vented cable supplied as standard. Continuous lengths up to 500 ft. are available. Please refer to manufacturer for larger lengths.

#### PDCR 86X

6 pin Bayonet receptacle, PTIH-10-6P or equivalent (Hermetic stainless) to MIL-C-26482.

Mating connector type PT06A-10-6S or equivalent not supplied.

### Pressure connection

1/4" NPT Flat end

7/16" UNF (1/4 A.N.) as MS33656-4

1/8" NPT with bulkhead mount (as shown on drawing PDCR 82X)

Flush fitting (M14 x 1.5 thread) - see example installation drawing on back page.

Depth cone (fitted as standard on PDCR 83X)

Others available on request.

Continuing development sometimes necessitates specification changes without notice.

**Ordering information**

Please state the following:

- (1) Type number

**PDCR 8XX**

- 0 32° to 122°F (0° to 50°C)
- 1 -5° to +175°F (-20° to +80°C)
- 0 basic core
- 1 integral vented cable and boot
- 2 teflon cable & reference tube
- 3 depth back end with integral vented cable which incorporates a Kevlar strain relieving core
- 6 integral connector

- (2) Operating pressure range
- (3) Pressure connection
- (4) Pressure media

For non-standard requirements please specify in detail.

**SPECIFICATION OPTIONS**

The following summarizes the possibilities and for further details and ordering information please contact our Sales Office.

**1. Parameter selection**

Every PDCR 800 series transducer is calibrated not only to its nominal full range pressures, but to two times and three times this pressure and also the temperature effects of zero and span are monitored at five temperatures between -5° to +175°F (-20° to +80°C). All this information is stored in a computer and enables us, where it is important, to optimize the performance parameters to suit specific applications. Selection can either be for improved performance in accuracy or temperature drift from standard transducers or to optimize certain parameters by using the transducers in the overrange condition.

**2. Improved accuracy**

The standard linearity and hysteresis is ±0.1% B.S.L., but this can be improved to ±0.05% B.S.L., or even better by selection. In some cases this may result in a reduction of the full scale output.

**3. Higher overload pressure**

The lowest overload pressure for standard devices is 400% but this can be increased up to 1000% where necessary. This will reduce the full scale output and increase the zero drift with temperature unless this is maintained by selection.

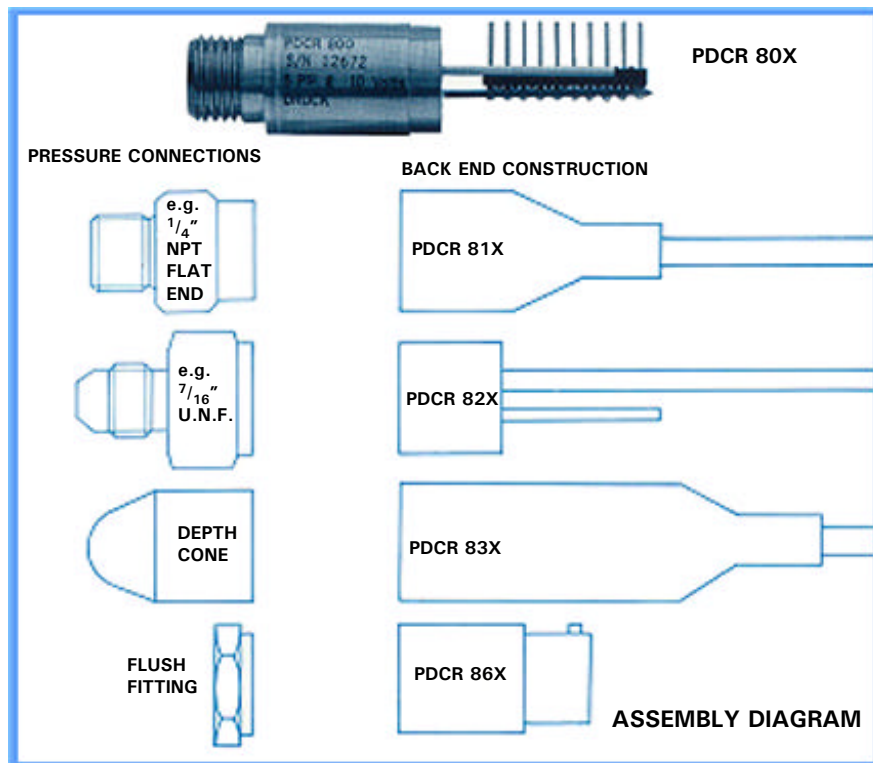
**4. Higher output**

All cores can be overranged by three times nominal full scale, giving outputs of up to 300mV for most ranges. This will improve the zero stability, reduce the overload, and the linearity will be slightly degraded.

N.B. The calibration data available for transducers operating in overload condition is limited to 1000 psi maximum.

**5. Excitation voltage**

The transducers can be operated from any d.c. excitation up to 12 Volts maximum. The output is proportional to excitation, but the exact offset and span should be measured at the desired excitation.



**6. Improved temperature effects**

Improved thermal error bands can be selected from the data base.  
 e.g. ±0.3% 32° to 122°F (0° to 50°C) ±1.0% -5° to 175° F (-20° to +80°C)  
 Other error bands over different temperature ranges can also be selected.

**7. Improved zero stability**

Thermal zero shift and long term zero stability are improved proportionally with overload.

**8. Long term stability**

The standard PDCR 800 series offers typically 0.2% F.S. per year stability at 10 Volt operation, but this can be improved considerably by operating in the overrange condition at a reduced supply voltage.

**9. Thermal hysteresis**

The calibration of a standard transducer at room temperature will repeat within 0.2% F.S. after cycling through the full temperature range.

**10. Rationalization**

The transducers can be selected such that both the zero offset and the full scale output are matched to better than 1% F.S. where interchangeability is important.

**11. Extended temperature range**

Transducers are available which will operate between -65° to +250° F (-54° to +125°C).

Please refer to PDCR 82X2 product note.

**12. Shunt cal.**

This facility is available by connecting an external resistor across the appropriate connection. The thermal coefficient of this Shunt cal. signal is typically 0.0025%/°F.

**13. Calibration print out**

Available on request relating to selected parameters above.

**Examples of alternative specifications based upon a standard 150 psig transducer**

Operating pressure range psi	Overload X.F.S.	Accuracy B.S.L. % F.S.	Output with 10 Volt excitation
100	X6	±0.06%	70mV
150	X4(600 psi)	±0.1%	100mV
300	X2	±0.15%	200mV
450	X1.3	±0.2%	300mV

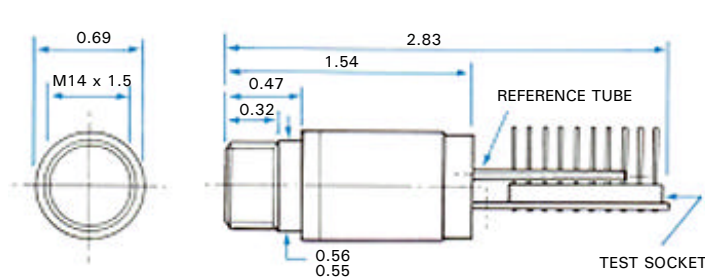
The above example illustrates the various specification performances when using the standard 150 psig core. e.g. used at 300 psi continuously, the overload is X2, accuracy is ±0.15% B.S.L. and output 200mV.

150 psig	X4(600 psi)	±0.06%	100mV
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The above example can be selected if ±0.06% is required with 100mV output for ranges up to 300 psi.

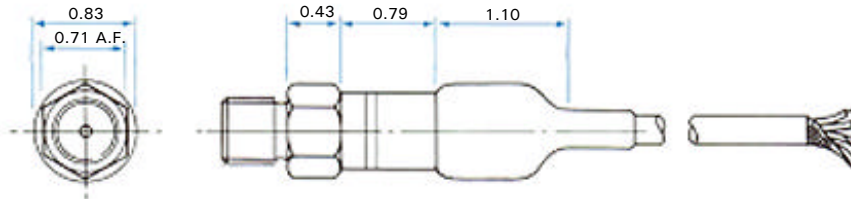
## INSTALLATION DRAWINGS

Dimensions: inches



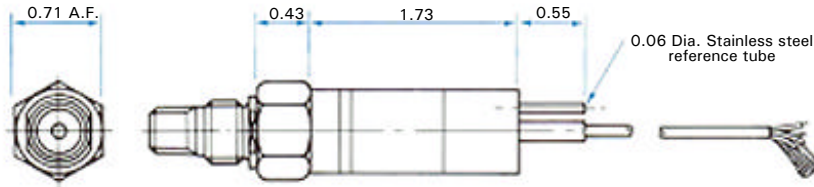
Electrical connection		
Test socket	PDCR 80X	
k	1	Output negative
f	3	Supply negative
e	4	Supply positive
j	5	Output positive

PDCR 80X



Electrical connection		
6 Core shielded/vented cable		
Red	Supply positive	
White	Supply negative	
Yellow	Output positive	
Blue	Output negative	
Shield	N/C to transducer body	
<i>Any other cores not connected.</i>		

PDCR 81X



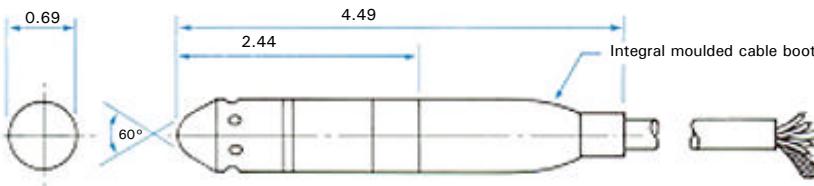
Electrical connection		
4 Core teflon shielded cable		
Red	Supply positive	
Blue	Supply negative	
Yellow	Output positive	
Green	Output negative	
Shield	N/C to transducer body	

PDCR 82X

### Pressure Connection

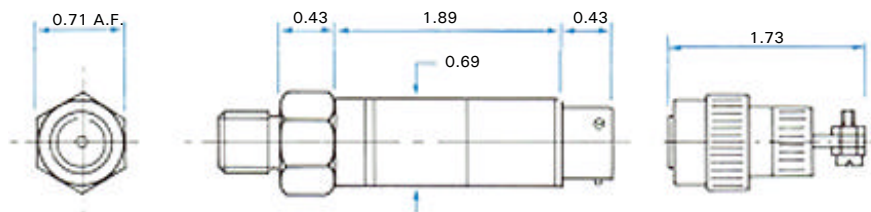
Illustrated front end depth cone fitted as standard.

This incorporates a hydraulic damper to protect the device from high pressure pulses caused by underwater impact.



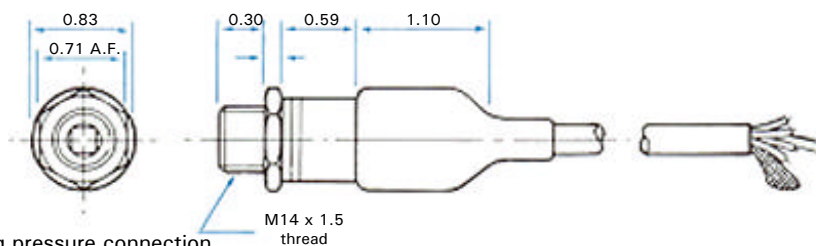
Electrical connection		
6 Core shielded/vented cable		
Red	Supply positive	
White	Supply negative	
Yellow	Output positive	
Blue	Output negative	
Black	} To transducer body	
Shield		
<i>Any other cores not connected.</i>		

PDCR 83X



Electrical connection		
Pin A	Supply positive	
Pin B	Output positive	
Pin C	Output negative	
Pin D	Supply negative	

PDCR 86X



Electrical connection		
6 Core shielded/vented cable		
Red	Supply positive	
White	Supply negative	
Yellow	Output positive	
Blue	Output negative	
Shield	N/C to transducer body	
<i>Any other cores not connected.</i>		

e.g. PDCR 81X

with flush fitting pressure connection



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