

PMP 4000

PMP 4000 Series

Amplified Output Pressure Transducers



- $\pm 0.04\%$ accuracy
- 400% overpressure
- 0.1% stability per annum
- Ranges from 70mbar to 700bar
- Available from core stock



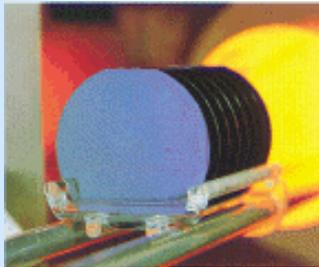
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For over 25 years Druck has manufactured precision pressure sensors with a capability to meet critical applications in industrial, aerospace and research environments.

The PMP 4000 series is the latest complete range of high level output pressure transducers offering new levels of measurement accuracy, stability and flexibility from a standard production device.

At the heart of the 4000 Series is an advanced, high stability pressure measurement element micro-machined from single crystal silicon within Druck's own Class 100 processing facility. The silicon element is mounted within a high integrity glass-to-metal seal and is fully isolated from the pressure media by a Hastelloy isolation diaphragm, electron beam welded to the front of the glass-to-metal seal.



Silicon wafers being loaded into an oxidation furnace.

Surface mount electronics condition the output from the silicon diaphragm, correct for thermal induced errors and configure the output to the required high level voltage. Advanced design features built into the electronic circuitry enables minimum sensor size with utmost reliability. The electronics incorporate power supply regulation, reverse polarity, over-voltage and short circuit protection, coupled with EMC protection components.

The fully encapsulated solid state design ensures integrity of product under high levels of shock and vibration, with an ingress protection rating of IP68, dependent upon the electrical termination selected.

Every sensor is fully tested over both pressure and temperature ranges to demonstrate compliance to the specification. Prior to despatch, the sensor is adjusted to meet the particular pressure range and units, configured to the desired high level output voltage and completed with a range of electrical connections.

The demountable electrical connection formats allow the user to access the zero and span trim controls for system interchangeability and ease of re-calibration. A range of stainless steel pressure connections interface the sensor to the process media.

The PMP 4000 Series from Druck is ideally suited to meet the demands of the industrial and automotive test cell market. New levels of performance measurement ($\pm 0.04\%$) coupled with excellent stability negates the need for regular re-calibration periods, thus significantly reducing the cost of ownership.

Automotive test applications include R&D, road test, production test, environmental test and many others where accuracy, stability and durability are of paramount importance.

A combination of

- High Accuracy
- High Overload
- Excellent Stability
- Fast Dynamic Response

make the Druck PMP 4000 Series a world leader in the industrial and automotive test market.

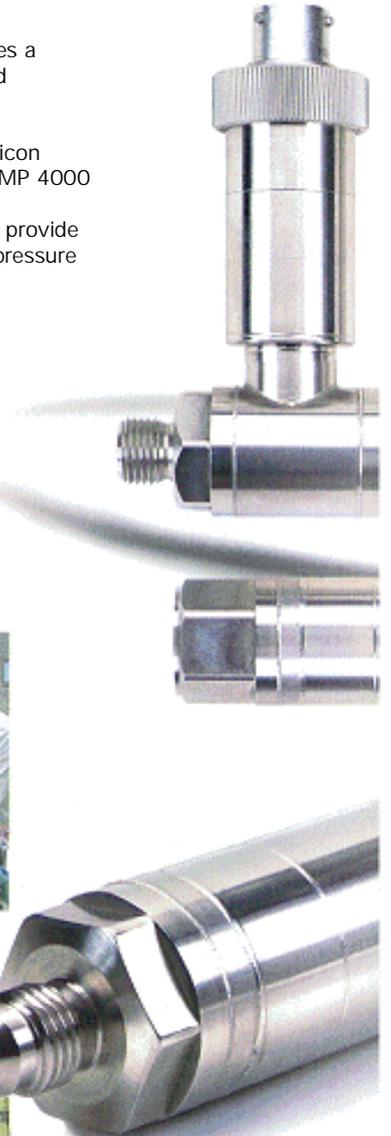
With the benefit of the latest silicon measurement technology, the PMP 4000 Series can withstand the most demanding applications and still provide the performance of a precision pressure measurement instrument.



Computerised testing and calibration of pressure transducers.



Automotive engine shown on a research and development test bed.



Standard Specification

Operating Pressure Range

Any zero based span available between 70mbar and 700 bar gauge and absolute limited to 35 bar for differential formats.

Standard Ranges

70, 175mbar (gauge only)
350, 700mbar, 1, 1.5, 2, 3.5, 5, 7, 10, 15, 20, 35 and 60 bar (gauge or absolute.)
70, 135, 200, 350, 500 and 700 bar (sealed gauge or absolute).
800 to 1200 mbar (absolute only)
70, 175, 350, 700 mbar, 1, 1.5, 2, 3.5, 5, 7, 10, 15, 20 and 35 bar (differential only)

Compound ranges (e.g., -1 to 2 bar gauge), bi-directional differential ranges and other pressure units can be specified

For pressure ranges down to 0.1 mbar refer to the LP series data sheets

Over Pressure

Gauge and absolute reference:-

- 10 x for ranges up to 350mbar
- 6 x for ranges up to 700mbar
- 4 x for ranges up to 60 bar (140 bar max.)

2 x for ranges up to 700 bar

Differential reference:-

Positive side:-

- 10 x for ranges up to 350 mbar
- 6 x for ranges up to 700 mbar
- 4 x for ranges up to 20 bar
- 100 bar for 35 bar range.

Negative side:-

Must not exceed positive side by greater than:-

- 6 x for ranges up to 350 mbar
- 4 x for ranges up to 700 mbar
- 2 x for ranges up to 5 bar
- 10 bar for 7 bar to 35 bar ranges.

Line Pressure

70 bar maximum

Positive Pressure Media

Fluids compatible with stainless steel 316L and Hastelloy C276.

Excitation Voltage

9 to 32 Vd.c. @10mA nominal.

Output Voltage

0 to 5 Vd.c. 3 wire

Alternative 3 wire outputs can be specified.

e.g. 1 to 5 V, 0 to 10 V, -5 to + 5 V etc.

Maximum offset voltage is 2.5V.

Maximum full scale voltage is 10 V with

15 V minimum supply. (5 V for pressure

ranges less than 700 mbar)

Bi-directional outputs available.

Output Impedance

< 20 Ω.

Load Impedance

Greater than 10 KΩ for quoted performance.

Combined Non-linearity, Hysteresis and Repeatability

Standard: ±0.08% F.S. BSL

Option A: ±0.04% F.S. BSL.

Zero Offset and Span Setting

±5% site adjustable by sealed, non-interacting potentiometers. Demountable electrical connections only.

Stability

0.1% F.S./annum

For ranges below 350 mbar this value may increase.

Operating Temperature Range

-20^o to + 80^oC standard.

This temperature range can be extended.

Temperature Effects

Standard: ±1% FS TEB over 0 to 50^oC

±2% FS TEB over -20 to 80^oC

Option B: ±0.5% FS TEB over 0 to 50^oC

±1% FS TEB over -20 to 80^oC

For ranges below 350 mbar these values may increase.

Improved specification available - refer to Druck.

Acceleration Sensitivity

Typically 0.02% F.S./g for 350 mbar decreasing to 0.0003% F.S./g for ranges above 60 bar, along the sensitive axis.

Mechanical Shock

1000g, 1ms half sine pulse in each of 3 mutually perpendicular axes will not affect performance.

Vibration

Response less than 0.05% F.S./g at 30g peak 10Hz-2kHz, limited by 12mm double amplitude. (MIL-STD 810C Proc 514.2-2 Curve L)

Weight

120 gms nominal (350mbar to 60 bar ranges)

170 gms nominal (70 bar to 700 bar ranges)

200 gms nominal for differential types.

Electrical Connection

A wide range of cable and connector versions are available. Some electrical options are demountable to allow access to zero and span potentiometers.

See installation drawings and ordering information for details.

Pressure Connection

70 mbar to 60 bar ranges:

G1/8B (60^o Int. cone) G1/4B (60^o Int. cone).

G1/4B (flat end) 1/4NPT, 7/16 "UNF, M12 X

1.5,

M14 x 1.5, G1/4

Others available on request - refer to Druck.

70 bar to 700 bar ranges:

G1/4

Adaptors available on request - refer to

Druck.

Options

(C) Internal "R" Cal Facility

Connecting an external link between the appropriate terminals results in a positive shift of 80%.

Other R-Cal options available - refer to Druck.

(D) Mating electrical connectors.

Supplied as standard with DIN plug version.

Ordering Information

Please state the following:

(1) Select model number

Code	Base Model Number
PMP40	Gauge or absolute
PMP41	Differential
	Code Electrical Connection
00	Core
10	Fixed cable
15	Demountable cable
20	Cable gland
50	Fixed male conduit
60	Fixed 6 pin bayonet plug
65	Demountable 6 pin bayonet plug
70	DIN plug/socket
80	Fixed Hi-rose plug
85	Demountable Hi-rose plug
90	WK6-32S plug

PMP4070 Typical model number

- (2) Pressure range and units
- (3) Gauge or absolute (PMP 4000 only)
- (4) Combined non-linearity, hysteresis and repeatability
State Option A (if required).
- (5) Temperature Effects
State Option B (if required).
- (6) Output voltage at zero pressure
- (7) Output voltage at full scale pressure
- (8) R-Cal Option C (if required).
- (9) Electrical mating connector Option D (if required).
- (10) Pressure connection

For non-standard requirements - refer to Druck.

Calibration Standards

Instruments manufactured by Druck are calibrated against precision pressure calibration equipment which is traceable to International Standards.



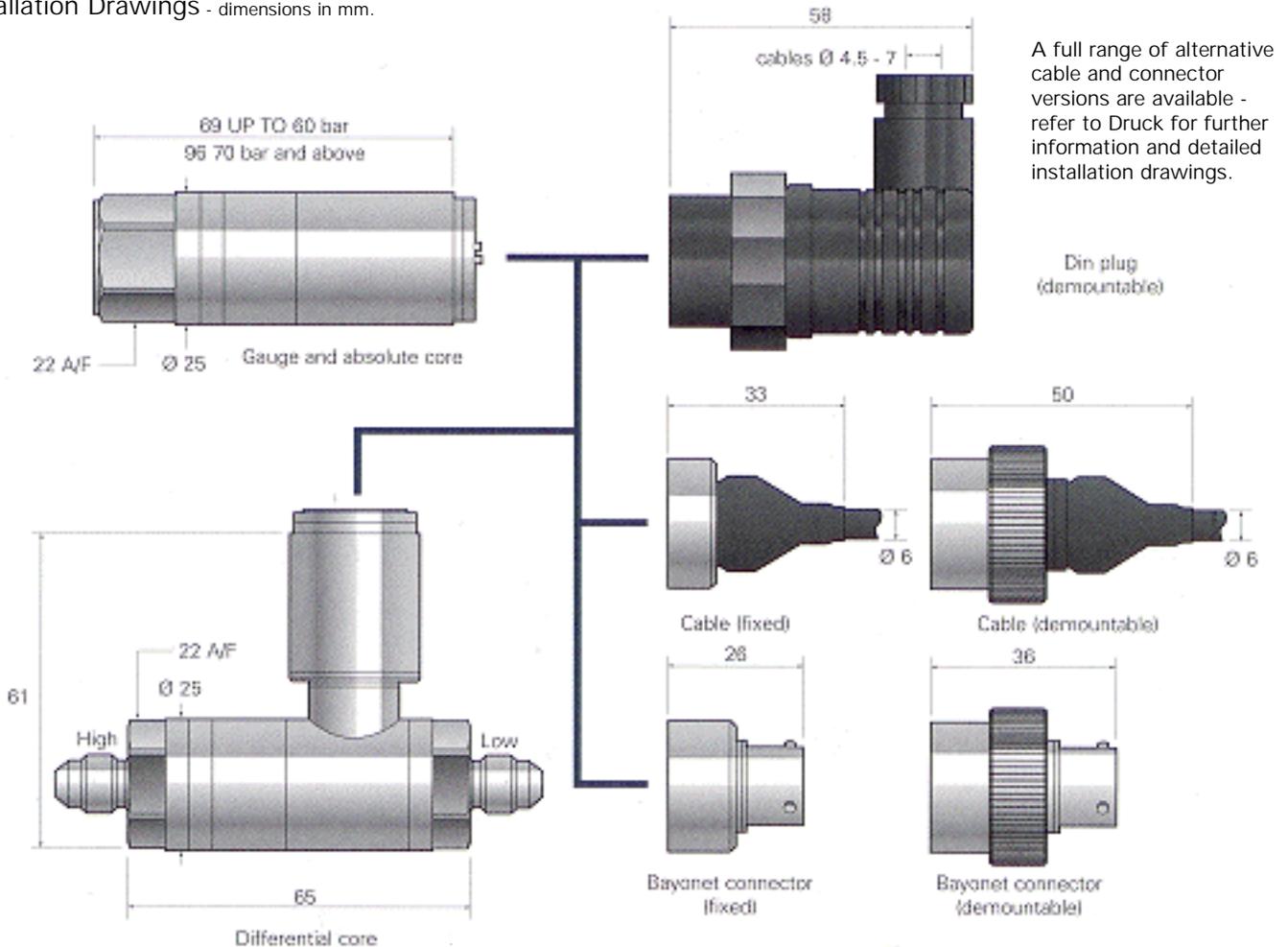
Continuing development sometimes necessitates specification changes without notice.

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Installation Drawings - dimensions in mm.



Associated Products

Druck manufactures a comprehensive range of pressure instrumentation to complement the PMP 4000 Series.

Portable pressure, temperature and electrical field calibrators allow for local calibration reducing plant down time whilst maintaining the quality requirements of ISO 9000. In addition, the Druck range of calibration equipment is completed by primary standard deadweight testers.

The LP Series of pressure sensors provide accurate measurement of differential, gauge or absolute pressures of gases and liquids from as low as 0.1 mbar.

For further information and product data sheets - refer to Druck.



Left: DPI 610 Field Portable Pressure Calibrator
 Centre: TRX-II Portable Documenting Calibrator
 Right: DPI 605 Precision Portable Pressure Calibrator
 Inset: LP Series of Low Pressure Sensors



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