

UNIK 5000

Pressure Sensing Platform



- Ranges from 70 mbar (1 psi) to 700 bar 10,000 psi)
- Accuracy to $\pm 0.04\%$ Full Scale (FS) Best Straight Line (BSL)
- Stainless Steel construction
- Frequency response to 5 kHz
- High over pressure capability
- Hazardous Area certifications
- mV, mA, voltage and configurable voltage outputs
- Multiple electrical & pressure connector options
- Operating temperature ranges from -55 to 125°C

The new UNIK 5000 is a high performance configurable solution to pressure measurement. The use of Druck silicon technology and analogue circuitry enables best in class performance for stability, low power and frequency response. The new platform enables you to easily build up your own sensor to match your own precise needs. This high performance, configurable solution to pressure measurement employs modular design and lean manufacturing techniques to offer:

High Quality

With 35 years of pressure measurement experience, our field-proven Druck silicon technology is at the heart of the new platform, resulting in a range of high quality, high stability pressure sensors.

Bespoke as Standard

Custom-built from standard components, manufacturing sensors to your requirement is fast and simple; each UNIK 5000 is a “bespoke” pressure sensing solution, but with the short lead times and competitive pricing you would expect from standard products.

Expertise

We have the people and the knowledge to support your needs for accurate and reliable product performance; our team of experts can help you make the right sensor selection, guiding you and providing the help and tools you need.

Technical Specifications

Measurement

Operating Pressure Ranges

Gauge ranges

Any zero based range between 70 mbar and 70 bar (1 to 1,000 psi) (values in psi are approximate)

Sealed Gauge Ranges

Any zero based range between 10 and 700 bar (145 to 10,000 psi)

Absolute Ranges

Any zero based range between 100 mbar and 700 bar (1.5 to 10,000 psi)

Differential Ranges

Wet/Dry

Uni-directional or bi-directional 70 mbar to 35 bar (1 to 500 psi)

Wet/Wet

Uni-directional or bi-directional 350 mbar to 35 bar (5 to 500 psi)

Line pressure: 70 bar max (1000 psi)

Barometric Ranges

Barometric ranges are available with a minimum span of 350 mbar (5.1 psi)

Non Zero Based Ranges

Non zero based ranges are available. Please contact Pacific Data Systems to discuss your requirements

Over Pressure

- 10 × FS for ranges up to 150 mbar (2 psi)
- 6 × FS for ranges up to 700 mbar (10 psi)
- 2 × FS for barometric ranges
- 4 × FS for all other ranges (up to 200 bar for ranges ≤70 bar and up to 1200 bar for ranges >70 bar)

For differential versions the negative side must not exceed the positive side by more than:

- 6 × FS for ranges up to 150 mbar (2 psi)
- 4 × FS for ranges up to 700 mbar (10 psi)
- 2 × FS for all other ranges up to a maximum of 15 bar (200 psi)

Containment Pressure

Ranges up to 150 mbar (2 psi) gauge 10 x FS

Ranges up to 70 bar (1000 psi) gauge 6 x FS (200 bar (3000 psi) max)

Ranges up to 70 bar (1000 psi) absolute

200 bar (3000 psi)

Ranges above 70 bar (1000 psi)

1200 bar (17500 psi)

Differential (-ve port) must not exceed positive port by more than 6 × FS (15 bar (200 psi) maximum)

Supply and Outputs

Electronics Option	Description	Supply voltage (V)	Output	Current Consumption (mA)
0	mV Passive	2.5 to 12	10 mV/V^	<2 at 10 V
1	mV Linearised	7 to 12	10 mV/V^	<3
2	mA	7 to 28**	4-20 mA	<30
3	0 to 5 V 4-wire	7 to 16**	0 to 5 V	<3
4	0 to 5 V 3-wire	7 to 16**	0 to 5 V*	<3
5	1 to 6 V 3-wire	7 to 16**	1 to 6 V	<3
6	0 to 10 V 4-wire	12 to 16**	0 to 10 V	<3
7	0.5 to 4.5 V Ratiometric	5.0 ± 0.5	0.5 to 4.5 V	<3
8	Isolated/Configurable	7 to 36	See below	See below

^ with a 10 volt supply mV output sensors give 100 mV over the full scale pressure.

- Output is ratiometric to the supply voltage
- Output reduces pro-rata for pressure ranges below 350 mbar (5 psi)

*0 to 5 V 3-wire output is non true zero. At pressures below 1% of span the output will be fixed at approximately 50 mV

**7 to 32 V in non-hazardous area operation

Isolated/Configurable (Option 8)

Any pressure signal output configurations will be available, subject to the following limitations:

- Minimum span: 2 V
- Maximum span: 20 V
- Output limits: ±10 V
- Maximum zero offset: ± span
- Output voltage range can be specified to a resolution of 0.1 V

Reverse output response to pressure is available.

The output will continue to respond to 110% FS. i.e. if a 0 to 10 V output is specified, the output will continue to increase proportionally to applied pressure until at least 11 V.

Current consumption is <20 mA @ 7 Vdc supply, reducing to <5 mA @ 32 Vdc supply. On startup <100 mA drawn for 10 ms typically.

Note: Restricted to 80°C (176°F) for this option.

Examples

Allowed	Not Allowed
-10 to 0 V	0 to 12 V (outside ±10 V limits)
0 to 5 V	6 to 10 V (offset too big)
-5 to +5 V	0 to 0.5 V (span too small)
-2 to 10 V	
1 to 6 V	
10 to 0 V	

Power-Up Time

- mV, Voltage and current versions: 10 ms
- Isolated/configurable version: 500 ms

Insulation

- 500 Vdc: 100 MW
- 500 Vac: < 5 mA leakage current (mV and mA versions only).

Shunt Calibration

Shunt Calibration provides a customer accessible connection which, when applied, causes a shift in output of 80% FS in order to simulate applied pressure.

It is fitted to the mV and Isolated/Configurable versions as standard. It is not available with DIN or M12 x 1 electrical connectors. (options 7, D and G).

Shunt calibration is activated in different ways depending on the electrical connector and version:

- mV versions: connect Shunt Cal to -ve Supply or, where available, connect both Shunt Cal connections together.
- Isolated/Configurable version: connect Shunt Cal to -ve Output or, where available, connect both Shunt Cal connections together.

Performance Specifications

There are three grades of performance specification:

Industrial, Improved and Premium

Accuracy

Voltage, Current and mV Linearised

Combined effects of non-linearity, hysteresis and repeatability:

Industrial: ±0.2% FS BSL

Improved: ±0.1% FS BSL

Premium: ±0.04% FS BSL

CE Conformity

Pressure Equipment Directive 97/23/EC

ATEX 94/9/EC (Optional)

EMC Directive 2004/108/EC

BS EN 61000-6-1: 2007 Susceptibility - Light Industrial

BS EN 61000-6-2: 2005 Susceptibility - Heavy Industrial (except mV versions)

BS EN 61000-6-3: 2007 Emissions - Light Industrial

BS EN 61000-6-4: 2007 Emissions - Heavy Industrial

BS EN 61326-1: 2006 Electrical Equipment for Measurement, Control and Laboratory Use

BS EN 61326-2-3: 2006 Particular requirements for pressure transducers

Hazardous Area Approvals (optional)

General applications • IECEx/ATEX Intrinsically Safe 'ia' Group IIC
 • FM Approved (Canada & US) Intrinsically Safe Exia Class I, Division 1, Groups A, B, C & D and Class I, Zone 0 AEx/Ex ia Group IIC; Single Seal

Mining applications • IECEx/ATEX Intrinsically Safe 'ia' Group I

For full certification details, refer to the type-examination certificates (or approval listings) and Hazardous Area Installation Instructions.

Temperature Effects

Four compensated temperature ranges can be chosen.

Industrial Accuracy performance:

-10 to +50 °C (14 to +122 °F):	±0.75% FS Temperature error band (TEB)
-20 to +80 °C (-4 to 176 °F):	±1.5% FS TEB
-40 to +80 °C (-40 to 176 °F):	±2.25% FS TEB
-40 to +125 °C (-40 to 257 °F):	±2.25% FS TEB

Improved and Premium Accuracy performance:

-10 to +50 °C (14 to +122 °F):	±0.5% FS TEB
-20 to +80 °C (-4 to 176 °F):	±1.0% FS TEB
-40 to +80 °C (-40 to 176 °F):	±1.5% FS TEB
-40 to +125 °C (-40 to 257 °F):	±1.5% FS TEB

Temperature effects increase pro-rata for pressure ranges below 350 mbar (5 psi) and are doubled for barometric ranges.

Line Pressure Effects (Differential Version Only)

Zero shift: <±0.03% span/bar of line pressure

Span shift: <±0.03% span/bar of line pressure

Effects increase pro-rata for differential pressure ranges below 700 mbar (10 psi).

mV Passive

≤ 70 bar

Industrial/Improved: ±0.2% FS BSL

Premium not available

> 70 bar

Industrial/Improved: ±0.5% FS BSL

Premium not available

Note: For the barometric pressure range, accuracy is of span, not full scale.

Zero Offset and Span Setting

Demountable electrical connector options allow access to potentiometers that give at least ±5% FS adjustment (see Electrical Connector section)

Factory set to:

Product Description	Industrial	Improved and Premium
Current and Voltage Versions (Demountable Electrical Connections and Cable Gland)	±0.5% FS	±0.2% FS
Current and Voltage Versions (All Other Electrical Connections)	±1.0% FS	±1.0% FS
mV Versions	±3.0 mV	±3.0 mV

Long Term Stability

±0.05% FS typical (±0.1% FS maximum) per year increasing pro-rata for pressure ranges below 350 mbar

Physical Specifications

Environmental Protection

- See Electrical Connector section
- Hyperbaric Pressure: 20 bar (300 psi) maximum

Operating Temperature Range

See Electrical Connector section

Pressure Media

Fluids compatible with Stainless Steel 316L and Hastelloy C276.

For the wet/dry differential version, negative pressure port: fluid compatible with stainless steel 316L, stainless steel 304, pyrex, silicon and structural adhesive.

Enclosure Materials

Stainless steel (body), nitrile- or silicone-rubber (o-rings, gaskets), EPDM (gaskets, depth cone), PTFE (vent filter), Nickel plated brass (lock rings), glass filled nylon (electrical connector assemblies), delrin (depth cone).

Cable sheaths as specified (see Electrical Connector).

Pressure Connector

Available options are

• G1/4 Female*	• 7/16-20 UNF Female
• G1/4 Male Flat	• 7/16-20 UNF Male Short Flat
• G1/4 Male 60° Internal Cone	• 7/16 UNF Long 37° Flare Tip
• G1/4 Male Flat Long	• 7/16-20 UNJF Male 74° External Cone
• G1/4 Male Flat with Snubber	• 3/8-24 UNJF
• G1/4 Male Flat with Cross Bore Protection	• 1/4 Swagelok Bulkhead
• G1/8 Male 60° Internal Cone	• M10 X 1 80° Internal Cone
• G1/2 Male via Adaptor*	• M12 X 1 60° Internal Cone
• 1/4 NPT Female*	• M14 X 1.5 60° Internal Cone
• 1/4 NPT Male	• M20 X 1.5 Male
• 1/8 NPT Male	• Depth Cone (G1/4 Female Open Face)
• 1/2 NPT Male via Adaptor	

Choose connectors marked * for pressure ranges over 70 bar.

Other pressure connectors may be available. Contact Pacific Data Systems to discuss your requirement

Electrical Connector

Various electrical connector options are available offering different features:

Code Number	Description	Max Operating temp range °C	IP rating	Zero span Adjust
0	No Connector	-55 to +125	-	Y
1	Cable Gland	-40 to +80	65	N
2	Raychem Cable	-55 to +125	65	N
3	Polyurethane Depth	-40 to +80	68	N
4	Hytrel Depth	-40 to +80	68	N
6/E	Bayonet MIL-C-26482	-55 to +125	67	N
7	DIN 43650 Form A Demountable	-40 to +80	65	Y
A/F	Bayonet MIL-C-26482 Demountable	-55 to +125	65	Y
C	1/2 NPT Conduit	-40 to +80	65	N
D	Micro DIN (9.4 mm pitch)	-40 to +80	65	N
G	M12x1 4pin	-55 to +125	67	N
K	Zero Halogen Cable Demountable	-40 to +80	65	Y

Note: Electronics output option 8, Isolated/Configurable, is restricted to a maximum operating temperature of 80°C (176°F).

Note: Hazardous area approved versions are restricted to a maximum operating temperature range of -40°C to 80°C (-40°F to 176°F).

Electrical Connector

Connector Type	Option Code		Electronics Option				
			4 to 20 mA	Voltage (3-wire)	Voltage (4-wire)	Isolated / Configurable	mV
Molex	0	1 Red	+ve Supply	+ve Supply	+ve Supply	+ve Supply	+ve Supply
		2 Yellow	-	+ve Output	+ve Output	+ve Output	+ve Output
		3 Green	-	-	-ve Output	-ve Output	-ve Output
		4 Blue	-ve Supply	0V Common	-ve Supply	-ve Supply	-ve Supply
		5 Orange	-	-	-	Shunt Cal	Shunt Cal
		6 Black	Case	Case	Case	Case	-
Cable (Not Raychem)	1, 3, 4, C	Red	+ve Supply	+ve Supply	+ve Supply	+ve Supply	+ve Supply
		Yellow	-	+ve Output	+ve Output	+ve Output	+ve Output
		Blue	-	-	-ve Output	-ve Output	-ve Output
		White	-ve Supply	0V Common	-ve Supply	-ve Supply	-ve Supply
		Orange	-	-	-	Shunt Cal	Shunt Cal
		Black	-	-	-	-	-
		Screen	-	-	-	-	-
Raychem Cable	2	Red	+ve Supply	+ve Supply	+ve Supply	+ve Supply	+ve Supply
		White	-	+ve Output	+ve Output	+ve Output	+ve Output
		Green	-	-	-ve Output	-ve Output	-ve Output
		Blue	-ve Supply	0V Common	-ve Supply	-ve Supply	-ve Supply
		Black	-	-	-	Shunt Cal	Shunt Cal
		Screen	-	-	-	-	-
Bayonet	6, A	A	+ve Supply	+ve Supply	+ve Supply	+ve Supply	+ve Supply
		B	-ve Supply	+ve Output	+ve Output	+ve Output	+ve Output
		C	-	-	-ve Output	-ve Output	-ve Output
		D	-	0V Common	-ve Supply	-ve Supply	-ve Supply
		E	-	-	-	Shunt Cal	Shunt Cal
		F	-	-	-	-	-
DIN A Micro DIN	7 D	1	+ve Supply	+ve Supply	+ve Supply	+ve Supply	+ve Supply
		2	-ve Supply	0V Common	-ve Supply	-ve Supply	-ve Supply
		3	-	+ve Output	+ve Output	+ve Output	+ve Output
		E	Case	Case	-ve Output	-ve Output	-ve Output
Bayonet Alternative Wiring Options	E, F	A	+ve Supply	+ve Supply	+ve Supply	+ve Supply	+ve Supply
		B	-	0V Common	-ve Supply	-ve Supply	-ve Supply
		C	-	+ve Output	+ve Output	+ve Output	+ve Output
		D	-ve Supply	-	-ve Output	-ve Output	-ve Output
		E	-	-	-	Shunt Cal	Shunt Cal
		F	-	-	-	Shunt Cal	-
M12 X 1 4 Pin	G	1	+ve Supply	+ve Supply	+ve Supply	+ve Supply	+ve Supply
		2	-	+ve Output	+ve Output	+ve Output	+ve Output
		3	-ve Supply	0V Common	-ve Supply	-ve Supply	-ve Supply
		4	Case	Case	-ve Output	-ve Output	-ve Output
Zero Halogen Cable (Demountable)	K	Pink	+ve Supply	+ve Supply	+ve Supply	+ve Supply	+ve Supply
		White	-	+ve Output	+ve Output	+ve Output	+ve Output
		Green	-	-	-ve Output	-ve Output	-ve Output
		Blue	-ve Supply	0V Common	-ve Supply	-ve Supply	-ve Supply
		Grey	-	-	-	Shunt Cal	Shunt Cal
		Brown	-	-	-	-	-
		Yellow	-	-	-	-	-
Screen	-	-	-	-	-		

Ordering Information

See the online configuration tool at www.unik5000.com

(1) Select model number

Main Product Variant

PMP Amplified Pressure Transducer

PDCR mV Pressure Transducer

PTX 4-20 mA Pressure Transmitter

Product Series

5 UNIK 5000

Diameter and Material

0 25mm Stainless Steel

Electrical Connector Note 6

0 No Electrical Connector **Note 7**

1 Cable Gland (Polyurethane Cable)

2 Raychem Cable

3 Polyurethane Cable (Depth)

4 Hytrel Cable (Depth)

6 MIL-C-26482 (6-pin Shell Size 10) (Mating connector not supplied)

7 DIN 43650 Form A Demountable (Mating connector supplied)

A Demountable MIL-C-26482 (6-pin Shell Size 10) (Mating connector not supplied)

C 1/2" NPT Conduit (Polyurethane cable)

D Micro DIN (9.4 mm Pitch) (Mating connector supplied)

E MIL-C-26482 (6 pin Shell Size 10) Alternative Wiring (Mating connector not supplied)

F Demountable MIL-C-26482 (6 pin Shell Size 10) Alternative Wiring (Mating connector not supplied)

G M12 x 1 4-pin male (Mating connector not supplied)

K Zero Halogen Cable Demountable

Electronics Option

0 mV Passive 4-wire (PDCR) **Note 1**

1 mV Linearised 4-wire (PDCR)

2 4 to 20 mA 2-wire (PTX)

3 0 to 5 V 4-wire (PMP)

4 0 to 5 V 3-wire (PMP)

5 1 to 6 V 3-wire (PMP)

6 0 to 10 V 4-wire (PMP)

7 0.5 to 4.5 V Ratiometric 3-wire (PMP) **Note 5**

8 Isolated/Configurable 4-wire (PMP) **Note 4, 5**

Compensated Temperature Range

TA -10 to +50 °C (-4 to +122 °F)

TB -20 to +80 °C (-4 to +176 °F)

TC -40 to +80 °C (-40 to +176 °F)

TD -40 to +125 °C (-40 to +257 °F) **Note 2, 5**

Accuracy

A1 Industrial

A2 Improved

A3 Premium

Calibration

CA Zero/Span Data

CB Room Temperature

CC Full Thermal

Hazardous Area Approval Note 6

H0 None

H1 IECEx/ATEX Intrinsically Safe 'ia' Group IIC

H2 IECEx/ATEX Intrinsically Safe 'ia' Group I

H6 FM (C & US) Intrinsically Safe 'ia' Group IIC/ABCD

HA H1 + H2

HS H1 + H6

Pressure Connector

PA G1/4 Female **Note 3**

PB G1/4 Male Flat

PC G1/4 Male 60 degree Int Cone

PD G1/8 Male 60 degree Int Cone

PE 1/4 NPT Female **Note 3**

PF 1/4 NPT Male

PG 1/8 NPT Male

PH M20x1.5

PJ M14x1.5 60° Internal Cone

PK M12x1 Internal Cone

PL 7/16-20 UNJF Male 74° External Cone

PN G1/2 Male via Adaptor **Note 3**

PR 1/2 NPT Male via adaptor **Note 3**

PS 1/4 Swagelok Bulkhead

PT G1/4 Male Flat Long

PU 7/16-20 UNF Long 37 degree flare tip

PV 7/16-20 UNF Female

PW Depth Cone (G1/4 Female open face)

PX 7/16-20 UNF Male Short Flat

PY 3/8-24 UNJF

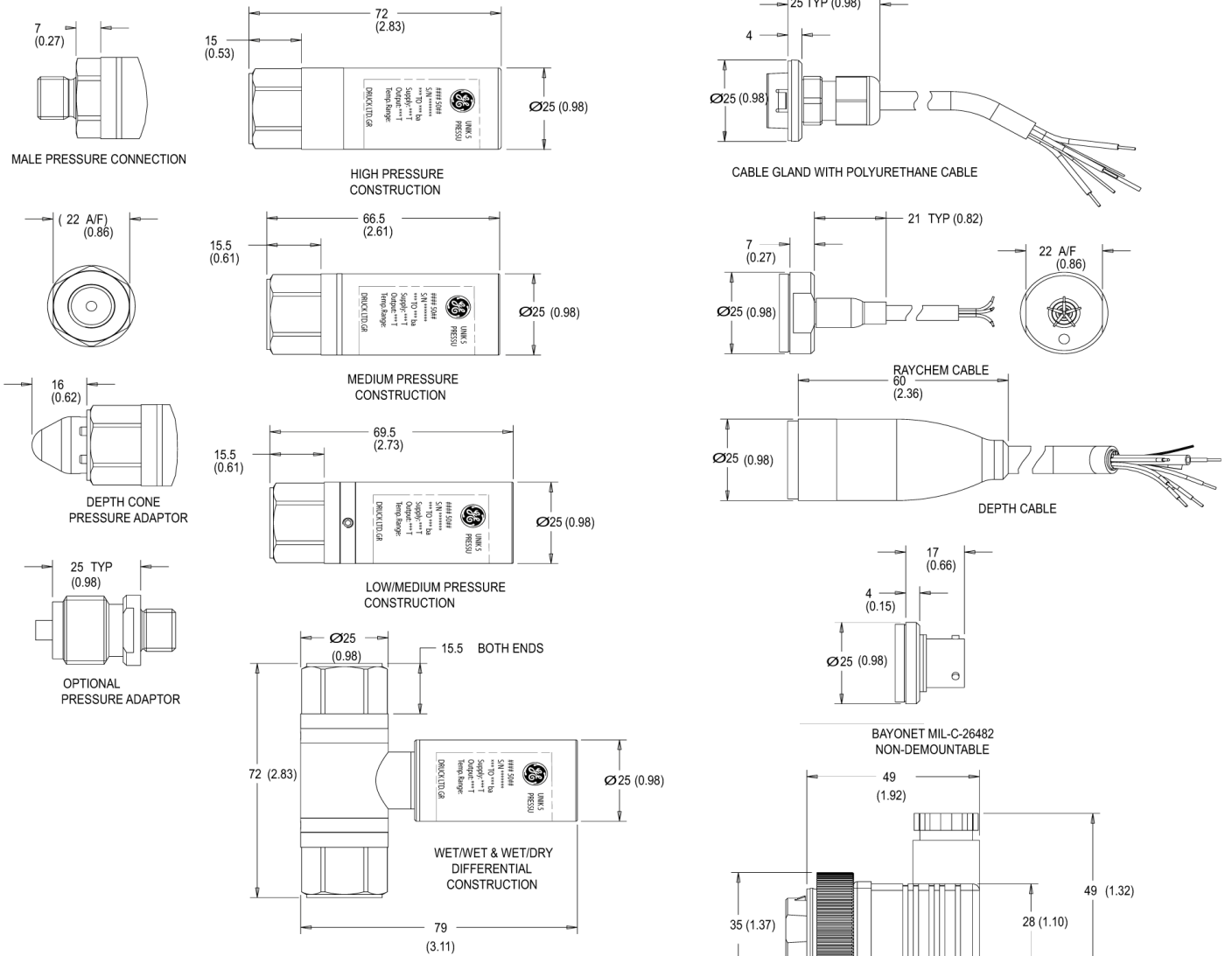
PZ M10 x 1 80° Int Cone

RB G1/4 Male Flat with Snubber

RC G1/4 Male Flat with Cross Bore Protection

PTX 5 0 7 2 - TA - A2 - CB - H0 - PA Typical Model Number

Mechanical Drawings



NOTES:

- [1] DIMENSIONS SHOWN ARE FOR STANDARD LENGTH PRODUCTS WITH THE FOLLOWING ELECTRICAL OUTPUT OPTIONS:
 mV LINEARISED (PDCR)
 4 TO 20 mA (PTX)
 STANDARD VOLTAGE OPTIONS (PMP)
 FOR mV PASSIVE (PDCR) SUBTRACT 10mm (0.39 in)
 FOR ISOLATED/CONFIGURABLE (PMP) ADD 15mm (0.59 in)
- [2] REFER TO PAGE 4 FOR LIST OF PRESSURE CONNECTION OPTIONS (ORIENTATION NOT CRITICAL)
- [3] ALL DIMENSIONS ARE IN MILLIMETRES (INCHES IN PARENTHESES)
- [4] **HIGH PRESSURE IS >70 BAR**
MEDIUM PRESSURE
 INDUSTRIAL ACCURACY >1 BAR < 50 BAR
 IMPROVED/PREMIUM ACCURACY >2 BAR < 70 BAR
LOW/MEDIUM PRESSURE
 INDUSTRIAL ACCURACY < 1 BAR, > 50 BAR TO < 70 BAR
 IMPROVED/PREMIUM ACCURACY < 2 BAR, > 50 BAR TO < 70 BAR

