



UNIK5000H

Hydrogen Focused Pressure Sensor

The UNIK5000H takes the existing and widely trusted UNIK5000 configurable pressure sensor and adds Hydrogen compatibility. The use of micromachined 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.

Challenges in hydrogen pressure measurement

As a market leader in pressure measurement for the past 50 years, Druck is fully aware of the challenges that hydrogen applications pose for pressure sensors due to the unique behaviour of the medium. Exposure to hydrogen gas can impact the performance of a pressure sensor, specifically via the processes of hydrogen permeation and embrittlement, hence key design aspects need to be considered with a hydrogen pressure sensor to maintain accuracy and stability.

Optimised for hydrogen applications

The stainless steel 316L construction of the UNIK5000H provides excellent resistance to hydrogen embrittlement. Permeation can affect the performance of all sensor technologies and the UNIK5000H uses an optimised barrier coating that limits hydrogen permeation and is unaffected by the presence of impurities.

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.

Features

- Ranges from 700 mbar (10.2 psi) to 700 bar (10000 psi)
- Accuracy to ±0.04% Full Scale (FS) Best Straight Line (BSL)
- Stainless steel construction
- Hydrogen compatible wetted materials
- Frequency response to 3.5 kHz
- High over pressure capability
- · Hazardous area certifications
- mV, mA, voltage and configurable voltage outputs
- Multiple electrical and pressure connector options
- Operating temperature ranges from -55 to +125°C (-67 to +257°F)
- Meets the requirements of EC134 compliant systems



UNIK5000H specifications

Measurement Operating pressure ranges

Gauge ranges

Any zero based range 700 mbar to 70 bar (10.2 to 1000 psi) Note: All psi values are approximate.

Sealed gauge ranges

Any zero based range 10 to 700 bar (146 to 10000 psi)

Absolute ranges

Any zero based range 700 mbar to 700 bar (10.2 to 10000 psi)

Non-zero based ranges

Non-zero based ranges are available. For non-zero based gauge ranges, please contact Druck to discuss your requirements.

Over pressure

 4 × FS (up to 200 bar for ranges ≤70 bar and up to 1200 bar for ranges >70 bar)*

Containment pressure

- 6 x FS (200 bar (2900 psi) max) for ranges up to 70 bar (1000 psi) gauge
- Ranges up to 70 bar (1000 psi) absolute 200 bar (2900 psi)
- Ranges above 70 bar (1000 psi) 1200 bar (17400 psi)*

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	Basic Configurable (3-wire)	See below	See below	<3
6	0 to 10 V 4-wire	12 to 16**	0 to 10 V	<3
7	0.5 V to 4.5 V Ratiometric	5.0 ± 0.5	0.5 to 4.5 V	<3
8	Configurable (4-wire)	7 to 36	See below	See below
9	Configurable (3-wire)	7 to 36	See below	See below

^ with a 10 V 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

Supply voltage is between [Maximum output + 1 V] (7 V minimum) to 16 V (32 V in non-hazardous area operation)

Basic configurable (option 5), configurable 4-wire (option 8), configurable 3-wire (option 9)

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

Output specification	Basic configurable (option 5)	Configurable (options 8, 9)		
Minimum span:	4 V	2 V		
Maximum span:	10 V	20 V		
Maximum output limit:	11 V	±10 V		
Maximum zero offset:	Span / 2	±Span		
Current consumption:	< 3 mA	< 20 mA @ 7 Vdc decreasing to < 5 mA @ 32 Vdc		
Reverse output response available:	No	Yes		
Maximum operating temperature:	+125°C	+80°C		

Output voltage range can be specified to a resolution of 0.1 V.

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

Option 5: Not true zero, the output will saturate at < 50 mV.

Options 8, 9: On startup <100 mA drawn for 10 ms typically.

Options 8, 9: Shunt calibration: not available with reverse output.

Examples

Configuration	Allowed	Not Allowed
Basic Configurable	0 to 5 V	1 to 4 V (span too small)
(Option 5)	0.5 to 4.5 V	4 to 11 V (offset too big)
	1 to 6 V	
	1 to 11 V	
Configurable (Options 8, 9)	-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
- · Configurable 3-wire and 4-wire versions: 500 ms

Insulation

- 500 Vdc: > 100 MΩ
- 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, configurable 4-wire and configurable 3-wire versions as standard. It is not available with DIN, M12 x 1 or M20 x 1.5 electrical connectors (options 7, D, G and R).

^{*600} bar (8700 psi) for pressure connector options PX, RA and RF

^{**32} V in non-hazardous area operation

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.
- Configurable 4-wire and configurable 3-wire versions: connect Shunt cal to -ve output or, where available, connect both shunt cal connections together.

Note: Not available with reverse output.

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

mV passive

≤ 70 bar

Industrial/Improved: ±0.25% FS BSL

Premium not available

> 70 bar

Industrial/Improved: ±0.5% FS BSL

Premium not available

Note 1: For the barometric pressure range, accuracy is of span, not full scale.

Note 2: For bi-directional ranges, accuracy is specified for each direction separately.

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

Temperature effects

Four compensated temperature ranges can be chosen.

Industrial accuracy performance:

*TEB = Temperature Error Band

-10 to +50°C (+14 to +122°F): ±0.75% FS 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 double for barometric ranges.

Physical specifications

Environmental protection

See Electrical connector section

Operating temperature range

See Electrical connector section

Pressure media

Fluids compatible with stainless steel 316L and gold

Do not use with oxygen rich media or other strong oxidizing agents.

This product contains materials or fluids that may degrade or combust in the presence of strong oxidizing agents.

Enclosure materials

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

Pressure connector

Refer to ordering information for available options.

General certifications

CRN Certified 0F13650.517890YTN ADD1/REV1, 0F13828.2 (sensor types C and K) and CSA 0F13650.56 ADD1 for pressure ranges up to and including 350 bar (5000 psi).

Electrical connector

Various electrical connector options are available offering different features:

Code	Description	Maximum o temperature		IP rating	Zero/ span adjust	
		°C °F			uujust	
1	Cable Gland	-40 to +80	-40 to +176	65	N	
2	Raychem Cable	-55 to +125	-67 to +257	65	N	
6/E	Bayonet MIL-C-26482	-55 to +125	-67 to +257	67	N	
7	DIN 43650 Form A Demountable	-40 to +80	-40 to +176	65	Y	
A/F	Bayonet MIL-C-26482 Demountable	-55 to +125	-67 to +257	65	Y	
С	1/2 NPT Conduit	-40 to +80	-40 to +176	65	N	
D	Micro DIN (9.4 mm pitch)	-40 to +80	-40 to +176	65	N	
G	M12x1 4-pin	-55 to +125	-67 to +257	67	N	
K	Zero Halogen Cable Demountable	-40 to +80	-40 to +176	65	Y	
R	M20 x 1.5 Inline	-40 to +80	-40 to +176	65	Y	

Note 1: Electronics output options 8 and 9 are restricted to a maximum operating temperature of 80°C (176°F).

Note 2: Hazardous area approved versions are restricted to a maximum operating temperature range of -40° C to $+80^{\circ}$ C (-40° F to $+176^{\circ}$ F).

Note 3: Electrical connector option R IP65 rating only with suitable conduit/cable fitting.

CE conformity

- RoHS 2011/65/EU
- Pressure equipment directive 2014/68/EU sound engineering practice
- ATEX 2014/34/EU (Optional)
- EMC directive 2014/30/EU
- BS EN 61000-6-1: 2007: Susceptibility light industrial
- BS EN 61000-6-2: 2005: Susceptibility heavy industrial*
- BS EN 61000-6-3: 2007+A1:2011: Emissions light industrial
- BS EN 61000-6-4: 2007+A1:2011: Emissions heavy industrial
- BS EN 61326-1: 2013: Electrical equipment for measurement, control and laboratory use
- BS EN 61326-2-3: 2013: Particular requirements for pressure transducers

Hazardous area approvals (optional)

General applications:

IECEX/ATEX/UKEX intrinsically safe 'ia' group IIC

For full certification details, refer to the type-examination certificates (or approval listings) and supplied hazardous area installation instructions.

^{*}PMP/PTX models with electrical connector options 6, A, C, E, F, G and R with cable screen connected to case.

Wiring details

	nnector type Option code		Electronics option							
Connector type			4 to 20 mA	Voltage (3- wire) and basic configurable	Voltage (4-wire)	Configurable voltage (4-wire)	Configurable voltage (3-wire)	mV		
Cable	1, C	Red	+ve Supply	+ve Supply	+ve Supply	+ve Supply	+ve Supply	+ve Supply		
(Not Raychem)		Yellow	-	+ve Output	+ve Output	+ve Output	+ve Output	+ve Output		
		Blue	_	_	-ve Output	-ve Output	0V Common	-ve Output		
		White	-ve Supply	0V Common	-ve Supply	-ve Supply	0V Common	-ve Supply		
		Orange	-	-	-	Shunt Cal	Shunt Cal	Shunt Cal		
		Black	-	-	-	_	-	-		
		Screen	-	-	-	-	-	-		
Raychem Cable	2	Red	+ve Supply	+ve Supply	+ve Supply	+ve Supply	+ve Supply	+ve Supply		
		White	-	+ve Output	+ve Output	+ve Output	+ve Output	+ve Output		
		Green	-	-	-ve Output	-ve Output	0V Common	-ve Output		
		Blue	-ve Supply	0V Common	-ve Supply	-ve Supply	0V Common	-ve Supply		
		Black	-	-	-	Shunt Cal	Shunt Cal	Shunt Cal		
		Screen	-	-	-	-	-	-		
MIL-C-26482	6, A	Α	+ve Supply	+ve Supply	+ve Supply	+ve Supply	+ve Supply	+ve Supply		
Bayonet		В	-ve Supply	+ve Output	+ve Output	+ve Output	+ve Output	+ve Output		
		С	-	-	-ve Output	-ve Output	0V Common	-ve Output		
		D	-	0V Common	-ve Supply	-ve Supply	0V Common	-ve Supply		
		E	-	-	-	Shunt Cal	Shunt Cal	Shunt Cal		
		F	-	-	-	-	-	Shunt Cal		
DIN 43650 Form A	7	1	+ve Supply	+ve Supply	+ve Supply	+ve Supply	+ve Supply	+ve Supply		
Micro DIN	D	2	-ve Supply	0V Common	-ve Supply	-ve Supply	0V Common	-ve Supply		
		3	-	+ve Output	+ve Output	+ve Output	+ve Output	+ve Output		
		E	Case	Case	-ve Output	-ve Output	0V Common	-ve Output		
Bayonet	E, F	Α	+ve Supply	+ve Supply	+ve Supply	+ve Supply	+ve Supply	+ve Supply		
Alternative Wiring		В	-	0V Common	-ve Supply	-ve Supply	0V Common	-ve Supply		
Options		С	-	+ve Output	+ve Output	+ve Output	+ve Output	+ve Output		
		D	-ve Supply	-	-ve Output	-ve Output	0V Common	-ve Output		
		E	-	-	_	Shunt Cal	Shunt Cal	Shunt Cal		
		F	-	-	-	Shunt Cal	Shunt Cal	-		
M12 x 1	G	1	+ve Supply	+ve Supply	+ve Supply	+ve Supply	+ve Supply	+ve Supply		
4-Pin		2		+ve Output	+ve Output	+ve Output	+ve Output	+ve Output		
		3	-ve Supply	0V Common	-ve Supply	-ve Supply	0V Common	-ve Supply		
		4	Case	Case	-ve Output	-ve Output	0V Common	-ve Output		
Zero Halogen Cable	K	Pink	+ve Supply	+ve Supply	+ve Supply	+ve Supply	+ve Supply	+ve Supply		
(Demountable)		White	-	+ve Output	+ve Output	+ve Output	+ve Output	+ve Output		
		Green	-	-	-ve Output	-ve Output	0V Common	-ve Output		
		Blue	-ve Supply	0V Common	-ve Supply	-ve Supply	0V Common	-ve Supply		
		Grey	-	-	-	Shunt Cal	Shunt Cal	Shunt Cal		
		Brown	-	-	-	-	-	-		
		Yellow	-	-	-	_	_	-		
		Screen	-	-	-	-	-	-		
M20 x 1.5 Female Demountable	R	+ve	+ve Supply	-	-	_	_	-		
Demountable		-ve	-ve Supply	-	-	-	-	-		

Ordering information (see the online configuration tool at Druck.com)

(1) Select model number

```
Main Product Variant
                 Amplified Pressure Transducer
PDCR
                 mV Pressure Transducer
4-20 mA Pressure Transmitter
                 Product Series
                       UNIK 5000
                       Diameter and Material
                                 25mm Stainless Steel
Electrical Connector (Note 6)
                                        Cable Gland (Polyurethane Cable)
                                       Cable Gland (Polyurethane Cable)
Raychem Cable
MIL-C-26482 (6-pin Shell Size 10) (Mating connector not supplied)
DIN 43650 Form A Demountable (Mating connector supplied)
Demountable MIL-C-26482 (6-pin Shell Size 10) (Mating connector not supplied)
1/2" NPT Conduit (Polyurethane cable)
Micro DIN (9.4 mm Pitch) (Mating connector supplied)
MIL-C-26482 (6 pin Shell Size 10) Alternative Wiring (Mating connector not supplied)
Demountable MIL-C-26482 (6 pin Shell Size 10) Alternative Wiring (Mating connector not supplied)
MI2 x 1 4-pin male (Mating connector not supplied)
Zero Halgeen Cable Demountable
                                        Zero Halogen Cable Demountable
M20 x 1.5 Inline Female Conduit Demountable (Note 8)
                                         Electronics Option
                                       1 mV Energised 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)
                                               Basic Configurable 3-wire (PMP)
                                               0 to 10 V 4-wire (PMP)
0.5 to 4.5 V Ratiometric 3-wire (PMP) (Note 5)
                                               Configurable 4-wire (PMP) (Note 4, 5)
Configurable 3-wire (PMP) (Note 4, 5)
H Hydrogen use
                                                                   TA -10 to +50 °C (14 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
                                                                                          Industrial
                                                                                           Improved
Premium
                                                                                            Calibration
CA Zero/Span Data
CB Room Temperature
                                                                                                      Full Thermal
Room Temperature/Measured Reading
                                                                                                       Hazardous Area Approval (Note 6)
                                                                                                                  None
                                                                                                                   IECEX/ATEX/UKEX Intrinsically Safe 'ia' Group IIC
                                                                                                                   Pressure Connector
PA G1/4 Female (Note 3)
                                                                                                                                GI/4 Female (Note 3)
GI/4 Male Flat
GI/4 Male 60° Internal Cone
GI/8 Male 60° Internal Cone
I/4 NPT Female (Note 3)
I/4 NPT Male
I/8 NPT Male
                                                                                                                   PD
                                                                                                                   PG
                                                                                                                                 M20x1.5 Male (3 mm bore)
M14x1.5 60° Internal Cone
M12x1 Internal Cone
                                                                                                                   PH
PJ
PK
                                                                                                                                 7/16-20 UNJF Male 74° External Cone
G1/2 Male via Adaptor (Note 3)
G1/4 Quick Connect
                                                                                                                                GIJ/4 QUICK CONNECT
IJ/2 NPT Male via Adaptor (Note 3)
I/4 Swagelok Bulkhead
GIJ/4 Male Flat Long
7/16-20 UNF Long 37º Flare Tip (Note 3)
7/16-20 UNJF Female (Note 3)
7/16-20 UNJF Semale Autockye (Note 3, 9)
7/16-20 UN
                                                                                                                   P58
PZ
RA
                                                                                                                                 7/16-20 UNF Female Autoclave (Note 10)
M10 x 1 80° Internal Cone
                                                                                                                                 VCR Female (Note 3, 9)
M12 x 1.0 74° External Cone
Quick Release Male
                                                                                                                   RE
                                                                                                                                 VCR Male (Note 3, 9)
                                                                                                                   RF
                                                                                                                                 M20 x 1.5 Male (8 mm bore)
1/8-27 NPT Female
                                                                                                                   RJ
RT
                                                                                                                                 R3/8 Male
                                                                                                                                 R1/4 Male
PTX
                 5 0
                                7
                                       2 H
                                                                   TA - A2 - CB - H0 - PA
                                                                                                                                 (Example Model Number)
```

Ordering notes

Note 1: Premium accuracy is not available on this version

Note 2: Please ensure that the electrical connector selected is option 2, 6, A. E. F or G.

Note 3: Select one of these pressure connectors for pressure ranges over 70 bar

Note 4: Maximum operating temperature is 80°C (176°F)

Note 5: Hazardous area certifications not available

Note 6: Hazardous area certifications are restricted by electrical connector options in line with the following table:

			Elect	rical c	onnect	or				
Approval	1	2	6/E	7	A/F	С	D	G	к	R
Н0	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ
Hl	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	-	Υ

Note 8: Electronics option 2 only

Note 9: Pressure ranges less than 500 bar

Note 10: Only available on pressure ranges of 500 bar and over.

2) State pressure range and units (e.g., 0 to 10 bar)

Pressure unit options are:

Symbol	Description
bar	bar
mbar	millibar
psi	pounds/sq. inch
Pa	Pascal
hPa	hectoPascal
kPa	kiloPascal
MPa	MegaPascal
mmH ₂ O	mm water
cmH ₂ O	cm water
mH ₂ O	metres water
inH ₂ O	inches water
ftH ₂ O	feet water
mmHg	mm mercury
inHg	inches mercury
kgf/cm ²	kg force/sq. cm
atm	atmosphere
Torr	torr

3) State pressure reference (e.g., gauge)

Reference options are:

- · gauge
- absolute
- · sealed gauge

4) State cable lengths and units

Integer values only, e.g. 1 m cable, 8 ft. Minimum length 1 m (3 ft) cable (only required with certain electrical connectors).

Maximum cable length 100 m (300 ft) for approval options not H0; 200 m (600 ft) for approval option H0.

5) Output options 5, 8 and 9

State voltage output at minimum and maximum pressure (e.g., output -1 to 9 V)

Typical order examples

PTX5012H-TB-A2-CA-H0-PA: 0 to 10 bar, gauge, 3 m cable

PMP5028H-TC-A3-CC-H0-PE: -15 to 75 psi, gauge, 15 ft cable, output voltage -1 to 5 V

PDCR5071H-TB-A1-CB-H0-PA: 0 to 100 bar, sealed gauge

Accessories (order as separate line items)

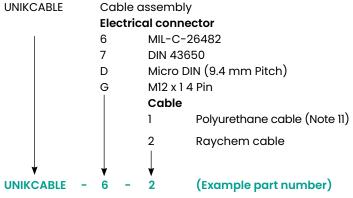
P/N 163-009: Mating connector for MIL-C-26482 (Electrical connector options 6, A, E, and F) (Note 10)

Cable assemblies (Note 11)

A made up electrical connector with a length of cable.

1) Select part number

Main product (Note 11)



2) State cable length and units (Integer value only)

Minimum length 1 m (3 ft)

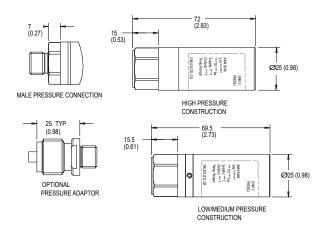
Maximum length 200 m (600 ft)

Example: UNIKCABLE-6-2 5 m

Note 11: Not considered suitable for use in hazardous areas.

Note 12: This cable is the same as that used in the electrical connector cable gland (Option 1 in the main product).

Mechanical drawings



→25 TYP (0.98) CABLE GLAND WITH POLYURETHANE CABLE (0.27) Ø25 (0.98 RAYCHEM CABLE

17 (0.66)

Ø25 (0.98)

NOTES:

[1] DIMENSIONS SHOWN ARE FOR STANDARD LENGTH PRODUCTS WITH THE FOLLOWING ELECTRICAL OUTPUT OPTIONS:

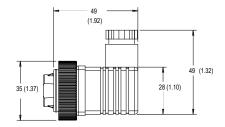
mV LINEARISED (PDCR)
4 TO 20 mA (PTX)
STANDARD VOLTAGE OPTIONS (PMP)
BASIC CONFIGURABLE (PMP)

FOR mV PASSIVE (PDCR) - SUBTRACT 10 mm (0.39 in) FOR CONFIGURABLE 4-WIRE AND CONFIGURABLE 3-WIRE (PMP) - ADD 15 mm (0.59 in)

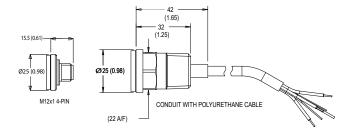
[2] REFER TO ORDERING INFORMATION FOR LIST OF PRESSURE CONNECTION OPTIONS (ORIENTATION NOT CRITICAL)

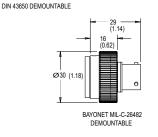
[3] ALL DIMENSIONS ARE IN MILLIMETRES (INCHES IN PARENTHESES)

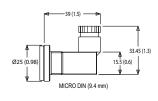
[4] HIGH PRESSURE IS >70 BAR LOW/MEDIUM PRESSURE IS <= 70 BAR

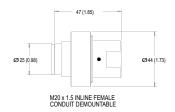


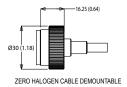
BAYONET MIL-C-26482 NON-DEMOUNTABLE











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