UNIK5000-UHP

Ultra High Purity Pressure Sensors

In Semiconductor and Solar PV industry, pressure is one of the most important parameters in multiple production processes using for measurement, calibration and control. Druck is a well-known brand for precise and reliable pressure measurement. We have accumulated application experience for over half century in many industries, including the semiconductor industry. We fabricate our silicon sensing element from our own clean room facility.

Druck has introduced specialized pressure sensors UNIK5000-UHP for ultra-pure media pressure measurement in the semiconductor and other cleanness required industries. The design of UNIK5000-UHP inherits from the classic UNIK5000 family, which has been widely recognised over decades in a variety of applications where performance, stability and reliability are critical, such as aerospace, railway, engine testing and other industries.

The UNIK5000-UHP series of high purity/ultra-high purity pressure sensors are designed to SEMI HP/UHP standard, and also manufactured and packaged with dedicated process to remove oil/grease and keep the wetted part clean. This sensor series has been proven with excellent reliability and stability from a long history of multiple applications.

Application Industries

- Semiconductor, solar energy, LCD/LED manufacturing equipment, etc
- Ultra-pure special gas cabinet and system pressure measurement

Application media

- Suitable for HP/UHP special gases and other fluids compatible with 316L SS and Hastelloy C276

Features

- Pressure ranges up to 350 bar
- High accuracy up to ±0.1% FS BSL
- Wide compensation temperature range from -40 to +125 °C (-67 to +257 °F)
- Piezo-resistive technology provide excellent stability of ±0.05% FS/year typical
- Fast response, power-up time less than 30ms
- Full stream HP/UHP process fitting options available
- Process fitting polished by EP with Ra ≤ 0.13µm (RA 5), according to SEMI F19
- Wetted part material compliant with SEMI F20, VIM/VAR material option available
- Wetted parts are degreased and cleaned, and product is double vacuum packed
- Hazardous area approvals available

UNIK5000-UHP specifications

Measurement

Pressure range

Absolute pressure range:
- 0~1 bar to 0~350 bar

Gauge pressure range:
- -1.035~1 to -1.035~70 bar

Sealed gauge pressure range:
- -1.035~10 to -1.035~350 bar

Over pressure

For pressure connector PA:
- Range > 70 bar: 4 × FS (up to 1200 bar)

For pressure connector RF:
- Range > 70 bar: 4 × FS (up to 600 bar)

For all other pressure connectors:
- Range ≤ 70 bar: 4 × FS (up to 200 bar)
- Range > 70 bar: 2 × FS (up to 296 bar)

Containment pressure

For pressure connector PA:
- Range > 70 bar: 1200 bar

For pressure connector RF:
- Range > 70 bar: 600 bar

For all other pressure connectors:
- Range ≤ 70 bar gauge: 6 × FS (up to 200 bar)
- Range ≤ 70 bar seal gauge and absolute: up to 200 bar
- Range > 70 bar: 296 bar

Supply and output

Electronics option	Description	Supply voltage (V)	Output	Current consumption (mA)
2	4 to 20 mA	7 to 28*	4-20 mA	<30
3	0 to 5 V 4-wire	7 to 16*	0 to 5 V	<3
5	Basic Configurable (3-wire)	7 to 16**	See below	<3
6	0 to 10 V 4-wire	12 to 16*	0 to 10 V	<3

* 32 V in non-hazardous area operation.

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

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

Basic configurable (option 5)

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

Output signal	Option 5
Minimum voltage span	4V
Maximum voltage span	10V
Maximum voltage output	11V
Maximum zero bias	Span/2
Inverted output response	No

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

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.

Power-up time

< 30 ms

Insulation

- • 500 Vdc: > 100 MΩ
- • 500 Vac: < 5 mA leakage current (mA version only)

Performance specifications

Accuracy

Combined effect of non-linearity, hysteresis, repeatability:
- Industrial: ±0.2% FS BSL
- Improved: ±0.1% FS BSL

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
DIN 43650 Form A Demountable	±0.5% FS	±0.2% FS
M12 x 1 4-Pin	±1.0% FS	±1.0% FS

Long term stability

Typical ±0.05% FS/year (Maximum ±0.1% FS/year).

Temperature effects

Various compensated temperature ranges can be chosen.

A1 Industrial accuracy performance:

- -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

*TEB = Temperature Error Band

A2 Improved accuracy performance:

- -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

Physical specification

Pressure connector

Available options are:

- G1/4 female
- 1/4 VCR male
- 1/4 male metal face seal VAR (VCR compatible)
- 1/4 male metal face seal VIM/VAR (VCR compatible)
- 1/4 female metal face seal VAR (VCR compatible)
- 1/4 female metal face seal VIM/VAR (VCR compatible)
- 1.125" C-seal VIM/VAR

Helium leak test

< 1 x 10^{-10} mbar·L/Sec to SEMI F1

Pressure media

Fluids compatible with stainless steel 316L and Hastelloy C276.

Do not use with media that has an oxygen concentration > 21% or other strong oxidizing agents.

Electrical connector

Code number	Description	Maximum operating temperature range	IP rating	Zero-span adjustment
7	DIN 43650, Demountable	-40 to +80 °C (-40 to +176 °F)	65	Yes
G	M12 x 1 4-pin	-55 to +125 °C (-67 to +257 °F)	67	No

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

Electrical connection

Electrical connection		Connection	Electronics option		
			Option 2 4-20mA	Option 5 basic configurable (3-wire)	Option 3 and 6 voltage (4-wire)
7	DIN 43650	1	+ve supply	+ve supply	+ve supply
		2	-ve supply	0V common	-ve supply
		3	—	+ve output	+ve output
		⏚	Case	Case	-ve output
G	M12 x 1 4-pin	1	+ve supply	+ve supply	+ve supply
		2	—	+ve output	+ve output
		3	-ve supply	0V common	-ve supply
		4	Case	Case	-ve output

Certifications

European Union & Eea	
EMC 2014/30/EU	BS EN 61000-6-1: 2007 BS EN 61000-6-2: 2005 BS EN 61000-6-3: 2007+A1:2011 BS EN 61000-6-4: 2007+A1:2011 BS EN 61326-1: 2013 BS EN 61326-2-3: 2013
PED 2014/68/EU	Sound engineering practice
LVD 2014/35/EU	Exempt
ATEX Directive 2014/34/EU*	EN IEC 60079-0: 2018 EN 60079- 11: 2012
RoHS 2011/65/EU	Compliant
International	
IECEx*	IEC 60079-0: 2017 IEC 60079-11: 2011
Canada	
CANADIAN ELECTRICAL CODE C22.1 Section 18*	CSA-C22.2 NO. 157: R2016 CAN/CSA-C22.2 NO. 60079-0: 2015 CAN/CSA-C22.2 NO. 60079-11: 2014 CAN/CSA-C22.2 NO. 61010-1: 2012 CSA-C22.2 NO. 60529: 2010 CSA-C22.2 NO. 94.1: 2015 CSA-C22.2 NO. 94.2: 2015 ANSI/ISA- 12.27.01: 2003

United States	
National Electrical Code NFPA 70. Articles 500 & 505*	FM 3600: 2018 FM 3610: 2018 FM 3810: 2005 ANSI/ISA 60079-0: 2013 ANSI/ISA 60079-11: 2014 ANSI/IEC 60529: 2004 ANSI/ISA- 12.27.01: 2003

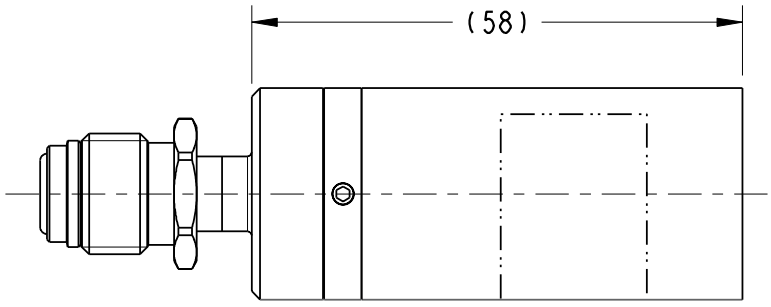
Hazardous area approvals (optional)

- IECEx/ATEX Intrinsically Safe Ex 'ia', Group IIC
- NEPSI Intrinsically Safe Ex 'ia', Group IIC
- FM approved (Canada & US) intrinsically safe Class I, Division 1, Groups A, B, C & D and Class I, Zone 0, AEx/Ex ia Group IIC; Single Seal

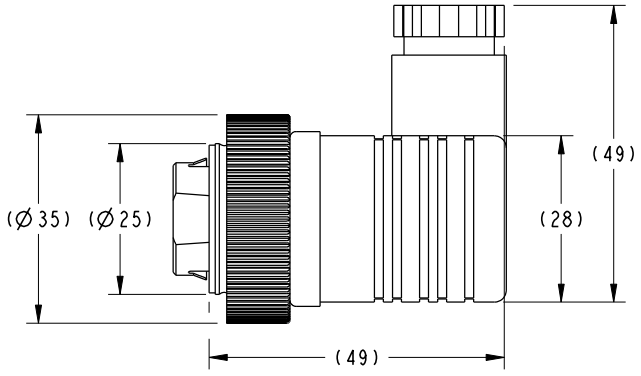
For full certification details, refer to the type-examination certificates (for approval listings) and supplied hazardous area instructions.

Mechanical drawings

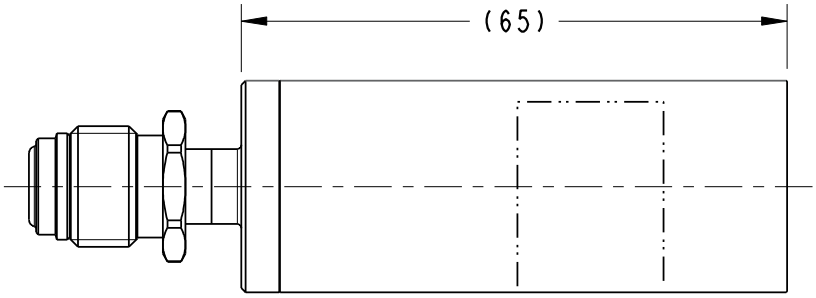
All dimensions in mm



PRESSURE RANGE: ≤ 70 bar
(PRESSURE CONNECTION OPTION P59 AND P66)

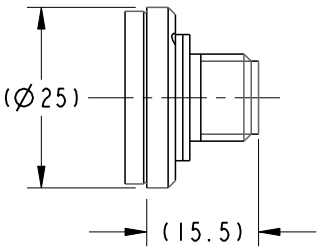


DIN 43650 FORM A DEMOUNTABLE

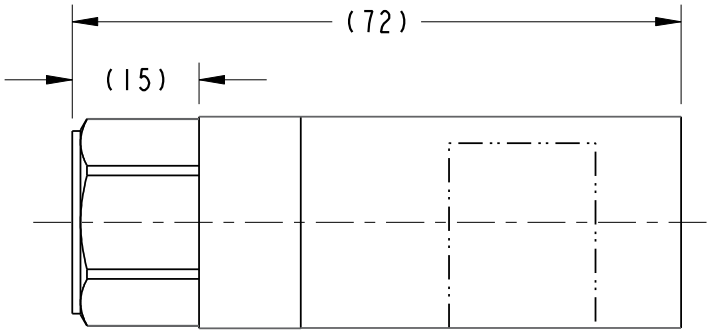


PRESSURE RANGE: ≤ 70 bar
(PRESSURE CONNECTION OPTION P65, P67 AND P68)

PRESSURE RANGE: > 70 bar to ≤ 207 bar
(PRESSURE CONNECTION OPTION: OTHER THAN PA AND RF)



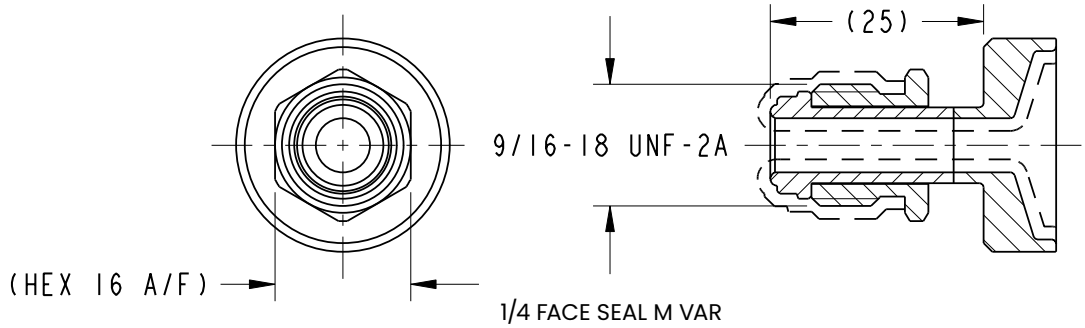
M12 x 1 4-PIN



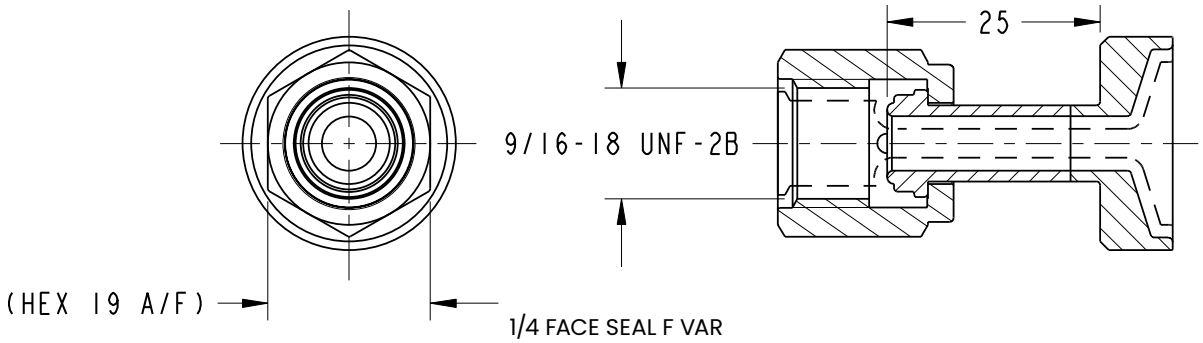
PRESSURE RANGE: > 70 bar to ≤ 350 bar
(PRESSURE CONNECTION OPTION PA AND RF)

Pressure fitting drawings

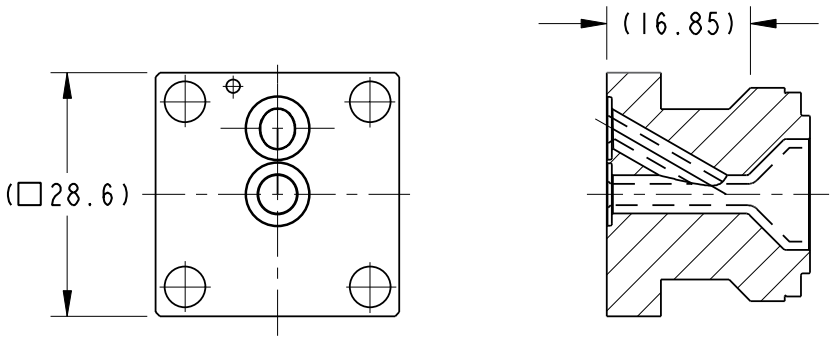
All dimensions in mm



1/4 FACE SEAL M VAR
1/4 FACE SALE M VIM-VAR



1/4 FACE SEAL F VAR
1/4 FACE SALE F VIM-VAR



1.125" C-SEAL VIM-VAR

Ordering information

(1) Select model number

Main Product Variant

PMP Amplified Pressure Transducer

PTX 4-20 mA Pressure Transmitter

Product Series

5 UNIK5000

Diameter and Material

0 25mm Stainless Steel

Electrical Connector

7 DIN 43650 Demountable (Mating connector supplied) **(Note 1)**

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

Electronics Option

2 4 - 20 mA 2-wire (PTX)

3 0 to 5 V 4-wire (PMP)

5 Base Configurable 3-wire (PMP)

6 0 to 10 V 4-wire (PMP)

Compensated Temperature Range

TB -20 ~ +80 °C (-4 to +176 °F)

TC -40 ~ +80 °C (-40 to +176 °F)

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

Accuracy

A1 Industrial ±0.2% FS BSL

A2 Improved ±0.1% FS BSL **(Note 3)**

Calibration

CS Zero/Span Data for HP/UHP

Hazardous Area Approval (Note 4)

H0 None

H1 IECEx/ATEX IS Group IIC

H6 FM C&US IS Groups IIC/ABCD

HS IECEx/ATEX/FM (C&US) IS Groups IIC/ABCD [H1 + H6]

J1 IECEx/ATEX/NEPSI IS Group IIC

Pressure Connector (Note 5)

PA G1/4 Female

RF 1/4 VCR Male

P59 1/4 Male Metal Face Seal VAR (VCR Compatible)

P65 1/4 Male Metal Face Seal VIM/VAR (VCR Compatible)

P66 1/4 Female Metal Face Seal VAR (VCR Compatible)

P67 1/4 Female Metal Face Seal VIM/VAR (VCR Compatible)

P68 1.125" C-Seal VIM/VAR

PTX 5 0 7 2 - TB - A1 - CS - H0 - P59 (Model Number Example: PTX5072-TB-A1-CS-H0-P59, 0-250psi Gauge)

Note 1: Not available for Compensated Temperature Range TD.
Note 2: Hazardous Area Certification not available.
Note 3: Pressure Connector P59, P65, P66, P67 with Pressure Range > 70 bar not available.
Note 4: Hazardous area certifications are restricted by pressure connector options in line with the following table.

Approval Code	Pressure Range (bar)	Pressure Connector Code						
		PA	RF	P59	P65	P66	P67	P68
H0	≤ 70	–	–	Y	Y	Y	Y	Y
	> 70	Y	Y	Y	Y	Y	Y	–
H1, H6, HS, J1	≤ 70	–	–	Y	–	Y	–	–
	> 70	Y	Y	–	–	–	–	–

Note 5: Pressure ranges are restricted by pressure connector options in line with the following table.

Pressure Type	Minimum FS (bar)	Maximum FS (bar)	Pressure Connector Code						
			PA	RF	P59	P65	P66	P67	P68
Gauge	1	70	–	–	Y	Y	Y	Y	Y
Sealed Gauge	10	70	–	–	Y	Y	Y	Y	Y
	> 70	207	Y	Y	Y	Y	Y	Y	–
	> 207	350	Y	Y	–	–	–	–	–
Absolute	1	70	–	–	Y	Y	Y	Y	Y
	> 70	207	Y	Y	Y	Y	Y	Y	–
	> 207	350	Y	Y	–	–	–	–	–

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