

# Ultra high purity transducer

## For applications in hazardous areas, Ex nA ic

### Models WU-20, WU-25 and WU-26

WIKA data sheet PE 87.07



## Applications

- Gas panels for OEM tools
- Semiconductor, flat panel display and photovoltaic industry
- Special and bulk-gas supply

## Special features

- High-accuracy pressure measurement 0.15 % RSS
- Excellent long-term stability
- Signal noise cancellation and shielding
- Active temperature compensation
- ATEX and IECEx zone 2 approval  
Class I, div. 2, groups A, B, C and D

## Description

### Reliable

The WU-2x series combines state-of-the-art digital transducer concepts with analogue-like output signals, in order to provide the safest and most accurate pressure measurements necessary for today's market requirements.

Pressure measurement, based on a true vacuum reference, and electronic measures for interference shielding and signal noise cancellation ensure high-accuracy pressure measurement and excellent long-term stability.

Active temperature compensation reduces the impact of changing temperatures on the transducer, allowing safe operations even in applications with high fluctuations in temperature, e.g. Joule-Thomson effect in the case of gas expansion.

The model WU-25 (flow through) and model WU-26 (surface mount) transducers are specifically designed to sustain torsion-applied stresses often incurred during installation. The special design of the thin-film sensor eliminates the risk of sensor failure due to loads at the process connection or welded joints.



**Fig. left:** WU-20, single end

**Fig. centre:** WU-25, flow through

**Fig. right:** WU-26, modular surface mount

### Versatile

The model WU-2x transducer can be readily installed in indoor or outdoor systems as well as in non-flammable or potentially flammable areas. The hermetically sealed design of the model WU-2x prevents the ingress of humidity.

Approvals for non-flammable and potentially flammable environments ensure a long service life and a high level of product safety. Instruments for temperature class T6 meet the high requirements for low, spontaneous ignition temperature media (phosphine (PH<sub>3</sub>) and silane (SiH<sub>4</sub>)).

### Compact

With its small footprint the model WU-2x is the most compact UHP transducer in the market. Thus it is optimally suited for installation in applications with limited mounting space and even in existing plants it can be easily retrofitted.

# Specifications

Accuracy specifications	
<b>Non-linearity per BFSL per IEC 61298-2</b>	
For measuring ranges > 2 bar	≤ 0.1 % of span
For measuring ranges ≤ 2 bar	≤ 0.15 % of span
<b>Accuracy</b>	→ See "Max. measuring deviation"
<b>Max. measuring deviation</b>	
RSS (root sum squares)	<ul style="list-style-type: none"> <li>■ ≤ 0.15 % of span</li> <li>■ ≤ 0.4 % of span with measuring ranges ≤ 2 bar</li> </ul>
Per IEC 61298-2	<ul style="list-style-type: none"> <li>■ ≤ 0.3 % of span</li> <li>■ ≤ 0.6 % of span with measuring ranges ≤ 2 bar</li> </ul>
<b>Zero point setting</b>	
Current output	-3.5 ... +3.5 % of span (via potentiometer)
Voltage output	-2 ... +3.5 % of span (via potentiometer)
<b>Non-repeatability per IEC 61298-2</b>	≤ 0.12 % of span
<b>Mean temperature coefficient at -20 ... +80 °C [-4 ... +176 °F] (actively compensated)</b>	
Zero point	≤ 0.1 % of span/10 K
Span	≤ 0.15 % of span/10 K
<b>Long-term drift per IEC 61298-2</b>	
Typical	≤ 0.25 % of span, at reference conditions
Measuring ranges ≤ 2 bar	≤ 0.4 % of span
<b>Reference conditions</b>	Per IEC 61298-1

## Measuring ranges, model WU-20 and model WU-25

bar	psi
0 ... 2	0 ... 30
0 ... 4	0 ... 60
0 ... 7	0 ... 100
0 ... 11	0 ... 160
0 ... 17	0 ... 250
0 ... 25	0 ... 350
0 ... 36	0 ... 500
0 ... 70	0 ... 1,000
0 ... 100	0 ... 1,500
0 ... 145	0 ... 2,000
0 ... 225	0 ... 3,000
0 ... 360	0 ... 5,000

## Measuring ranges, model WU-26

bar	psi
0 ... 2	0 ... 30
0 ... 4	0 ... 60
0 ... 7	0 ... 100
0 ... 11	0 ... 160
0 ... 17	0 ... 250

Other measuring ranges on request.

Further details on: Measuring range	
<b>Overpressure limit</b>	<ul style="list-style-type: none"> <li>■ 2-fold</li> <li>■ 4-fold for measuring range 0 ... 2 bar [0 ... 30 psi]</li> </ul>

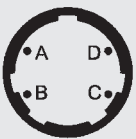
Output signal		
<b>Signal type</b>	<ul style="list-style-type: none"> <li>■ 4 ... 20 mA, 2-wire</li> <li>■ DC 0 ... 5 V, 3-wire</li> <li>■ DC 0 ... 10 V, 3-wire</li> </ul>	
<b>Load in <math>\Omega</math></b>		
4 ... 20 mA	$\leq (U_+ - 10 \text{ V}) / 0.02 \text{ A}$	
DC 0 ... 5 V	$> 5 \text{ k}\Omega$	
DC 0 ... 10 V	$> 10 \text{ k}\Omega$	
<b>Voltage supply</b>		
Supply voltage	Output signal DC 0 ... 5 V / 4 ... 20 mA	DC 10 ... 30 V
	Output signal DC 0 ... 10 V	DC 14 ... 30 V
Power $P_{\text{max}}$	1 W	
<b>Dynamic behaviour</b>		
Rise time (10 ... 90 %)	$\leq 300 \text{ ms}$	

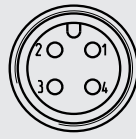
Electrical connection				
Connection type	IP code <sup>1)</sup>	Wire cross-section	Cable diameter	Cable lengths
Bayonet connector (4-pin)	IP67	-	-	-
Circular connector M12 x 1 (4-pin)	IP67 (NEMA 4)	-	-	-
Cable outlet	IP67 (NEMA 4)	0.22 mm <sup>2</sup> (AWG 24)	4.8 mm	<ul style="list-style-type: none"> <li>■ 1.5 m [5 ft]</li> <li>■ 3 m [10 ft]</li> </ul>
Sub-D connector (9-pin)	IP54	-	-	-
Sub-D HD connector (15-pin)	IP54	-	-	-

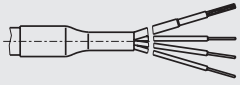
1) The stated IP codes only apply when plugged in using mating connectors that have the appropriate IP code.

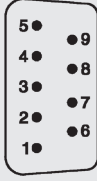
Further details on: Electrical connection	
Connection type	→ See above
Wire cross-section	→ See above
Cable diameter	→ See above
Cable length	→ See above
Pin assignment	→ See below
Ingress protection (IP code) per IEC 60529	→ See above
Short-circuit resistance	S+ vs. U- (short time)
Reverse polarity protection	U+ vs. U-
Insulation voltage	DC 500 V

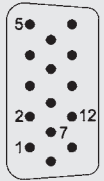
## Pin assignment

Bayonet connector (4-pin)			
		2-wire	3-wire
	U <sub>+</sub>	A	A
	U <sub>-</sub>	D	D
	S <sub>+</sub>	-	B

Circular connector M12 x 1 (4-pin)			
		2-wire	3-wire
	U <sub>+</sub>	1	1
	U <sub>-</sub>	3	3
	S <sub>+</sub>	-	4

Cable outlet			
		2-wire	3-wire
	U <sub>+</sub>	Red	Red
	U <sub>-</sub>	Black	Black
	S <sub>+</sub>	-	Brown

Sub-D connector (9-pin)			
		2-wire	3-wire
	U <sub>+</sub>	4	4
	U <sub>-</sub>	8/9	8/9
	S <sub>+</sub>	-	1

Sub-D HD connector (15-pin)			
		2-wire	3-wire
	U <sub>+</sub>	7	7
	U <sub>-</sub>	5/12	5/12
	S <sub>+</sub>	-	2

### Legend

- U<sub>+</sub> Positive power supply terminal
- U<sub>-</sub> Negative power supply terminal
- S<sub>+</sub> Positive output terminal

Material	
<b>Material (wetted)</b>	
Process connection	<ul style="list-style-type: none"> <li>■ 316L per SEMI F20</li> <li>■ 316L VIM/VAR</li> </ul>
Thin-film sensor	2.4711 / UNS R30003
<b>Material (in contact with the environment)</b>	
Case	304 SS
<b>Surface treatment</b>	Electropolished per SEMI F19
<b>Surface roughness Ra</b>	
Typical	≤ 0.13 μm (RA 5)
Maximum	≤ 0.18 μm (RA 7)





For the verification of material quality and origin in accordance with SEMI F20-0706, a certificate in accordance with EN 10204 clause 3.1 can be issued on request, with or without a sub-supplier certificate.

Operating conditions	
Permissible media	<ul style="list-style-type: none"> <li>■ Speciality gases</li> <li>■ Vapours</li> <li>■ Liquids</li> </ul>
Helium leak test	< 1 x 10 <sup>-9</sup> mbar l/sec (atm STD cc/sec) per SEMI F1
Vibration resistance per IEC 60068-2-6	0.35 mm (10 ... 58 Hz) / 5 g (58.1 ... 2,000 Hz)
Shock resistance per IEC 60068-2-27	500 g (1.5 ms)

Further details on: Operating conditions				
Permissible temperature ranges	Non-Ex	T4	T5	T6
Medium temperature limit	-20 ... +100 °C [-4 ... +212 °F]	-20 ... +85 °C [-4 ... +185 °F]	-20 ... +60 °C [-4 ... +140 °F]	-20 ... +40 °C [-4 ... +104 °F]
Ambient temperature limit	-20 ... +85 °C [-4 ... +185 °F]	-20 ... +85 °C [-4 ... +185 °F]	-20 ... +60 °C [-4 ... +140 °F]	-20 ... +40 °C [-4 ... +104 °F]
Storage temperature limit	-40 ... +100 °C [-40 ... +212 °F]	-20 ... +85 °C [-4 ... +185 °F]	-20 ... +85 °C [-4 ... +185 °F]	-20 ... +85 °C [-4 ... +185 °F]

Packaging and instrument labelling	
Packaging	Double bagging per SEMI E49.6
Assembly and packaging location	Clean room class 5 per ISO 14644
Instrument labelling	WIKA product label, glued

## Approvals

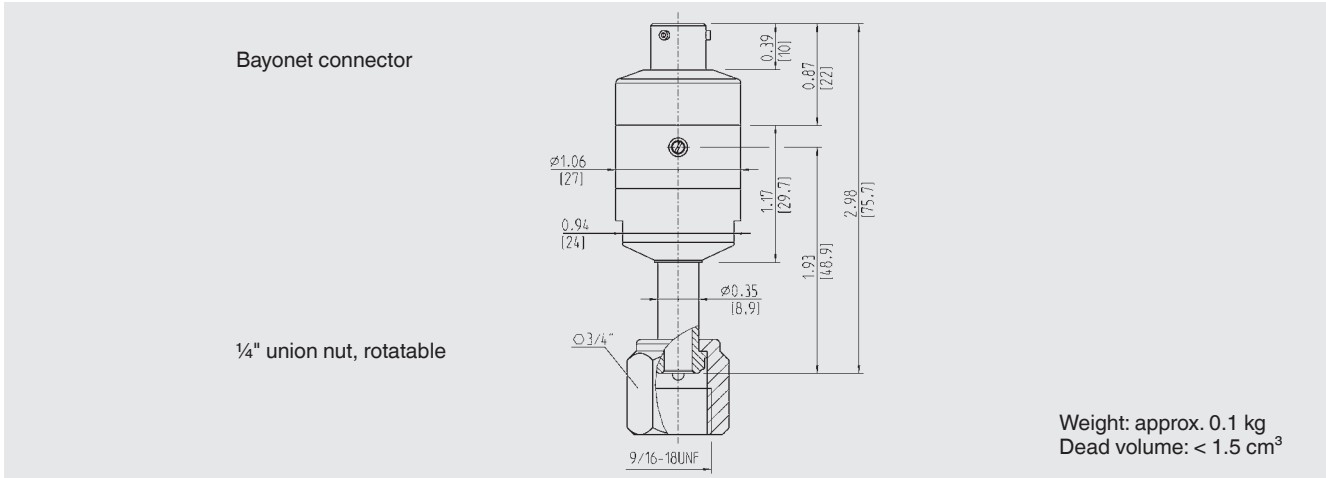
Logo	Description	Country
 	<b>EU declaration of conformity</b>	European Union
	EMC directive EN 61326 emission (group 1, class B) and immunity (industrial application)	
	Pressure equipment directive	
	RoHS directive	
 	<b>IECEx (option)</b> Hazardous areas - Ex n Zone 2 gas [II 3G Ex nA ic IIC T4/T5/T6 Gc X] [II 3G Ex ec ic IIC T4/T5/T6 Gc X]	International
	<b>FM (option)</b> Hazardous areas - Nonincendive apparatus for use in class I, division 2, groups A,B,C,D - Nonincendive for use in class I, zone 2, group IIC (classified) locations	USA

→ For approvals and certificates, see website

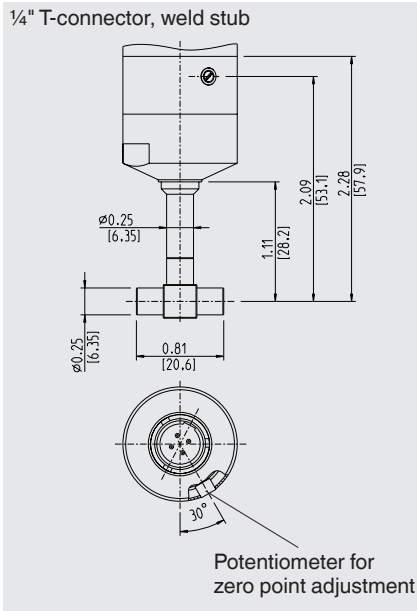
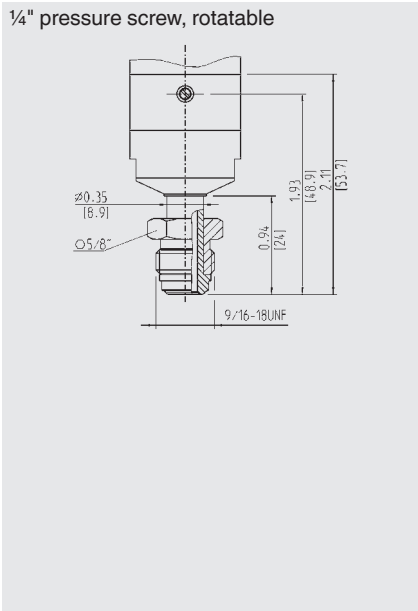
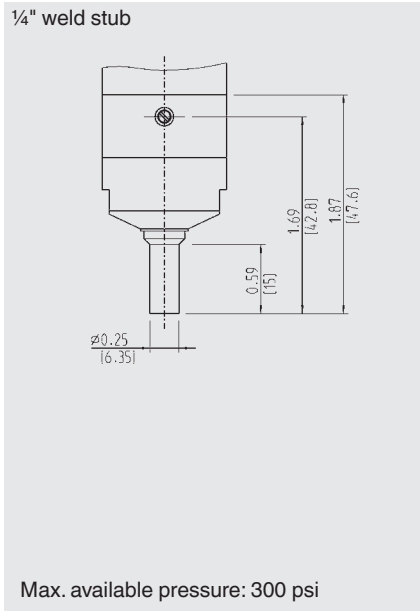
## Safety-related characteristic values

Safety-related characteristic values	
MTTF	> 100 years

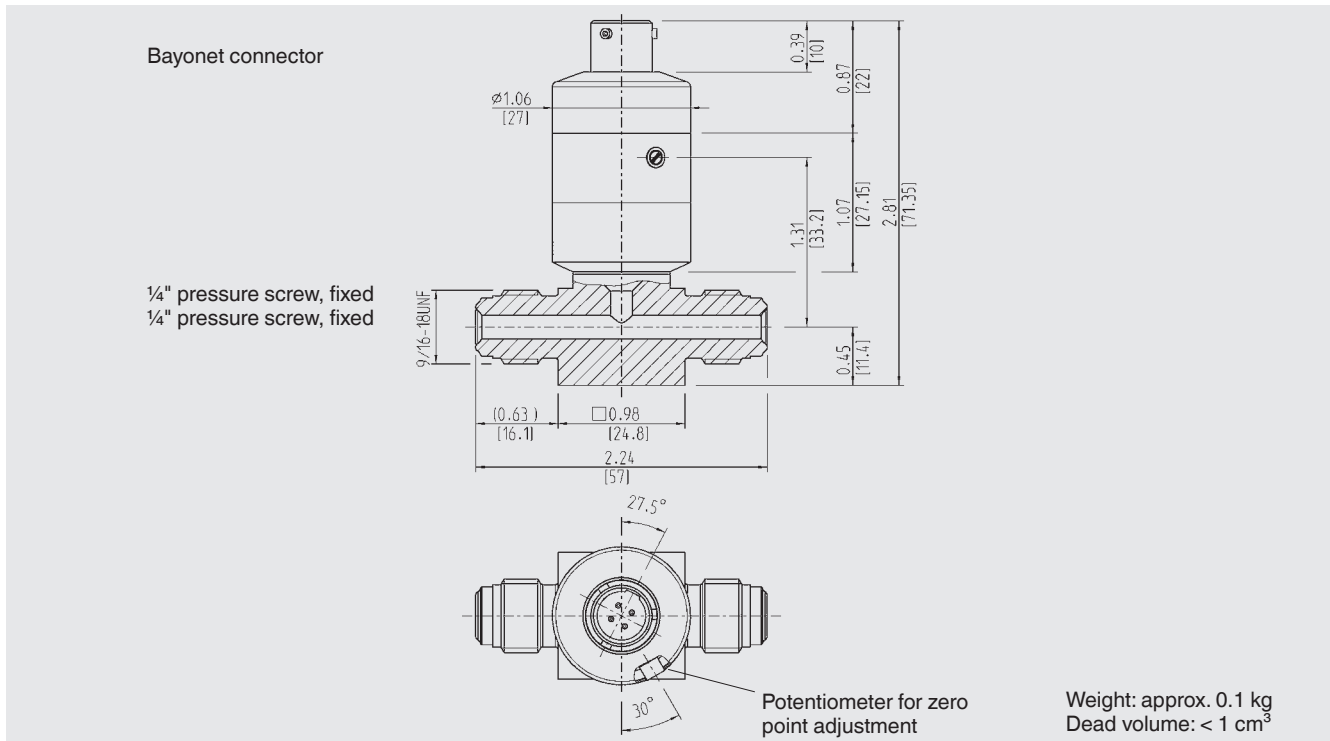
**Dimensions in inch [mm], model WU-20**



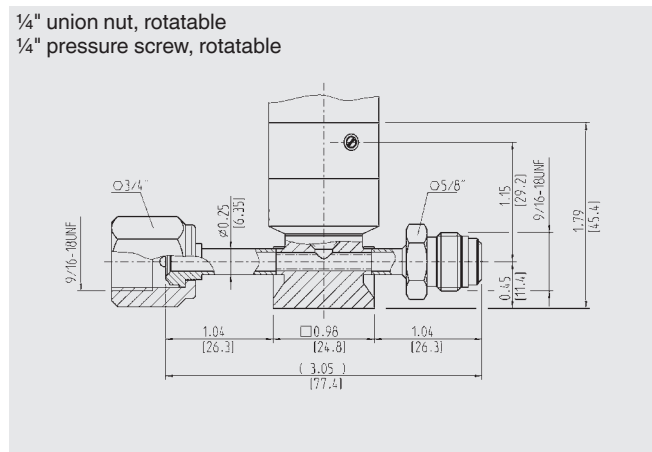
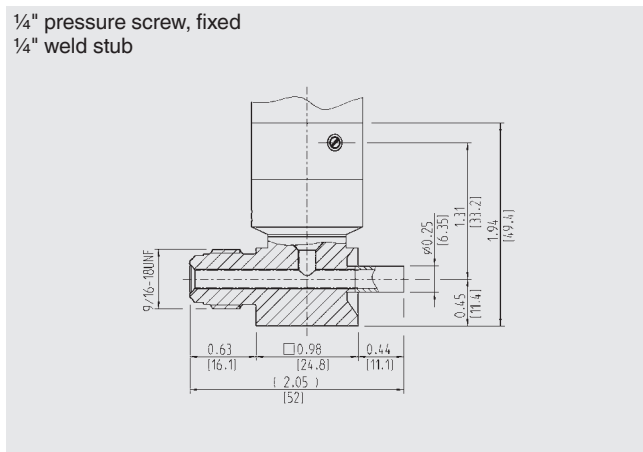
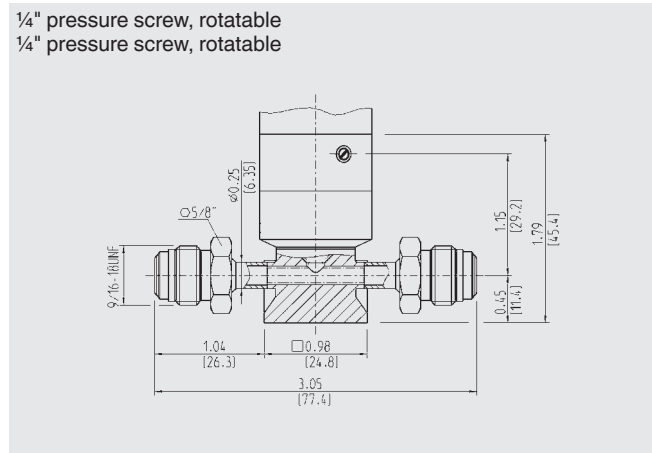
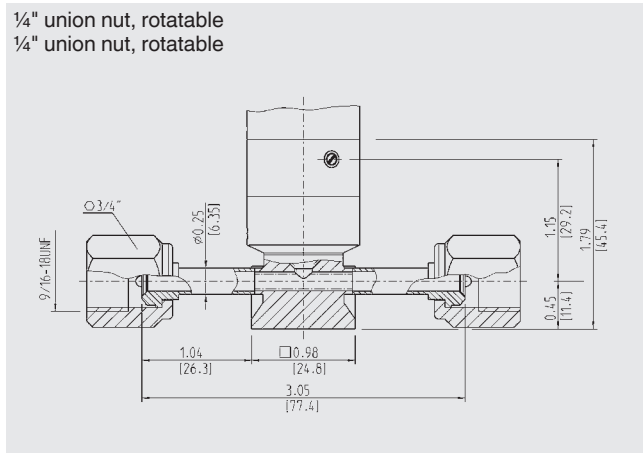
**Process connections**



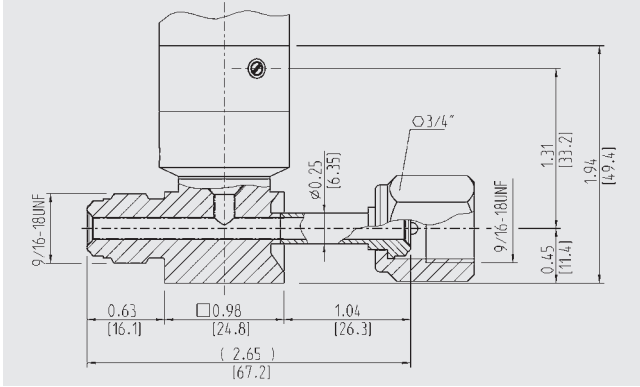
# Dimensions in inch [mm], model WU-25



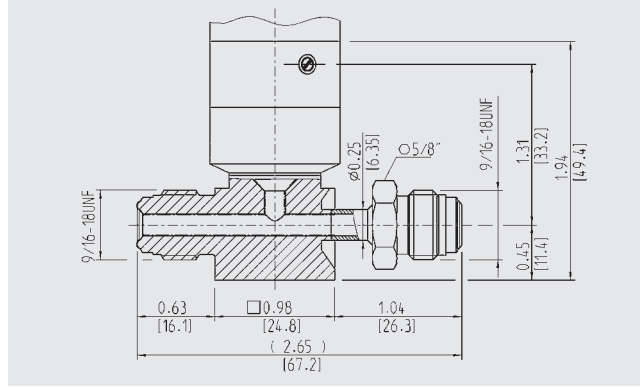
## Process connections



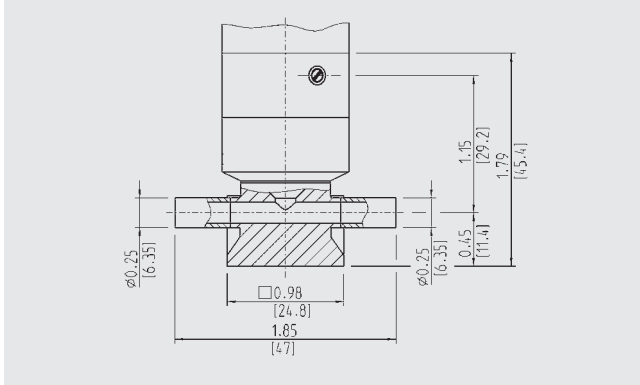
1/4" pressure screw, fixed  
 1/4" union nut, rotatable



1/4" pressure screw, fixed  
 1/4" pressure screw, rotatable



1/4" weld stub  
 1/4" weld stub

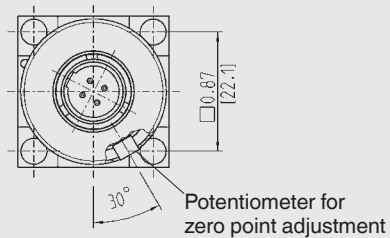
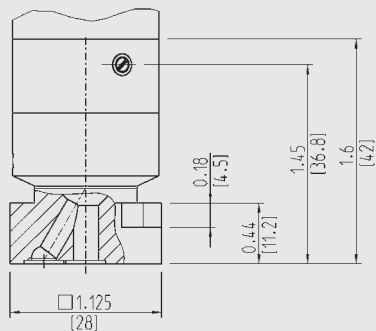




# Dimensions in inch [mm], model WU-26

## Process connections

MSM C 1 1/8"



Weight: approx. 0.1 kg  
Dead volume: < 1 cm<sup>3</sup>

## Ordering information

Model / Measuring range / Process connection / Output signal / Supply voltage / Electrical connection / Cable length / Approval

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