

Ultra high purity transducer, Ex nA nL 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 shielding and cancellation
- Active temperature compensation
- ATEX zone 2 approval, FM class I div. 2 groups A, B, C, D



Ultra high purity transducer

Fig. left: WU-20, single end

Fig. centre: WU-25, flow through

Fig. right: WU-26, modular surface mount

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.

WU-25 (flow through) and 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.

Versatile

The 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 WU-2x prevents the ingress of humidity.

Approvals for non-flammable and potentially flammable environments ensure a high level of product safety. Instruments for temperature class T6 meet the high requirements for low, spontaneous ignition temperature media (phosphine (PH₃) and silane (SiH₄)).

Compact

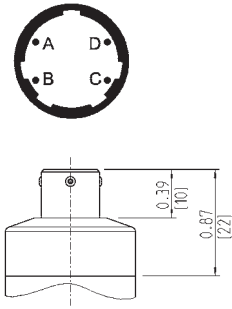
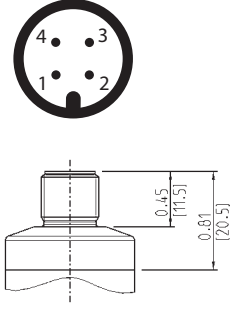
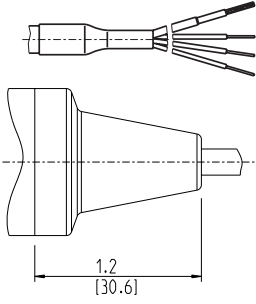
With its small footprint the WU-2x is the most compact UHP transducer in the market. Thus it is optimally suited for installation in applications with limited mounting space, and even in existing plants it can be easily retrofitted.

Specifications

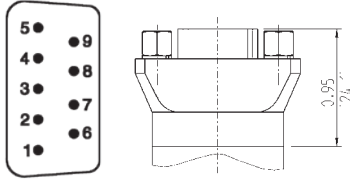
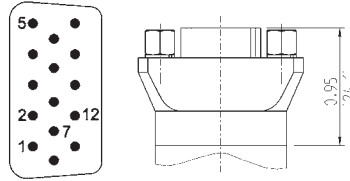
	Model WU-20, WU-25, WU-26					Model WU-20, WU-25						
Measuring range (bar)	2	4	7	11	17	25	36	70	100	145	225	360
Measuring range (psi)	30	60	100	160	250	350	500	1,000	1,500	2,000	3,000	5,000
Overpressure limit (bar)	8	8	14	20	32	50	80	150	200	320	500	720
Burst pressure (bar)	120	120	150	170	330	400	500	550	720	720	720	720
	Other measuring ranges and pressure units on request 1 psi = 0.069 bar											
Measuring principle	Thin-film measuring cell											
Materials												
■ Wetted parts												
- Process connection	316L VIM/VAR											
- Thin-film measuring cell	2.4711 / UNS R30003											
■ Case	304 SS											
Particle test	≤ 0.1 µm particles 0.1 ptc / ft ³ per SEMI E49.8											
Helium leak test	< 1 x 10 ⁻⁹ mbar l/sec (atm STD cc/sec) per SEMI F1											
Surface treatment	Electropolished, typical Ra ≤ 0.13 µm (RA 5); max. Ra ≤ 0.18 µm (RA 7) per SEMI F19											
Dead volume	WU-20 < 1.5 cm ³ , WU-25 < 1 cm ³ , WU-26 < 1 cm ³											
Permissible media	Special gas, vapour, liquid											
Power supply U+	DC 10 ... 31 V with output signal DC 0 ... 5 V / 4 ... 20 mA DC 14 ... 31 V with output signal DC 0 ... 10 V											
Output signals and max. load	4 ... 20 mA, 2-wire, R _A ≤ (U+ - 10 V) / 0.02 A DC 0 ... 5 V, 3-wire, R _A > 5 kΩ DC 0 ... 10 V, 3-wire, R _A > 10 kΩ											
Power P _i	1 W											
Adjustability of zero point	-3.5 ... +3.5 % of span (via potentiometer), current output -2 ... +3.5 % of span (via potentiometer), voltage output											
Response time (10 ... 90 %)	≤ 300 ms											
Insulation voltage	DC 500 V											
Accuracy	≤ 0.15 % of span (≤ 0.4 % of span with measuring ranges ≤ 2 bar) RSS (root sum squares) ≤ 0.3 % of span ¹⁾ (≤ 0.6 % of span ¹⁾ with measuring ranges ≤ 2 bar) per IEC 61298-2											
Hysteresis	≤ 0.14 % of span											
Non-repeatability	≤ 0.12 % of span											
Stability per year	≤ 0.25 % of span (typ.), at reference conditions (≤ 0.4 % of span with measuring ranges ≤ 2 bar)											
Permissible temperature ranges	Without approval		T4		T5		T6					
■ Medium	-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	-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	-40 ... +100 °C -4 ... +104 °F		-40 ... +100 °C -4 ... +212 °F		-40 ... +100 °C -40 ... +212 °F		-40 ... +100 °C -40 ... +212 °F					
Rated temperature range	-20 ... +80 °C, -4 ... +176 °F (actively compensated)											
Temperature coefficients within the rated temperature range (actively compensated)												
■ Mean TC of zero	≤ 0.1 % of span/10 K											
■ Mean TC of span	≤ 0.15 % of span/10 K											
RoHS conformity	Yes (not with bayonet connector)											
CE conformity												
■ Pressure equipment directive	97/23/EC											
■ EMC directive	2004/108/EC, EN 61326-1, emission (group 1, class B) and interference immunity (industrial application)											
■ ATEX directive	94/9/EC											
Ignition protection type	ATEX: II 3G Ex nA nL IIC T4/T5/T6 X (for transducers with Ex mark) FM: Non-flammable for use in class I, div. 2, groups A, B, C, D and class I, zone 2, group IIC, hazardous locations (hazard classes)											
Assembly and packaging area	Clean room class 5 per ISO 14644											
Packaging	Double packaging per SEMI E49.6											
Shock resistance	500 g (1.5 ms) per IEC 60068-2-27											
Vibration resistance	0.35 mm (10 ... 58 Hz) / 5 g (58.1 ... 2,000 Hz) per IEC 60068-2-6											
Electrical safety												
■ Short circuit	S+ vs. U-											
■ Reverse polarity	U+ vs. U-											
Weight	Approx. 0.1 kg											

1) Including non-linearity, hysteresis, zero offset and end value deviation (corresponds to measured error per IEC 61298-2)

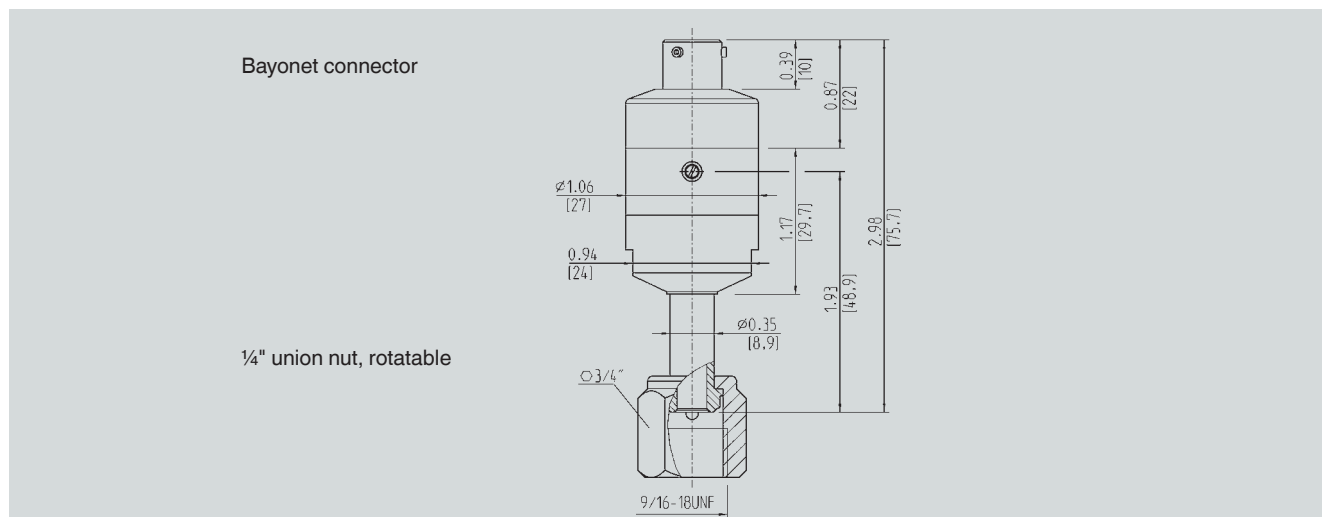
Electrical connections

	Bayonet connector (4-pin)			Circular connector M12 x 1 (4-pin)			Cable outlet 1.5 m and 3 m		
									
2-wire	U ₊ = A	U ₋ = D		U ₊ = 1	U ₋ = 3		U ₊ = red	U ₋ = black	
3-wire	U ₊ = A	U ₋ = D	S ₊ = B	U ₊ = 1	U ₋ = 3	S ₊ = 4	U ₊ = red	U ₋ = black	S ₊ = brown
Conductor cross-section	-			-			0.22 mm ² (AWG 24)		
Cable diameter	-			-			4.8 mm		
Ingress protection per IEC 60529	IP 67 (NEMA 4)			IP 67 (NEMA 4)			IP 67 (NEMA 4)		
	Ingress protection only applies when plugged in using mating connectors that have the appropriate ingress protection.								

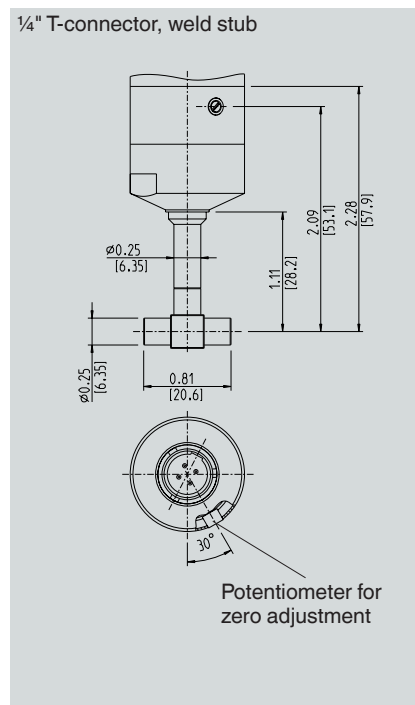
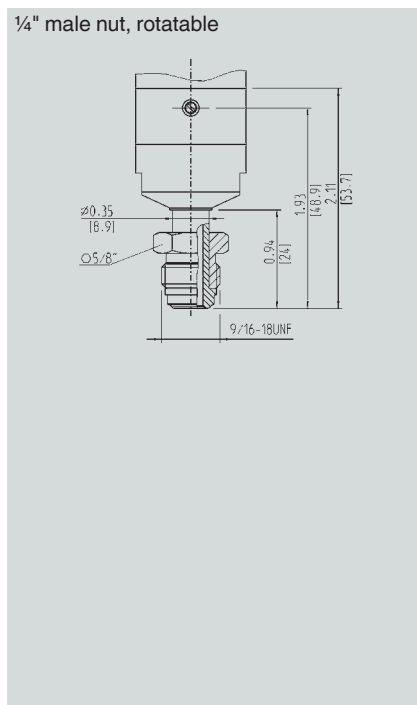
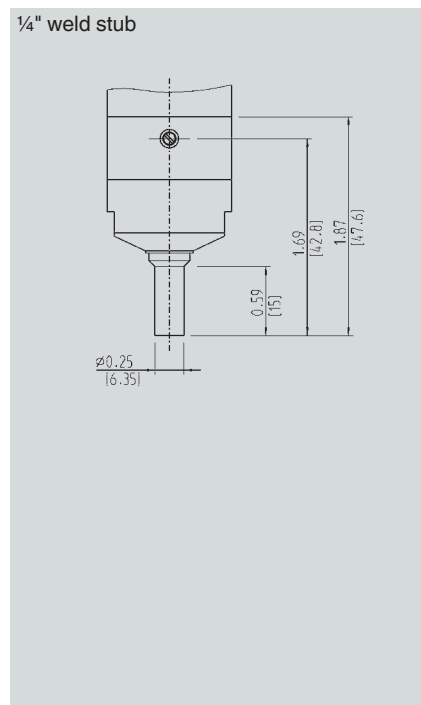
Electrical connections

	Sub-D connector, 9-pin			Sub-D HD connector (15-pin)		
						
2-wire	U ₊ = 4	U ₋ = 8 U ₋ = 9		U ₊ = 7	U ₋ = 5 U ₋ = 12	
3-wire	U ₊ = 4	U ₋ = 8 U ₋ = 9	S ₊ = 1	U ₊ = 7	U ₋ = 5 U ₋ = 12	S ₊ = 2
Conductor cross-section	-			-		
Cable diameter	-			-		
Ingress protection per IEC 60529	IP 54			IP 54		
	Ingress protection only applies when plugged in using mating connectors that have the appropriate ingress protection.					

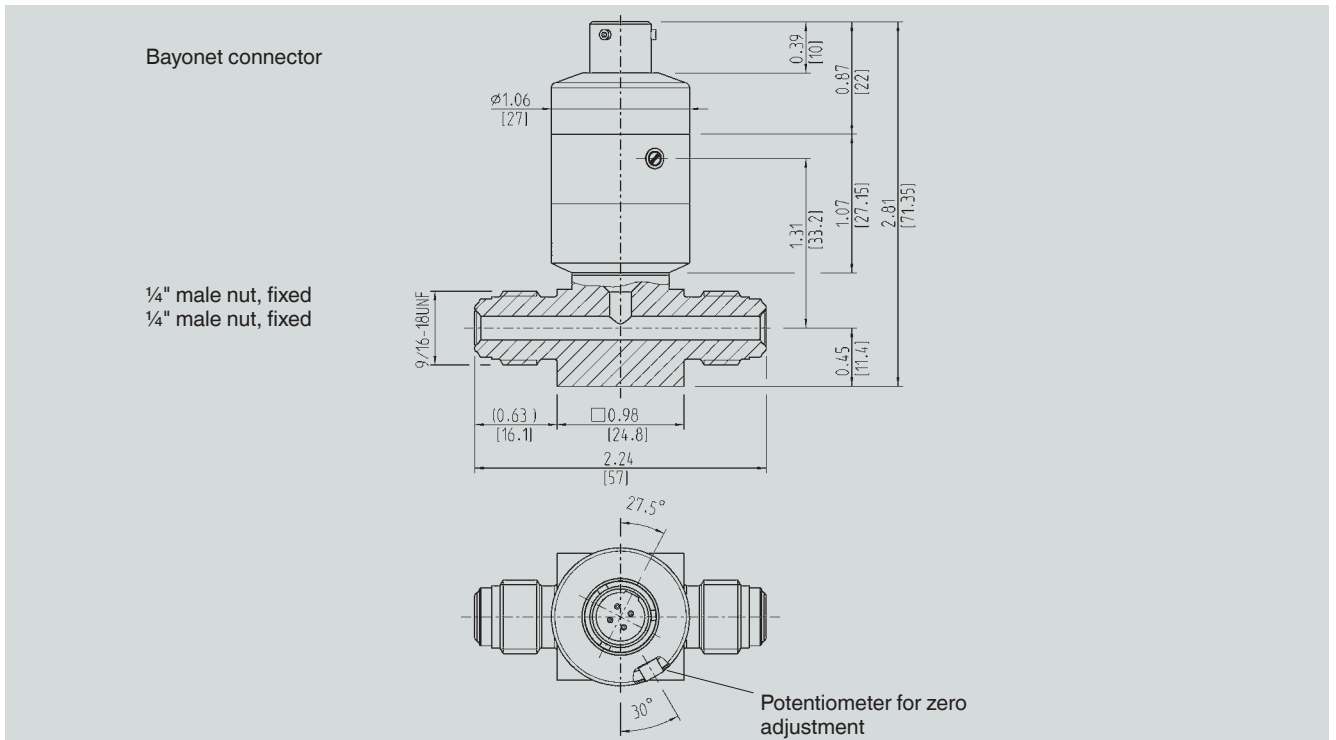
Dimensions in inch [mm], model WU-20



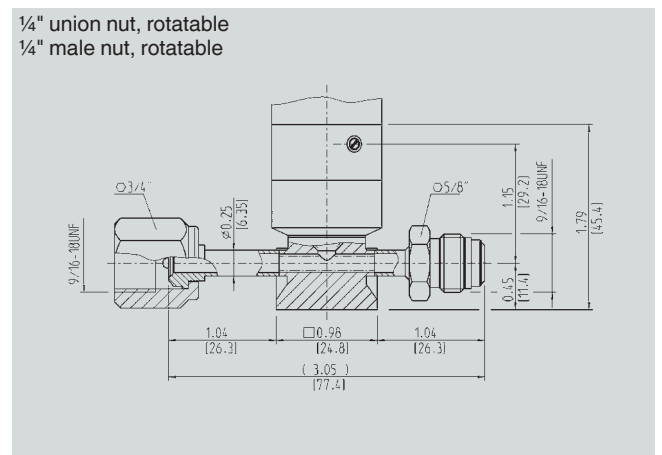
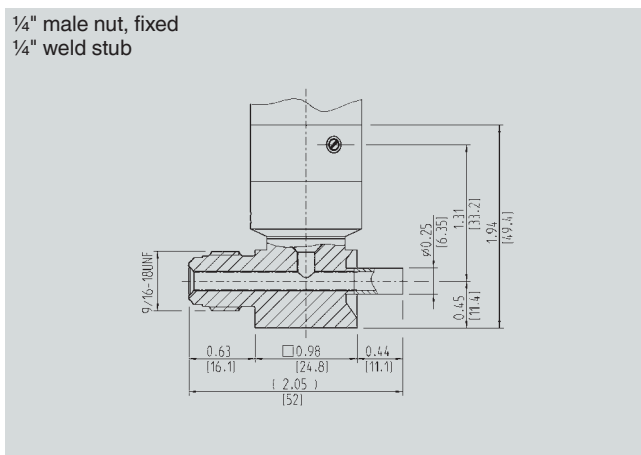
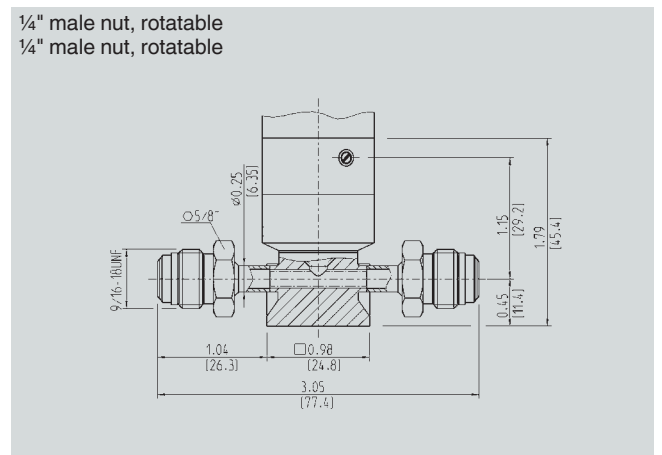
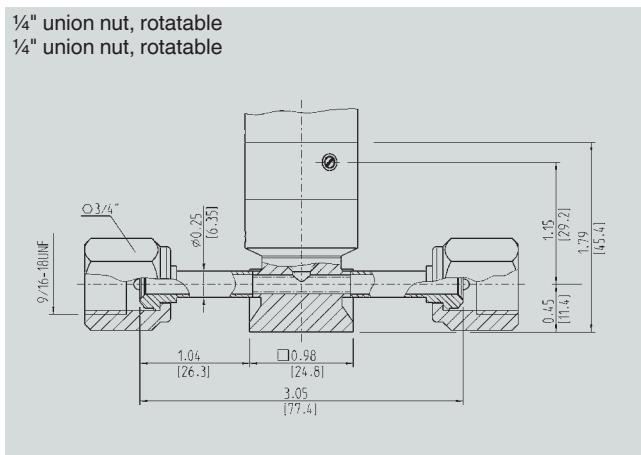
Process connections



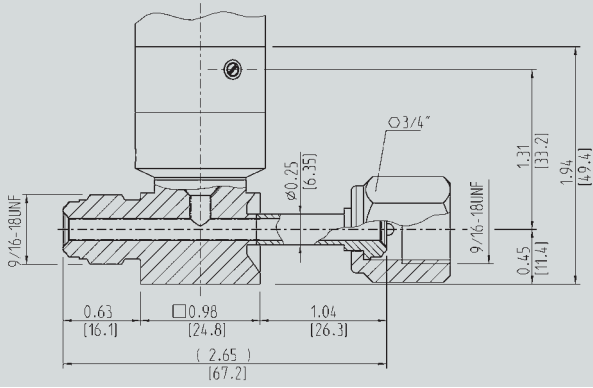
Dimensions in inch [mm], model WU-25



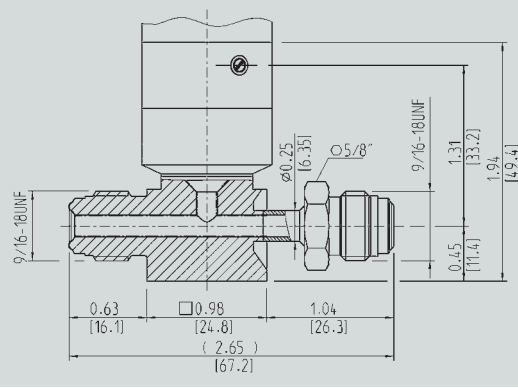
Process connections



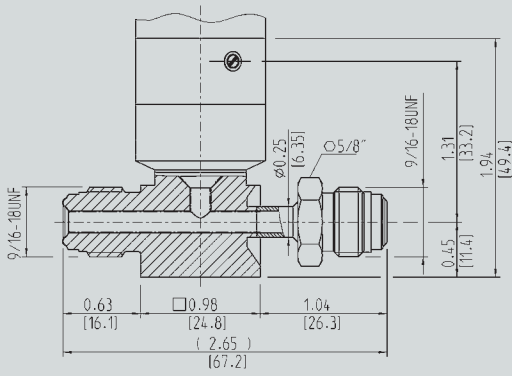
1/4" male nut, fixed
1/4" union nut, rotatable



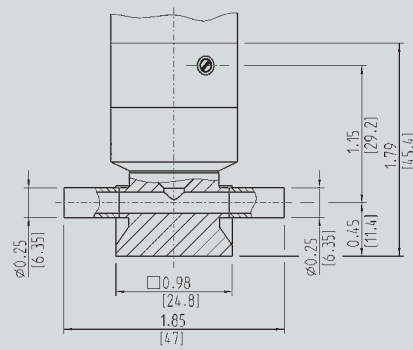
1/4" male nut, fixed
1/4" male nut, rotatable



1/4" male nut, fixed
1/4" male nut, rotatable



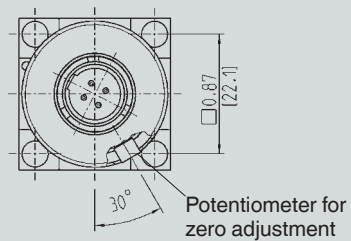
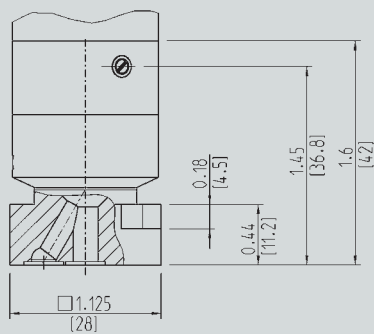
1/4" weld stub
1/4" weld stub



Dimensions in inch [mm], model WU-26

Process connections

MSM C 1 1/8"

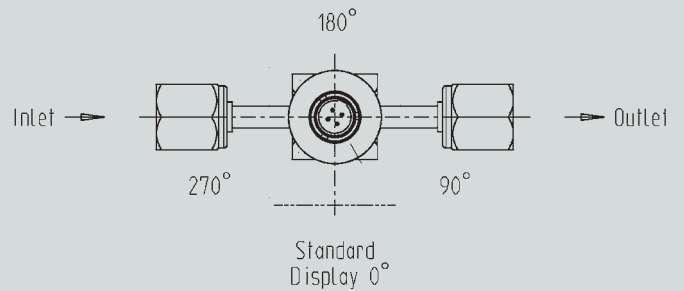
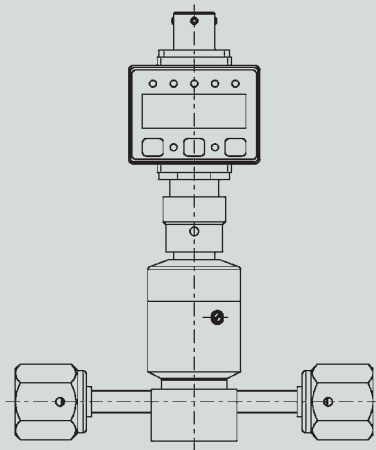


Connector orientation for the mounting of attachable indicators

Connector orientation

Standard 0°

Optional
90°
180°
270°



Accessories

LED attachable indicator WUR-1

- 4-digit display
- Ingress protection IP 65
- Accuracy: $\leq 0.5\% \pm 1$ digit
- Up to 2 switching outputs configurable
- 5 different pressure units adjustable



Front view



Top view

Model WUR-1			Order no.	
Input	Output	Signal	Front view	Top view
M12 x 1	M12 x 1	4 ... 20 mA, 2-wire	7043425	7330752
M12 x 1	M12 x 1	DC 0.1 ... 10.1 V, 3-wire	7717683	7495459
M12 x 1	M12 x 1	DC 0.1 ... 5.1 V, 3-wire	7717594	7717488
Bayonet	Bayonet	4 ... 20 mA, 2-wire	7291390	7196444
Bayonet	Bayonet	DC 0.1 ... 10.1 V, 3-wire	7718736	7718689
Bayonet	Bayonet	DC 0.1 ... 5.1 V, 3-wire	7718701	7718671
Bayonet	Cable	4 ... 20 mA, 2-wire	7005299	7005311

Ordering information

Model / Measuring range / Process connection / Output signal / Power supply / Electrical connection / Cable length / Approval

