

Ultra high purity transducer For explosion-protected areas, Ex nA ic Models WUC-10, WUC-15 and WUC-16

WIKA data sheet PE 87.06



Applications

- Semiconductor, flat panel display and photovoltaic industry
- Ultrapure media and special gas systems (gas sticks, gas panels, bulk-gas supply, tank farm installations)

Special features

- Compact design
- ATEX and IECEx zone 2 approval
- Ingress protection IP 67 (NEMA 4) with “side access” zero potentiometer
- Excellent EMC stability
- Active temperature compensation

Description

Compact

The space-saving design of the model WUC-1x provides greater free space in plants and installations.

The WUC-15 and 16 series transducers are notable for their excellent self-draining characteristics. The special sensor connection design eliminates the influence on the sensor signal through loads on the process connections or weld seams.

Versatile

The high IP 67 ingress protection also enables them to be used under harsh conditions on tank farm and speciality gas installations outdoors.

This series of instruments was also developed for use in Ex zone 2. The T6 temperature class classification ensures that even measurements of media with low self-ignition temperatures, such as PH₃ (phosphine), do not present a problem.



Fig. left: Model WUC-10, single end

Fig. centre: Model WUC-15, flow through

Fig. right: Model WUC-16, modular surface mount

Reliable

With cyclic pressure rinsing, high gas throttling values (Joule-Thompson effect) and external operation, high temperature fluctuations can occur. The active temperature compensation detects these changes and minimises their influence. Thus stable measurement is ensured.

Through the sealed “side access” zero point adjustment, the high IP 67 ingress protection is permanently maintained. Simple handling and protection from unintentional adjustment is ensured.

For all wetted parts the materials 316L VIM VAR and special thin-film sensors from 2.4711 / UNS R30003 are used. Prior to final assembly all wetted parts are electropolished and cleaned using state-of-the-art processes.

Through an individual examination of each transducer it is ensured that the required values for leak tightness, overpressure stability, accuracy and particles are met in accordance with the applicable SEMI™ standards.

Specifications

		WUC-10, WUC-15											
		WUC-16											
Measuring range	psi	30	60	100	160	250	350	500	1,000	1,500	2,000	3,000	5,000
	bar	2	4	7	11	17	25	36	70	100	145	225	360
Overpressure limit ¹⁾	psi	120	120	210	320	500	750	1,100	2,100	3,000	4,200	6,600	10,000
Burst pressure ¹⁾	psi	1,800	1,800	2,200	2,600	4,800	6,200	7,400	8,000	10,500	10,500	10,500	10,500
Other measuring ranges and pressure units (e. g. MPa, kg/cm ²) on request													
Measuring principle	Thin-film sensor												
Material													
■ Wetted parts													
- Process connection	316L VIM/VAR												
- Pressure sensor	2.4711 / UNS R30003												
■ Case	304 SS												
Particle test	≤ 0.1 µm particles 0.1 ptc / ft ³ per SEMI E49.8												
Inboard helium leak test	< 1 x 10 ⁻⁹ mbar l/sec (atm STD cc/sec) per SEMI F1												
Surface quality per SEMI F19	Electropolished typ. R _a ≤ 0.13 µm (R _A 5) max. R _a ≤ 0.18 µm (R _A 7)												
Dead volume	WUC-10 < 1.5 cm ³ WUC-15 < 1 cm ³ WUC-16 < 1 cm ³												
Permissible media	Speciality gases, mist, liquids												
Power supply U ₊	DC 10 ... 30 V DC 14 ... 30 V with output 0 ... 10 V												
Output signal and permissible max. load R _A in Ω	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	-5 ... +3.5 % of span (via potentiometer) current output signal -2 ... +5 % of span (via potentiometer) voltage output signal												
Settling time (10 ... 90 %)	≤ 300 ms												
Insulation voltage	DC 500 V												
Accuracy	≤ 0.2 % of span (≤ 0.4 % of span for measuring ranges ≤ 2 bar) RSS (root sum squares) incl. non-linearity, hysteresis and non-repeatability												
Non-linearity	≤ 0.5 ²⁾ % of span (≤ 1.0 ²⁾ % of span for measuring ranges ≤ 2 bar) per IEC 61298-2												
Hysteresis	≤ 0.1 % of span (≤ 0.15 % of span for measuring ranges ≤ 2 bar) (BFSL) per IEC 61298-2												
Non-repeatability	≤ 0.14 % of span												
Long-term stability	≤ 0.12 % of span												
Permissible temperature ranges	Not Ex												
■ Medium	-20 ... +100 °C			T4 -20 ... +85 °C			T5 -20 ... +60 °C			T6 -20 ... +40 °C			
■ Ambient	-20 ... +85 °C			-20 ... +85 °C			-20 ... +60 °C			-20 ... +40 °C			
■ Storage	-40 ... +100 °C			-40 ... +100 °C			-40 ... +100 °C			-40 ... +100 °C			
Rated temperature range	-20 ... +80 °C (actively compensated)												
Temperature coefficients in 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 circular connector)												
CE conformity													
■ Pressure equipment directive	97/23/EC												
■ EMC directive	2004/108/EC, EN 61326 emission (group 1, class B) and interference immunity (industrial application)												
■ ATEX directive	94/9/EC												
Ex protection (ATEX, IECEx)	Category 3G (for transducers with Ex mark)												
Ignition protection type	II 3G Ex nA ic IIC T4/T5/T6 Gc (for transducers with Ex mark)												

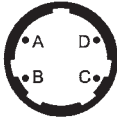

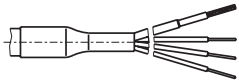
Specifications

Ex protection (FM)	Class I
Ignition protection type	Non-incendive class I division 2 group A, B, C and D
Production environment	Clean room class 5 per ISO 14644
Packaging	Double-bagged 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 EN 60068-2-6
Short-circuit resistance	S ₊ vs. U ₋ (short time)
Reverse polarity protection	U ₊ vs. U ₋
Weight	approx. 0.1 kg

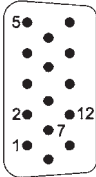
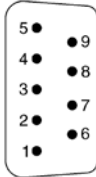
1) 1 psi = 0.069 bar

2) Including non-linearity, hysteresis, zero offset and end value deviation (corresponds to measured error per IEC 61298-2).
 Kalibrated in vertical mounting position with process connection facing downwards.

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
Wire 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)		
	The ingress protection classes specified only apply while the pressure transmitter is connected with female connectors that provide the corresponding ingress protection.								

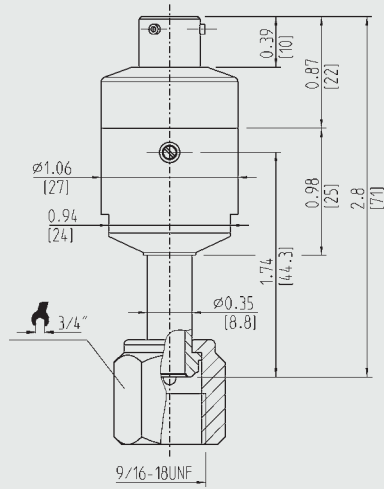
Electrical connections

	Sub-D HD connector (15-pin)			Sub-D connector (9-pin)		
						
2-wire	U ₊ = 7	U ₋ = 5		U ₊ = 4	U ₋ = 8	
		U ₋ = 12			U ₋ = 9	
3-wire	U ₊ = 7	U ₋ = 5	S ₊ = 2	U ₊ = 4	U ₋ = 8	S ₊ = 1
		U ₋ = 12			U ₋ = 9	
Wire cross-section	-			-		
Cable diameter	-			-		
Ingress protection per IEC 60529	IP 54			IP 54		
	The ingress protection classes specified only apply while the pressure transmitter is connected with female connectors that provide the corresponding ingress protection.					

Dimensions in inch [mm] WUC-10

Electrical connections

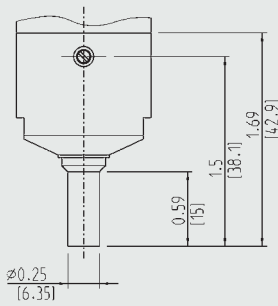
Bayonet circular connector



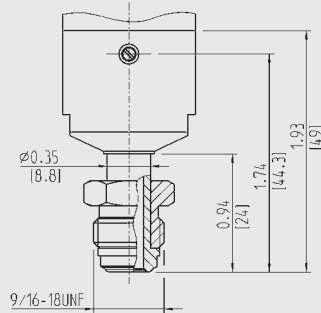
1/4" union nut, rotatable

Process connections

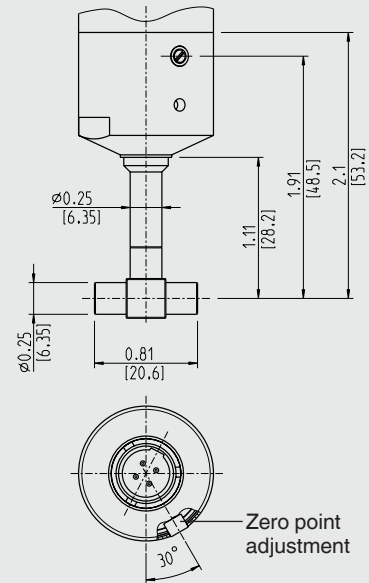
1/4" weld-in connection



1/4" male nut, rotatable

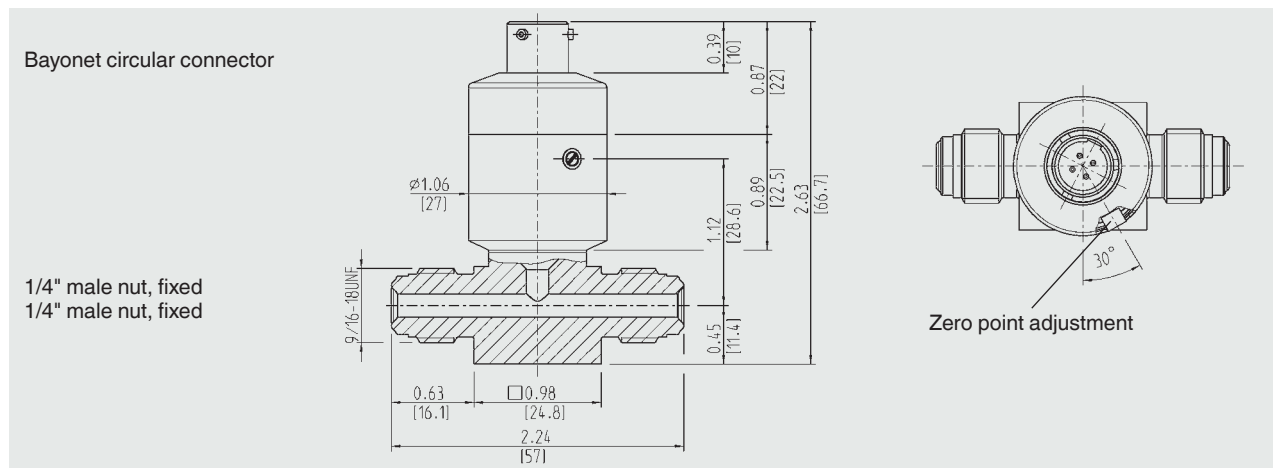


1/4" T-connector, weld-in connection

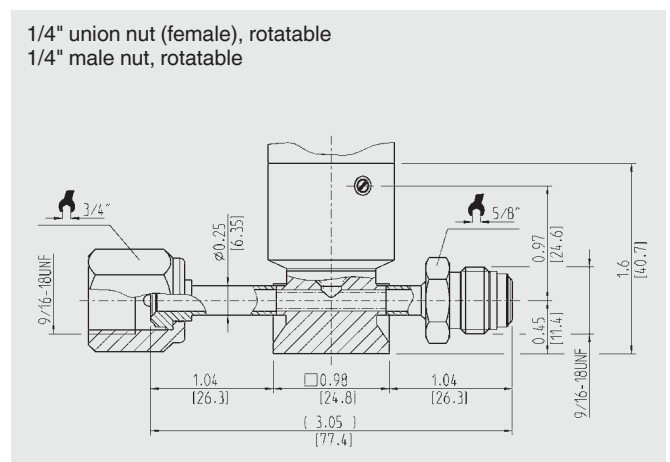
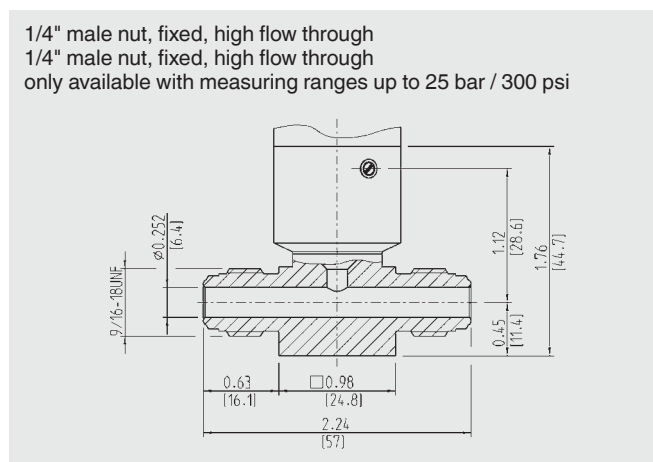
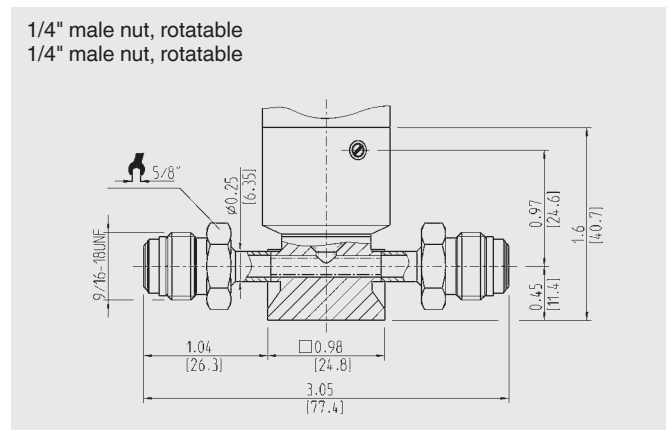
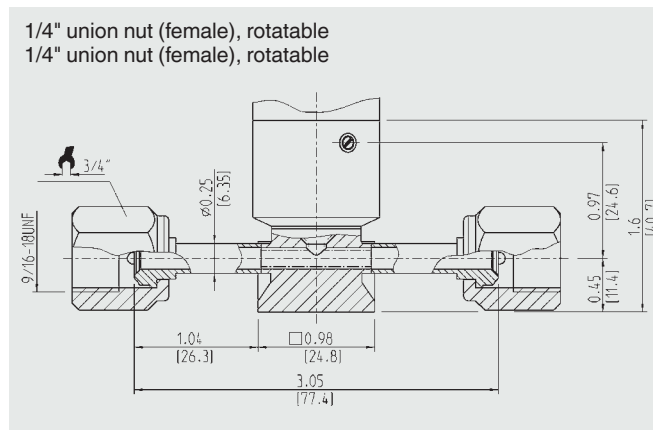


Dimensions in inch [mm] WUC-15

Electrical connections

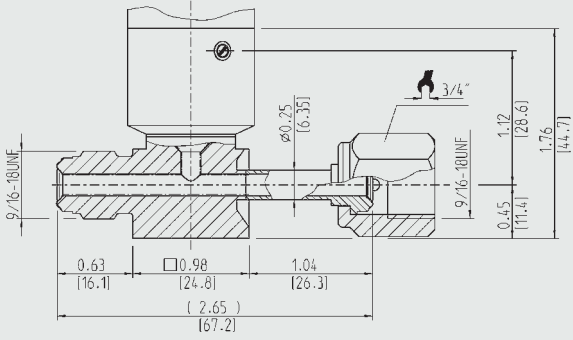


Process connections

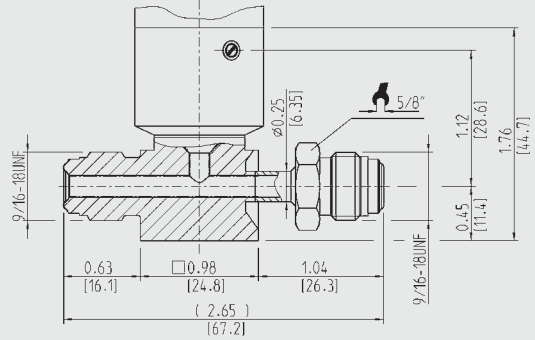


Process connections for WUC-15

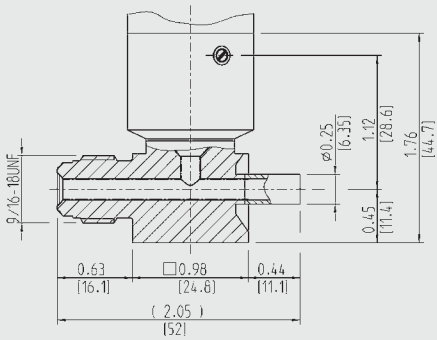
1/4" male nut, fixed
1/4" union nut (female), rotatable



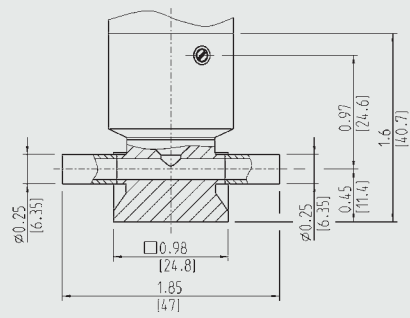
1/4" male nut, fixed
1/4" male nut, rotatable



1/4" male nut, fixed
1/4" weld-in connection

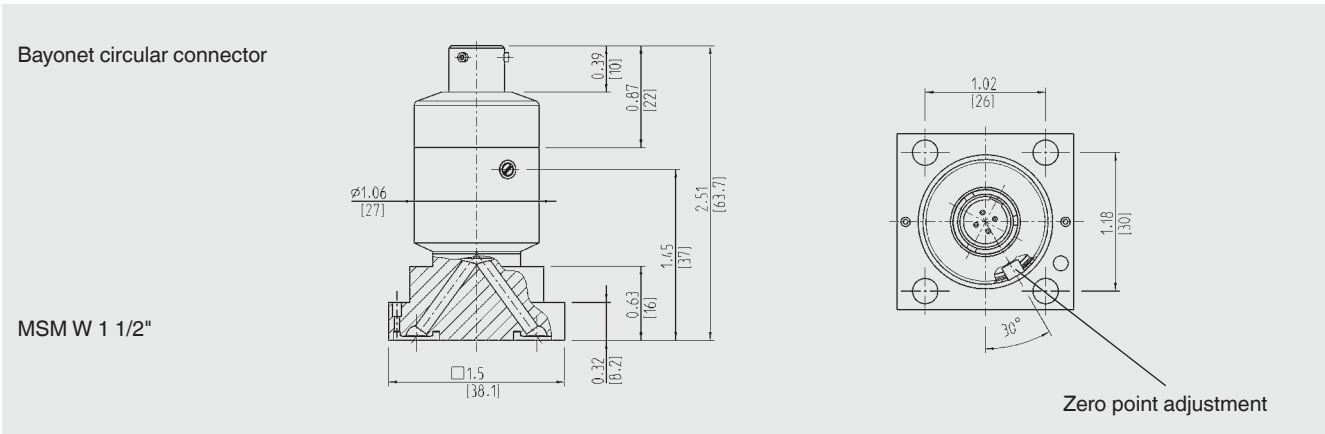


1/4" weld-in connection
1/4" weld-in connection

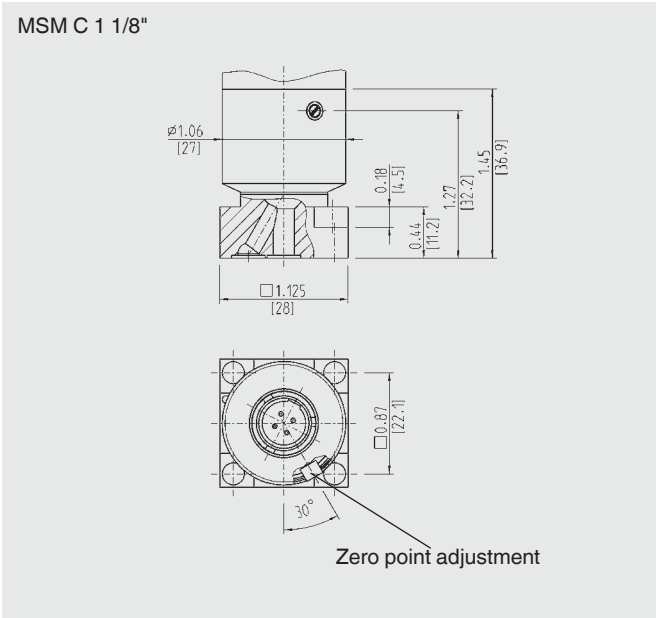
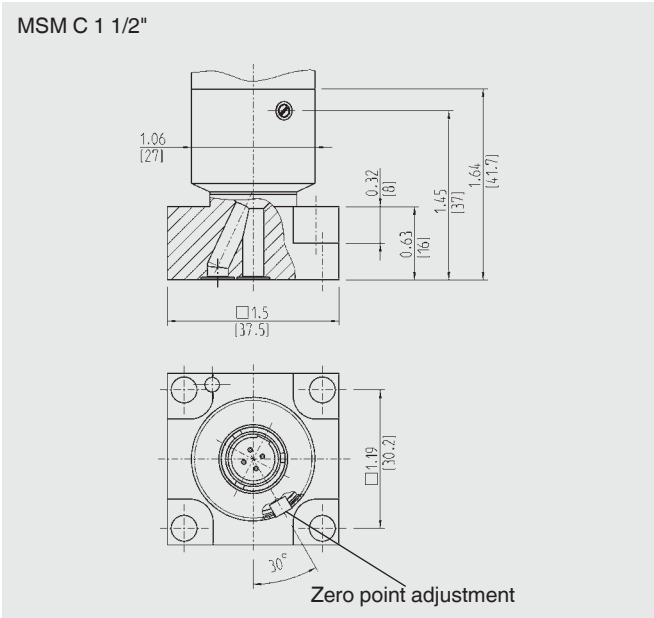


Dimensions in inch [mm] WUC-16

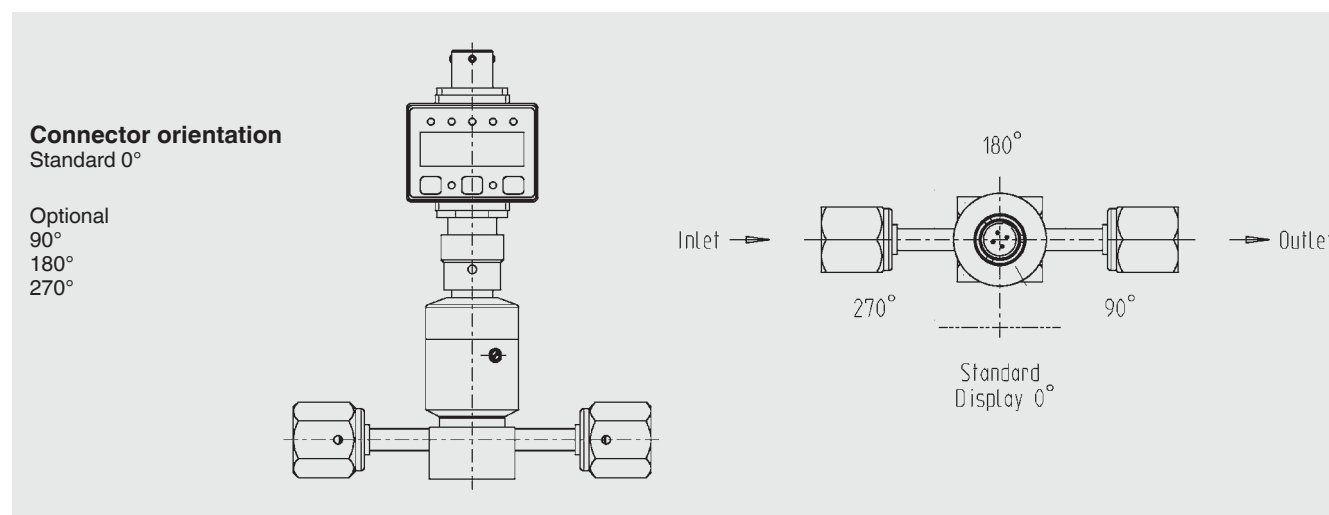
Electrical connections



Process connections



Connector orientation for the mounting of attachable indicators



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

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