

# Ultra high purity transducer, Ex n 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 zone 2 approval
- Ingress protection IP 67 (NEMA 4) with "side access" zero point 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 has also been 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.

The materials 316L VIM VAR are used for all wetted parts and the special thin film sensors are from 2.4711 / UNSR 30003. All wetted parts are electropolished and cleaned with the latest processes before final assembly.

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

# Models WUC-10, WUC-15, WUC-16

		WUC-10, WUC-15													
		WUC-16													
Measuring range	psi	14.5	25	60	100	160	250	350	500	1000	1500	2000	3000	5000	
	bar	1	1.7	4	7	11	17	25	36	70	100	145	225	360	
Overpressure safety <sup>1)</sup>	psi	120	120	120	210	320	500	750	1100	2100	3000	4200	6600	10000	
Burst pressure <sup>1)</sup>	psi	1800	1800	1800	2200	2600	4800	6200	7400	8000	10500	10500	10500	10500	
		Other measuring ranges and pressure units (e. g. MPa, kg/cm <sup>2</sup> ) on request													
Measuring principle		Thin-film sensor													
Material															
■ Wetted parts															
- Process connection		316L VIM/VAR													
- Pressure sensor		2.4711 / UNSR 30003													
■ Case		304 SS													
Particle test		≤ 0.1 µm particle 0.1 ptc / ft <sup>3</sup> per Semi E49.8													
Inboard helium leak test		< 1 x 10 <sup>-9</sup> mbar l/sec (atm STD cc/sec) per Semi F1													
Surface finish		Electropolished, typ. Ra ≤ 0.13 µm (RA 5); max. Ra ≤ 0.18 µm (RA 7) per Semi F19													
Dead volume	cm <sup>3</sup>	WUC-10 < 1.5, WUC-15 < 1, WUC-16 < 1													
Permissible media		Speciality gases, mist, liquids													
Power supply U <sub>+</sub>	DC	10 ... 30 V 14 ... 30 V with output 0 ... 5 V / 0 ... 10 V													
Output signal and permissible max. load R <sub>A</sub>	R <sub>A</sub> in ohm	4 ... 20 mA, 2-wire							R <sub>A</sub> ≤ (U <sub>+</sub> - 10 V) / 0.02 A						
		0 ... 5 V, 3-wire							R <sub>A</sub> > 5k						
		0 ... 10 V, 3-wire							R <sub>A</sub> > 10k						
Power P <sub>i</sub>	W	1													
Adjustability of zero point	% of span	-5 to +3.5 (via potentiometer) current output signal -2 to +5 (via potentiometer) voltage output signal													
Settling time (10 ... 90 %)	ms	≤ 300													
Insulation voltage	DC	500 V													
Accuracy	% of span	≤ 0.2 (≤ 0.4 with measuring ranges ≤ 2 bar) RSS (Root Sum Squares) per Semi draft # 3440 ≤ 0.5 <sup>2)</sup> (≤ 1.0 <sup>2)</sup> with measuring ranges ≤ 2 bar) per IEC 61298-2													
Non-linearity	% of span	≤ 0.1 (≤ 0.15 with measuring ranges ≤ 2 bar) (BFSL) per IEC 61298-2													
Hysteresis	% of span	≤ 0.14													
Non-repeatability	% of span	≤ 0.12													
Long-term stability	% of span	≤ 0.25 typ. / year (at reference conditions)													
Permissible temperature ranges		Non-Atex			T4			T5			T6				
■ Medium	°C	-20 ... +100			-20 ... +85			-20 ... +60			-20 ... +40				
■ Ambient	°C	-20 ... +85			-20 ... +85			-20 ... +60			-20 ... +40				
■ Storage	°C	-40 ... +100			-40 ... +100			-40 ... +100			-40 ... +100				
Rated temperature range	°C	-20 ... +80 (actively compensated)													
Temperature coefficients in rated temperature range (actively compensated):															
■ TC of zero point	% of span	≤ 0.1 / 10 K													
■ TC of span	% of span	≤ 0.15 / 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 immunity (industrial locations)													
■ ATEX directive		94/9/EC													
Ex protection	ATEX	Category 3G (for transducers with Ex mark)													
Ignition protection type		II 3G Ex nA nL IIC T4/T5/T6 X (for transducers with Ex mark)													
Ex protection	FM	Class I													
Ignition protection type		Self-protected energy-limited class I div 2 group A,B,C,D													
Production environment		Clean room class 5 per ISO 14644													
Packaging		Double-bagged per SEMI E49.6													

## Specifications

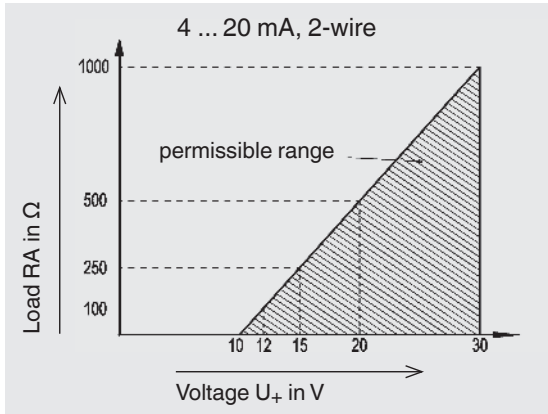
## Models WUC-10, WUC-15, WUC-16

Shock resistance	g	500 (1.5 ms) per IEC 60068-2-27
Vibration resistance		0.35 mm (10 - 58 Hz) / 5 g (58.1 - 2000 Hz) per EN 60068-2-6
Short-circuit resistance		S <sub>+</sub> towards U <sub>-</sub> (short-time)
Reverse polarity protection		U <sub>+</sub> towards U <sub>-</sub>
Weight	kg	approx. 0.1

1) 1 psi = 0,069 bar

2) Including non-linearity, hysteresis, zero-point and full scale value deviations (corresponds to measured error per IEC 61298-2).  
Calibrated in vertical mounting position with process connection facing downwards.

## Output signal and permissible load



### Current output (2-wire)

4 ... 20 mA:  $R_A \leq (U_+ - 10 \text{ V}) / 0.02 \text{ A}$

### Voltage output (3-wire)

0 ... 5 V:  $R_A > 5 \text{ k}$

0 ... 10 V:  $R_A > 10 \text{ k}$

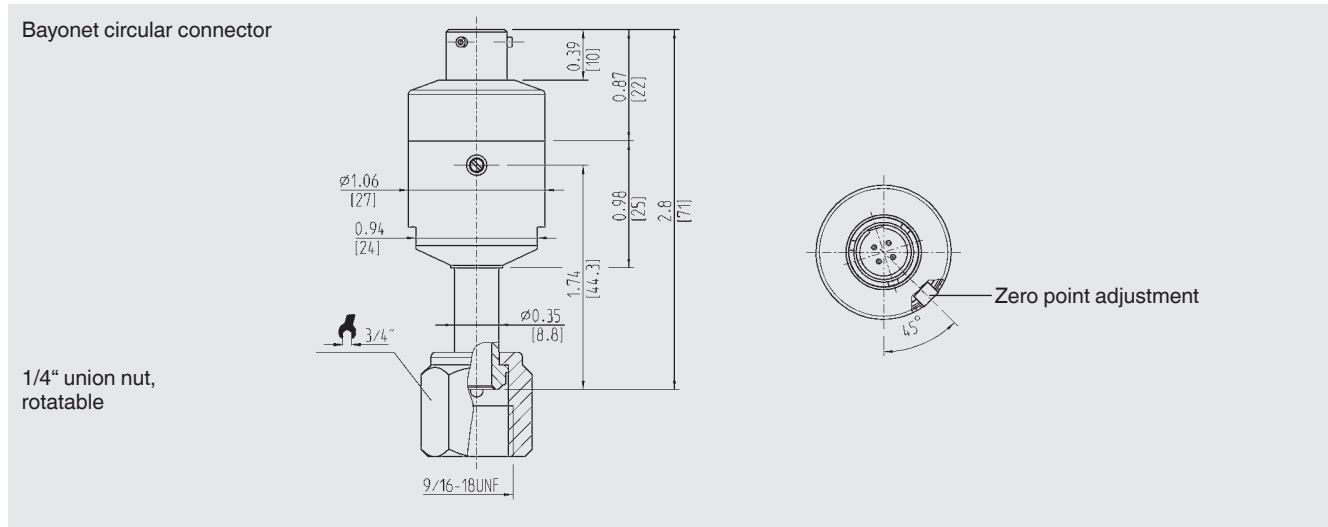
with  $R_A$  in ohm and  $U_+$  in VDC

## Electrical connections

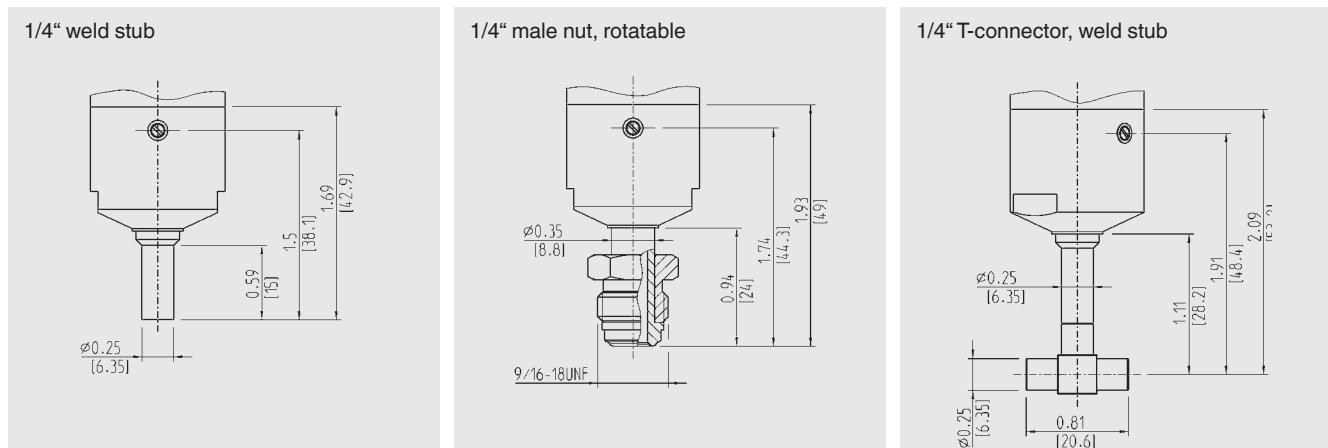
	Bayonet circular connector 4-pin	Circular connector M12 x 1, 4-pin	Cable outlet 1.5 m	Sub-D HD connector 15-pin
2-wire	U <sub>+</sub> = A U <sub>-</sub> = D	U <sub>+</sub> = 1 U <sub>-</sub> = 3	U <sub>+</sub> = red U <sub>-</sub> = black	U <sub>+</sub> = 7 U <sub>-</sub> = 5
3-wire	U <sub>+</sub> = A U <sub>-</sub> = D S <sub>+</sub> = B	U <sub>+</sub> = 1 U <sub>-</sub> = 3 S <sub>+</sub> = 4	U <sub>+</sub> = red U <sub>-</sub> = black S <sub>+</sub> = brown	U <sub>+</sub> = 7 U <sub>-</sub> = 5 S <sub>+</sub> = 2
Wire cross-section	-	-	0.22 mm <sup>2</sup> (AWG 24)	-
Cable diameter	-	-	4.8 mm	-
Ingress protection per IEC 60529	IP 67 (NEMA 4)	IP 67 (NEMA 4)	IP 67 (NEMA 4)	IP 54
	The stated ingress protection only applies when plugged-in using mating connectors that have the appropriate ingress protection.			

# Dimensions in inch [mm] WUC-10

## Electrical connections

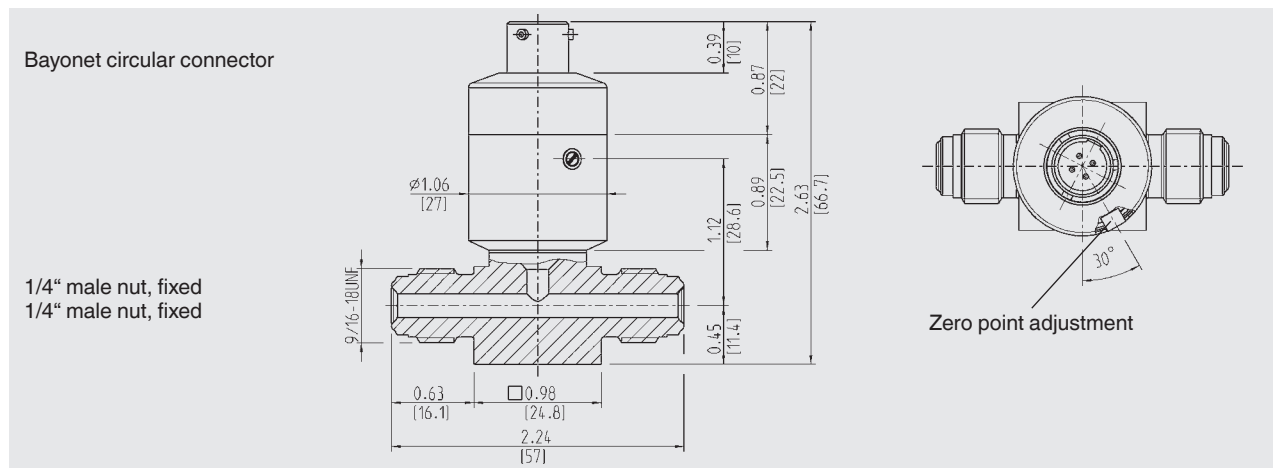


## Process connections

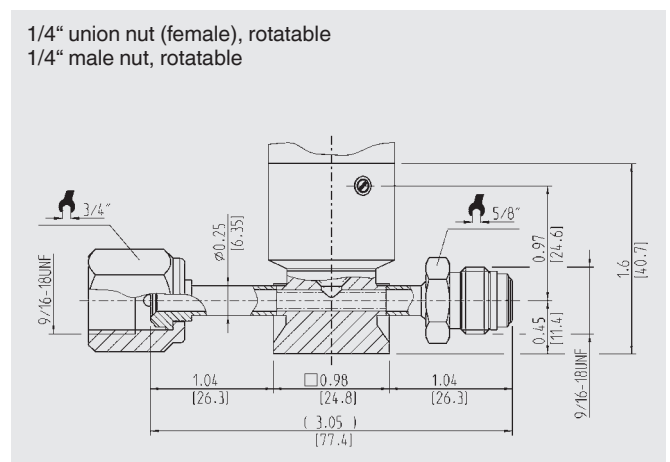
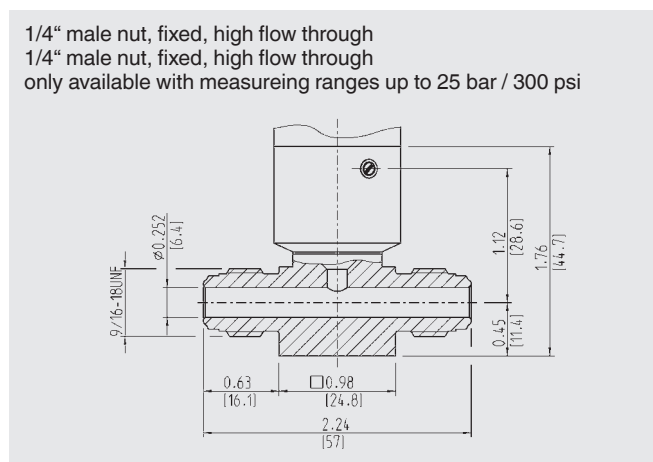
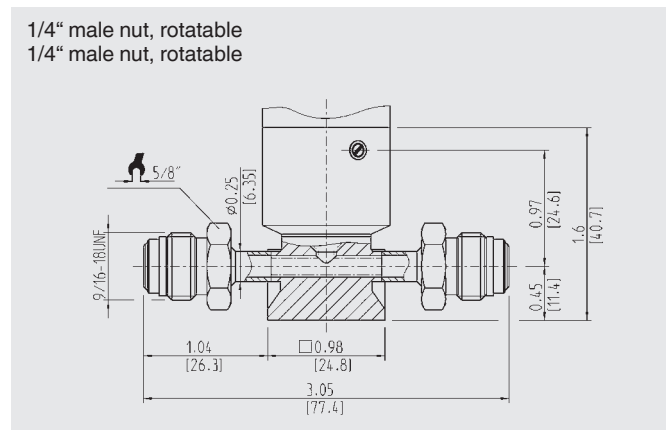
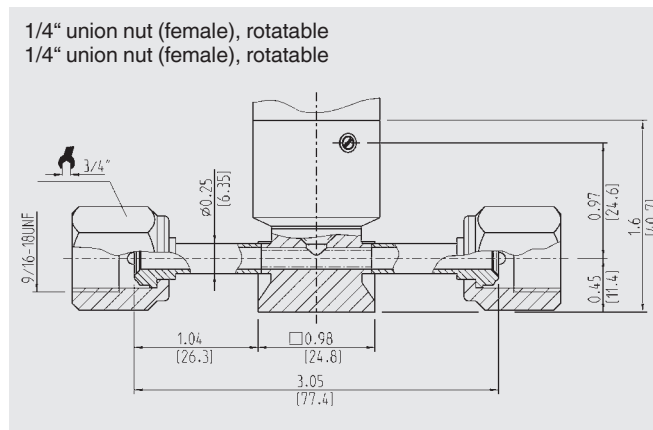


# Dimensions in inch [mm] WUC-15

## Electrical connections

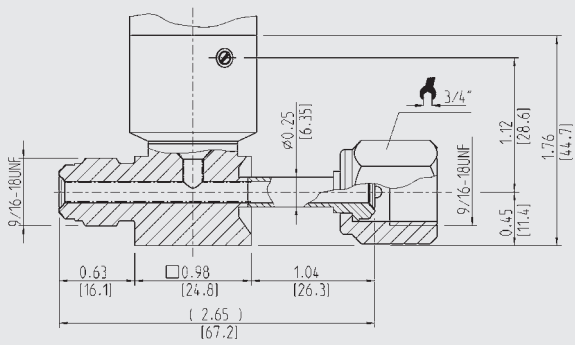


## Process connections

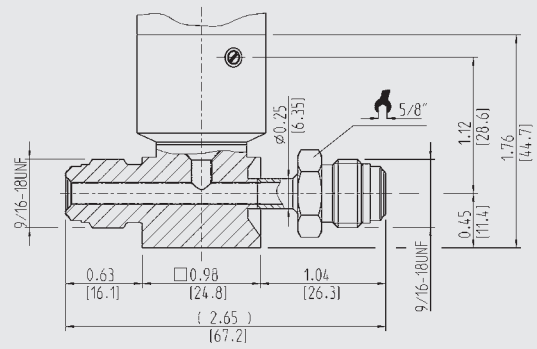


**Process connections for WUC-15**

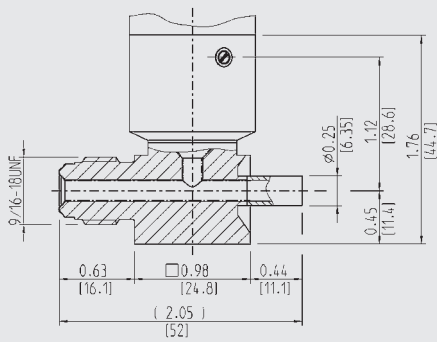
1/4" male nut, fixed  
1/4" union nut (female), rotatable



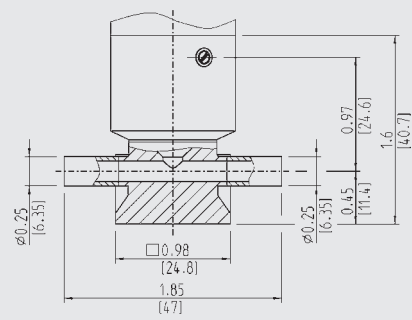
1/4" male nut, fixed  
1/4" male nut, rotatable



1/4" male nut, fixed  
1/4" weld stub

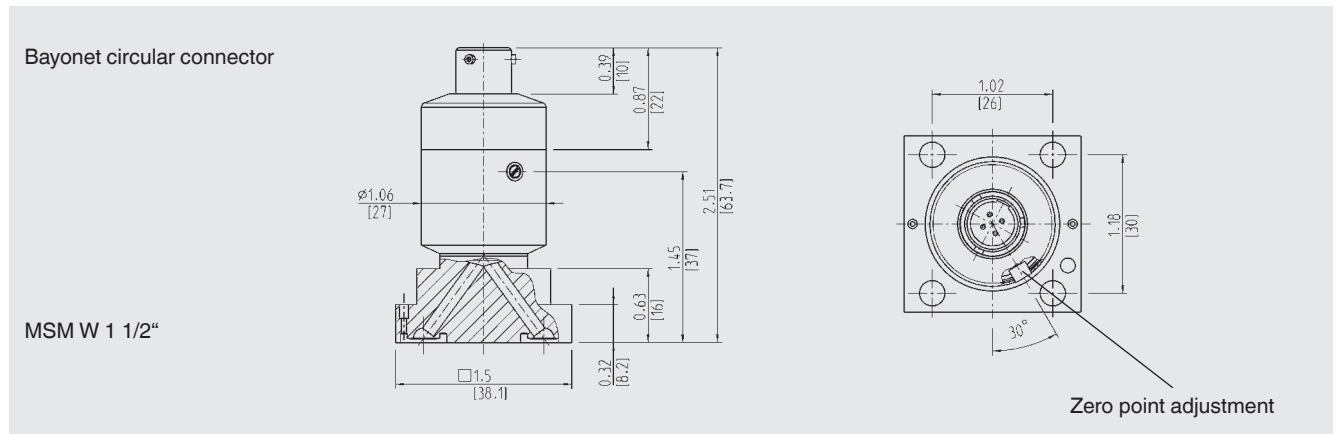


1/4" weld stub  
1/4" weld stub

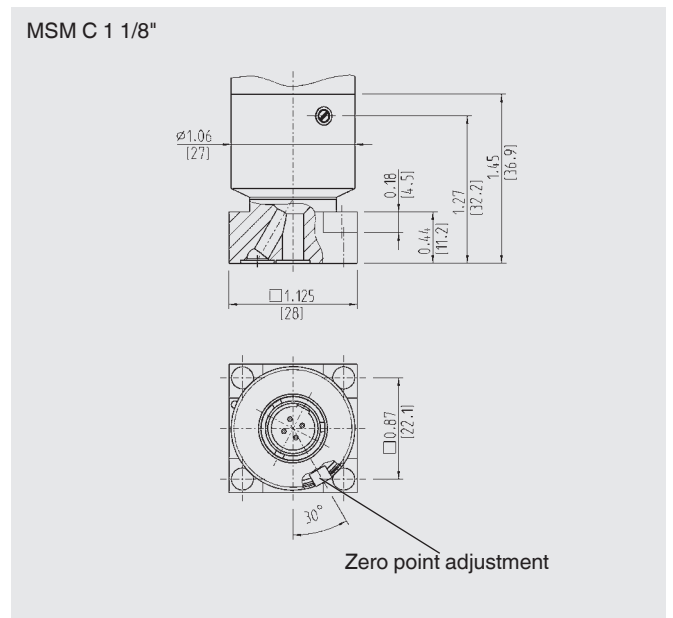
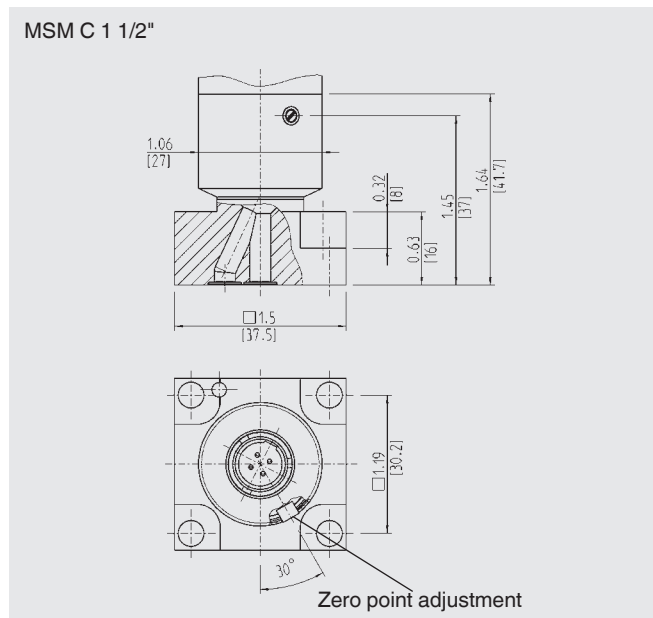


# Dimensions in inch [mm] WUC-16

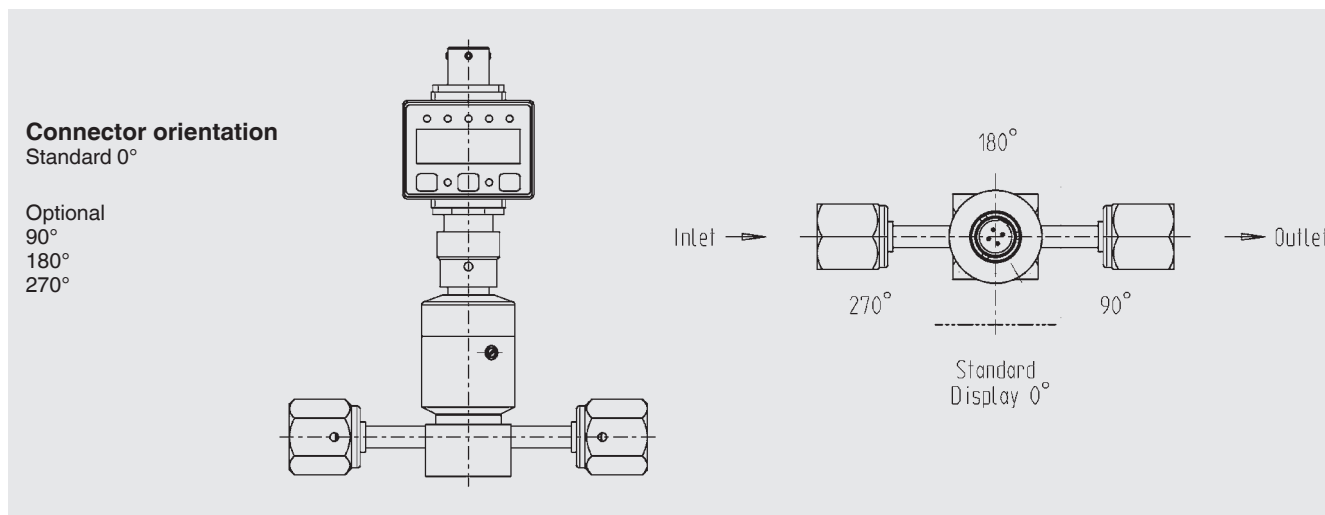
## Electrical connections



## Process connections



## Connector orientation for the mounting of attachable indicators



## Accessories

### Attachable indicator with LED (N)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

Order numbers			Model WUR-1		Model NWUR-1 (Ex n)	
Input	Output	Signal	Front view	Top view	Front view	Top view
M12 x 1	M12 x 1	4 ... 20 mA, 2-wire	7043425	7330752	7238163	7216461
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	7284122	7284300
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	-	-

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