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

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

Fig. left: Model WUC-10, single end
Fig. centre: Model WUC-15, flow through
Fig. right: Model WUC-16, modular surface mount

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 PH_3 (phosphine), do not present a problem.

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.

Data sheets for accessories:
UHP attachable indicator with LED; model WUR-1; see data sheet PE 87.20

Specifications

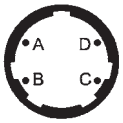
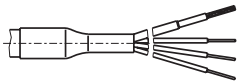
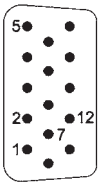
		WUC-10, WUC-15											
		WUC-16											
Measuring range	psi	30	60	100	160	250	350	500	1,000	1,500	2,000	3,000	5,000
	bar	2	4	7	11	17	25	36	70	100	145	225	360
Overpressure limit [1]	psi	120	120	210	320	500	750	1,100	2,100	3,000	4,200	6,600	10,000
Burst pressure [1]	psi	1,800	1,800	2,200	2,600	4,800	6,200	7,400	8,000	10,500	10,500	10,500	10,500
	Other measuring ranges and pressure units (e. g. MPa, kg/cm²) 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 / ft³ 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 cm³ WUC-15 < 1 cm³ WUC-16 < 1 cm³												
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 $R_A \leq (U+ - 10\ V) / 0.02\ A$ 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 ≤ 0.5 [2] % of span (≤ 1.0 [2] % of span for measuring ranges ≤ 2 bar) per IEC 61298-2												
Non-linearity	≤ 0.1 % of span (≤ 0.15 % of span for measuring ranges ≤ 2 bar) (BFSL) per IEC 61298-2												
Hysteresis	≤ 0.14 % of span												
Non-repeatability	≤ 0.12 % of span												
Long-term stability	≤ 0.25 typ./year (at reference conditions)												
Permissible temperature ranges	Not Ex		T4				T5			T6			
■ Medium	-20 ... +100 °C		-20 ... +85 °C				-20 ... +60 °C			-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.

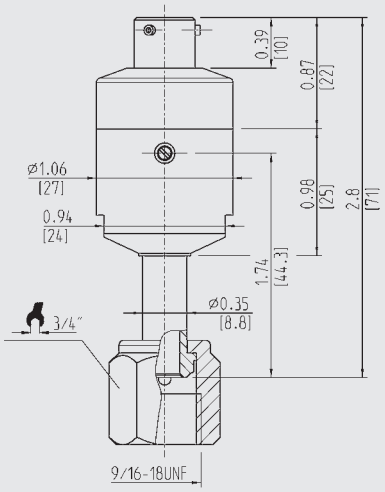
Electrical connections

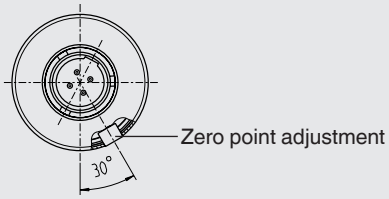
	Bayonet connector (4-pin)			Circular connector M12 x 1 (4-pin)			Cable outlet 1.5 m and 3 m			Sub-D HD connector (15-pin)		
												
2-wire	U_+ = A	U- = D		U_+ = 1	U- = 3		U_+ = red	U- = black		U_+ = 7	U- = 5 U- = 12	
3-wire	U_+ = A	U- = D	S_+ = B	U_+ = 1	U- = 3	S_+ = 4	U_+ = red	U- = black	S_+ = brown	U_+ = 7	U- = 5 U- = 12	S_+ = 2
Wire cross-section	-			-			0.22 mm² (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

Bayonet circular connector

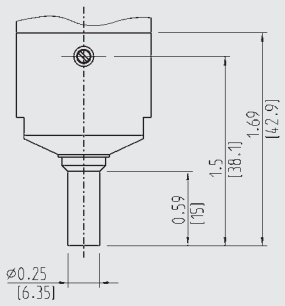




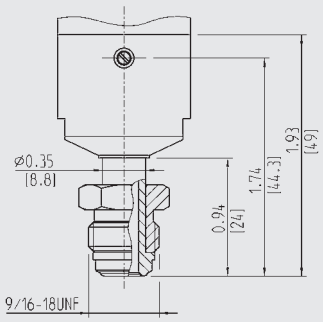
1/4" union nut, rotatable

Process connections

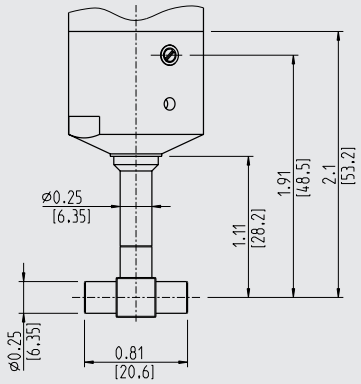
1/4" weld-in connection



1/4" male nut, rotatable



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

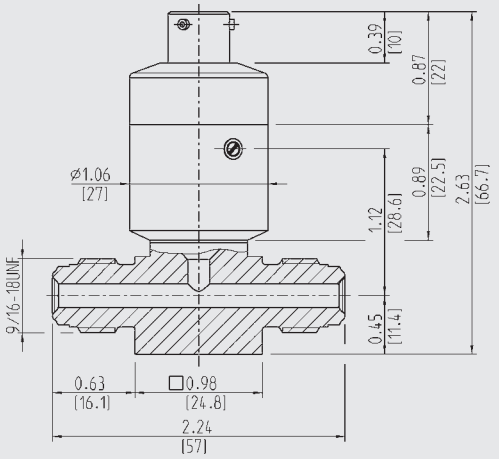


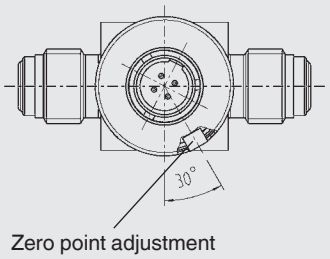
Dimensions in inch [mm] WUC-15

Electrical connections

Bayonet circular connector

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

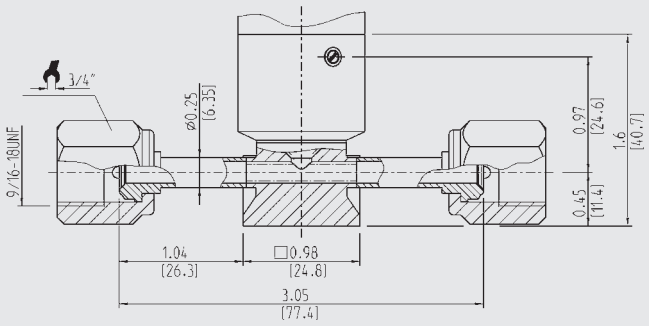




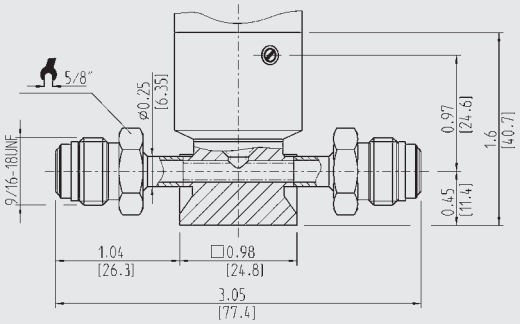
Zero point adjustment

Process connections

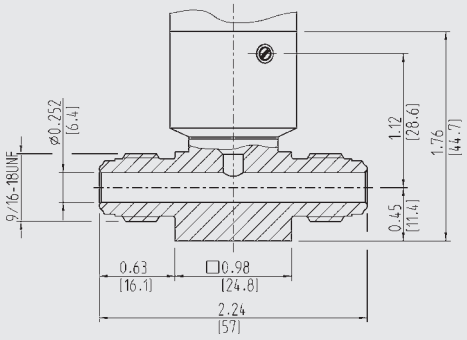
1/4" union nut (female), rotatable
1/4" union nut (female), rotatable



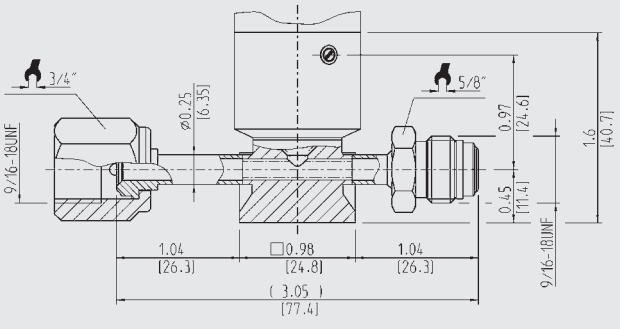
1/4" male nut, rotatable
1/4" male nut, rotatable



1/4" male nut, fixed, high flow through
1/4" male nut, fixed, high flow through
only available with measuring ranges up to 25 bar / 300 psi

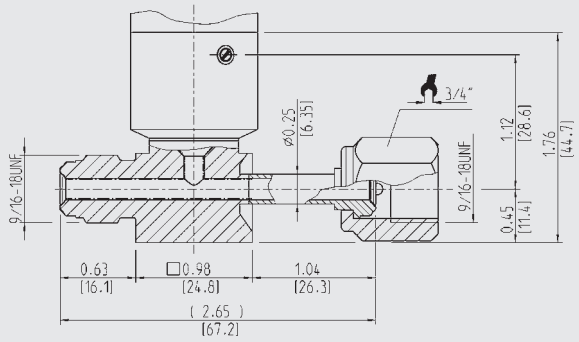


1/4" union nut (female), rotatable
1/4" male nut, rotatable

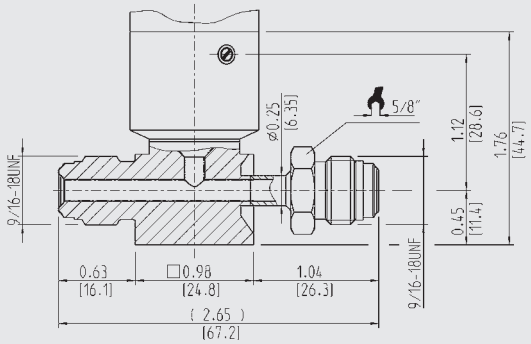


Process connections for WUC-15

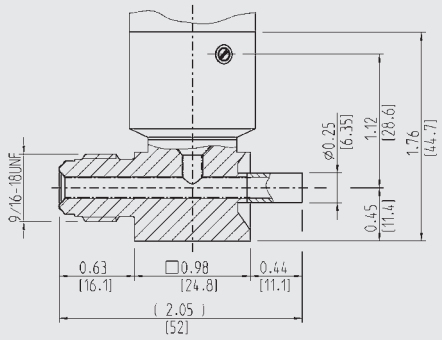
1/4" male nut, fixed
1/4" union nut (female), rotatable



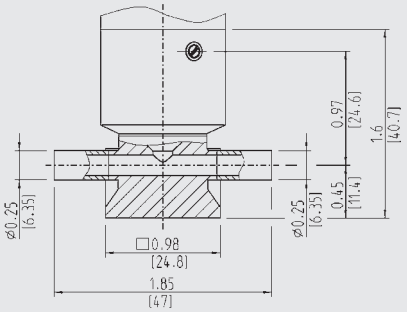
1/4" male nut, fixed
1/4" male nut, rotatable



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



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

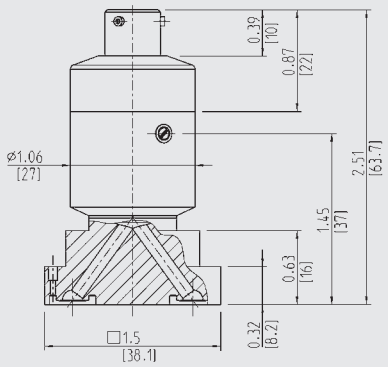


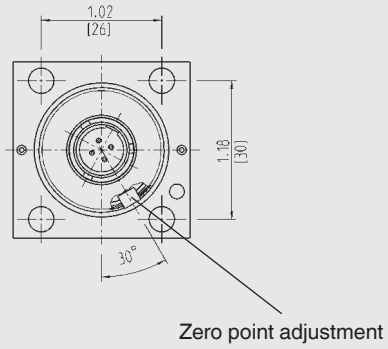
Dimensions in inch [mm] WUC-16

Electrical connections

Bayonet circular connector

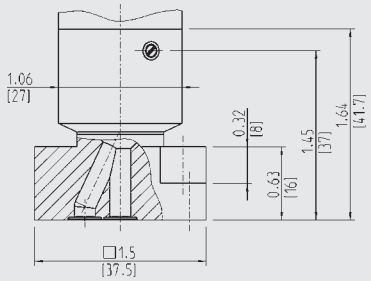
MSM W 1 1/2"

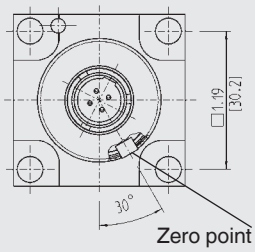




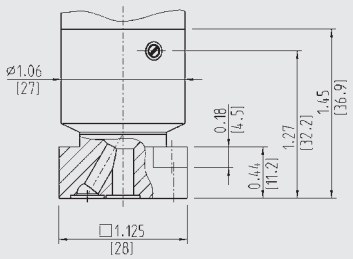
Process connections

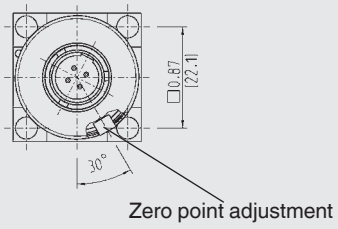
MSM C 1 1/2"





MSM C 1 1/8"

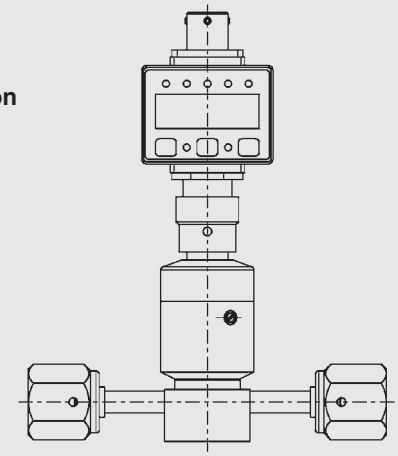


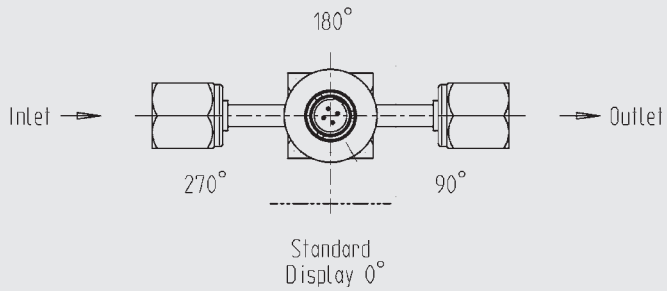


Connector orientation for the mounting of attachable indicators

Connector orientation
Standard 0°

Optional
90°
180°
270°





Accessories
LED attachable indicator WUR-1

- 4-digit display
- Ingress protection IP 65
- Accuracy: ≤ 0.5 % ± 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

WIKA Alexander Wiegand SE & Co. KG
Alexander-Wiegand-Straße 30
63911 Klingenberg/Germany
Tel. +49 9372 132-0
Fax +49 9372 132-406
info@wika.com
www.wika.com

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