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
  FM class I div. 2 groups A, B, C & D
- Ingress protection IP67 (NEMA 4) with “side access” zero potentiometer
- Excellent EMC stability
- Active temperature compensation

Fig. left: **WUC-10, single end**
Fig. centre: **WUC-15, flow through**
Fig. right: **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 IP67 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.

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 IP67 ingress protection is permanently maintained. Simple handling and protection from unintentional adjustment is ensured.

Wetted parts consist of SEMI F20 compliant 316L stainless steel and a special 2.4711 / UNS R30003 thin film sensor. Prior to final assembly all wetted parts are electropolished and cleaned using state-of-the-art processes.

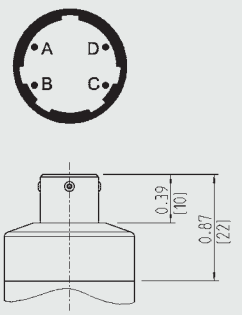
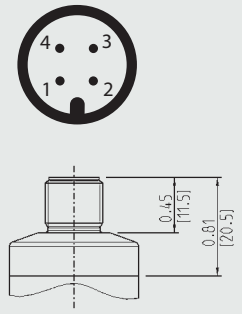
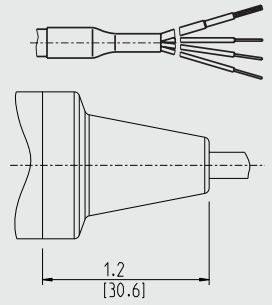
Through an individual examination of each transducer it is ensured that the required values for leak tightness, overpressure stability, accuracy and particles are met in accordance with the applicable SEMI™ standards.

Specifications

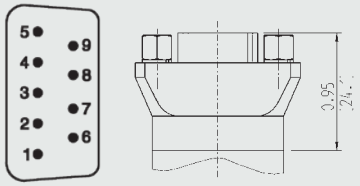
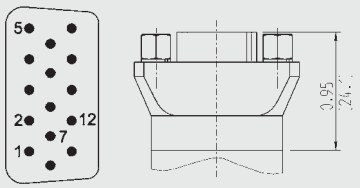
	Model WUC-10, WUC-15											
	Model WUC-16											
Measuring range (psi)	30	60	100	160	250	350	500	1,000	1,500	2,000	3,000	5,000
Measuring range (bar)	2	4	7	11	17	25	36	70	100	145	225	360
Overload safety (psi)	120	120	210	320	500	750	1,100	2,100	3,000	4,200	6,600	10,000
Burst pressure (psi)	1,800	1,800	2,200	2,600	4,800	6,200	7,400	8,000	10,500	10,500	10,500	10,500
	Further measuring ranges on request											
Measuring principle	Thin-film sensor											
Materials												
■ Wetted parts	Process connection: 316L stainless steel, according to SEMI F20 (option: 316L VIM/VAR) Thin-film sensor: 2.4711 / UNS R30003											
■ Case	304 SS											
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	WUC-10 < 1.5 cm^3, WUC-15 < 1 cm^3, WUC-16 < 1 cm^3											
Permissible media	Speciality gases, vapours, liquids											
Power supply U_+	DC 10 ... 30 V with output signal DC 0 ... 5 V / 4 ... 20 mA DC 14 ... 30 V with output signal DC 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_{max}	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											
Response 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) ≤ 0.5 % of span [1] (≤ 1.0 % of span [1] 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											
Stability per year	≤ 0.25 % of span (typ.) at reference conditions (≤ 0.4 % of span with measuring ranges ≤ 2 bar)											
Permissible temperature ranges	non-Ex		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 -40 ... +212 °F		-40 ... +100 °C -40 ... +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											
Production environment	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 EN 60068-2-6											
Short-circuit resistance	S_+ vs. U- (short time)											
Reverse polarity protection	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 mm² (AWG 24)		
Cable diameter	-			-			4.8 mm		
Ingress protection per IEC 60529	IP67 (NEMA 4)			IP67 (NEMA 4)			IP67 (NEMA 4)		
	Ingress protection only applies when plugged in using mating connectors that have the appropriate ingress protection.								

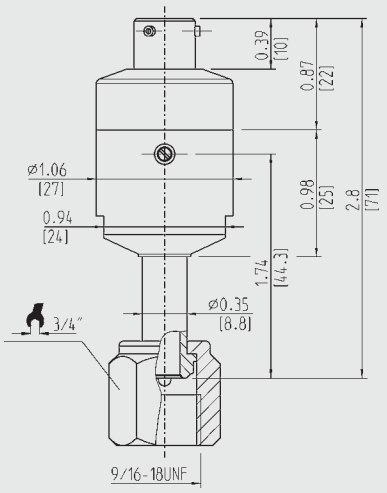
Electrical connections

	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	IP54			IP54		
	Ingress protection only applies when plugged in using mating connectors that have the appropriate ingress protection.					

Dimensions in inch [mm] WUC-10

Electrical connections

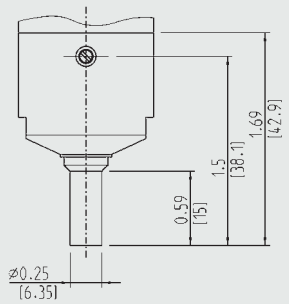
Bayonet circular connector



1/4" union nut, rotatable

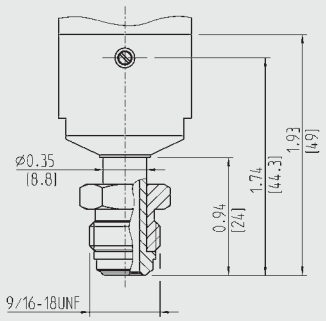
Process connections

1/4" weld stub

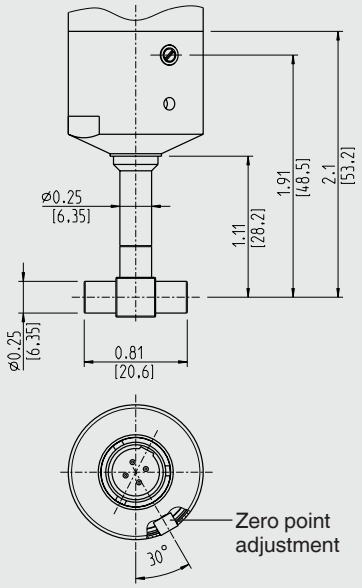


Max. available pressure: 300 psi

1/4" male nut, rotatable



1/4" T-connector, weld stub

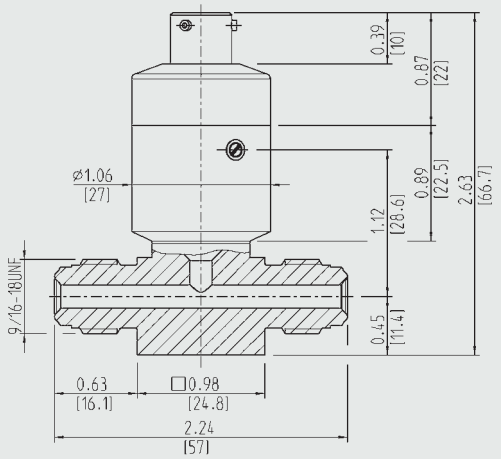


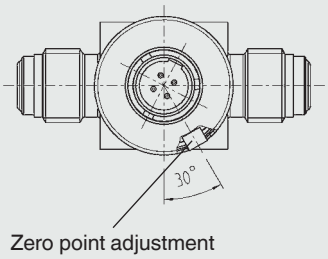
Dimensions in inch [mm] WUC-15

Electrical connections

Bayonet circular connector

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

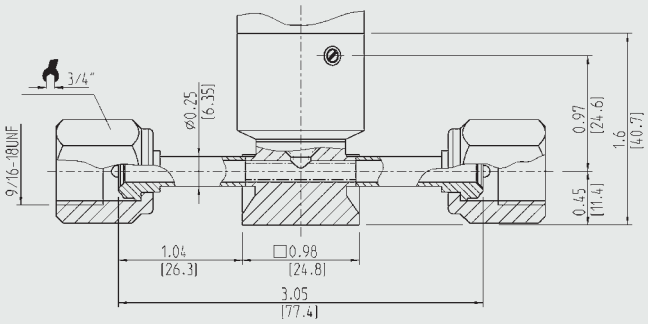




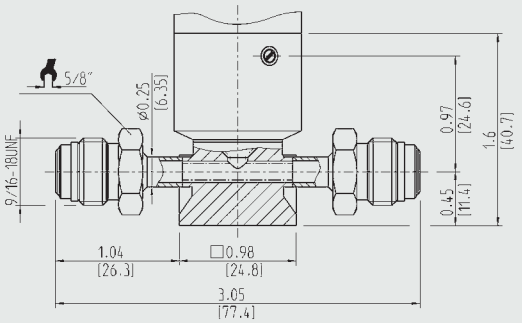
Zero point adjustment

Process connections

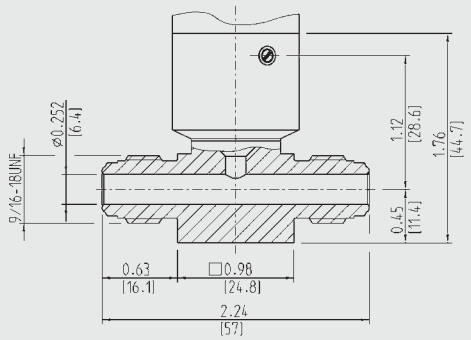
1/4" union nut (female), rotatable
1/4" union nut (female), rotatable



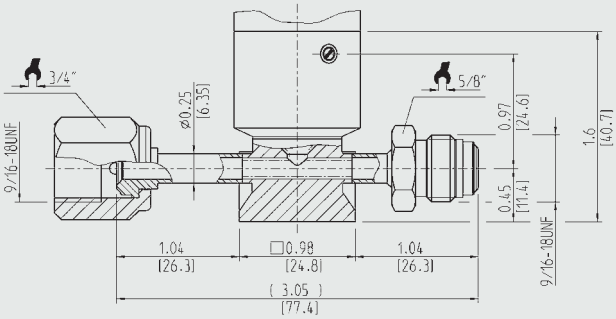
1/4" male nut, rotatable
1/4" male nut, rotatable



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

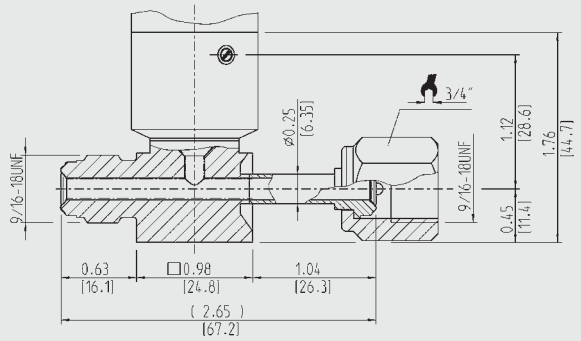


1/4" union nut (female), rotatable
1/4" male nut, rotatable

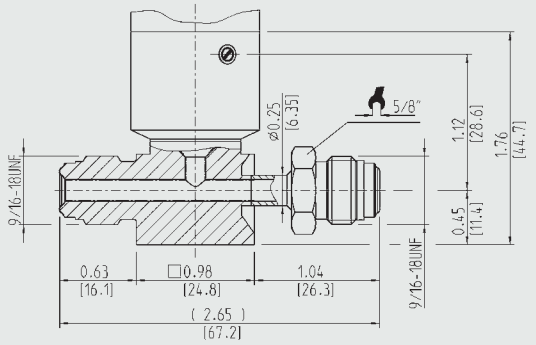


Process connections for WUC-15

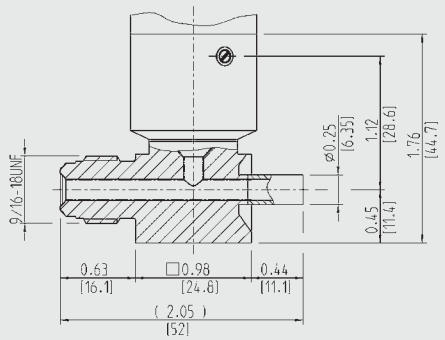
1/4" male nut, fixed
1/4" union nut (female), rotatable



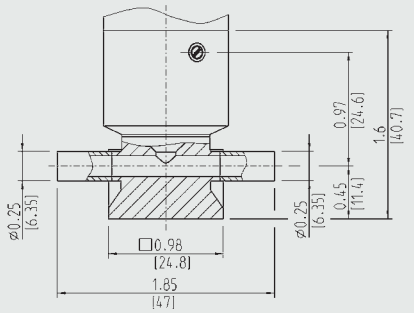
1/4" male nut, fixed
1/4" male nut, rotatable



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



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

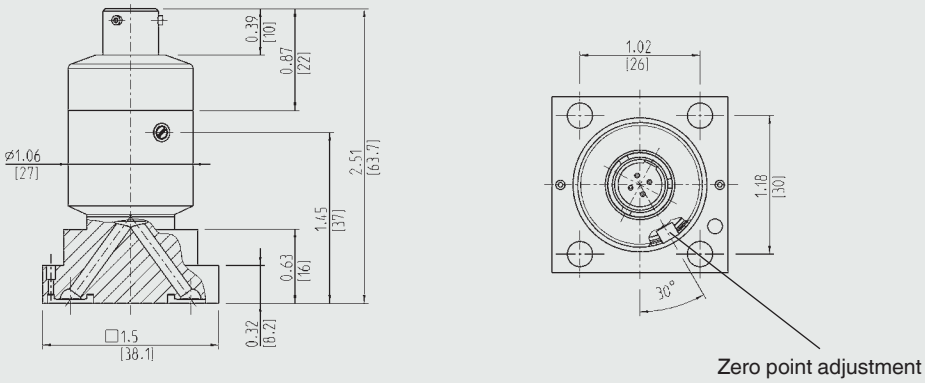


Dimensions in inch [mm] WUC-16

Electrical connections

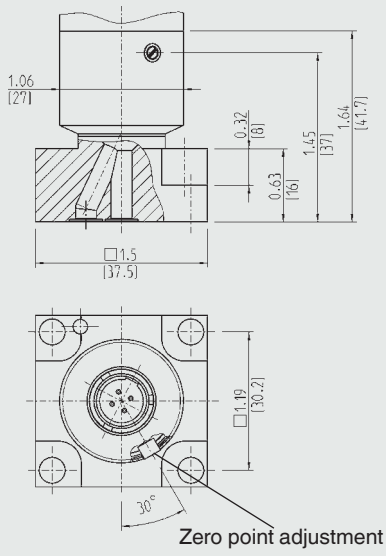
Bayonet circular connector

MSM W 1 1/2"

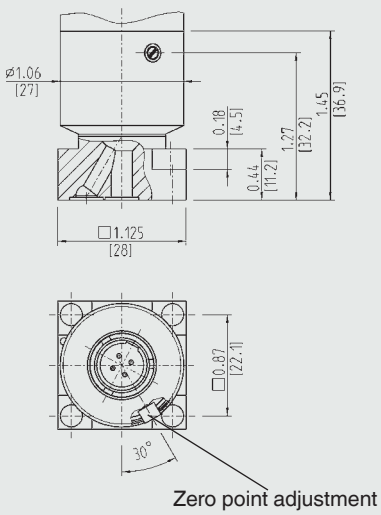


Process connections

MSM C 1 1/2"



MSM C 1 1/8"



Approvals

Logo	Description	Country
CE Ex	**EU declaration of conformity** ■ EMC directive EN 61326 emission (group 1, class B) and interference immunity (industrial application) ■ Pressure equipment directive ■ RoHS directive ■ ATEX directive (option) Hazardous areas - Ex n Zone 2 gas [II 3G Ex nA ic IIC T4/T5/T6 Gc X]	European Union
IEC IECEx	**IECEx (option)** Hazardous areas - Ex n Zone 2 gas [Ex nA ic IIC T4/T5/T6 Gc]	International
FM APPROVED	**FM (option)** 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

Ordering information

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

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