

Ultra high purity transducer

For applications in hazardous 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 supply systems, bulk-gas supply, tank farm installations)

Special features

- Compact design
- ATEX and IECEx zone 2 approval
Class I, div. 2, groups A, B, C and 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 plant and speciality gas installations outdoors.

The instrument series 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.

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.

The 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

Accuracy specifications		
Non-linearity per BFSL per IEC 61298-2		
For measuring ranges > 2 bar	≤ 0.1 % of span	
For measuring ranges ≤ 2 bar	≤ 0.15 % of span	
Accuracy	→ See "Max. measuring deviation"	
Max. measuring deviation		
RSS (root sum squares)	For measuring ranges ≤ 2 bar	≤ 0.4 % of span
	For measuring ranges > 2 bar	≤ 0.2 % of span
Per IEC 61298-2	For measuring ranges ≤ 2 bar	≤ 1 % of span
	For measuring ranges > 2 bar	≤ 0.5 % of span
Zero point setting		
Current output	-5 ... +3.5 % of span (via potentiometer)	
Voltage output	-2 ... +5 % of span (via potentiometer)	
Non-repeatability per IEC 61298-2	≤ 0.12 % of span	
Mean temperature coefficient at -20 ... +80 °C [-4 ... +176 °F] (actively compensated)		
Zero point	≤ 0.1 % of span/10 K	
Span	≤ 0.15 % of span/10 K	
Long-term drift per IEC 61298-2		
For measuring ranges ≤ 2 bar	≤ 0.4 % of span	
For measuring ranges > 2 bar	≤ 0.25 % of span, at reference conditions	
Reference conditions	Per IEC 61298-1	

Measuring ranges, gauge pressure, models WUC-10 and WUC-15

bar	
0 ... 2	0 ... 36
0 ... 4	0 ... 70
0 ... 7	0 ... 100
0 ... 11	0 ... 145
0 ... 17	0 ... 225
0 ... 25	0 ... 360

psi	
0 ... 30	0 ... 500
0 ... 60	0 ... 1,000
0 ... 100	0 ... 1,500
0 ... 160	0 ... 2,000
0 ... 250	0 ... 3,000
0 ... 350	0 ... 5,000

Measuring ranges, gauge pressure, model WUC-16

bar	
0 ... 2	0 ... 11
0 ... 4	0 ... 17
0 ... 7	

psi	
0 ... 30	0 ... 160
0 ... 60	0 ... 250
0 ... 100	

Other measuring ranges on request.

Further details on: Measuring range

Overpressure limit	■ 2-fold
	■ 4-fold for measuring range 0 ... 2 bar [0 ... 30 psi]

Output signal**Signal type**

Current (2-wire)	4 ... 20 mA
Voltage (3-wire)	■ DC 0 ... 5 V
	■ DC 0 ... 10 V

Load in Ω

Output signal 4 ... 20 mA	$\leq (\text{supply voltage} - 10 \text{ V}) / 0.02 \text{ A}$
Output signal DC 0 ... 5 V	$> 5 \text{ k}\Omega$
Output signal DC 0 ... 10 V	$> 10 \text{ k}\Omega$

Voltage supply

Supply voltage	Output signal DC 0 ... 5 V / 4 ... 20 mA	DC 10 ... 30 V
	Output signal DC 0 ... 10 V	DC 14 ... 30 V
Power P_{max}	1 W	

Dynamic behaviour

Rise time (10 ... 90 %)	$\leq 300 \text{ ms}$
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Electrical connection

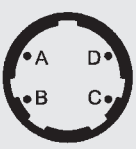
Connection type	IP code ¹⁾	Wire cross-section	Cable diameter	Cable lengths
Bayonet connector (4-pin)	IP67	-	-	-
Circular connector M12 x 1 (4-pin)	IP67 (NEMA 4)	-	-	-
Cable outlet	IP67 (NEMA 4)	0.22 mm ² (AWG 24)	4.8 mm	■ 1.5 m [5 ft] ■ 3 m [10 ft]
Sub-D connector (9-pin)	IP54	-	-	-
Sub-D HD connector (15-pin)	IP54	-	-	-

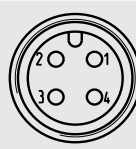
1) The stated IP codes only apply when plugged in using mating connectors that have the appropriate IP code.

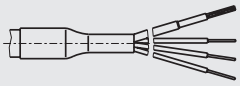
Further details on: Electrical connection

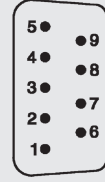
Connection type	→ See above
Wire cross-section	→ See above
Cable diameter	→ See above
Cable length	→ See above
Pin assignment	→ See below
Ingress protection (IP code) per IEC 60529	→ See above
Short-circuit resistance	S+ vs. U-
Reverse polarity protection	U+ vs. U-
Insulation voltage	DC 500 V

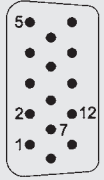
Pin assignment

Bayonet connector (4-pin)			
		2-wire	3-wire
	U ₊	A	A
	U ₋	D	D
	S ₊	-	B

Circular connector M12 x 1 (4-pin)			
		2-wire	3-wire
	U ₊	1	1
	U ₋	3	3
	S ₊	-	4

Cable outlet			
		2-wire	3-wire
	U ₊	Red	Red
	U ₋	Black	Black
	S ₊	-	Brown

Sub-D connector (9-pin)			
		2-wire	3-wire
	U ₊	4	4
	U ₋	8/9	8/9
	S ₊	-	1

Sub-D HD connector (15-pin)			
		2-wire	3-wire
	U ₊	7	7
	U ₋	5/12	5/12
	S ₊	-	2

Legend

- U₊ Positive power supply terminal
- U₋ Negative power supply terminal
- S₊ Positive output terminal

Material	
Material (wetted)	
Process connection	<ul style="list-style-type: none"> ■ 316L per SEMI F20 ■ 316L VIM/VAR
Thin-film sensor	2.4711 / UNS R30003
Material (in contact with the environment)	
Case	304 SS
Surface treatment	Electropolished per SEMI F19
Surface roughness Ra	
Typical	≤ 0.13 μm (RA 5)
Maximum	≤ 0.18 μm (RA 7)





For the verification of material quality and origin in accordance with SEMI F20-0706, a certificate in accordance with EN 10204 clause 3.1 can be issued on request, with or without a sub-supplier certificate.

Operating conditions				
Permissible temperature ranges	Non-Ex	T4	T5	T6
Medium temperature limit	-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 temperature limit	-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 temperature limit	-40 ... +100 °C [-40 ... +212 °F]	-20 ... +85 °C [-4 ... +185 °F]	-20 ... +85 °C [-4 ... +185 °F]	-20 ... +85 °C [-4 ... +185 °F]

Further details on: Operating conditions	
Permissible media	<ul style="list-style-type: none"> ■ Speciality gases ■ Vapours ■ Liquids
Helium leak test	< 1 x 10 ⁻⁹ mbar l/sec (atm STD cc/sec) per SEMI F1
Ingress protection (IP code) per IEC 60529	→ See "Electrical connection"
Vibration resistance per IEC 60068-2-6	0.35 mm (10 ... 58 Hz) / 5 g (58.1 ... 2,000 Hz)
Shock resistance per IEC 60068-2-27	500 g (1.5 ms)

Packaging and instrument labelling	
Packaging	Double bagging per SEMI E49.6
Assembly and packaging location	Clean room class 5 per ISO 14644
Instrument labelling	WIKA product label, glued

Approvals

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

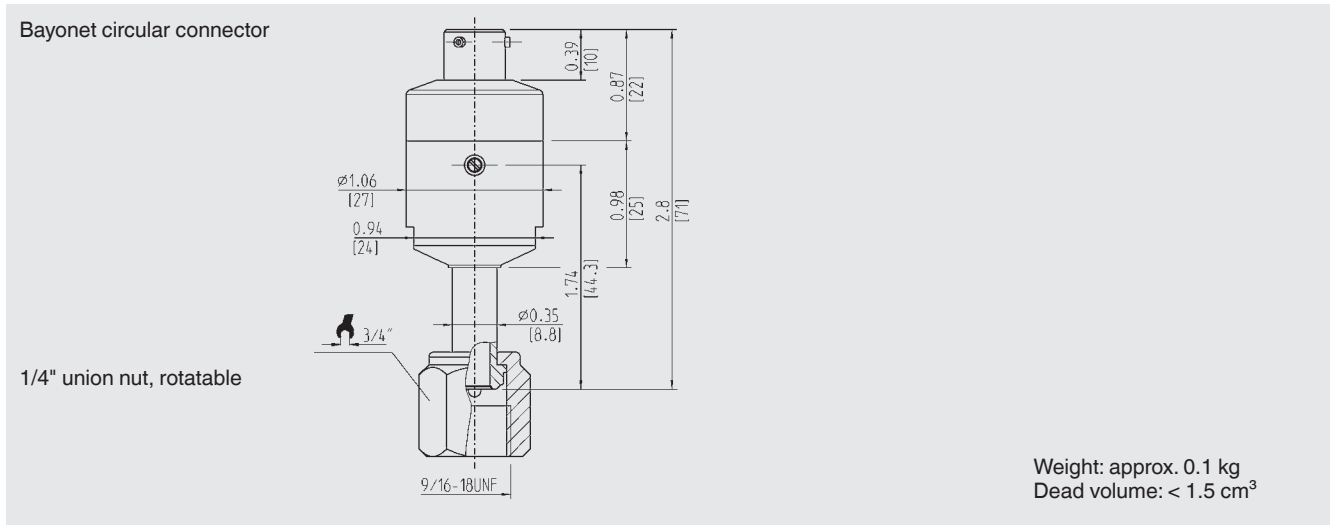
→ For approvals and certificates, see website

Safety-related characteristic values

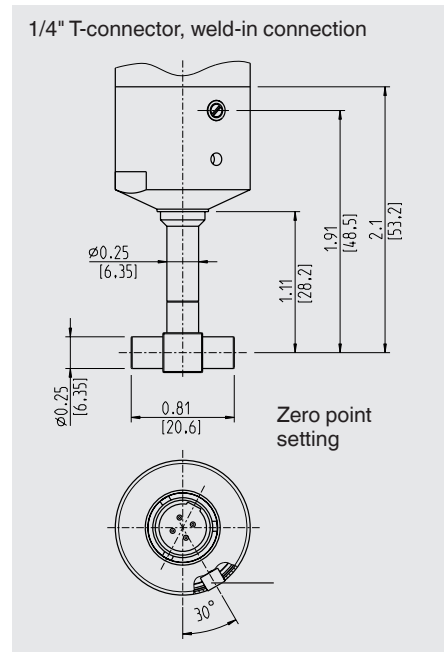
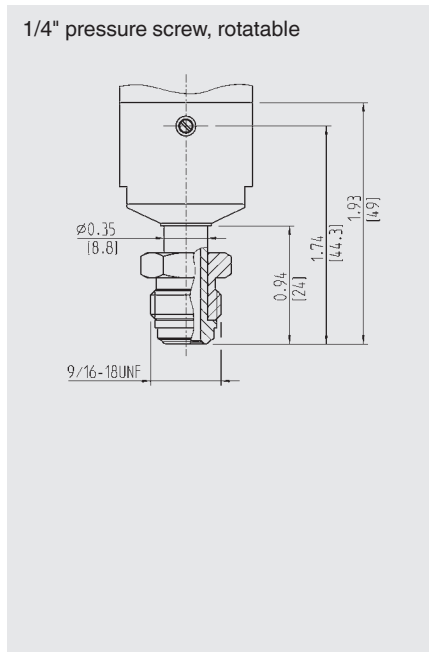
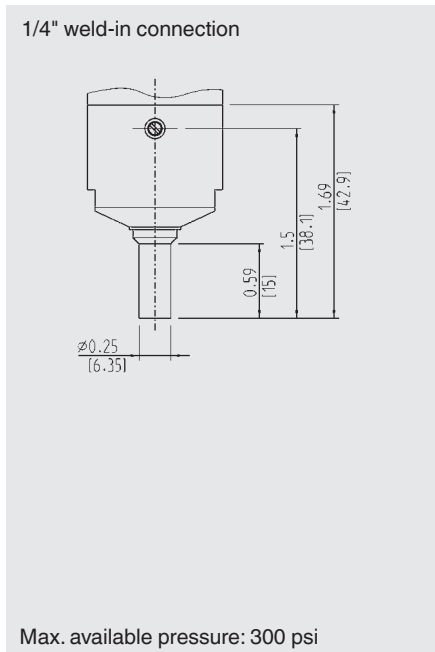
Safety-related characteristic values	
MTTF	> 100 years

Dimensions in inch [mm] WUC-10

Electrical connections

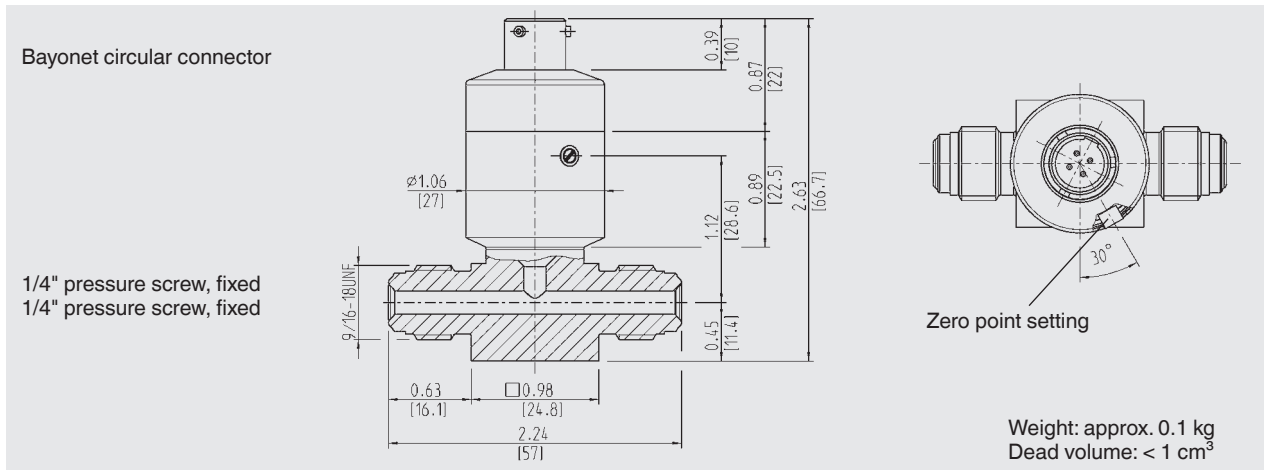


Process connections

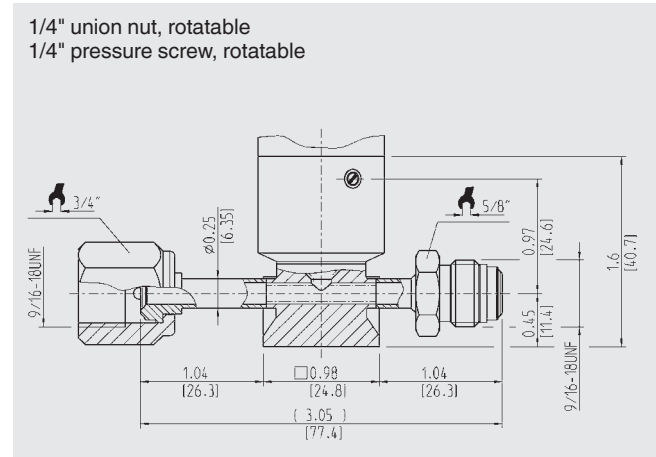
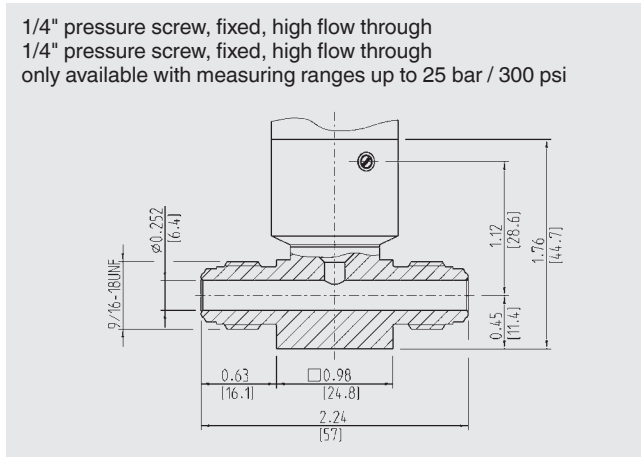
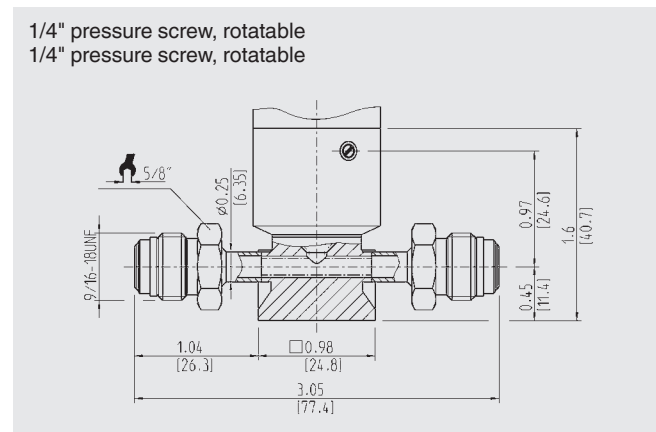
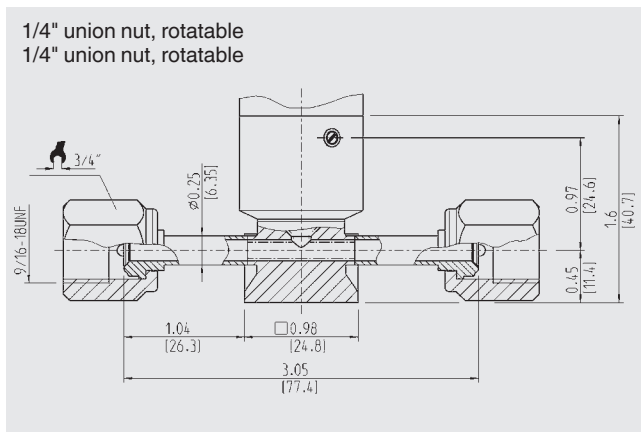


Dimensions in inch [mm] WUC-15

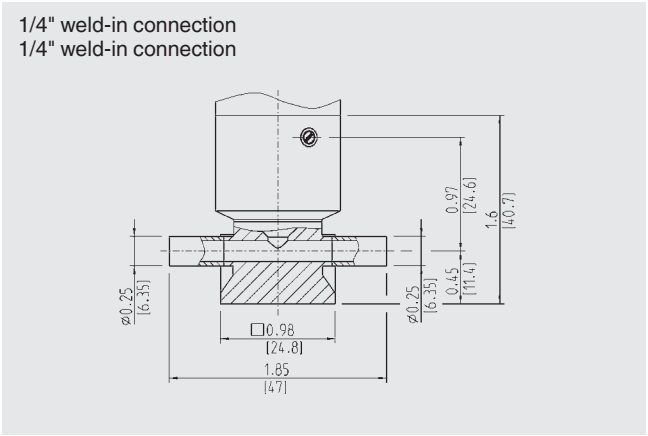
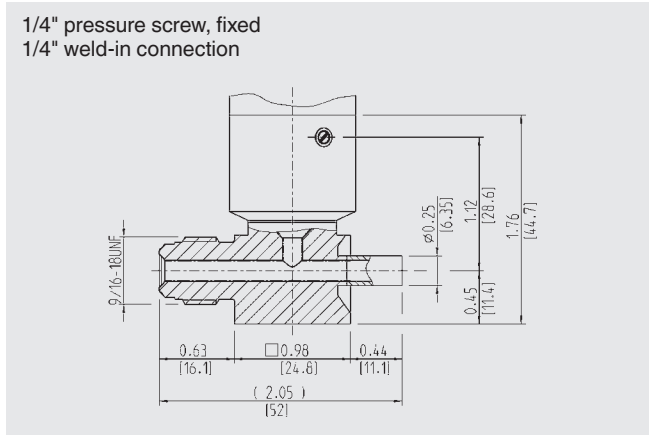
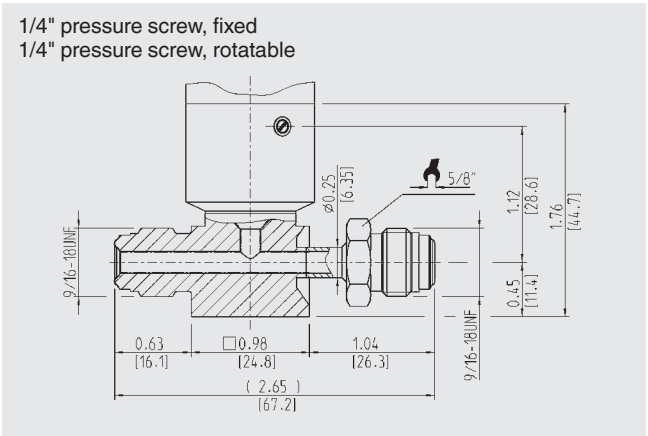
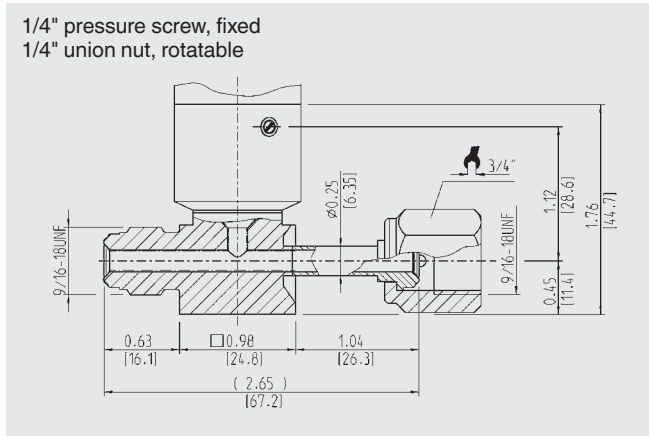
Electrical connections



Process connections

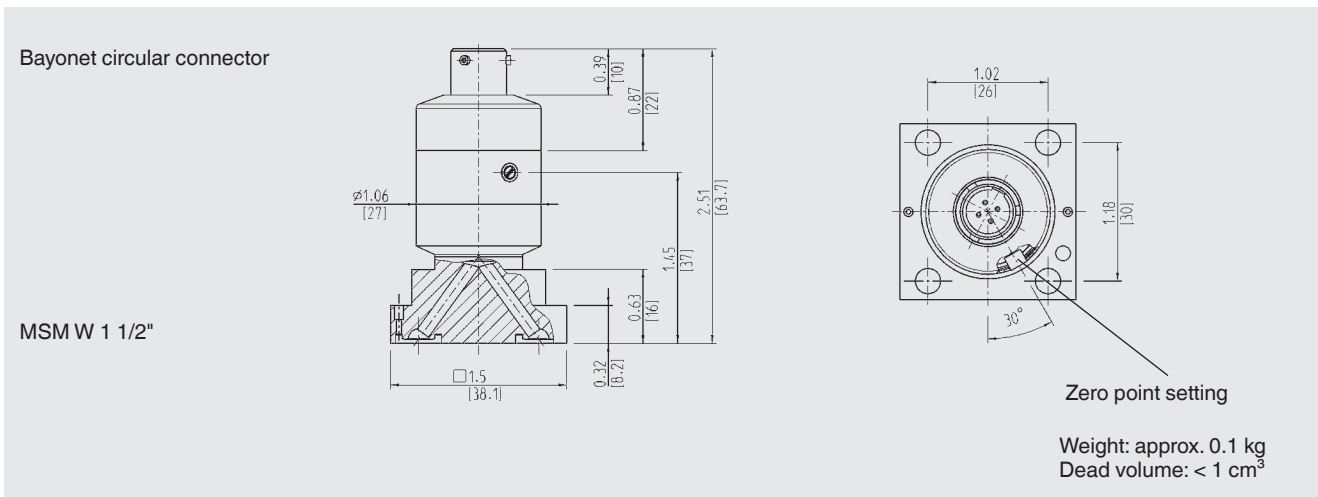


Process connections for WUC-15

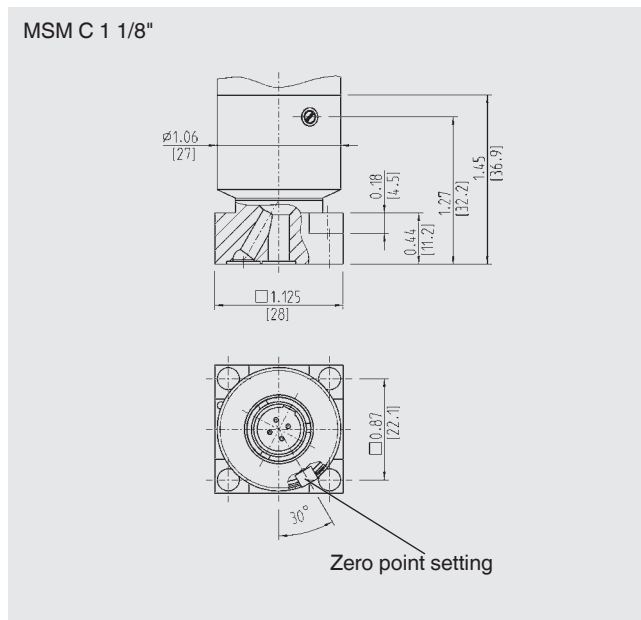
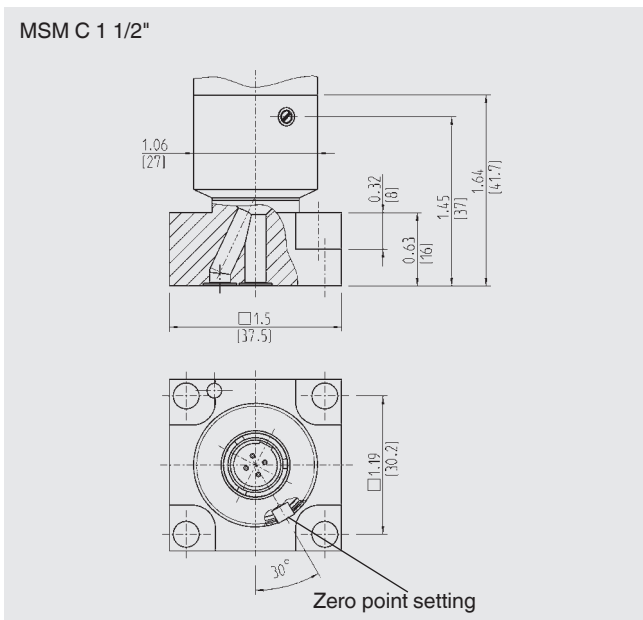


Dimensions in inch [mm] WUC-16

Electrical connections



Process connections



Ordering information

Model / Measuring range / Process connection / Output signal / Supply voltage / Electrical connection / Cable length / Approval

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