

FM

Pressure

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 endFig. centre:WUC-15, flow throughFig. 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-Thomson 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.

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WIKA Part of your business

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Data sheets showing similar products:

Ultra high purity transducer for applications in hazardous areas, Ex nA ic; models WU-2x; see data sheet PE 87.07 Ultra high purity transducer with integrated display and optional switch contacts; models WUD-2x; see data sheet PE 87.08

Specifications

Accuracy specifications				
Non-linearity per BFSL per IEC 61298-2				
For measuring ranges > 2 bar	≤ 0.1 % of span			
For measuring ranges \leq 2 bar	≤ 0.15 % of span			
Accuracy	\rightarrow See "Max. measuring deviati	on"		
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	\leq 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 -2	0 +80 °C [-4 +176 °F] (act	ively compensated)		
Zero point	\leq 0.1 % of span/10 K			
Span	≤ 0.15 % of span/10 K			
Long-term drift per IEC 61298-2				
For measuring ranges \leq 2 bar	\leq 0.4 % of span	≤ 0.4 % of span		
For measuring ranges > 2 bar	\leq 0.25 % of span, at reference conditions			
Reference conditions	Reference conditions Per IEC 61298-1			

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

bar		psi	
02	036	0 30	0 500
04	0 70	0 60	0 1,000
07	0 100	0 100	0 1,500
011	0 145	0 160	0 2,000
017	0 225	0 250	0 3,000
0 25	0 360	0 350	0 5,000

Measuring ranges, gauge pressure, model WUC-16

bar	
02	0 11
04	0 17
07	

psi	
0 30	0 160
0 60	0250
0 100	

Other measuring ranges on request.

Further details on: Measuring range

Overpressure limit

2-fold4-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 (supply voltage – 10 V) / 0.02 A			
Output signal DC 0 5 V	> 5 kΩ	>5 kΩ		
Output signal DC 0 10 V	> 10 kΩ			
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 %)	≤ 300 ms			

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+	А	А
•A	D• C•	U.	D	D
		S+	-	В

Circular connector M12 x 1 (4-pin)					
2-wire 3-wire					
	U+	1	1		
$\begin{pmatrix} \begin{pmatrix} 2 \circ & \circ 1 \\ 3 \circ & \circ 4 \end{pmatrix} \end{pmatrix}$	U.	3	3		
	S+	-	4		

Sub-D connector (9-pin)

Cable outlet

	2-wire	3-wire
U+	Red	Red
U.	Black	Black
S+	-	Brown

		2-wire	3-wire	
5	U+	4	4	
4● 3● 2●	U.	8/9	8/9	
20 06 10	S+	-	1	

Sub-D HD connector (15-pin)				
		2-wire	3-wire	
5•• • • 2••12	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	 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	Т5	Т6		
Medium temperature limit	-20 +100 °C	-20 +85 °C	-20 +60 °C	-20 +40 °C		
	[-4 +212 °F]	[-4 +185 °F]	[-4 +140 °F]	[-4 +104 °F]		
Ambient temperature limit	-20 +85 °C	-20 +85 °C	-20 +60 °C	-20 +40 °C		
	[-4 +185 °F]	[-4 +185 °F]	[-4 +140 °F]	[-4 +104 °F]		
Storage temperature limit	-40 +100 °C	-20 +85 °C	-20 +85 °C	-20 +85 °C		
	[-40 +212 °F]	[-4 +185 °F]	[-4 +185 °F]	[-4 +185 °F]		

Further details on: Operating conditions				
Permissible media	 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 ic IIC T4/T5/T6 Gc X] [II 3G Ex ec ic IIC T4/T5/T6 Gc X]		
IEC IECEx	IECEx (option) Hazardous areas		International	
	- Ex n Zone 2 gas	[Ex nA ic IIC T4/T5/T6 Gc] [Ex ec ic IIC T4/T5/T6 Gc]		
APPROVED		us for use in class I, division 2, groups A,B,C,D n class I, zone 2, group IIC (classified) locations	USA	

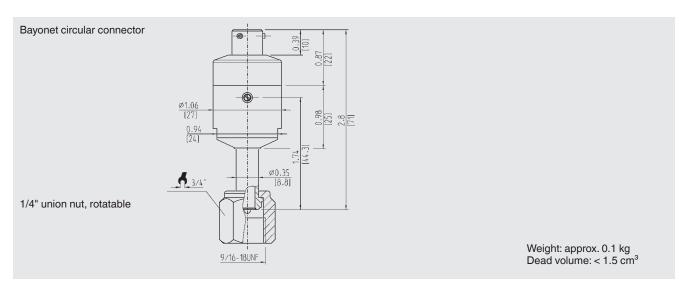
 \rightarrow For approvals and certificates, see website

Safety-related characteristic values

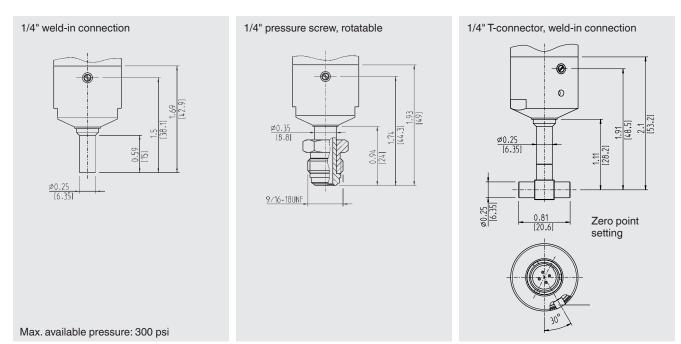
Safety-related characteristic valuesMTTF> 100 years

Dimensions in inch [mm] WUC-10

Electrical connections

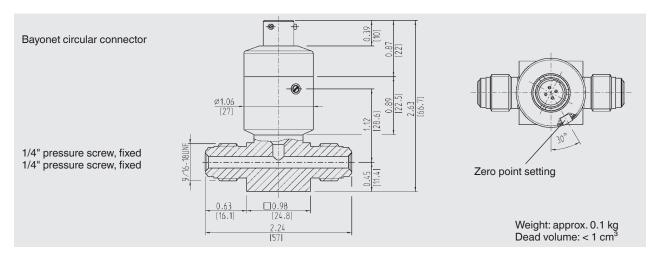


Process connections

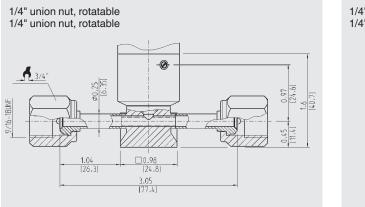


Dimensions in inch [mm] WUC-15

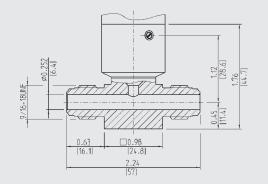
Electrical connections



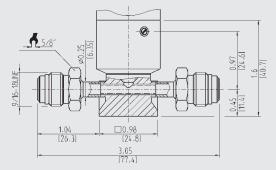
Process connections



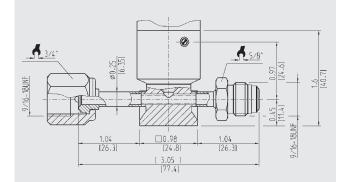
- 1/4" pressure screw, fixed, high flow through 1/4" pressure screw, fixed, high flow through
- only available with measuring ranges up to 25 bar / 300 psi



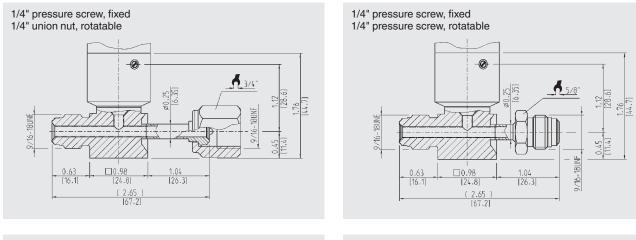
1/4" pressure screw, rotatable 1/4" pressure screw, rotatable

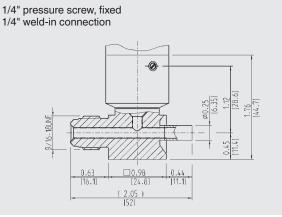


- 1/4" union nut, rotatable
- 1/4" pressure screw, rotatable

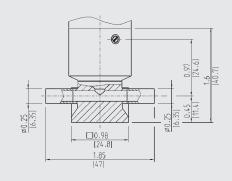


Process connections for WUC-15



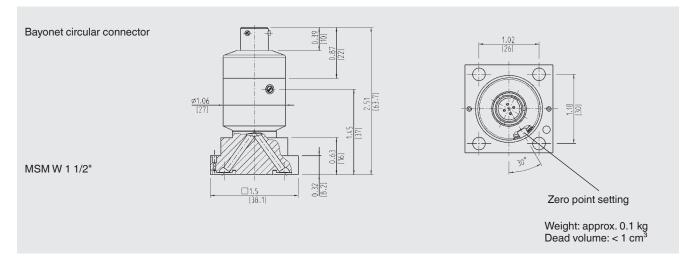


1/4" weld-in connection 1/4" weld-in connection

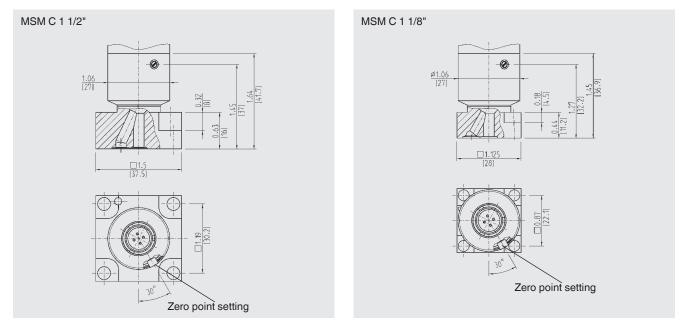


Dimensions in inch [mm] WUC-16

Electrical connections



Process connections



Ordering information

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

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