

Ultra high purity transducer For explosion-protected 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 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

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.



Ultra high purity transducer

Fig. left: WUC-10, single end

Fig. centre: WUC-15, flow through

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

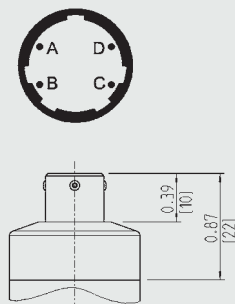
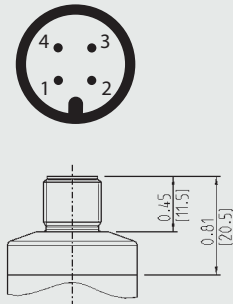
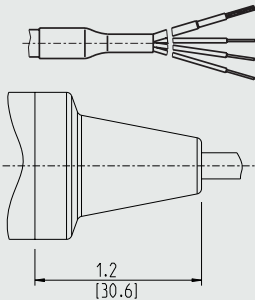
For all wetted parts the materials 316L VIM VAR and special thin-film sensors from 2.4711 / UNS R30003 are used. Prior to final assembly all wetted parts are electropolished and cleaned using state-of-the-art processes.

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.

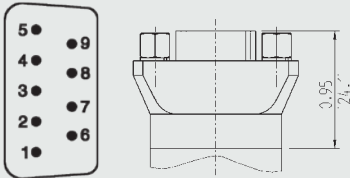
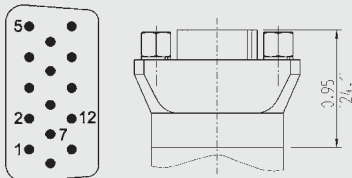
Specifications												
	Model WUC-10, WUC-15											
	Model WUC-16											
Measuring range (psi)	30	60	100	160	250	350	500	1,000	1,500	2,000	3,000	5,000
Measuring range (bar)	2	4	7	11	17	25	36	70	100	145	225	360
Overload safety (psi)	120	120	210	320	500	750	1,100	2,100	3,000	4,200	6,600	10,000
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 VIM/VAR Thin-film sensor: 2.4711 / UNS R30003											
■ Case	304 SS											
Particle test	≤ 0.1 µm particles 0.1 ptc / ft³ per SEMI E49.8											
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 cm³, WUC-15 < 1 cm³, WUC-16 < 1 cm³											
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

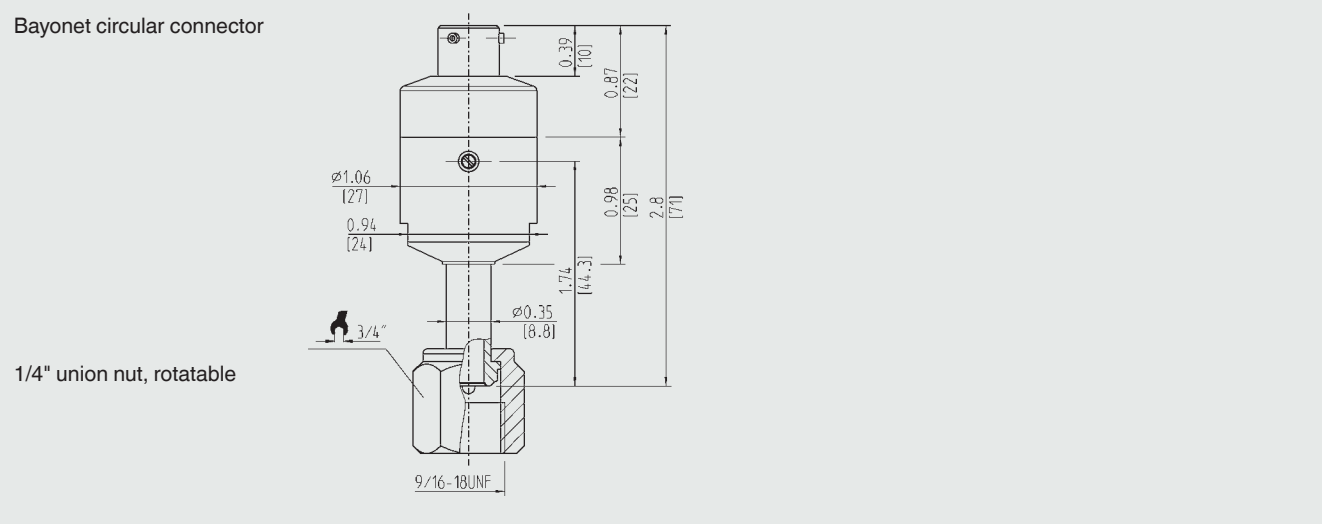
	Bayonet connector (4-pin)			Circular connector M12 x 1 (4-pin)			Cable outlet 1.5 m and 3 m		
									
2-wire	U+ = A	U- = D		U+ = 1	U- = 3		U+ = red	U- = black	
3-wire	U+ = A	U- = D	S+ = B	U+ = 1	U- = 3	S+ = 4	U+ = red	U- = black	S+ = brown
Conductor cross-section	-			-			0.22 mm ² (AWG 24)		
Cable 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

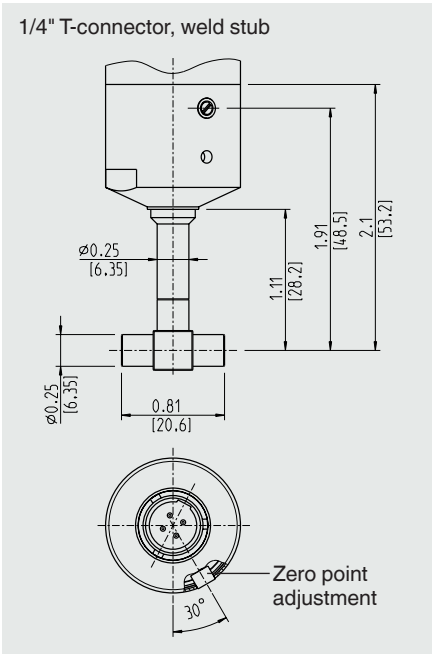
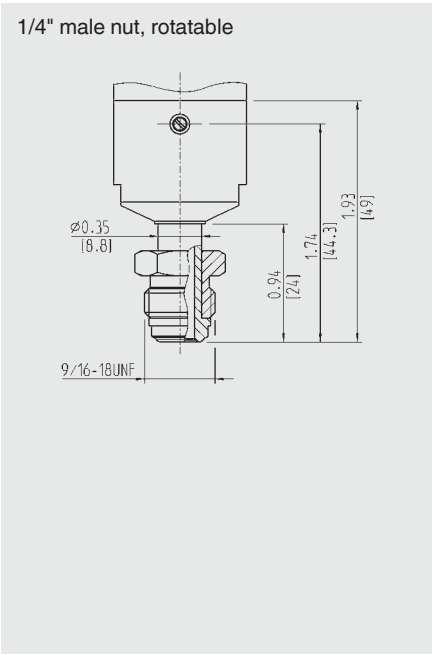
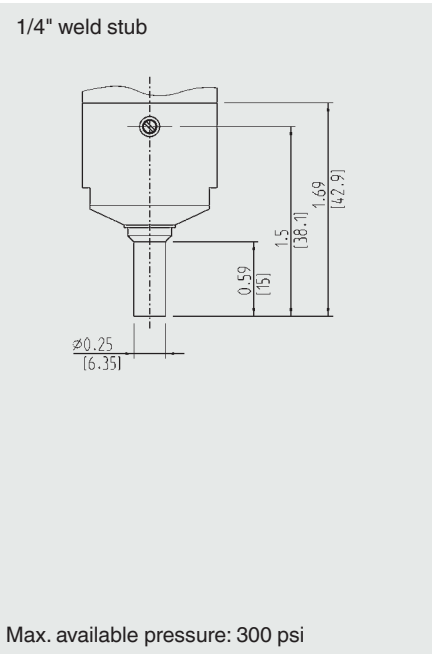
	Sub-D connector, 9-pin			Sub-D HD connector (15-pin)		
						
2-wire	U ₊ = 4	U ₋ = 8 U ₋ = 9		U ₊ = 7	U ₋ = 5 U ₋ = 12	
3-wire	U ₊ = 4	U ₋ = 8 U ₋ = 9	S ₊ = 1	U ₊ = 7	U ₋ = 5 U ₋ = 12	S ₊ = 2
Conductor cross-section	-			-		
Cable diameter	-			-		
Ingress protection per IEC 60529	IP54			IP54		
Ingress protection only applies when plugged in using mating connectors that have the appropriate ingress protection.						

Dimensions in inch [mm] WUC-10

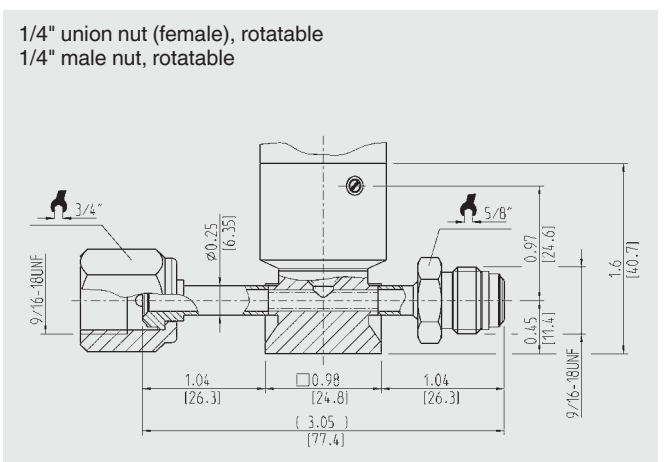
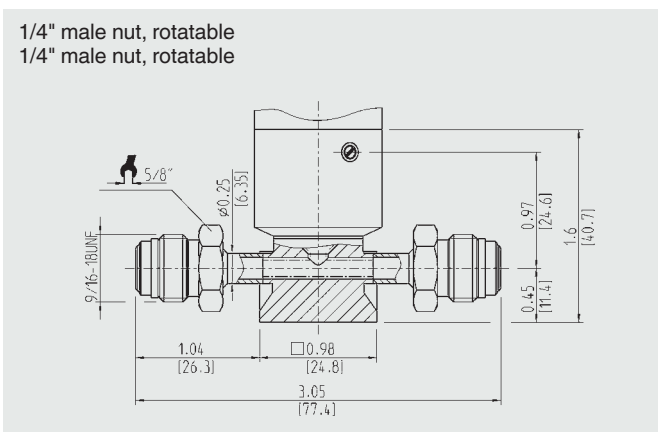
Electrical connections



Process connections

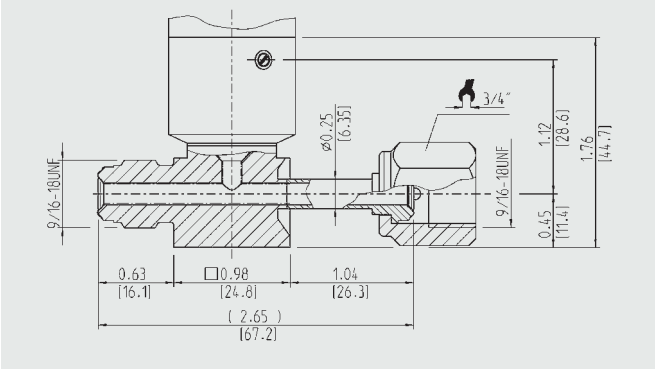


Electrical connections

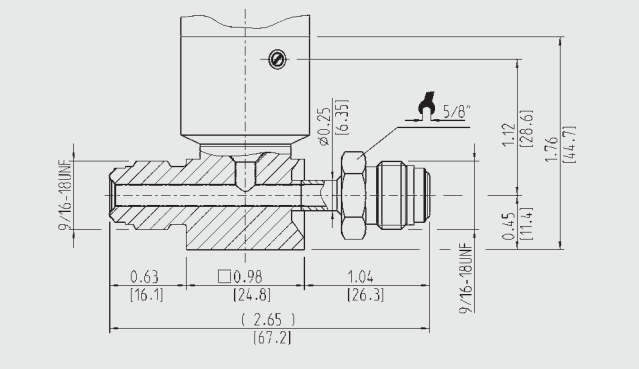


Process connections for WUC-15

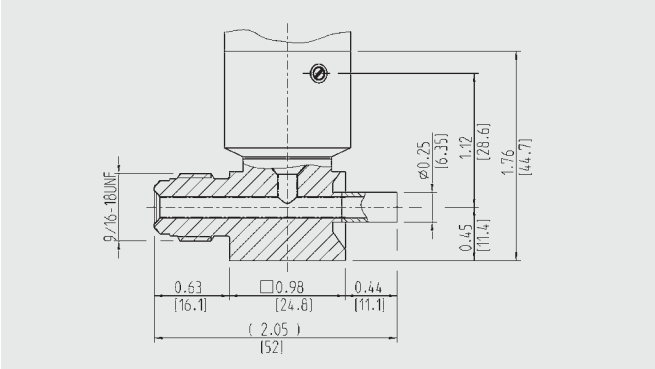
1/4" male nut, fixed
 1/4" union nut (female), rotatable



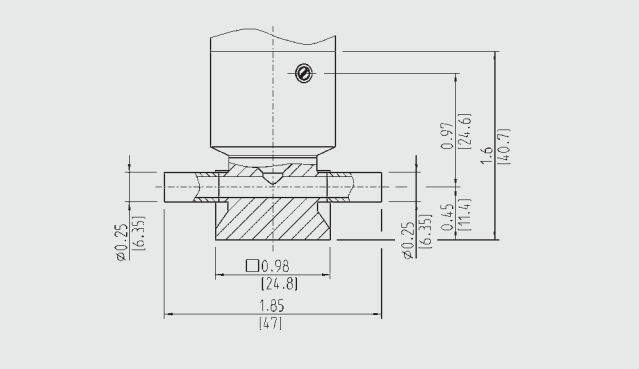
1/4" male nut, fixed
 1/4" male nut, rotatable



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

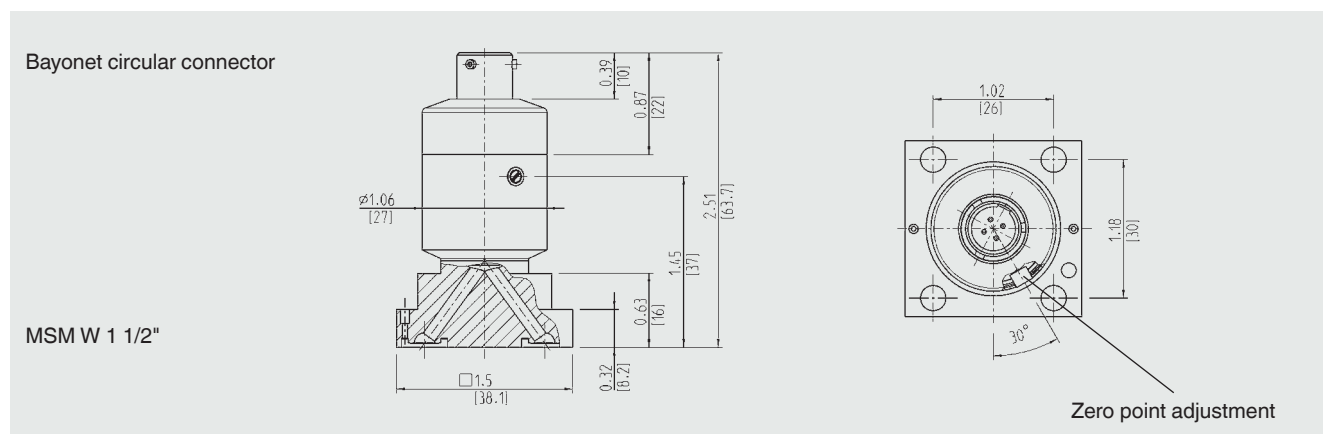


1/4" weld stub
 1/4" weld stub

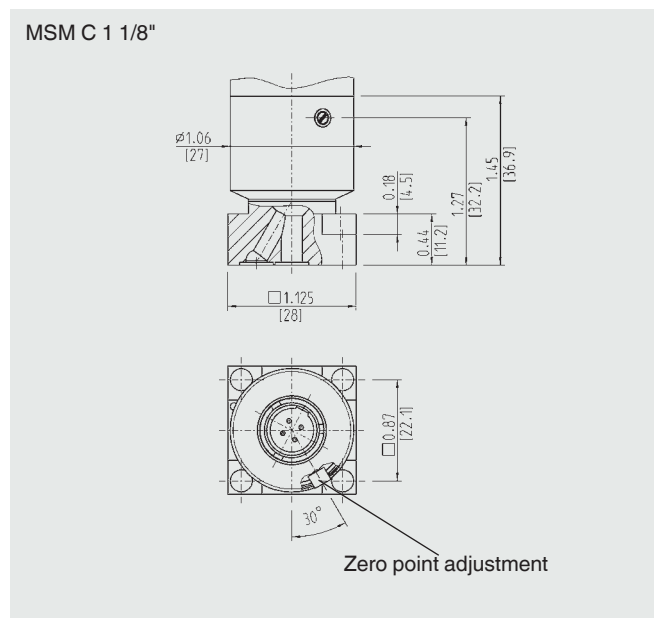
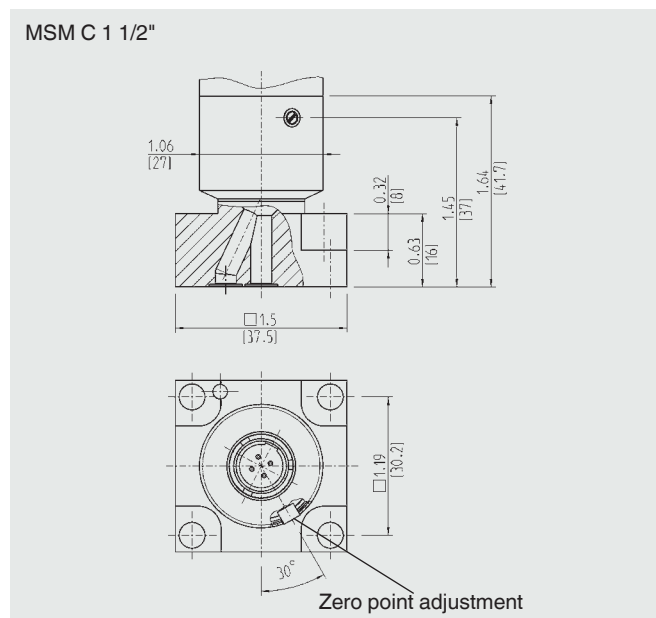


Dimensions in inch [mm] WUC-16

Electrical connections



Process connections



Approvals

Logo	Description	Country
 	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
	IECEx (option) Hazardous areas - Ex n Zone 2 gas [Ex nA 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

Ordering information

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

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