Ultra High Purity Transducer, Ex nA ic
Models WUC-10, WUC-15 and WUC-16

Applications

- Semiconductor, flat panel display and photovoltaic industry
- Specialty and bulk gas distribution systems
  (Gas Sticks, Gas Panels, VMBs)

Special Features

- Compact design
- ATEX and IECEx Zone 2 approval
- FM Class 1 Div 2 Groups A,B,C,D
- Ingress protection NEMA 4 (IP 67)
  with side access zero point adjustment
- Excellent EMC stability
- Active temperature compensation

Fig. left Transducer WUC-10, Single End
Fig. center Transducer WUC-15, Flow Through
Fig. right Transducer WUC-16, Modular Surface Mount

Standard Features

Compact
The ultra compact design of the WUC-1X meets the smallest product footprint requirements. The space saving design easily replaces competitive transducers, making it the perfect fit for new equipment and retrofit projects.

Our flow through (WUC-15) and surface mount (WUC-16) series transducers are specifically designed and manufactured to sustain torsion applied stresses often incurred during installation. The special design of our thin film sensor eliminates the risk of sensor signal error due to influenced loads at the pressure connection or welded joints.

Versatile
The highest materials of construction ensure that every WUC-1X series transducer is well suited for use in corrosive or non-corrosive medias. Additionally, because every WUC-1X series transducer comes standard with NEMA4, ATEX, IECEx and FM certifications, it can be confidently installed in indoor or outdoor systems as well as in non-flammable or potentially flammable areas.

The sealed side access zero point adjustment prevents entry of moisture when used outdoors. The transducer's non-incendive ATEX, IECEx and FM approvals for potentially flammable environments provide essential safeguards for life and product safety. Carrying a T6 temperature class designator, WUC-1X series transducers easily meet the measurement requirements for low, spontaneous ignition temperature medias such as phosphine (PH3) and silane (SiH4).

Reliable
Active temperature compensation reduces the transducers impact to changing temperatures and provides for safer operations in purge-vent cycling of high Joule-Thomson effect gases.

The hermetically sealed design of the transducer's zero point potentiometer protects against unintentional change as well as prevents entry of moisture when used outdoors. The transducers thin film sensors are made of 2.4711/ UNS R30003 to ensure high corrosion resistance and excellent hysteresis characteristics. The remaining wetted components are made from 316L VIM/VAR stainless steel. Prior to final assembly, all wetted parts are electropolished and cleaned using the latest techniques and industry standards. Individual testing of each transducer guarantees compliance with the requirements for leak integrity, overpressure stability, accuracy, and particles levels according to the applicable and relevant SEMI standards.

Specifications — Models WUC-10, WUC-15 and WUC-16

		WUC-10 / WUC-15 / WUC-16											
Pressure ranges	psi	30	60	100	160	250	350	500	1000	1500	2000	3000	5000
	bar	2	4	7	11	17	25	36	70	100	145	225	360
Over pressure safety [1]	psi	120	120	210	320	500	750	1100	2100	3000	4200	6600	10000
Burst pressure [1]	psi	1800	1800	2200	2600	4800	6200	7400	8000	10500	10500	10500	10500
	Other pressure ranges and pressure units (e.g. MPa, kg/cm2) on request												
	[1] 1 psi = 0.069 bar												

Measuring principle		Metal thin film sensor
Materials		
■ Wetted parts		
» Pressure Connection		316L VIM/VAR
» Pressure sensor		2.4711 / UNS R30003
■ Case		304 SS
Particle test		≤ 0.1 µm Particle 0.1 ptc / ft^3 according to Semi E49.8
Inboard helium leak test		< 1 x 10-9 mbar l/sec (atm STD cc/sec) according to Semi F1
Surface finish		Electropolished, typical Ra ≤ 0.13 µm (RA 5); max. Ra ≤ 0.18 µm (RA 7) according to Semi F19
Dead volume	cm^3	WUC-10 < 1.5, WUC-15 < 1, WUC-16 < 1
Permissible Medium		Special gas / Vapour / Liquid
Power supply U+	U+ in VDC	10... 30 with output signal 4... 20 mA / DC 0... 5 V
		14... 30 with output signal DC 0 ... 10 V
Signal output and permissible maximum ohmic load R_A	R_A in Ohm	4... 20 mA, 2-wire $R_A \leq (U+ - 10\ V) / 0.02\ A$
		0... 5 V, 3-wire $R_A > 5k\Omega$
		0... 10 V, 3-wire $R_A > 10k\Omega$
Power Pi	W	1
Adjustability zero	% of span	-5 up to +3.5 (via potentiometer) Current output signal
	% of span	-2 up to +5 (via potentiometer) Voltage output signal
Response time (10 ... 90 %)	ms	≤ 300
Insulation voltage	VDC	500
Accuracy	% of span	≤ 0.2 (≤ 0.4 with pressure ranges ≤ 2 bar) RSS (Root Sum Squares) incl. Linearity, Hysterisis, non-repeatability
	% of span	≤0.5 [2] (≤1.0 [2] with pressure ranges ≤2 bar)
		[2] Including non-linearity, hysteresis, zero point and full scale error
		(corresponds to error of measurement per IEC 61298-2)
Non-linearity	% of span	≤ 0.1 (≤ 0.15 for pressure ranges ≤ 2 bar) (BFSL) according to IEC 61298-2
Hysteresis	% of span	≤ 0.14
Non-repeatability	% of span	≤ 0.12
1-year stability	% of span	≤ 0.25 typ. at reference conditions (≤ 0.4 with pressure ranges ≤ 2bar)

Permissible temperature of	without Approval		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
■ Ambience	-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

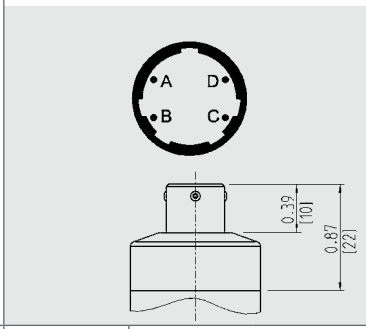
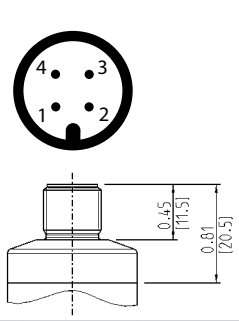
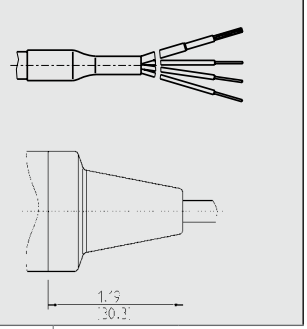
Related temperature range		-20... +80 °C / -4 ... +176 °F (active compensated)
Temperature coefficients within related temperature range (active compensated):		
■ mean TC of zero	% of span	≤ 0.1 / 10 K
■ mean TC of range	% of span	≤ 0.15 / 10 K
RoHS-conformity		Yes (not with bayonet connector)
CE-conformity		
■ Pressure equipment directive		97/23/EC
■ EMC directive		2004/108/EC, EN 61 326 Emission (Group 1, Class B) and Immunity (industrial locations)
■ Directive ATEX of equipment intended for use in potentially explosive atmospheres		94/9/EC
Ex-protection	ATEX & IECEx	Category [3] 3G (for transducers with Ex-marking)
Ignition protection type		II 3G Ex nA ic IIC T4/T5/T6 Gc (for transducer with Ex-marking)
	FM	FM; Nonincendive for use in Class I, Div. 2, Groups A, B, C, D and Class I, Zone 2, Group IIC, Hazardous (Classified) Locations

[3] Read the operating conditions and safety-relevant data in the operating instruction in any case

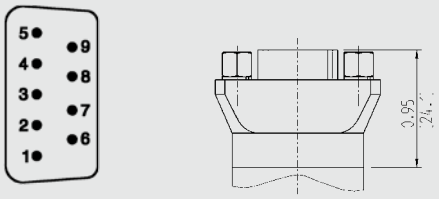
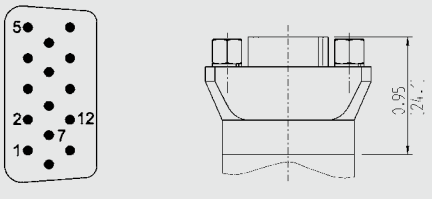
Specifications — Models WUC-10, WUC-15 and WUC-16

Assembly and packing area		Clean room class 5 according to ISO 14644	
Packaging		Double bagging according to SEMI E49.6	
Shock resistance	g	500 (1.5 ms)	according to IEC 60068-2-27
Vibration resistance		0.35 mm (10 - 58 Hz) / 5 g (58.1 - 2000 Hz)	according to IEC 60068-2-6
Wiring protection			
■ Short-circuit		S+ towards U- (short-time)	
■ Reverse polarity		U+ towards U-	
Weight	kg	Approx. 0.1	

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
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)		
	The ingress protection classes specified only apply while the pressure transmitter is connected with female connectors that provide the corresponding ingress protection.								

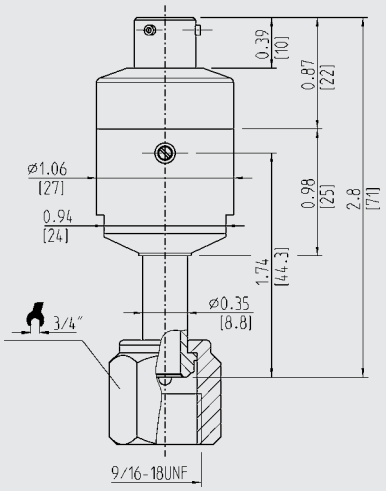
Electrical connections

	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
Wire cross-section	-			-		
Cable diameter	-			-		
Ingress protection per IEC 60529	IP 54			IP 54		
	The ingress protection classes specified only apply while the pressure transmitter is connected with female connectors that provide the corresponding ingress protection.					

Dimensions in inches [mm] WUC-10

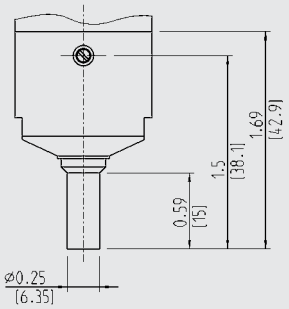
Bayonet connector

1/4" Swivel Female
Face Seal

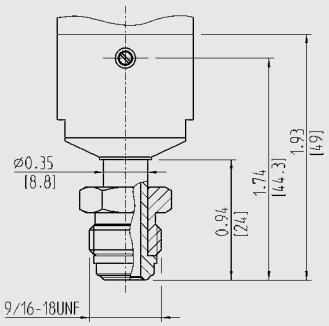


Process connection variants

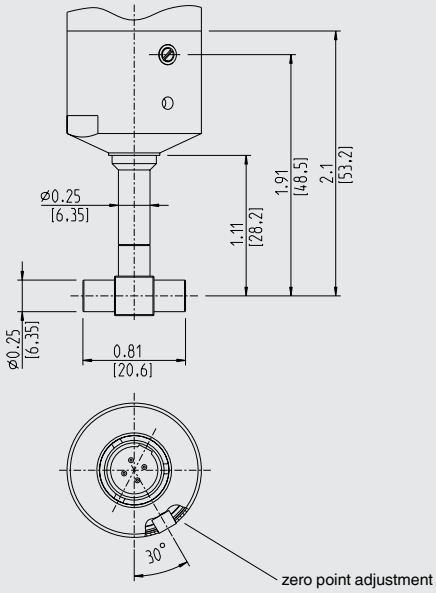
1/4" Weld Stub



1/4" Swivel Male Face Seal



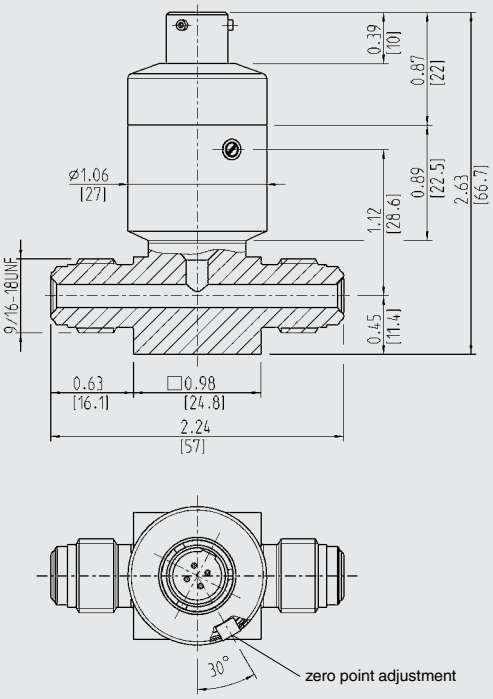
1/4" T-Connector, Weld Stub



Dimensions in inches [mm] WUC-15

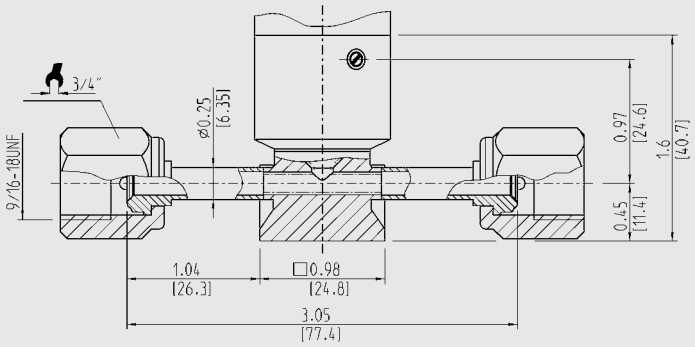
Bayonet connector

1/4" Fixed Male Face Seal
1/4" Fixed Male Face Seal

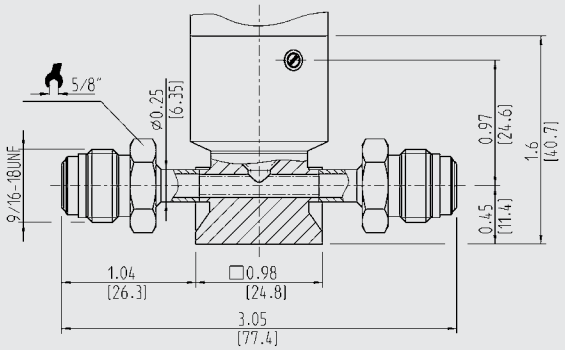


Process connection variants

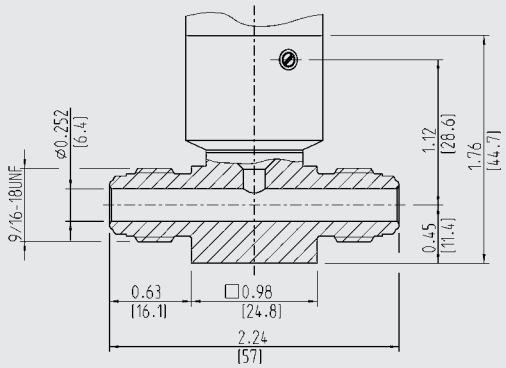
1/4" Swivel Female Face Seal
1/4" Swivel Female Face Seal



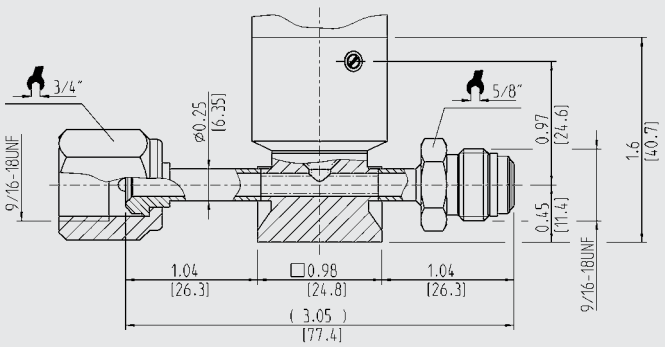
1/4" Swivel Male Face Seal
1/4" Swivel Male Face Seal



1/4" Fixed Male Face Seal High Flow Through
1/4" Fixed Male Face Seal High Flow Through
only available with pressure ranges up to 25 bar / 300 psi

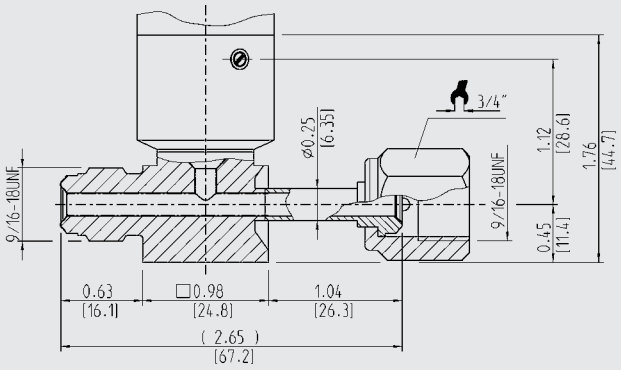


1/4" Swivel Femal Face Seal
1/4" Swivel Male Face Seal

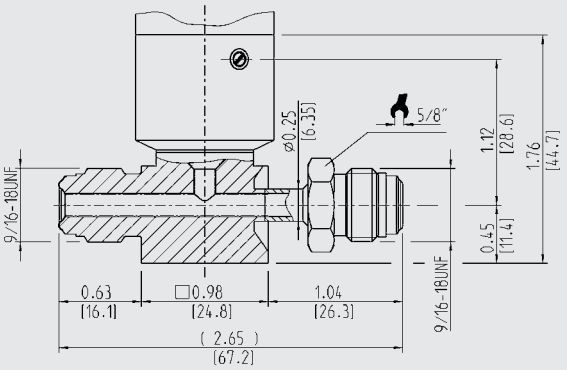


Process connection variants WUC-15

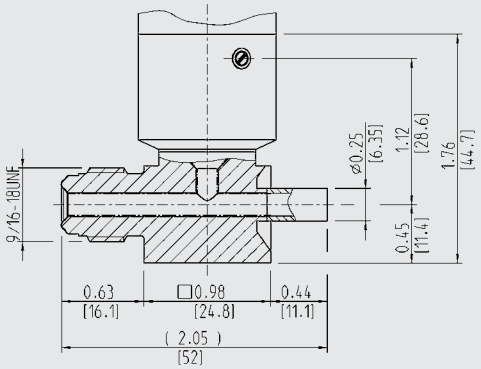
1/4" Fixed Male Face Seal
1/4" Swivel Female Face Seal



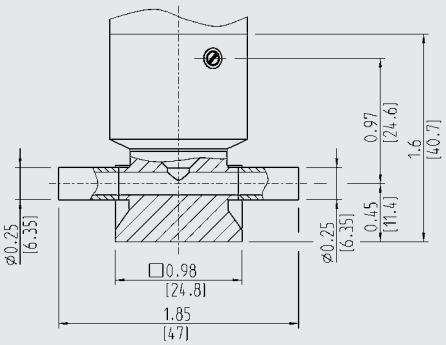
1/4" Fixed Male Face Seal
1/4" Swivel Male Face Seal



1/4" Fixed Male Face Seal
1/4" Weld Stub



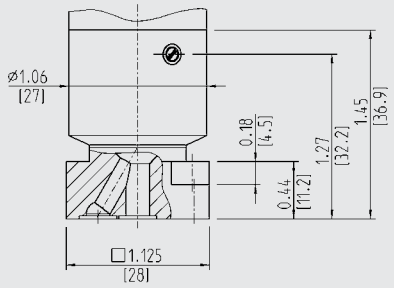
1/4" Weld Stub
1/4" Weld Stub

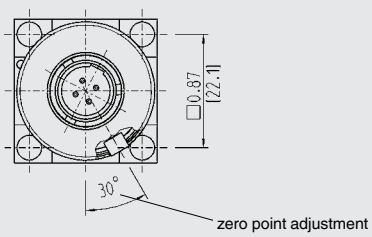


Dimensions in inches [mm] WUC-16

Process connection variants

MSM C 1 1/8"

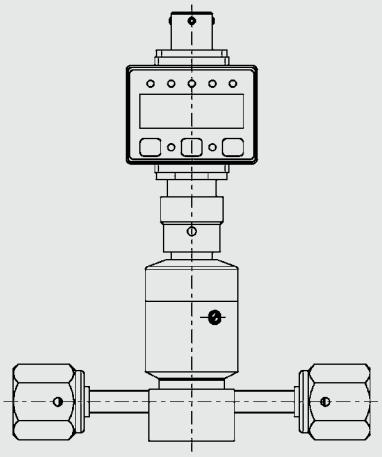


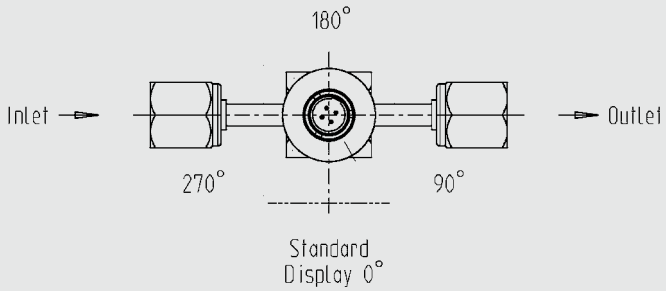


Connector orientation for the mounting of attachable indicators

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

WUC-1X Smart Codes for Custom Order Configurations

Field No.	Code	Feature
		Type
	0	Process connection: single end
	5	Process connection: flow through
1	6	Process connection: surface mount
		Signal Output
	A	4…20 mA, 2-wire
	F	0…10 V, 3-wire
	G	0…5 V, 3-wire
	C	0.1…10.1 V, 3-wire
2	H	0.1…5.1 V, 3-wire
		Dampening
3	Z	Without
		Unit
	B	bar
	P	psi
	E	MPa
	K	kg/cm2
4	?	Other
		Absolute or Relative Pressure
	G	Gauge
	V	Compound
5	A	Absolute
		Pressure Range

	G	V	A
320	0…2 bar gauge	-1…+1 bar gauge	0…2 bar abs
340	0…4 bar gauge	-1…+3 bar gauge	0…4 bar abs
370	0…7 bar gauge	-1…+6 bar gauge	0…7 bar abs
380		-1…+7 bar gauge	
410	0…10 bar gauge	-1…+9 bar gauge	0…10 bar abs
416	0…16 bar gauge	-1…+15 bar gauge	0…16 bar abs
425	0…25 bar gauge		0…25 bar abs
426		-1…+25 bar gauge	
440	0…40 bar gauge		0…40 bar abs
441		-1…+40 bar gauge	
460	0…60 bar gauge		0…60 bar abs
461		-1…+60 bar gauge	
471		-1…+70 bar gauge	
510	0…100 bar gauge	-1…+100 bar gauge	
516	0…160 bar gauge	-1…+160 bar gauge	
525	0…250 bar gauge	-1…+250 bar gauge	
540	0…400 bar gauge		
320		-30 In Hg…+15 psi	
321	0…30 psig		0…30 psia
331		-30 In Hg…+30 psi	
335			0…50 psia
341	0…60 psig	-30 In Hg…+45 psi	0…60 psia

WUC-1X Smart Codes for Custom Order Configurations (continued)

Field No.	Code	Feature		
		Pressure Range continued		
		G	V	A
	351		-30 In Hg…+60 psi	
	369	0…100 pisg		0…100 psia
	379		-30 In Hg…+100 psi	
	411	0…160 psig		0…160 psia
	412		-30 In Hg…+160 psi	
	417	0…250 psig		0…250 psia
	418		-30 In Hg…+250 psi	
	421	0…300 psig		0…300 psia
	422		-30 In Hg…+300 psi	
	434	0…500 psig		0…500 psia
	436		-30 In Hg…+500 psi	
	469	0…1000 psig		0…1000 psia
	470		-30 In Hg…+1000 psi	
	510	0…1500 psig		0…1500 psia
	514	0…2000 psig	-30 In Hg...+2000 psi	0…2000 psia
	521	0…3000 psig	-30 In Hg...+3000psi	0…3000 psia
	534	0…5000 psig		0…5000 psia
	320	0…0.2 MPa gauge		0…0.2 MPa abs
	340	0…0.4 MPa gauge	-0.1…+3 MPa gauge	0…0.4 MPa abs
	370	0…0.7 MPa gauge	-0.1…+6 MPa gauge	0…0.7 MPa abs
	410	0…1 MPa gauge		0…1 MPa abs
	416	0…1.6 MPa gauge	-0.1…+1.5 MPa gauge	0…1.6 MPa abs
	425	0…2.5 MPa gauge		0…2.5 MPa abs
	426		-0.1…+2.5 MPa gauge	
	440	0…4 MPa gauge		0…4 MPa abs
	441		-0.1…+4 MPa gauge	
	460	0…6 MPa gauge		0…6 MPa abs
	461		-0.1…+6 MPa gauge	
	510	0…10 MPa gauge	-0.1…+10 MPa gauge	
	516	0…16 MPa gauge	-0.1…+16 MPa gauge	
	525	0…25 MPa gauge	-0.1…+25 MPa gauge	
6	540	0…40 MPa gauge		
		Process Connection		
	WG	¼" Fixed male face seal, 9/16-18 UNF[1)]		(FSFM)
	71	Original swivel male nut SS4-VCR-4		(FSM)
	72	Original female union nut S-VCR-1		(FSF)
	VN	¼" Weld stub		
	WR	¼" T-connector (1" version)		
	WC	MSM C 1½" SQ		
	WD	MSM W 1½"		
	WE	MSM C 1⅛" SQ		
	WF	MSM W 1 ⅛"		
7	??	Other		

1) WUC-15 only

WUC-1X Smart Codes for Custom Order Configurations (continued)

Field No.	Code	Feature	
		Outlet Process Connection	
	71	Original swivel male nut SS4-VCR-4	(FSM)
	72	Original female union nut S-VCR-1	(FSF)
	VN	¼" Weld stub	
	WG	¼" Fixed male face seal, 9/16-18 UNF[2)]	(FSFM)
8	??	Other	
		Electrical Connection	
	M4	Circular connector M12x1, 4-pin	
	DL	Cable w/free ends	
	O4	4-Pin bayonet connector	
	9S	9-Pin Sub-D connector	
9	TX	15-Pin high density Sub-D plug	
		Cable length	
	Z	Without	
10	E	3 m	
		Approvals	
11	N	ATEX and IECEx II 3G Ex nA ic IIC T4/T5/T6 Gc and FM Class 1 Div. 2 Group A, B, C, D	
		Local Approvals	
	Z	without (Default for US Market)	
	K	KOSHA Ex nA IIC T6/T5/T4, without CE, for Korea only	
	I	IECEx Ex nA ic IIC (without CE-mark)	
	C	without approvals, without CE, for Korea only	
12	N	NEPSI Ex ic nA IIC T4-T6 Gc, without CE, for China only	
		Quality Certificates	
	Z	Without	
13	1	Quality certificates*	
		Additional Ordering Information	
	Z	Without	
14	T	Additional text*	

2) Used with WG Process Connection only

Order Code:

	1		2	3		4	5	6		7	8		9	10	11	12		13*	14*
WUC-1		-			-				-			-					-		

*Additional ordering/quality certificate details _____

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