

Ultra High Purity Transducer, Ex nA nL Models WU-20, WU-25 and WU-26

WIKA Datasheet PE 87.07



Applications

- Gas panels for OEM tools
- Semiconductor, flat panel display and photovoltaic production
- Specialty and bulk-gas distribution

Special Features

- High accuracy pressure measurement
0.15% RSS (or 0.3% BFSL)
- Vacuum referenced pressure readings
- Excellent long term stability
- Signal noise cancellation and shielding
- 2.4711/UNSR 30003 thin film sensor
- Active temperature compensation
- Hermetically sealed (NEMA4 / IP67)
- ATEX Zone 2
- RoHS compliant
- Compact design

Description

Reliable

The WU-2x series combines state of the art digital transducer concepts with analog-like output signals, in order to provide the safest and most accurate pressure measurements necessary for today's demanding market requirements.

Vacuum referenced pressure readings, integrated signal noise cancellation and shielding features ensure high accuracy pressure measurement and excellent long term stability. Active temperature compensation routines reduce the transducers impact to changing temperatures, allowing safer operations involving purge-vent cycling of high Joule-Thomson effect gases.

Flow through (WU-25) and surface mount (WU-26) 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.



Fig. left Transducer WU-20, Single End
Fig.center Transducer WU-25, Flow Through
Fig. right Transducer WU-26, Modular Surface Mount

Versatile

The WU-2X can be readily installed in indoor or outdoor systems as well as in non-flammable or potentially flammable areas. Compliance to the most stringent standards (NEMA4, IP67, RoHS) improves install base flexibility and acceptance worldwide.

The hermetically sealed design of the WU-2X prevents entry of moisture when used outdoors. Non-incendive (ATEX) approvals for potentially flammable environments provide essential safeguards for life and product safety. A T6 temperature class designator complies to the highest measurement requirements for low, spontaneous ignition temperature medias (i.e., phosphine (PH₃) and silane (SiH₄).

Compact

The ultra compact design of the WU-2X is the smallest product footprint in the market today. The space saving design easily replaces competitive transducers, making it the perfect fit for new equipment and retrofit projects.

Specifications

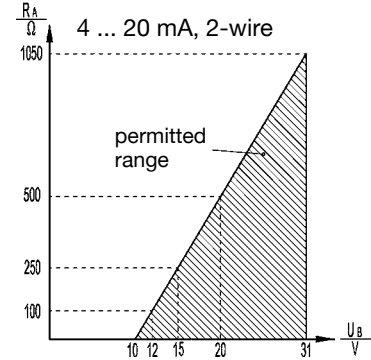
Models WU-20, WU-25 and WU-26

		WU-20 / WU-25													
		WU-26													
Pressure ranges	psi	14.5	25	60	100	160	250	350	500	1000	1500	2000	3000	5000	
	bar	1	1.7	4	7	11	17	25	36	70	100	145	225	360	
Over pressure safety 1)	psi	120	120	120	210	320	500	750	1100	2100	3000	4200	6600	10500	
Burst pressure 1)	psi	1800	1800	1800	2200	2600	4800	6200	5800	8000	10500	10500	10500	12000	
Other pressure ranges and pressure units (e.g. MPa, kg/cm ²) on request															
*) 1 psi = 0.069 bar															
Measuring principle		Metal thin film sensor													
Materials															
■ Wetted parts															
» Pressure Connection		316L VIM/VAR													
» Pressure sensor		2.4711 / UNSR 30003													
■ 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)													
		Exceeds Semi F19													
Dead volume	cm ³	WU-20 < 1.5, WU-25 < 1, WU-26 < 1													
Permissible Medium		Special gas / Vapor / Liquid													
Power supply U+	U+ in VDC	10 ... 31 V with output signal 0 ... 5 V / 4 ... 20 mA 14 ... 31 V with output signal 0 ... 10 V													
Signal output and maximum ohmic load RA	RA in Ohm	4 ... 20 mA, 2-wire RA ≤ (U+ - 10 V) / 0.02 A 0 ... 5 V, 3-wire RA > 5 k 0 ... 10 V, 3-wire RA > 10 k													
Power Pi	W	1													
Adjustability zero	% of span	-3.5 up to +3.5 (via potentiometer) Current output signal													
	% of span	-2 up to +3.5 (via potentiometer) Voltage output signal													
Response time (10 ... 90 %)	ms	≤ 300													
Insulation voltage	VDC	500													
Accuracy	% of span	≤ 0.15 (≤ 0.4 with pressure ranges ≤ 2 bar) RSS (Root Sum Squares) according to Semi # 3440 draft													
	% of span	≤ 0.3 (≤ 0.6 with pressure ranges ≤ 2 bar) BFSL													
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)													
Permissible temperature of		non-ATEX			T4				T5				T6		
■ Medium		-20...+100°C	-4...+212°F	-20...+85°C	-4...+185°F	-20...+50°C	-4...+122°F	-20...+34°C	-4...+93°F						
■ Ambience		-20...+85°C	-4...+185°F	-20...+85°C	-4...+185°F	-20...+50°C	-4...+122°F	-20...+34°C	-4...+93°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 (active compensated)													
Temperature coefficients within rated 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	Category 2) 3G (for transducer with Ex-marking)													
Ignition protection type		II 3G Ex nA nL IIC T4/T5/T6 X (for transducer with Ex-marking)													
2) Read the operating conditions and safety-relevant data in the operating instruction in any case															

Specifications Models WU-20, WU-25 and WU-26

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-
■ Reverse polarity		U+ towards U-
Weight	kg	Approx. 0.1

Signal output and allowed load



Current output (2-wire)
 4 ... 20 mA:
 $RA \leq (U+ - 10 V) / 0.02 A$

Voltage output (3-wire)
 0 ... 5 V: RA > 5 k
 0 ... 10 V: RA > 10 k

with RA in Ohm and U+ in Volt

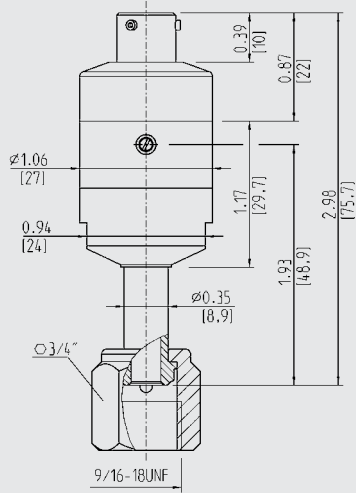
Electrical connections

	Bayonet connector, 4-pin not possible with ATEX	Circular connector M12x1, 4-pin	Flying leads, 1.5 m	Sub-D HD connector, 15-pin not possible with ATEX
2-wire	U+ = A U- = D	U+ = 1 U- = 3	U+ = red U- = black	U+ = 7 U- = 5 U- = 12
3-wire	U+ = A U- = D S+ = B	U+ = 1 U- = 3 S+ = 4	U+ = red U- = black S+ = brown	U+ = 7 U- = 5 U- = 12 S+ = 2
Wire gauge	-	-	0.22 mm ² (AWG 24)	-
Diameter of cable	-	-	4.8 mm	-
Ingress Protection per IEC 60 529	NEMA 4 (IP 67)	NEMA 4 (IP 67)	NEMA 4X (IP 67)	(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 inch [mm] WU-20

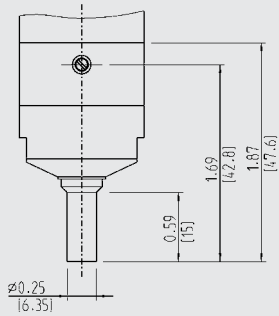
Bayonet connector



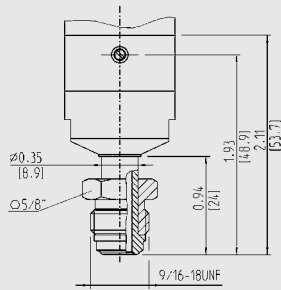
1/4" Swivel Female Face Seal

Process connection variants

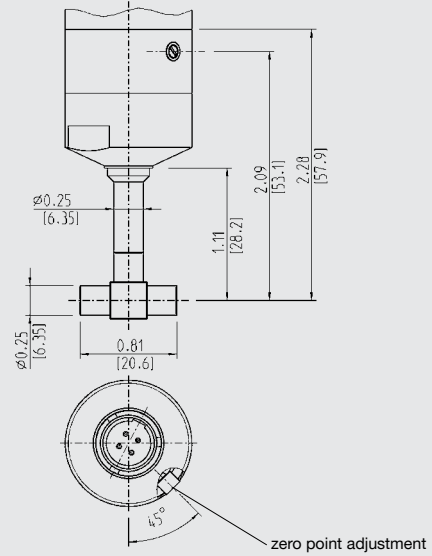
1/4" Weld Stub



1/4" Swivel Male Face Seal



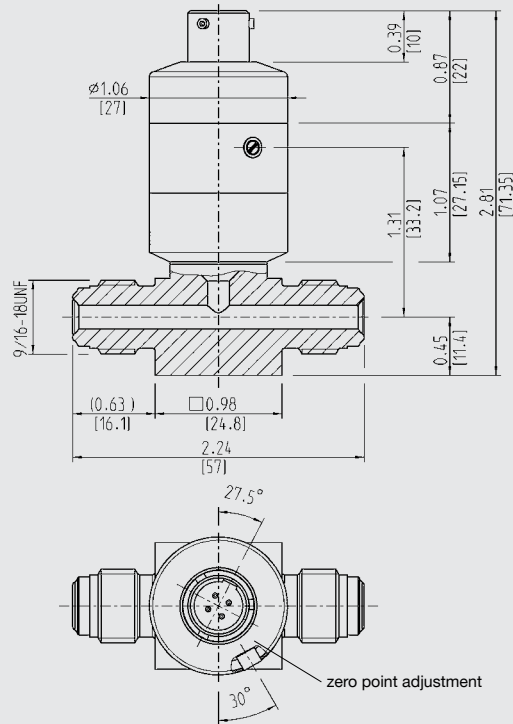
1/4" T-Connector, Weld Stub



Dimensions in inch [mm] WU-25

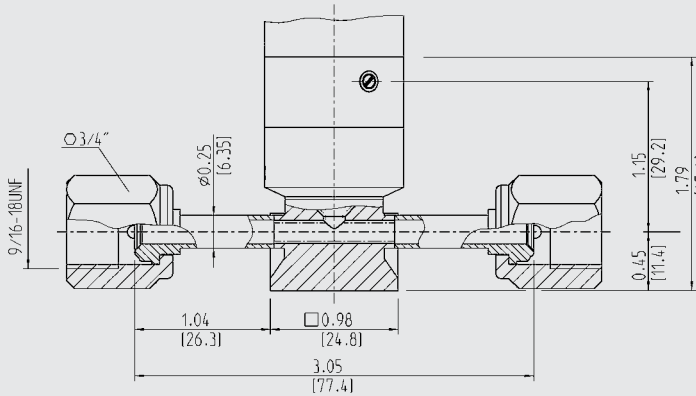
Bayonet connector

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

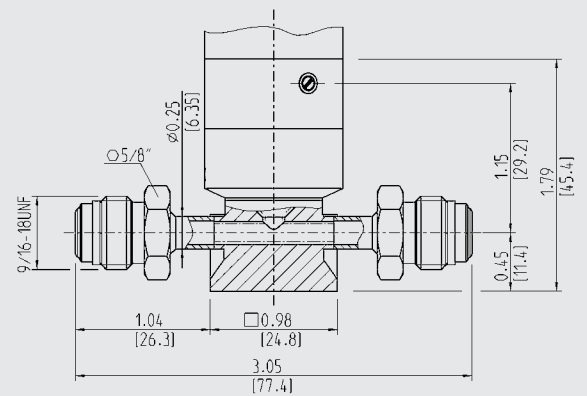


Process connection variants

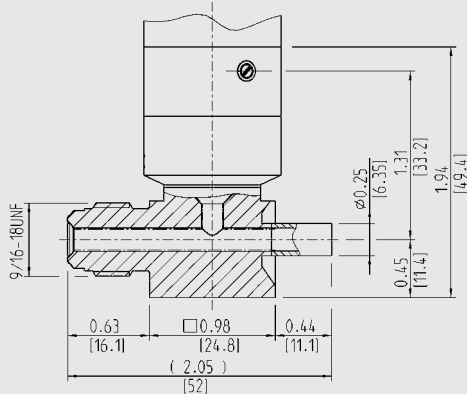
1/4" Swivel Female Face Seal
1/4" Swivel Female Face Seal



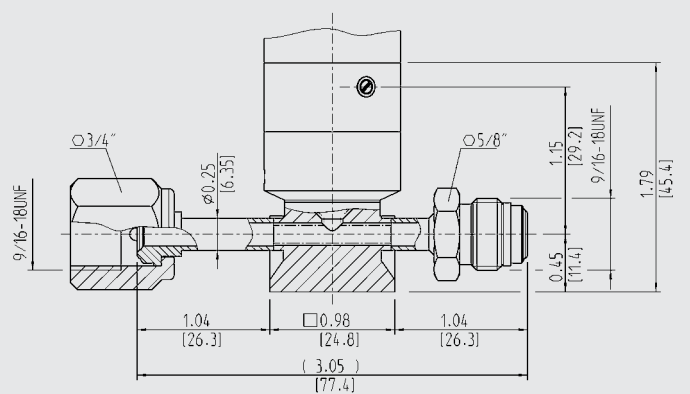
1/4" Swivel Male Face Seal
1/4" Swivel Male Face Seal



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

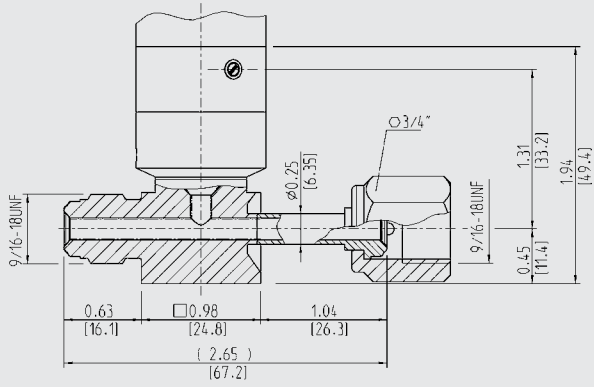


1/4" Swivel Femal Face Seal
1/4" Swivel Male Face Seal

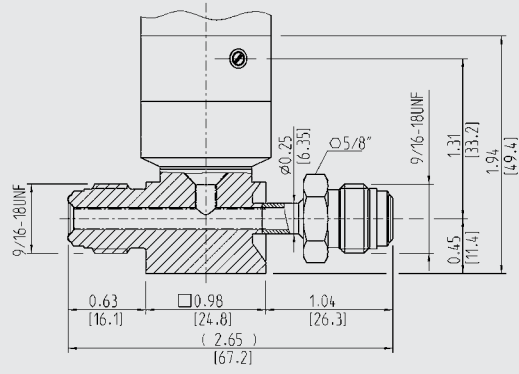


Process connection variants WU-25

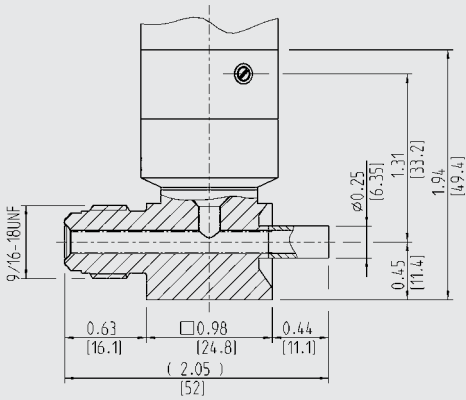
1/4" Fixed Male Face Seal
1/4" Swivel Female Face Seal



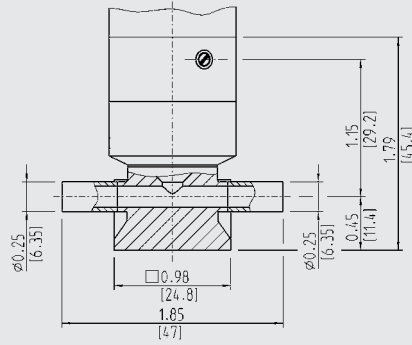
1/4" Fixed Male Face Seal
1/4" Swivel Male Face Seal



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



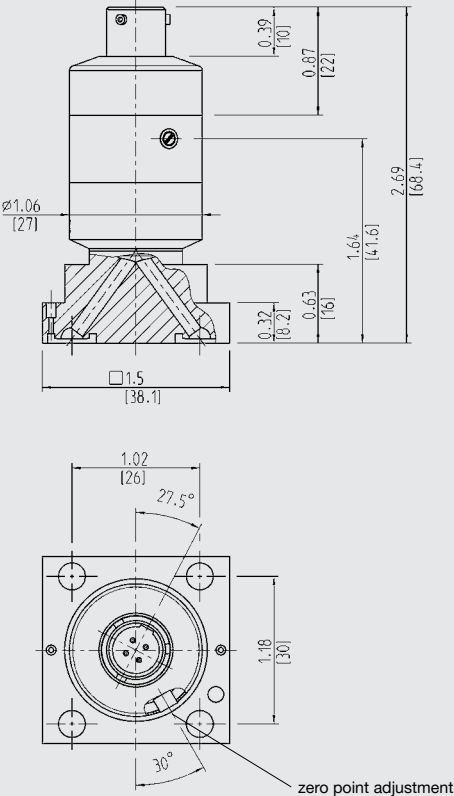
1/4" Weld Stub
1/4" Weld Stub



Dimensions in inch [mm] WU-26

Bayonet connector

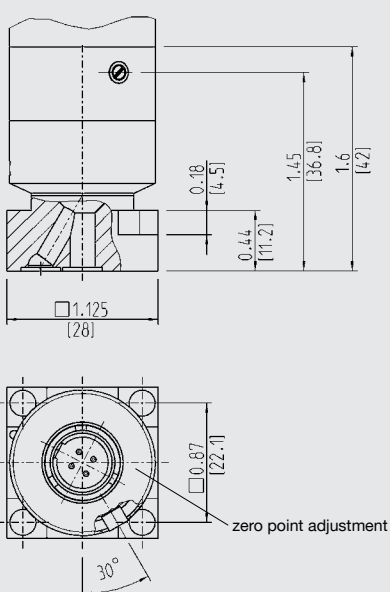
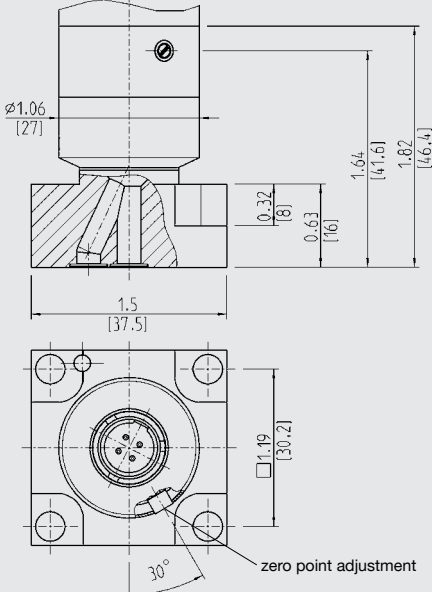
MSM W 1 1/2"



Process connection variants

MSM C 1 1/2"

MSM C 1 1/8"



WU-2X Smart Codes for Custom Order Configurations

Field No.	Code	Feature		
1	Type			
	0	Process connection: single end		
	5	Process connection: flow through		
2	Signal Output			
	A	4 ... 20 mA, 2-wire		
	F	0 ... 10 V, 3-wire		
3	Dampening			
	Z	Without		
4	Unit			
	B	bar		
	p	psi		
	K	kg/cm ²		
5	Absolute or relative pressure			
	G	gauge		
	V	compound		
	A	absolute		
6	Pressure Range			
	320	0...2 bar gauge	-1...+1 bar gauge	
	340	0...4 bar gauge	-1...+3 bar gauge	
	370	0...7 bar gauge	-1...+6 bar gauge	
	410	0...10 bar gauge	-1...+9 bar gauge	
	416	0...16 bar gauge	-1...+15 bar gauge	
	425	0...25 bar gauge		
	440	0...40 bar gauge		
	460	0...60 bar gauge		
	510	0...100 bar gauge	-1...+100 bar gauge	0...1500 psia
	516	0...160 bar gauge	-1...+160 bar gauge	
	525	0...250 bar gauge	-1...+250 bar gauge	
	540	0...400 bar gauge		
	380		-1...+7 bar gauge	
	426		-1...+25 bar gauge	
	441		-1 ...+40 bar gauge	
	461		-1 ...+60 bar gauge	
	471		-1...+70 bar gauge	
	339	0...4 kg/cm ² gauge		
	359	0...6 kg/cm ² gauge		
	398	0...10 kg/cm ² gauge		
	439	0...40 kg/cm ² gauge		
	459	0...60 kg/cm ² gauge		
	498	0...100 kg/cm ² gauge		
	520	0...200 kg/cm ² gauge		

WU-2X Smart Codes for Custom Order Configurations (continued)

Field No. Code Feature

Pressure range continued				
6	321	0...30 psig	0...30 psia	
	335	0...50 psia		
	341	0...60 psig	30 InHg...+45 psi	0...60 psia
	369	0...100 psig		0...00 psia
	411	0...160 psig		0...60 psia
	417	0...250 psig		0...250 psia
	421	0...300 psig		0...300psia
	434	0...500 psig		0...500 psia
	469	0...1000 psig		0...1000 psia
	514	0...2000 psig	-30 InHg...+2000 psi	0...2000 psia
	521	0...3000 psig	-30 InHg...+3000 psi	0...3000 psia
	534	0...5000 psig		0...5000 psia
	331		-30 InHg...+30 psi	
	351		-30 InHg...+60 psi	
	379		-30 InHg...+100 psi	
	412		-30 InHg...+160 psi	
	418		-30 InHg...+250 psi	
	422		-30 InHg...+300 psi	
	436		-30 InHg...+500 psi	
	470		-30 InHg...+1000 psi	
	Process connection			
	7	70	Original fixed male nut (9/16-UNF)	(FSFM)
		71	Original swivel male nut SS4-VCR-4	(FSM)
		72	Original female union nut S-VCR-1	(FSF)
		VN	1/4" weld stub	
		WK	1/2" swivel male face seal	(FSM)
		WL	1/2" swivel female face seal	(FSF)
		WT	1/4" T-Connector (0.87" version)	
WP		1/2" T-Connector		
WN		3/8" T-Connector		
WR		1/4" T-Connector		
WC		MSM C 1 1/2" SQ		
WD		MSM W 1 1/2"		
WE		MSM C 1 1/8" SQ		
??		Other		
Outlet process connection				
8	ZZ	Without		
	70	Original fixed male nut (9/16-UNF)	(FSFM)	
	71	Original swivel male nut SS4-VCR-4	(FSM)	
	72	Original female union nut S-VCR-1	(FSF)	
	VN	1/4" weld stub		
	??	Other		

WU-2X Smart Codes for Custom Order Configurations (continued)

Field No.	Code	Feature
9	Electrical connection	
	M4	Circular connector M12x1, 4-pin
	DL	Cable w/free ends
	O4	4-Pin bayonet connector
	TX	15-pin high density Sub-D plug
10	Cable length	
	Z	Without
	C	1.5 m
	E	3 m
	J	12 m
11	Approvals	
	E	ATEX Ex. nA nL IIC 3G T4/T5/T6 X

	Additional order info		
	YES	NO	
12	1	Z	quality certificates
13	Z	T	without

Order Code:

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

WU-2X - - - - -

*Additional order details _____

Specifications and dimensions given in this leaflet represent the state of engineering at the time of printing. Modifications may take place and materials specified may be replaced by others without prior notice.



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