

Ultra High Purity Pressure Transducer and Integrated Display with Optional Alarm Contacts Models WUD-20, WUD-25 and WUD-26

WIKA Datasheet WUD-2X

Applications

- Gas panel for OEM tools
- Semiconductor, flat panel display and photovoltaic production

Special Features

- High accuracy pressure measurement 0.15% RSS
- Excellent long term stability
- Signal noise cancellation and shielding
- Vacuum referenced pressure readings
- Active temperature compensation

Description

Reliable

The WUD-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 (WUD-25) and surface mount (WUD-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 WUD-20, Single End
Fig. Center WUD-25, Flow Through
Fig. Right Transducer WUD-26, Modular Surface Mount

Versatile

The WUD-2X can be readily installed in OEM gas panels / boxes. The fully rotatable display provides visual indication of pressure from nearly any angle.

2 user-programmable switch outputs allow the user to set, monitor and control operations associated with varying critical pressure conditions.

Compact

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

Specifications

Models WUD-20, WUD-25 and WUD-26

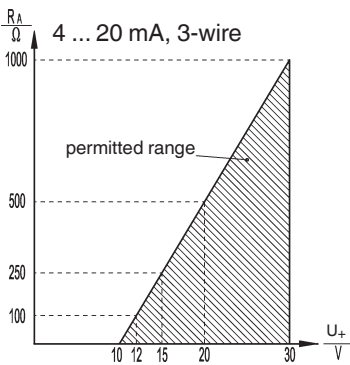
		WUD-20 / WUD-25												
		WUD-26												
Pressure ranges	psi	15	30	60	100	160	250	350	500	1000	1500	2000	3000	5000
	bar	1	2	4	7	11	17	25	36	70	100	145	225	360
Over pressure safety ¹⁾	psi	120	120	120	210	320	500	750	1100	2100	3000	4200	6600	10000
Burst pressure ¹⁾	psi	1800	1800	1800	2200	2600	4800	6200	7400	8000	10500	10500	10500	10500
		Other pressure ranges and pressure units (e.g. MPa, kg/cm ²) on request												
		Absolute pressure: 0...2 bar to 0...60 bar; Vacuum pressure: -1...1 bar to -1...250bar 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														
» Lower body		304 SS												
» Plastic components		PBT												
» Keyboard		TPE												
» Display Window		PC												
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	WUD-20 < 1.5, WUD-25 < 1, WUD-26 < 1												
Permissible Medium		Special gas / Vapor / Liquid												
Power supply U ₊	U ₊ in VDC	10 ... 30 V with output signal 4 ... 20 mA / DC 0 ... 5 V												
		14 ... 30 V with output signal 0 ... 10 V												
Signal output and maximum ohmic load RA	RA in Ohm	4 ... 20 mA, 3-wire R _A ≤ (U ₊ - 10 V) / 0.02 A												
		DC 0 ... 5 V, 3-wire R _A > 5 k												
		DC 0 ... 10 V, 3-wire R _A > 10 k												
Power P _i	W	1												
Current consumption		max. 50 mA												
Total current supply		max. 250 mA (including switching current)												
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												
Signal response (10 ... 90 %)	ms	≤ 300												
Switch Points		Individually adjustable via external control keys												
■ Type		Transistor switching output NPN												
■ Number		1 or 2												
■ Function		normally open, normally closed, on, off												
■ Switching current		SP1 / SP2: 100 mA												
■ Accuracy	% of span	≤ 0.5												
Insulation voltage	VDC	DC 500 V												
Display														
■ Design		7 segment-LED, red, 4 digits, height 8mm, 270° rotatable												
■ Accuracy	% of span	≤ 1.0 ± 1 Digit												
■ Update	sec	0.2, 0.5, 1, 5, 10, 60 (adjustable)												
Accuracy	% of span	≤ 0.15 (≤ 0.4 with pressure ranges ≤ 2 bar) RSS (Root Sum Squares)												
	% of span	≤ 0.3 ²⁾ (≤ 0.6 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 typical at reference conditions (≤ 0.4 with pressure ranges ≤ 2 bar)												

Specifications

Models WUD-20, WUD-25 and WUD-26

Permissible temperature of		
■ Medium		-20 ... +100°C / -4 ... +212°F
■ Ambience		-10 ... +60°C / -14 ... +140°F
■ Storage		-10 ... +60°C / -14 ... +140°F
Rated temperature range (medium)		-20 ... +80 °C / -4 ... +176 °F (active compensated)
Temperature coefficients within rated temperature range (active compensated):		
■ mean TC of zero	% of span	≤ 0.10 / 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)
Assembly and packing area		Clean room class 5 according to ISO 14644
Packaging		Double bagging according to SEMI E49.6
Shock resistance	g	15 g (11ms); 30g (6ms) according to IEC 60068-2-27
Vibration resistance		7.5mm or 2g (1 - 200Hz) / 5g (200 - 500Hz) according to IEC 60068-2-6
Wiring protection		
■ Short-circuit proofness		S ₊ towards U ₋
■ Reverse polarity protection		U ₊ towards U ₋
Weight	kg	Approx. 0.2

Signal output and allowed load



Current output (3-wire)

4 ... 20 mA:

$$R_A \leq (U_+ - 10 \text{ V}) / 0.02 \text{ A}$$

Voltage output (3-wire)

0 ... 5 V: $R_A > 5 \text{ kOhm}$

0 ... 10 V: $R_A > 10 \text{ kOhm}$

with R_A in Ohm and U_+ in Volt

Wiring details

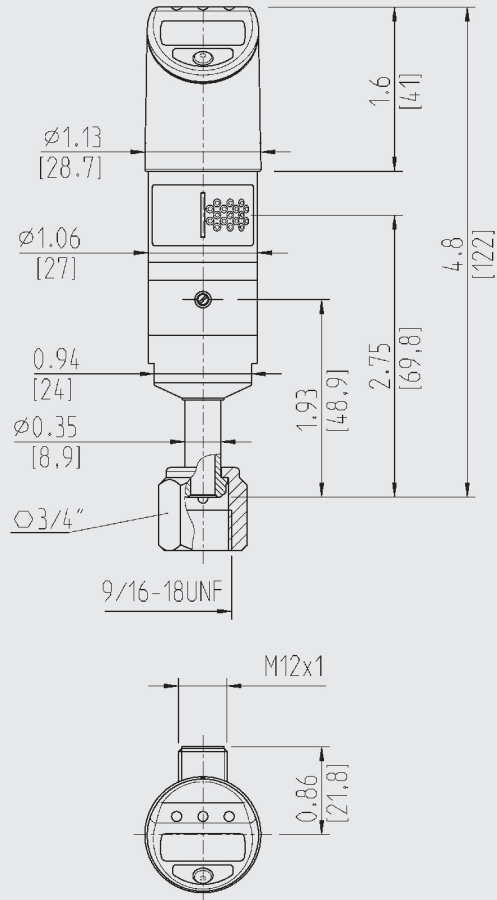
	Bayonet connector, 4-pin			Circular connector M12x1, 4-pin			Circular connector M12x1, 5-pin			Flying leads, 1.5 m or 3 m		
												
3-wire	$U_+ = A$	$U_- = D$	$S_+ = B$	$U_+ = 1$	$U_- = 3$	$S_+ = 4$	$U_+ = 1$	$U_- = 3$	$S_+ = 4$	$U_+ = \text{red}$	$U_- = \text{black}$	$S_+ = \text{brown}$
Switching outputs				SP1 = 2			SP1 = 2, SP2 = 5			SP1 = blue, SP2 = white		
Wire gauge	-			-			-			0.15 mm ²		
Diameter of cable	-			-			-			4.6 mm ± 0.2 mm		
Ingress Protection per IEC 60529	IP 67			IP 67			IP 67			IP 65		
The ingress protection classes specified only apply while the pressure transmitter is connected with female connectors that provide the corresponding ingress protection.												

Wiring details

	Sub-D HD connector, 15-pin		
3-wire	$U_+ = 7$	$U_- = 5$ $U_- = 12$	$S_+ = 2$
Switching outputs	SP1 = 14, SP2 = 13		
Wire gauge	-		
Diameter of cable	-		
Ingress Protection per IEC 60529	IP 20		
	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] WUD-20

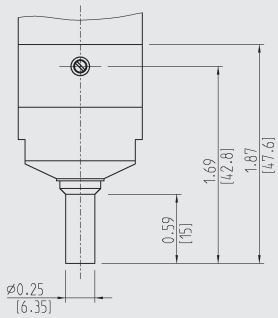
M12 Connector



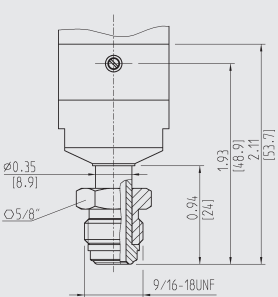
1/4" Swivel Female
Face Seal

Process connection variants

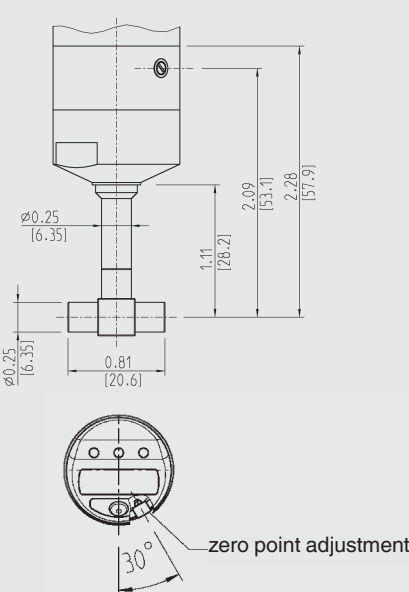
1/4" Weld Stub ¹⁾



1/4" Swivel Male Face Seal



1/4" T-Connector, Weld Stub

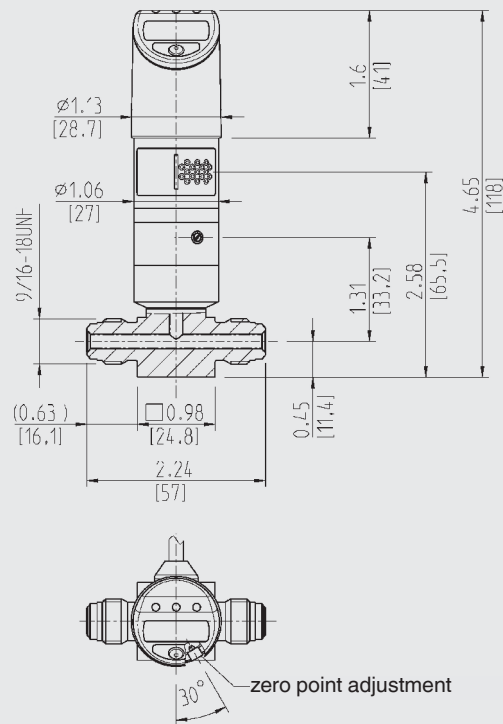


¹⁾ Maximum allowable pressure range of 300 psi for single-end units only

Dimensions in inch [mm] WUD-25

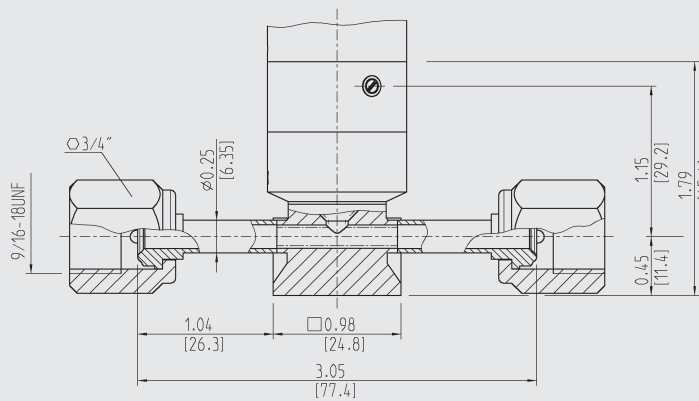
Flying Leads

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

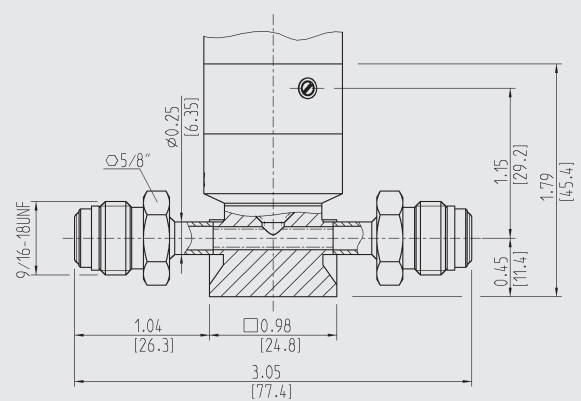


Process connection variants

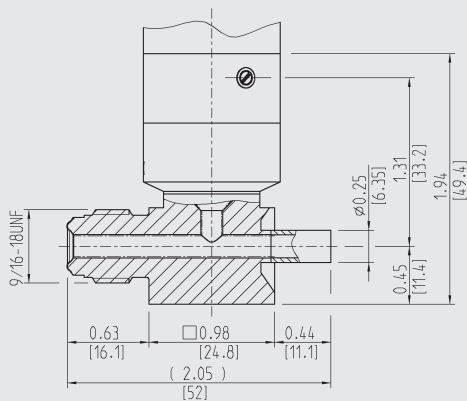
1/4" Swivel Female Face Seal
1/4" Swivel Female Face Seal



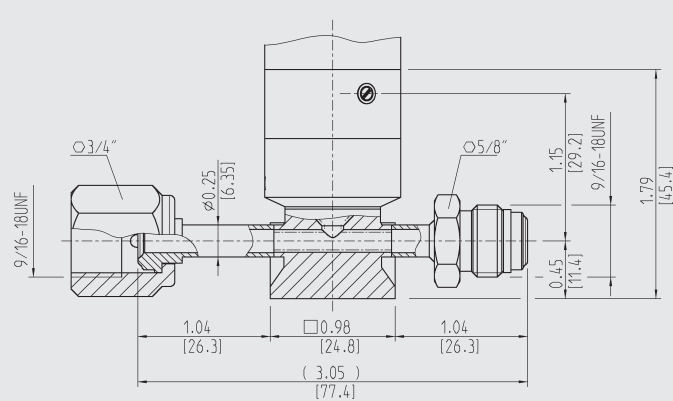
1/4" Swivel Male Face Seal
1/4" Swivel Male Face Seal



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



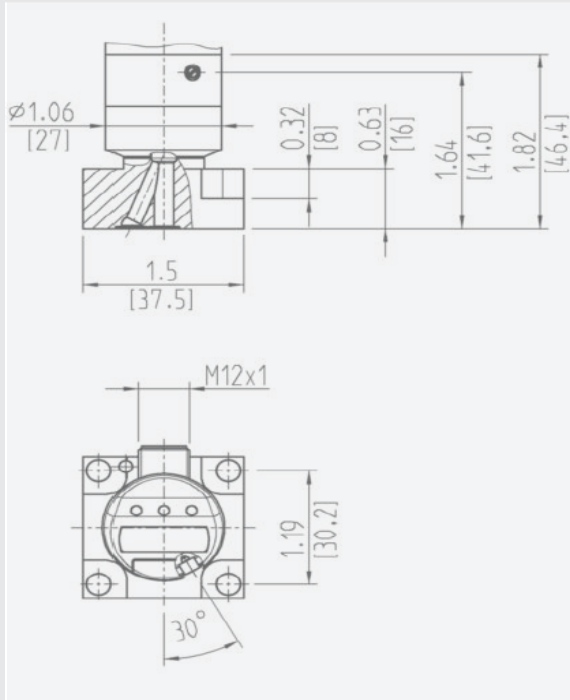
1/4" Swivel Female Face Seal
1/4" Swivel Male Face Seal



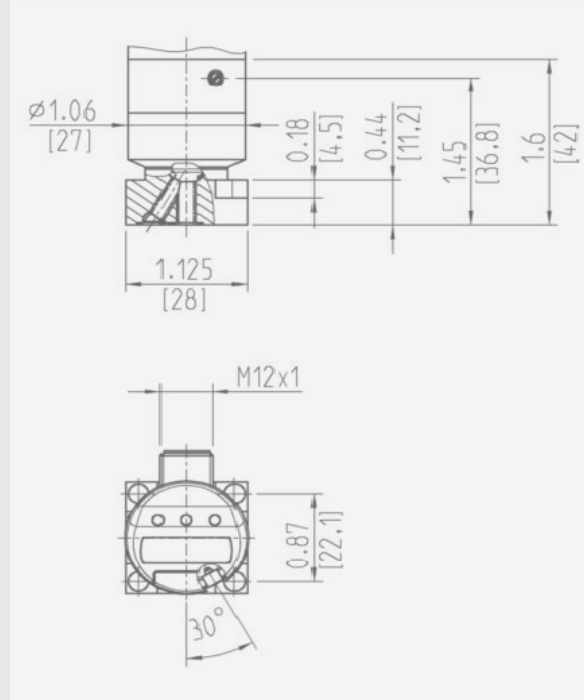
Dimensions in inch [mm] WUD-26

Process connection variants

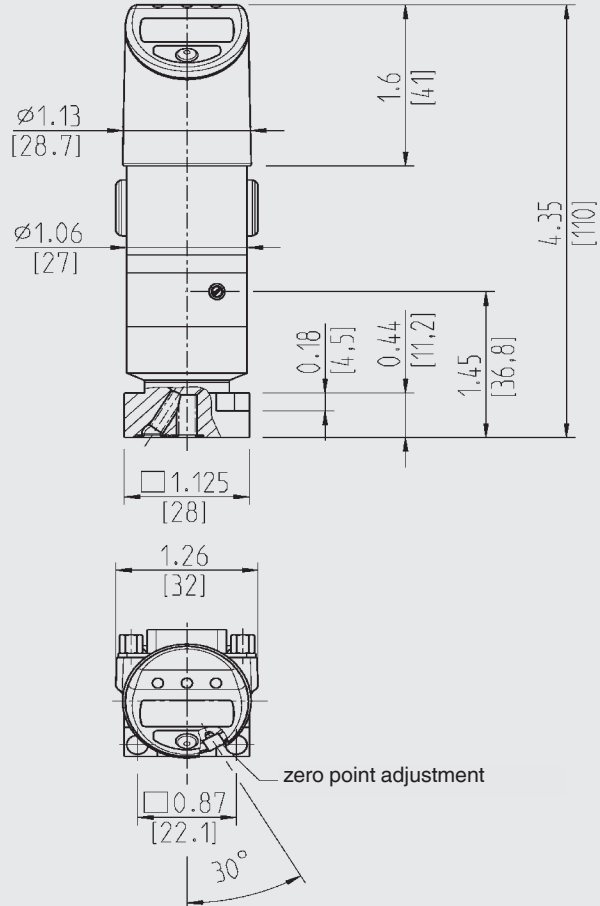
MSM C 1 1/2"



MSM C 1 1/8"



Sub-D Connector



WUD-2X Smart Codes for Custom Order Configurations

Field No. Code Feature

1	Type			
	0	Process connection: single end		
	5	Process connection: flow through		
	6	Process connection: surface mount		
2	Signal Output			
	A	4 ... 20 mA, 3-wire - without switching outputs		
	B	0... 5 V, 3-wire - without switching outputs		
	D	0... 10 V, 3-wire - without switching outputs		
	V	4 ... 20 mA, 3-wire - with two switching outputs (NPN)		
	K	0... 5 V, 3-wire - with two switching outputs (NPN)		
	W	0... 10 V, 3-wire - with two switching outputs (NPN)		
3	Unit			
	B	bar		
	P	psi		
	E	MPa		
	?	Other		
4	Absolute or relative pressure			
	K	true absolute		
	V	compound		
	G	gauge		
	Pressure Range			
	310	0 ... 1 bar abs	-1 ... 0 bar gauge	0 ... 1 bar gauge
	320	0 ... 2 bar abs	-1 ... +1 bar gauge	0 ... 2 bar gauge
	340	0 ... 4 bar abs	-1 ... +3 bar gauge	0 ... 4 bar gauge
	370	0 ... 7 bar abs	-1 ... +6 bar gauge	0 ... 7 bar gauge
	410	0 ... 10 bar abs	-1 ... +9 bar gauge	0 ... 10 bar gauge
	416	0 ... 16 bar abs	-1 ... +15 bar gauge	0 ... 16 bar gauge
	425	0 ... 25 bar abs		0 ... 25 bar gauge
	440	0 ... 40 bar abs		0 ... 40 bar gauge
	460	0 ... 60 bar abs		0 ... 60 bar gauge
	510		-1 ... +100 bar gauge	0 ... 100 bar gauge
	516		-1 ... +160 bar gauge	0 ... 160 bar gauge
	525		-1 ... +250 bar gauge	0 ... 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	
	310	0 ... 15 psia	-30 In Hg ... 0 psi	0 ... 15 psig
	321	0 ... 30 psia		0 ... 30 psig
	335	0 ... 50 psia		
	341	0 ... 60 psia	-30 In Hg ... +45 psi	0 ... 60 psig
	369	0 ... 100 psia		0 ... 100 psig
	411	0 ... 160 psia		0 ... 160 psig
	417	0 ... 250 psia		0 ... 250 psig

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

Field No. Code Feature

	Pressure range continued		
	421	0 ... 300 psia	0 ... 300 psig
	434	0 ... 500 psia	0 ... 500 psig
	469	0 ... 1000 psia	0 ... 1000 psig
	510	0 ... 1500 psia	0 ... 1500 psig
	514	0 ... 2000 psia -30 In Hg ... +2000 psi	0 ... 2000 psig
	521	0 ... 3000 psia -30 In Hg ... +3000psi	0 ... 3000 psig
	534	0 ... 5000 psia	0 ... 5000 psig
	320	-30 In Hg ... +15 psi	
	331	-30 In Hg ... +30 psi	
	351	-30 In Hg ... +60 psi	
	379	-30 In Hg ... +100 psi	
	412	-30 In Hg ... +160 psi	
	418	-30 In Hg ... +250 psi	
	422	-30 In Hg ... +300 psi	
	436	-30 In Hg ... +500 psi	
	470	-30 In Hg ... +1000 psi	
	310	0 ... 0.1 MPa abs -0.1 ... 0 MPa gauge	0 ... 0.1 MPa gauge
	320	0 ... 0.2 MPa abs	0 ... 0.2 MPa gauge
	340	0 ... 0.4 MPa abs -0.1 ... +3 MPa gauge	0 ... 0.4 MPa gauge
	370	0 ... 0.7 MPa abs -0.1 ... +6 MPa gauge	0 ... 0.7 MPa gauge
	410	0 ... 1 MPa abs -0.1 ... +9 MPa gauge	0 ... 1 MPa gauge
	416	0 ... 1.6 MPa abs -0.1 ... +1.5 MPa gauge	0 ... 1.6 MPa gauge
	425	0 ... 2.5 MPa abs	0 ... 2.5 MPa gauge
	440	0 ... 4 MPa abs	0 ... 4 MPa gauge
	460	0...6 MPa abs	0 ... 6 MPa gauge
	510	-0.1 ... +10 MPa gauge	0 ... 10 MPa gauge
	516	-0.1 ... +16 MPa gauge	0 ... 16 MPa gauge
	525	-0.1 ... +25 MPa gauge	0 ... 25 MPa gauge
	540		0 ... 40 MPa gauge
5	441	-0.1 ... +4 MPa gauge	
	461	-0.1 ... +6 MPa gauge	
	Process connection		
	70	Original fixed male nut (9/16-UNF)	
	71	Original swivel male nut SS4-VCR-4	
	72	Original female union nut S-VCR-1	
	VN	1/4" weld stub ¹⁾	
	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	
	WF	MSM W 1 1/8"	
7	??	Other	
	Outlet process connection		
	ZZ	Without	
	70	Original fixed male nut (9/16-UNF)	
	71	Original swivel male nut SS4-VCR-4	
	72	Original female union nut S-VCR-1	
	VN	1/4" weld stub	
8	??	Other	

¹⁾ Maximum allowable pressure range of 300 psi for single-end units only

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

Field No.	Code	Feature
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9	Electrical connection	
	M4	Circular connector M12x1, 4-pin
	M5	Circular connector M12x1, 5-pin
	DA	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
	?	Other

Order Code:

	1	2	3	4	5		7	8		9	10
WUD-2		-	-			- A	-		-		

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.

