

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

WIKA Datasheet WUC-1X



## Applications

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

## Special Features

- Compact design
- ATEX 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
- RoHS compliant

## 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 and ATEX/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, FM) approvals for poten-



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

tially 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 (PH<sub>3</sub>) and silane (SiH<sub>4</sub>).

### 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/UNSR 30003 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	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	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 <sup>2</sup> ) 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 / UNSR 30003												
■ Case		304 SS												
Particle test		≤ 0.1 µm Particle 0.1 ptc / ft <sup>3</sup> according to Semi E49.8												
Inboard helium leak test		< 1 x 10 <sup>-9</sup> 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 <sup>3</sup>	WUC-10 < 1.5, WUC-15 < 1, WUC-16 < 1												
Permissible Medium		Special gas / Vapour / Liquid												
Power supply U+	U+ in VDC	10 ... 30 14 ... 30 with output signal 0 ... 5 V / 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	-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) according to Semi # 3440 draft												
	% of span	≤ 0.5 2) (≤ 1.0 2) with pressure ranges ≤ 2 bar) according to IEC 61298-2												
		2) Including non-linearity, hysteresis, zero point and full scale error according to 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)												
Permissible temperature of		non-ATEX		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/EG												
■ EMC directive		2004/108/EEC, 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 3G (for transducer with Ex-marking)												
Ignition protection type		II 3G Ex nA nL IIC T4/T5/T6 X (for transducer with Ex-marking)												
	FM	FM Class 1 Div 2 Group A,B,C,D												

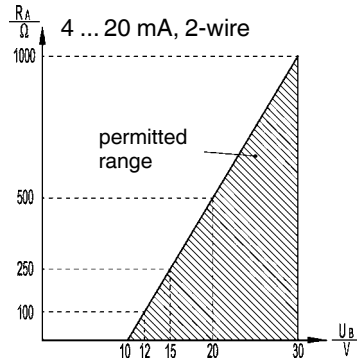
<sup>3)</sup> Read the operating conditions and safety-relevant data in the operating instruction in any case

# 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

## Signal output and allowed load



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

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

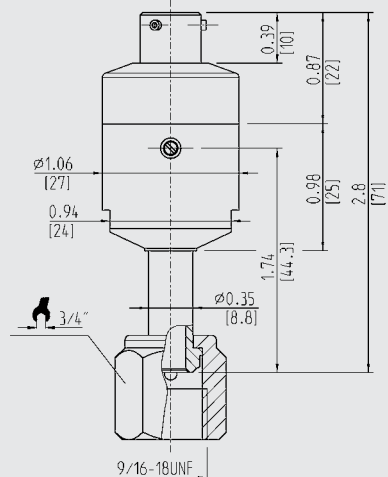
with RA in Ohm and U+ in Volt

## Electrical connections

	Bayonet connector, 4-pin	Circular connector M12x1, 4-pin	Flying leads, 3 m	Sub-D HD connector, 15-pin
2-wire	U+ = A   U- = D	U+ = 1   U- = 3	U+ = red   U- = black	U+ = 7   U- = 5
3-wire	U+ = A   U- = D   S+ = B	U+ = 1   U- = 3   S+ = 4	U+ = red   U- = black   S+ = brown	U+ = 7   U- = 5   S+ = 2
Wire gauge	-	-	0.22 mm <sup>2</sup> (AWG 24)	-
Diameter of cable	-	-	4.8 mm	-
Ingress Protection per IEC 60 529	NEMA 4 (IP 67)	NEMA 4 (IP 67)	NEMA 4 (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] WUC-10

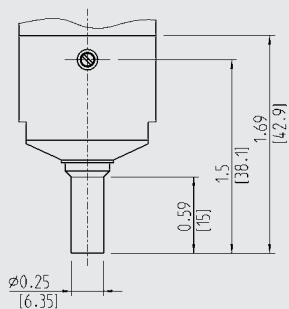
Bayonet connector



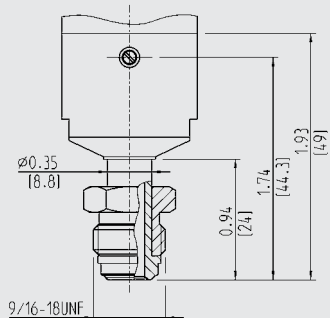
1/4" Swivel Female Face Seal

## Process connection variants

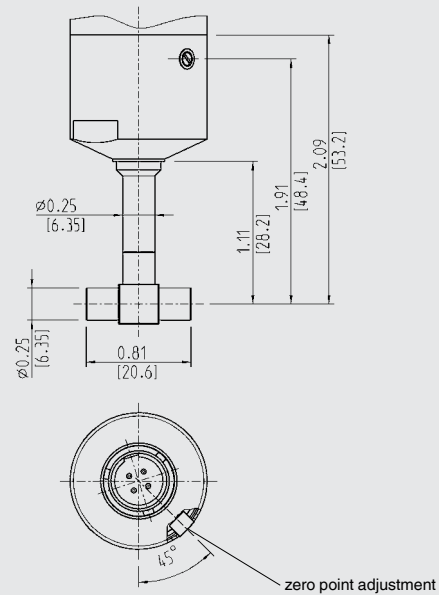
1/4" Weld Stub



1/4" Swivel Male Face Seal



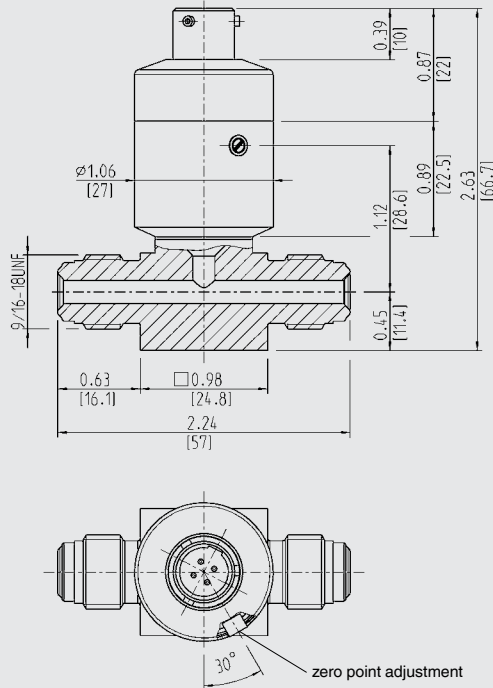
1/4" T-Connector, Weld Stub



# Dimensions in inch [mm] WUC-15

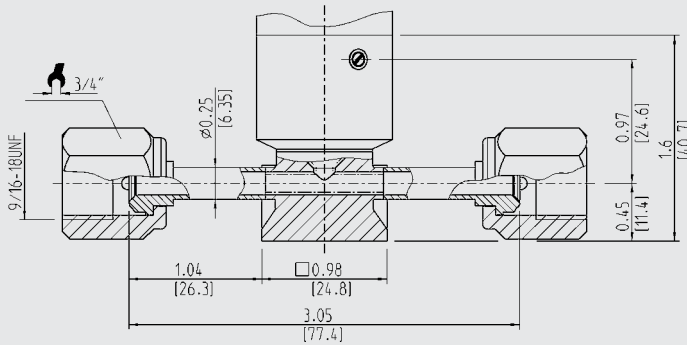
Bayonet connector

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

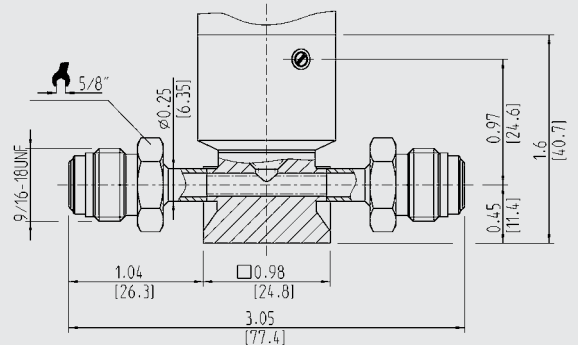


## Process connection variants

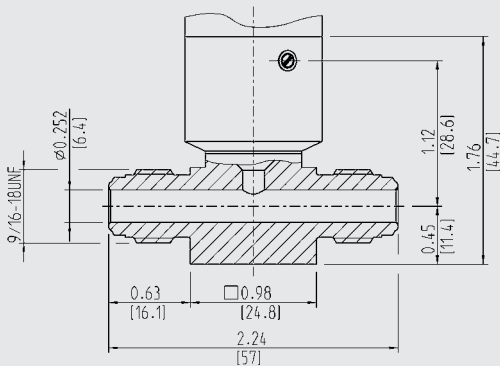
1/4" Swivel Female Face Seal  
1/4" Swivel Female Face Seal



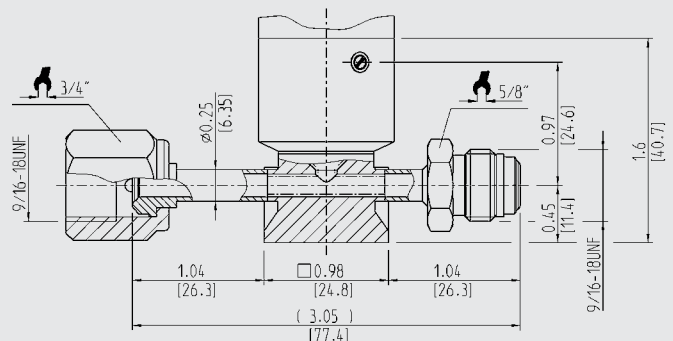
1/4" Swivel Male Face Seal  
1/4" Swivel Male Face Seal



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

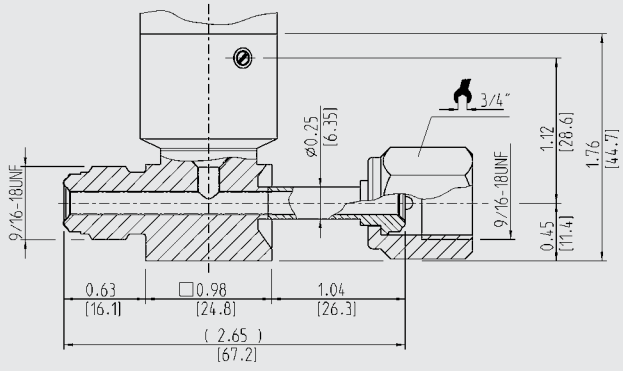


1/4" Swivel Femal Face Seal  
1/4" Swivel Male Face Seal

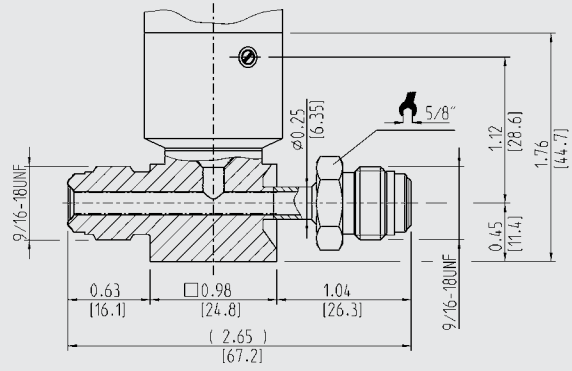


**Process connection variants WUC-15**

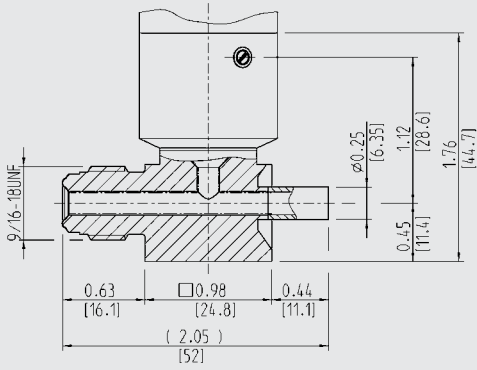
1/4" Fixed Male Face Seal  
1/4" Swivel Female Face Seal



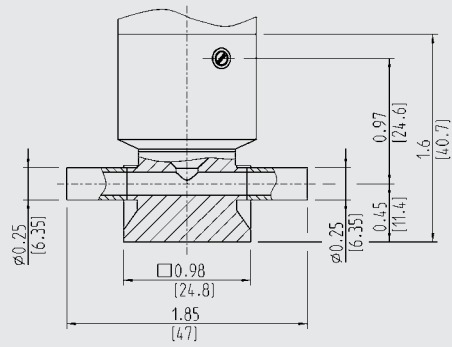
1/4" Fixed Male Face Seal  
1/4" Swivel Male Face Seal



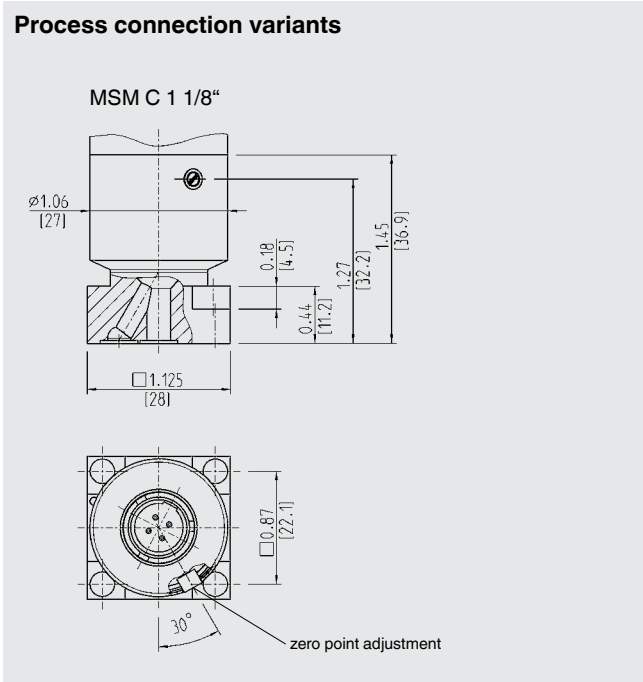
1/4" Fixed Male Face Seal  
1/4" Weld Stub



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



# Dimensions in inch [mm] WUC-16



# WUC-1X Smart Codes for Custom Order Configurations

Field No.	Code	Feature
1	<b>Type</b>	
	0	Process connection: single end
	5	Process connection: flow through
2	6	Process connection: surface mount
	<b>Signal Output</b>	
	A	4 ... 20 mA, 2-wire
2	F	0 ... 10 V, 3-wire
	G	0... 5 V, 3-wire
3	<b>Dampening</b>	
	Z	Without
4	<b>Unit</b>	
	B	bar
	p	psi
	K	kg/cm <sup>2</sup>
	?	Other
5	<b>Absolute or relative pressure</b>	
	G	gauge
	V	compound
	A	absolute
5	<b>Pressure Range</b>	
	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 <sup>2</sup> gauge
	359	0...6 kg/cm <sup>2</sup> gauge
	398	0...10 kg/cm <sup>2</sup> gauge
	439	0...40 kg/cm <sup>2</sup> gauge
	459	0...60 kg/cm <sup>2</sup> gauge
	498	0...100 kg/cm <sup>2</sup> gauge
	520	0...200 kg/cm <sup>2</sup> gauge



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

Field No. Code Feature

Pressure range continued			
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...100 psia
411	0...160 psig		0...160 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	
6	<b>Process connection</b>		
	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	¼" weld stub	
	WT	¼" T-Connector (0.87" version)	
	WR	¼" T-Connector	
	WE	MSM C 1 ⅛" SQ	
	WF	MSM W 1 ⅛"	
	<b>Outlet process connection</b>		
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	¼" weld stub		
??	Other		
8			

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

Field No.	Code	Feature
<b>Electrical connection</b>		
9	M4	Circular connector M12x1, 4-pin
	DL	Cable w/free ends
	O4	4-Pin bayonet connector
	TX	15-pin high density Sub-D plug
<b>Cable length</b>		
10	Z	Without
	E	3 m
	?	Other
<b>Approvals</b>		
11	C	ATEX II 3G EX nA nL IIC T4/T5/T6X and FM Class 1 Div. 2 Group A, B, C, D

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\*

**WUC-1**     -  -  -  -  -

\*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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