

Ultra high purity transducer With display, EtherCAT® Models WUD-20-E, WUD-25-E, WUD-26-E

WIKA data sheet PE 87.12

EtherCAT®
Conformance tested

Applications

- Semiconductor, display and photovoltaic industry
- Ultrapure gas supply in semiconductor production systems

Special features

- Highest process safety through file over EtherCAT®
- Expanded spectrum of features
- Scalable quantities and individual adaptations for OEM applications
- Maximum plant safety through cable redundancy



Ultra high purity transducer, model WUD-20-E, single end

Description

The WUD-2x-E model is a particularly compact, ultra high purity transducer for high-accuracy pressure measurement of ultrapure gases in the semiconductor industry. It is the first transducer to use the SDP 5003.2080 and offers maximum security of investment. Due to minimal signal noise, the sensor provides precise measured values in the long term. Thanks to active temperature compensation, even with high temperature fluctuations. Measured values can be viewed on the display.

Highest process safety through file over EtherCAT®

Thanks to EtherCAT®, the model WUD-2x-E does not have to be disconnected from the network for firmware updates or troubleshooting. This avoids production downtime due to incorrect installation or removal, maximises process safety and allows updating of the instruments.

Expanded spectrum of features

New functions thanks to the digital interface: In addition to pressure values, temperature data or error status can also be transmitted. Instruments can thus be monitored extensively and problems detected at an early stage.

Parameters can be configured digitally and transmitted from a defective instrument to a new one. The sensor can even be replaced while the EtherCAT® system is running, using the hot-swap feature. This means less downtime and lower costs.

Scalable quantities and individual adaptations for OEM applications

Production takes place with a high degree of automation in a clean room. The high production capacity offers security of supply. Via model coding, solutions with individually configured connections are enabled.

Maximum plant safety through cable redundancy

The model WUD-2x-E features two RJ-45 connections. The cable redundancy enables trouble-free communication, even if one sensor in the system fails. The benefit: Greater process safety with reduced risk of downtime.

Specifications

Accuracy specifications	
Non-linearity per BFSL per IEC 62828-1	$\leq 0.1\%$ of span ($\leq 0.15\%$ of span with measuring range 2 bar [29 psi])
Accuracy	→ See „Max. measured error per IEC 62828-1“
Max. measured error per IEC 62828-1	$\leq 0.3\%$ of span ($\leq 0.6\%$ of span with measuring range 2 bar [29 psi])
Accuracy of the digital display	1 % of span ± 1 digit
Zero point error	$\leq 0.25\%$ of span
Zero point setting	$\pm 3.5\%$ of span
Signal noise	$\leq \pm 0.06\%$ of span
Non-repeatability per IEC 62828-1	$\leq 0.12\%$ of span
Influence of auxiliary power	0.1 %/10 V
Total probable error per IEC 62828-2	0.5 % of span at -10 ... +60 °C [14 ... +140 °F]
Mean temperature coefficient	
Zero point	$\leq 0.1\%$ of span/10K
Span	$\leq 0.15\%$ of span/10K
Long-term stability per IEC 62828-1	$\leq 0.25\%$ of span/year ($\leq 0.4\%$ of span/year with measuring range 2 bar [29 psi])
Resolution	0.01 % of span
Reference conditions	Per IEC 62828-1

Measuring ranges, gauge pressure

bar	
0 ... 2	0 ... 160
0 ... 4	0 ... 250
0 ... 7	0 ... 400

psi	
0 ... 30	0 ... 2,000
0 ... 60	0 ... 3,000
0 ... 100	0 ... 5,000

Measuring ranges, absolute pressure (compensated)

bar	
0 ... 2	0 ... 25
0 ... 4	0 ... 40
0 ... 7	0 ... 60

psi	
0 ... 30	0 ... 300
0 ... 60	0 ... 500
0 ... 100	0 ... 1,000

Vacuum and compound measuring ranges

bar	
-1 ... +1	-1 ... +70
-1 ... +3	-1 ... +100
-1 ... +6	-1 ... +250

psi	
-14.5 ... +14.5	-14.5 ... +1,000
-14.5 ... +30	-14.5 ... +2,000
-14.5 ... +45	-14.5 ... +3,000

Further details on: measuring ranges	
Units	■ bar ■ psi ■ MPa ■ Torr
Maximum working pressure	→ Corresponds to the upper measuring range value / measuring range full scale value → Any permanent operation above the maximum working pressure is not permissible.
Overpressure limit per IEC 62828-2	The overpressure limit is based on the measuring range. Depending on the selected process connection and the seal, restrictions in overpressure limit can result. 2 times (4 times for measuring range 2 bar [29 psi])
Vacuum resistance	Yes

Process connection		
Model	Thread size	Max. measuring range
Model WUD-20-E	¼" swivel union nut	400 bar [5,000 psi]
	¼" male swivel nut	
	¼" weld stub	20 bar [300 psi]
	¼" T-connector	
Model WUD-25-E	¼" fixed male nut	400 bar [5,000 psi]
	¼" swivel union nut	
	¼" weld stub	
Model WUD-26-E	MSM C-seal 1 ⅛"	50 bar [500 psi]
	MSM W-seal 1 ⅛"	
	MSM C-seal 1 ½"	
	MSM W-seal 1 ½"	

Details must be tested separately in the respective application. The specified values for the overpressure limit serve only as a rough orientation. The values depend on the temperature, the seal used, the selected torque, the type and material of the mating thread and the prevailing operating conditions.

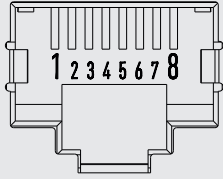
→ Other process connections on request.

Output signal	
Signal type	
EtherCAT®	SDP 5003.2080
Transmission rate	100 ms
Monitoring function	Sensor failure, electronics failure
Voltage supply	
Auxiliary power	DC 10 ... 30 V
Power consumption	< 2 W
Dynamic behaviour	
Settling time per IEC 62828-1	< 300 ms
Switch-on time	< 30 sec.

Electrical connection	
Connection type	■ Circular connector M8 x 1 (3-pin) per DIN EN 61076-2-104 ■ Ethernet CAT5e RJ45, shield connected
Pin assignment	→ See „Pin assignment“
Ingress protection (IP code) per IEC 60529 ¹⁾	IP20
Reverse polarity protection	U+ vs. U-
Insulation voltage	DC 500 V

1) The stated IP codes only apply when plugged in using mating connectors that have the appropriate IP code.

Pin assignment

Ethernet CAT5e RJ45	
	TxD + 1
	TxD – 2
	RxD + 3
	N/C 4
	N/C 5
	RxD – 6
	N/C 7
	N/C 8

Circular connector M8 x 1 (3-pin)		
	U+	4
	U-	1.3
	-	-

→ Other pin assignments on request.

Material		
Material (wetted)		
Process connection	Material	Stainless steel 1.4404 (316L) per SEMI F20 Stainless steel 1.4404 (316L) VIM/VAR
	Surface treatment	Electropolished per SEMI F19
Thin-film sensor	2.4711 / UNS R30003	
Material (in contact with the environment)		
Case	Stainless steel 1.4301 (304)	
Display head	PA12	
Surface roughness Ra		
Typical	≤ 0.13 μm (RA 5)	
Maximum	≤ 0.18 μm (RA 7)	

Operating conditions	
Medium temperature limit	-20 ... +100 °C [-4 ... +212 °F]
Ambient temperature limit	-10 ... +60 °C [14 ... 140 °F]
Storage temperature limit	-10 ... +60 °C [14 ... 140 °F]
Humidity	0 ... 85 % relative humidity (non-condensing)
Helium leak test	< 1 x 10 ⁻⁹ mbar l/sec (atm STD cc/sec) per SEMI F1
Vibration resistance per IEC 60068-2-6	7.5 mm or 2g for 1 ... 200 Hz / 5g for 200 ... 500 Hz
Shock resistance per IEC 60068-2-27	15g for a duration of 11 ms / 30g for a duration of 6 ms
Operating altitude	≤ 2,000 m [6,561 ft] above sea level
Ingress protection (IP code) per IEC 60529	→ See “Electrical connection”
Pollution degree	2
Overvoltage category	I

Packaging and instrument labelling	
Packaging	■ Double packaging per SEMI E49.6 ■ Individual packaging
Assembly and packaging location	Clean room class 5 per ISO 14644
Instrument labelling	WIKA product label, glued

Approvals

Logo	Description	Region
CE	EU declaration of conformity	European Union
	EMC Directive EN 61326 emission (group 1, class B) and immunity (industrial environments)	
	Pressure Equipment Directive	
	RoHS directive	

Manufacturer's declaration

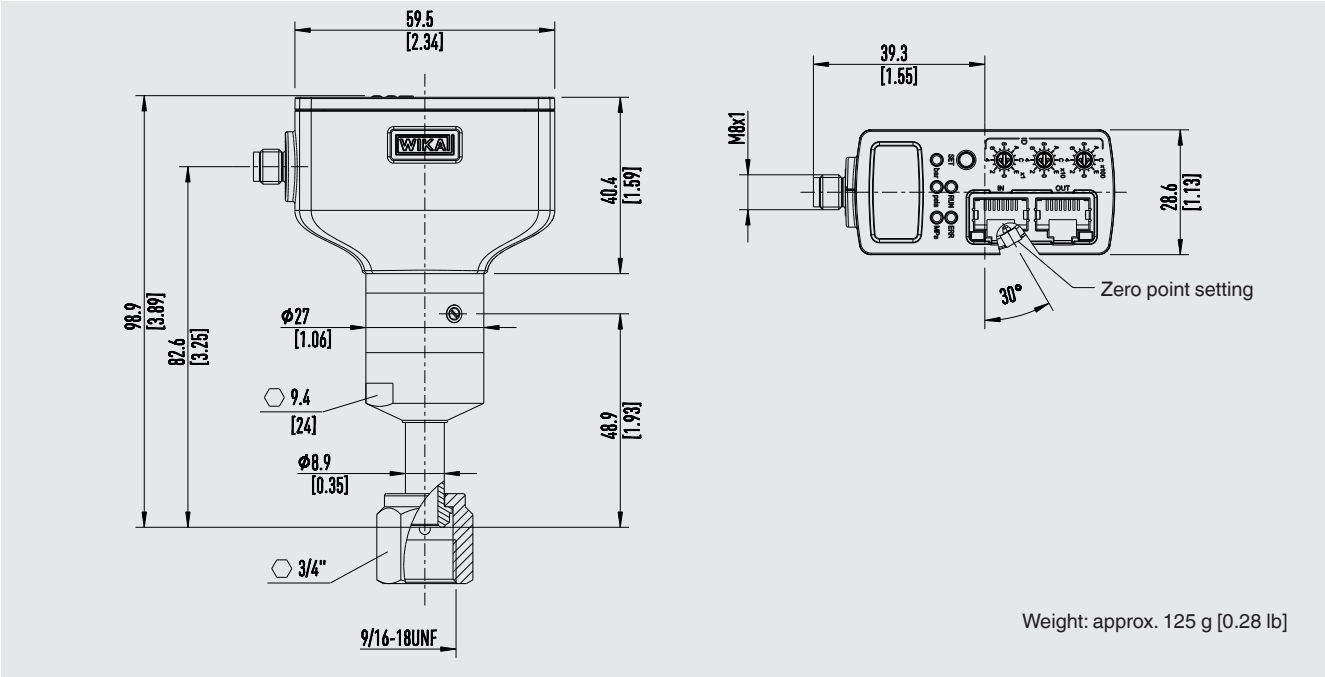
Logo	Description
-	MTTF: > 100 years
-	China RoHS directive
-	EtherCAT® certificate of conformity

Test report

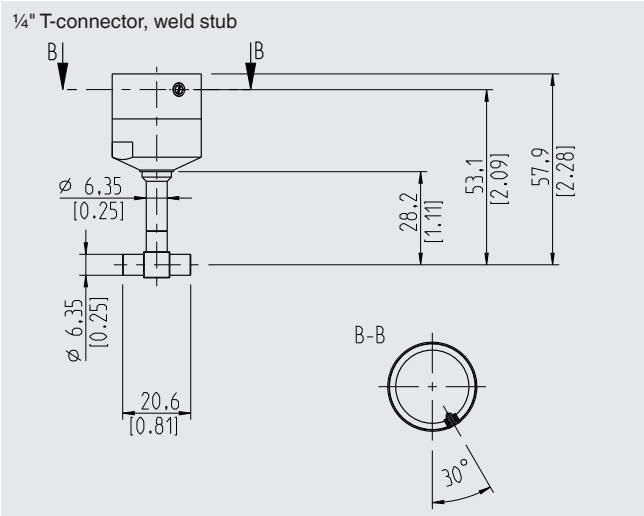
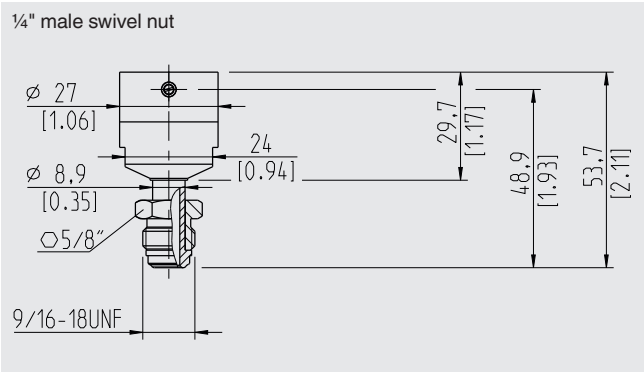
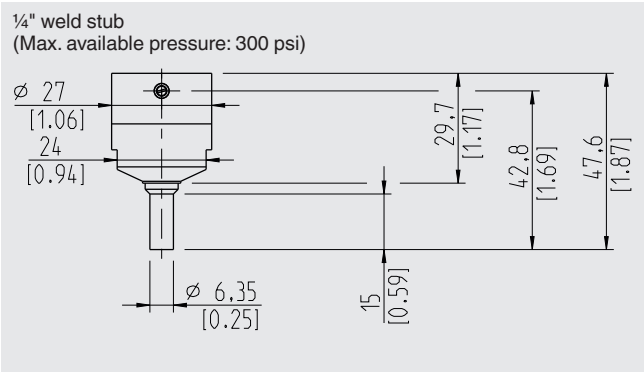
Description	
Test report	■ 3 measuring points ■ Maximum total error ■ Helium leakage rate

→ For approvals and certificates, see website

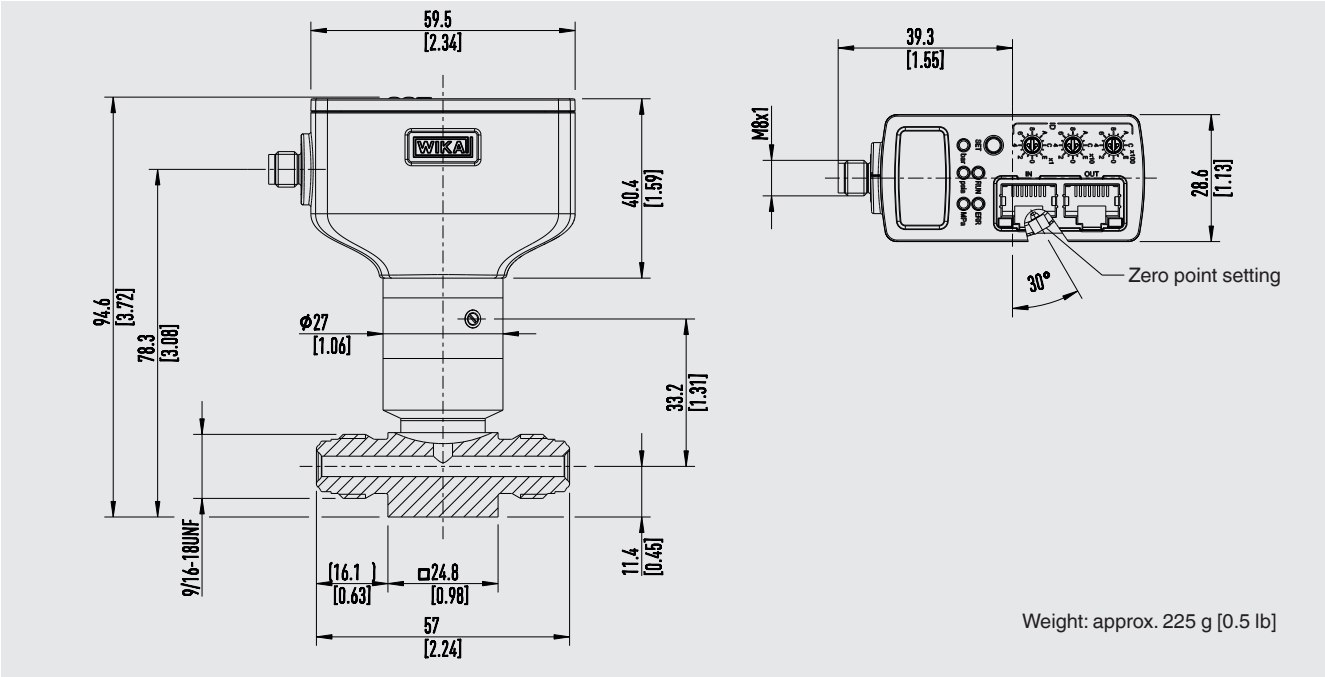
Dimensions in mm [in], model WUD-20-E



Process connections

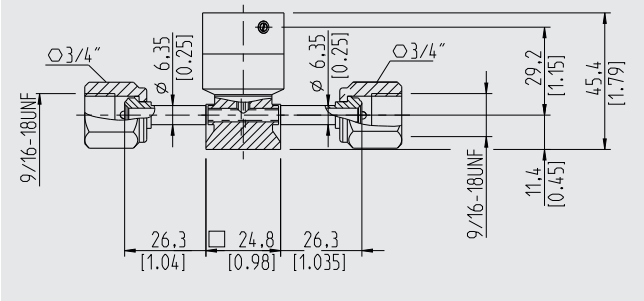


Dimensions in mm [in], model WUD-25-E

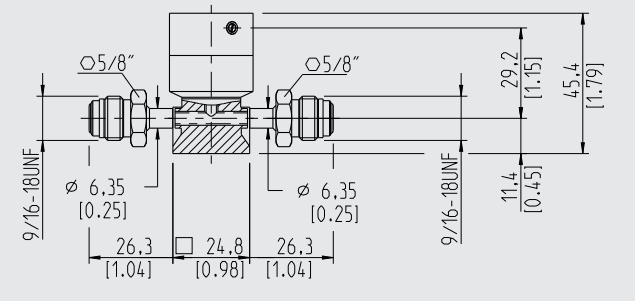


Process connections

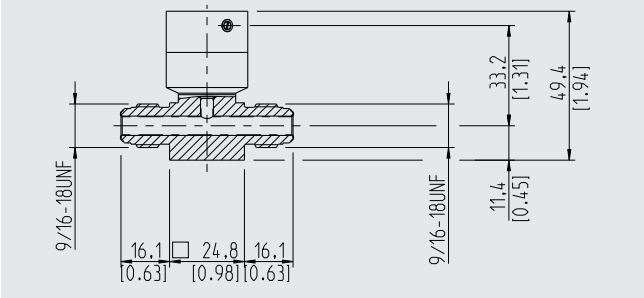
1/4" swivel union nut (female)
1/4" swivel union nut (female)



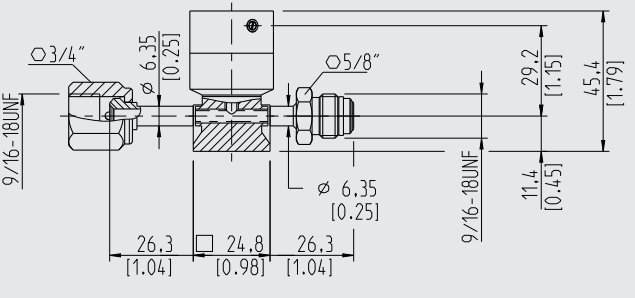
1/4" male swivel nut
1/4" male swivel nut



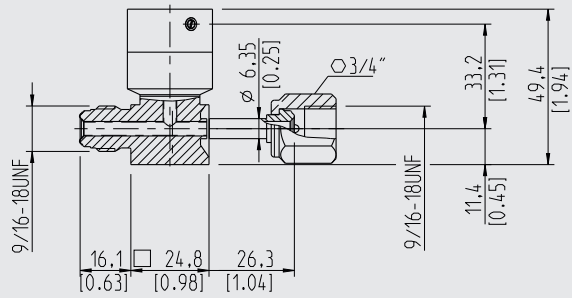
1/4" fixed male nut, high flow through
1/4" fixed male nut, high flow through



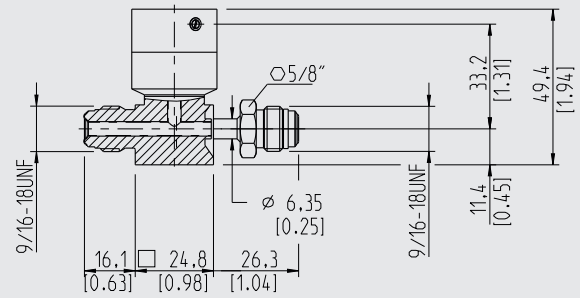
1/4" swivel union nut (female)
1/4" male swivel nut



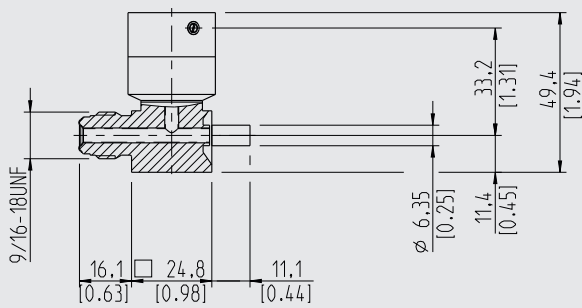
¼" fixed male nut
¼" swivel union nut (female)



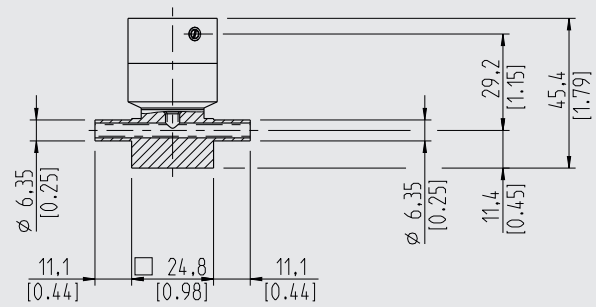
¼" fixed male nut
¼" male swivel nut



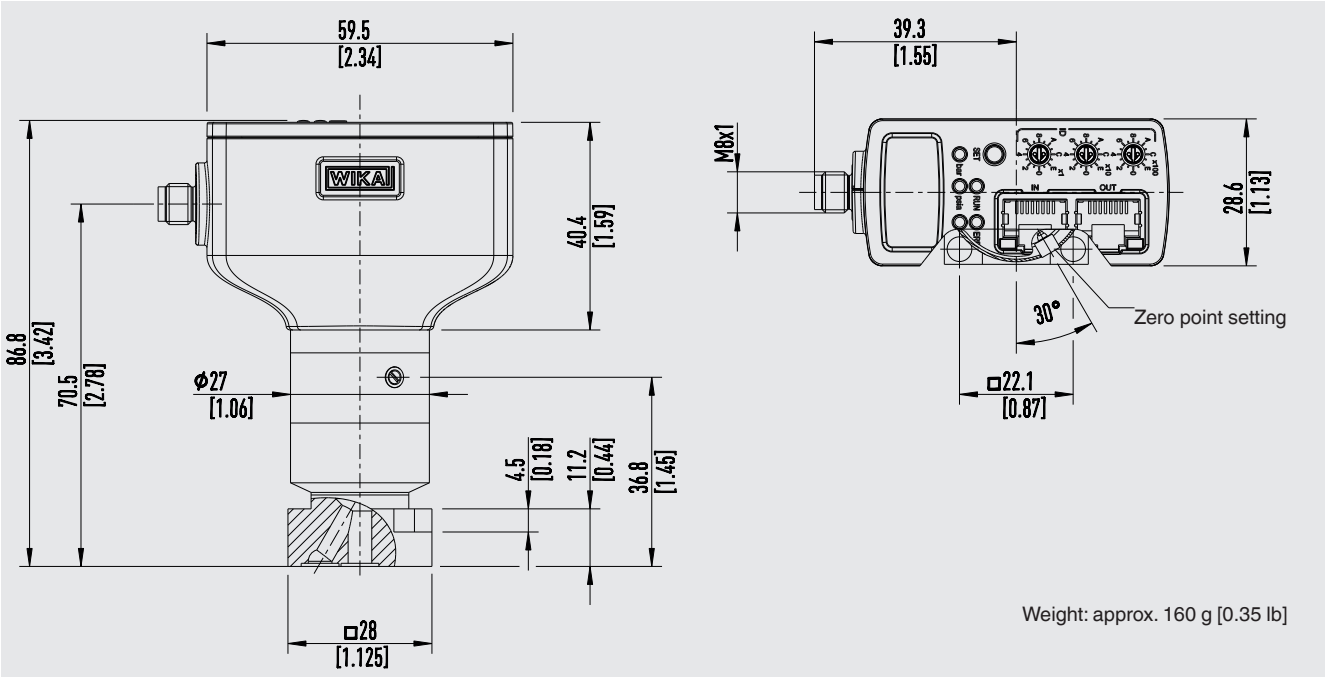
¼" fixed male nut
¼" weld stub



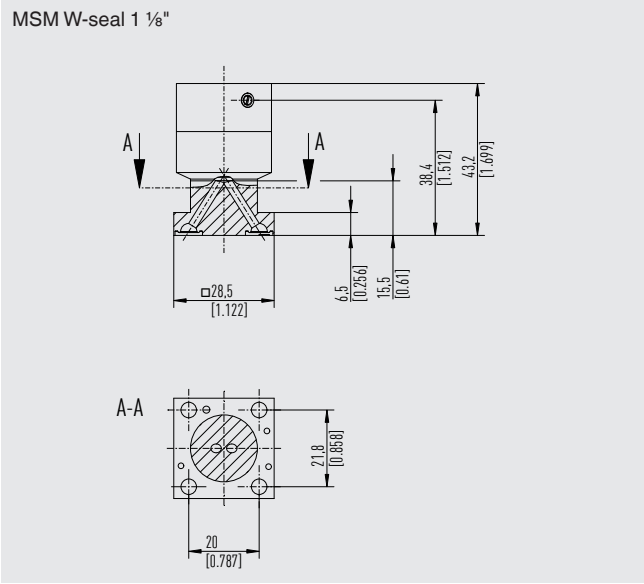
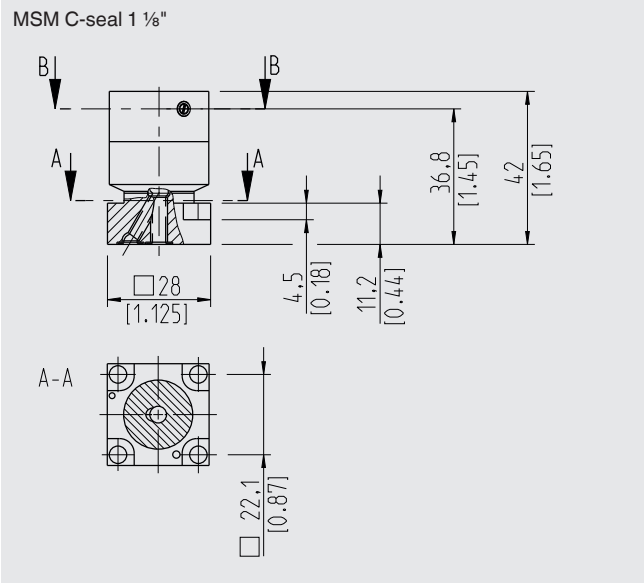
¼" weld stub
¼" weld stub



Dimensions in mm [in], model WUD-26-E



Process connections



EtherCAT® is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.

Ordering information

Model / Accuracy specifications / Unit / Pressure type / Measuring range / Process connection (outlet) / Output signal / Electrical connection / Firmware / Switchable pressure unit / Wetted parts / Certificates / Approvals / Additional ordering information

© 10/2021 WIKA Alexander Wiegand SE & Co. KG, all rights reserved.
The specifications given in this document represent the state of engineering at the time of publishing.
We reserve the right to make modifications to the specifications and materials.
In case of a different interpretation of the translated and the English data sheet, the English wording shall prevail.



WIKA Alexander Wiegand SE & Co. KG
Alexander-Wiegand-Straße 30
63911 Klingenberg/Germany
Tel. +49 9372 132-0
info@wika.de
www.wika.de