BOISWOOD
GAS AND LIQUID CONTROL TECHNOLOGIES
Pressure & Vacuum
Flow
Level & Temperature
Tube & Fittings
HVACR
Custom Services

Ultra high purity transducer
Increased safety (Ex ec), intrinsic safety (Ex ic)
Models WUC-10, WUC-15 and WUC-16

For further approvals,
see page 6

Applications

- Semiconductor, display and photovoltaic industry
- Ultrapure media and special gas systems (gas supply systems, bulk-gas supply, tank farm installations)

Special features

- Secure and fast availability
- Developed for applications in hazardous areas
- Variable: Compact design and many configurations
- Accurate measurement, even with high temperature fluctuations

Ultra high purity transducer, model WUC-10

Description

The models WUC-10, WUC-15 and WUC-16 are particularly compact, ultra high purity transducers for pressure measurement of ultrapure gases in the semiconductor industry, especially for hazardous areas. The wetted parts consist of SEMI F20-compliant, electropolished stainless steel 316L and a special 2.4711/UNS R30003 thin-film sensor. The transducers feature excellent EMC stability and a variety of electrical and process connections. The easy access side potentiometer provides convenient zero point setting. Each individual transducer is checked for leak tightness and accuracy.

Secure and fast availability
The WUC series is manufactured under clean room conditions and strictly monitored. The large production capacity guarantees maximum delivery reliability for high-volume customers. This saves time, minimises risk and increases productivity.

Developed for applications in hazardous areas
The WUC series, which was developed for hazardous areas, offers many local and international explosion protection approvals.

Variable: Compact design and many configurations
The WUC series offers the industry-standard grid dimension of 28.4 mm [1 ⅛ in] with low installation height as well as the widest range of electrical and process connections. Individually configured solutions are produced using a high degree of automation.

Accurate measurement, even with high temperature fluctuations
The active temperature compensation detects high fluctuations (cyclic pressure flushing, high gas throttling values, Joule-Thomson effect) and minimises the influences. Thus stable measurement from -20 to +80 °C [-4 ... 176 °F] is ensured.

WIKA
Smart in sensing

Data sheets showing similar products:
Ultra high purity transducer; models WU-2x; see data sheet PE 87.07
Ultra high purity transducer; models WUD-2x; see data sheet PE 87.08

Specifications

Accuracy specifications		
Non-linearity per BFSL per IEC 61298-2		
For measuring ranges > 2 bar	≤ 0.1 % of span	
For measuring ranges ≤ 2 bar	≤ 0.15 % of span	
Accuracy	→ See „Max. measured error“ below	
Max. measured error		
RSS (root sum squares)	For measuring ranges ≤ 2 bar	≤ 0.4 % of span
	For measuring ranges > 2 bar	≤ 0.2 % of span
Per IEC 61298-2	For measuring ranges ≤ 2 bar	≤ 1 % of span
	For measuring ranges > 2 bar	≤ 0.5 % of span
Zero point setting		
Current output	-5 ... +3.5 % of span (via potentiometer)	
Voltage output	-2 ... +5 % of span (via potentiometer)	
Non-repeatability per IEC 61298-2	≤ 0.12 % of span	
Mean temperature coefficient at -20 ... +80 °C [-4 ... +176 °F] (actively compensated)		
Zero point	≤ 0.1 % of span/10 K	
Span	≤ 0.15 % of span/10 K	
Long-term drift per IEC 61298-2		
For measuring ranges ≤ 2 bar	≤ 0.4 % of span	
For measuring ranges > 2 bar	≤ 0.25 % of span, at reference conditions	
Reference conditions	Per IEC 61298-1	

Measuring ranges, gauge pressure, models WUC-10 and WUC-15

bar	
0 ... 2	0 ... 40
0 ... 4	0 ... 60
0 ... 7	0 ... 100
0 ... 10	0 ... 160
0 ... 16	0 ... 250
0 ... 25	0 ... 400

psi	
0 ... 30	0 ... 500
0 ... 60	0 ... 1,000
0 ... 100	0 ... 1,500
0 ... 160	0 ... 2,000
0 ... 250	0 ... 3,000
0 ... 300	0 ... 5,000

MPa	
0 ... 0.2	0 ... 4
0 ... 0.4	0 ... 6
0 ... 0.7	0 ... 10
0 ... 1	0 ... 16
0 ... 1.6	0 ... 25
0 ... 2.5	0 ... 40

Measuring ranges, gauge pressure, model WUC-16

bar	
0 ... 2	0 ... 10
0 ... 4	0 ... 16
0 ... 7	-

psi	
0 ... 30	0 ... 160
0 ... 60	0 ... 250
0 ... 100	-

MPa	
0 ... 0.2	0 ... 1
0 ... 0.4	0 ... 1.6
0 ... 0.7	-

Other measuring ranges on request.

Further details on: Measuring range	
Units	■ bar ■ psi ■ MPa
Maximum working pressure	Corresponds to the upper measuring range value/measuring range full scale value
Overpressure limit	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 0 ... 2 bar [0 ... 30 psi])

Process connection		
Model	**Thread size**	**Max. measuring range**
Model WUC-10	¼" swivel union nut	400 bar [6.000 psi]
	¼" male swivel nut	
	¼" T-connector	
	¼" weld stub	20 bar [300 psi]
Model WUC-15	¼" fixed male nut	400 bar [6,000 psi]
	¼" swivel union nut	
	¼" weld stub	
Model WUC-16	MSM C-seal 1 ⅛"	50 bar [750 psi]
	MSM W-seal 1 ⅛"	
	MSM C-seal 1 ½"	
	MSM W-seal 1 ½"	

Output signal		
Signal type		
Current (2-wire)	4 ... 20 mA	
Voltage (3-wire)	■ DC 0 ... 5 V ■ DC 0 ... 10 V	
Load		
Output signal 4 ... 20 mA	≤ (auxiliary power – 10 V) / 0.02 A	
Output signal DC 0 ... 5 V	> 5 kΩ	
Output signal DC 0 ... 10 V	> 10 kΩ	
Voltage supply		
Auxiliary power	Output signal DC 0 ... 5 V / 4 ... 20 mA	DC 10 ... 30 V
	Output signal DC 0 ... 10 V	DC 14 ... 30 V
Power P_{max}	1 W	
Dynamic behaviour		
Rise time (10 ... 90 %)	≤ 300 ms	

Electrical connection				
Connection type	**IP code [1)]**	**Wire cross-section**	**Cable diameter**	**Cable length**
Bayonet connector (4-pin)	IP67	-	-	-
Circular connector M12 x 1 (4-pin)	IP67 (NEMA 4)	-	-	-
Cable outlet	IP67 (NEMA 4)	0.22 mm² (AWG 24)	4.8 mm [0.19 in]	■ 1.5 m [5 ft] ■ 3 m [10 ft] ■ 12 m [40 ft]
Sub-D connector (9-pin)	IP54	-	-	-
Sub-D HD connector (15-pin)	IP54	-	-	-

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

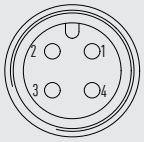
Further details on: Electrical connection	
Connection type	→ See table „Electrical connection“ on page 4
Wire cross-section	→ See table „Electrical connection“ on page 4
Cable diameter	→ See table „Electrical connection“ on page 4
Cable length	→ See table „Electrical connection“ on page 4
Pin assignment	→ See „Pin assignment“ on page 4
Ingress protection (IP code) per IEC 60529	→ See table „Electrical connection“ on page 4
Short-circuit resistance	S+ vs. U-
Reverse polarity protection	U+ vs. U-
Insulation voltage	DC 500 V

Pin assignment

Bayonet connector (4-pin)

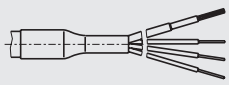
	2-wire	3-wire
U+	A	A
U-	D	D
S+	-	B

Circular connector M12 x 1 (4-pin)



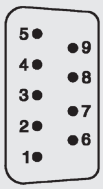
	2-wire	3-wire
U+	1	1
U-	3	3
S+	-	4

Cable outlet



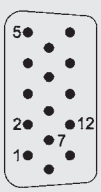
	2-wire	3-wire
U+	Red	Red
U-	Black	Black
S+	-	Brown

Sub-D connector (9-pin)



	2-wire	3-wire
U+	4	4
U-	8/9	8/9
S+	-	1

Sub-D HD connector (15-pin)



	2-wire	3-wire
U+	7	7
U-	5/12	5/12
S+	-	2

Legend

U+ Positive power supply terminal
U- Negative power supply terminal
S+ Positive measuring connection

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

For the verification of material quality and origin in accordance with SEMI F20-0706, a certificate in accordance with EN 10204 clause 3.1 can be issued on request, with or without a subsupplier certificate.

Operating conditions				
Permissible temperature ranges	**Non-Ex**	**T4**	**T5**	**T6**
Medium temperature limit	-20 ... +100 °C [-4 ... +212 °F]	-20 ... +85 °C [-4 ... +185 °F]	-20 ... +60 °C [-4 ... +140 °F]	-20 ... +40 °C [-4 ... +104 °F]
Ambient temperature limit	-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 temperature limit	-40 ... +100 °C [-40 ... +212 °F]	-20 ... +85 °C [-4 ... +185 °F]	-20 ... +85 °C [-4 ... +185 °F]	-20 ... +85 °C [-4 ... +185 °F]

Further details on: Operating conditions	
Permissible media	Speciality gases, Vapours, Liquids
Helium leak test	< 1 x 10^{-9} mbar l/sec (atm STD cc/sec) per SEMI F1
Pollution degree	2
Vibration resistance per IEC 60068-2-6	0.35 mm (10 ... 58 Hz) / 5g (58.1 ... 2,000 Hz)
Shock resistance per IEC 60068-2-27	500g (1.5 ms)
Ingress protection (IP code) per IEC 60529	→ See “Electrical connection”

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

Approvals

Logo	Description	Country
CE Ex	**EU declaration of conformity**	European Union
	EMC directive EN 61326 emission (group 1, class B) and immunity (industrial environments)	
	Pressure Equipment Directive	
	RoHS directive	
	ATEX directive (option) Hazardous areas - Ex zone 2 (gas) [II 3G Ex ec ic IIC T4/T5/T6 Gc X]	
IEC IECEx	**IECEx (option)** Hazardous areas - Ex zone 2 (gas) [Ex ec ic IIC T4/T5/T6 Gc X]	International
FM APPROVED	**FM (option)** Hazardous areas - Non-incendive apparatus for use in class I, division 2, groups A,B,C,D - Non-incendive for use in class I, zone 2, group IIC (classified) locations	USA

→ For approvals and certificates, see website

Test report

Description
■ 3 measuring points ■ Max. measured error ■ Helium leakage rate

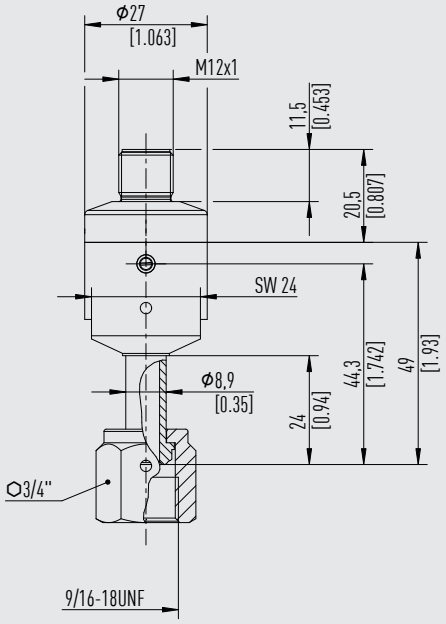
Manufacturer's declaration

Description	
MTBF	> 100 years

Dimensions in mm [inch] WUC-10

Electrical connections

Circular connector M12 x 1

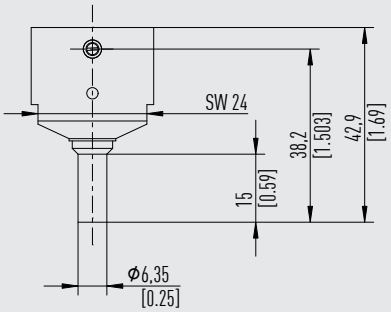


¼" swivel union nut

Weight: approx. 0.1 kg
Dead volume: < 1.5 cm³

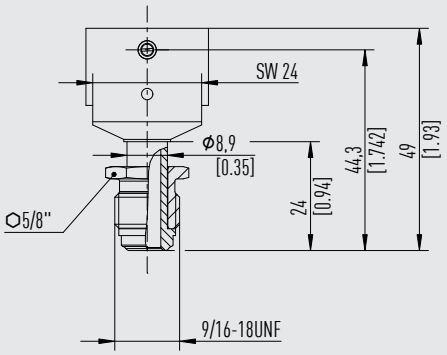
Process connections

¼" weld-in connection

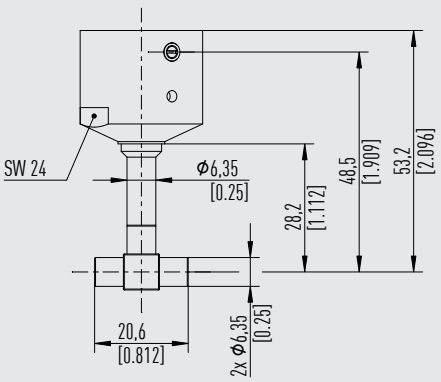


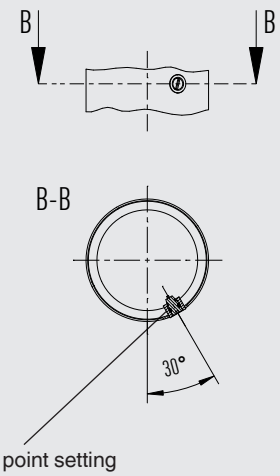
Max. available pressure: 300 psi [20 bar]

¼" male swivel nut



¼" T-connector, weld-in connection





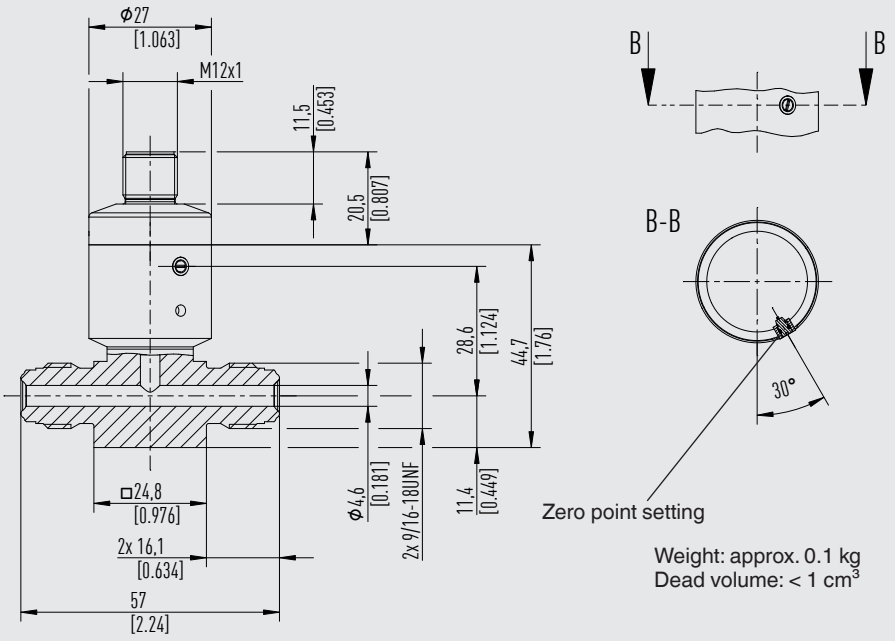
Zero point setting

Dimensions in mm [inch] WUC-15

Electrical connections

Circular connector M12 x 1

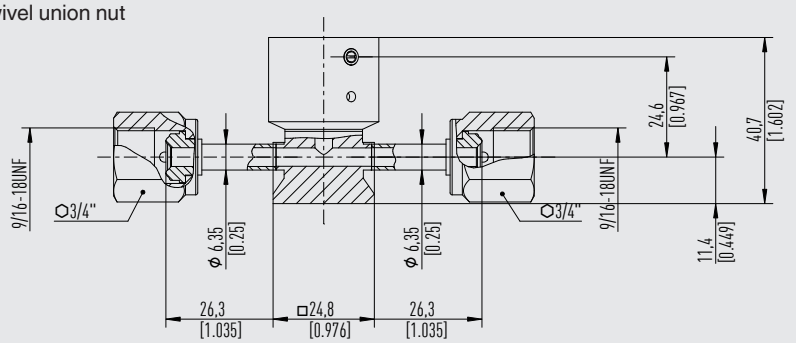
¼" fixed male nut
¼" fixed male nut



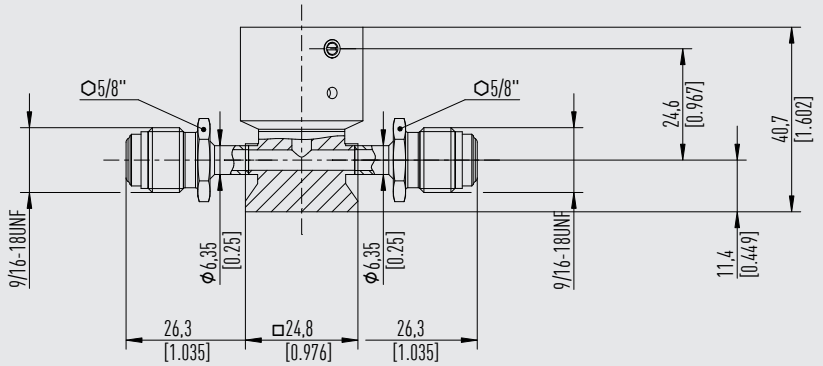
Weight: approx. 0.1 kg
Dead volume: < 1 cm³

Process connections

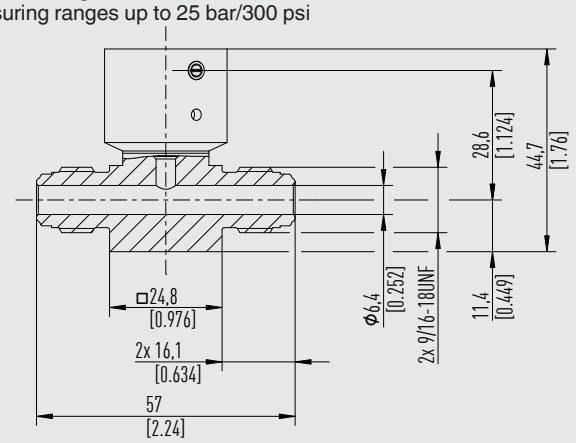
¼" swivel union nut
¼" swivel union nut



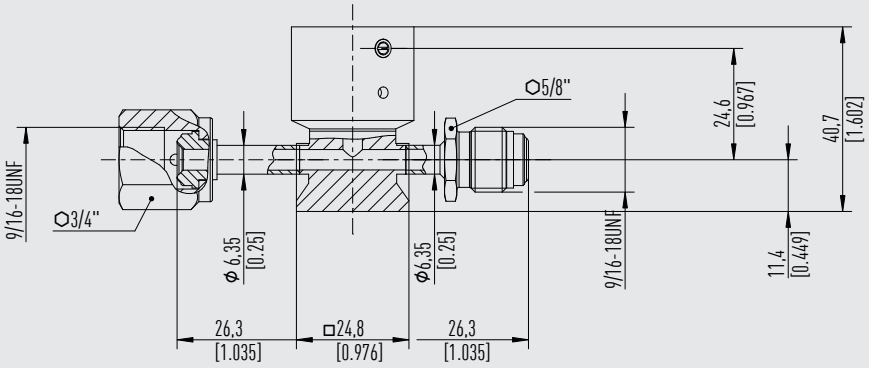
¼" male swivel nut
¼" male swivel nut



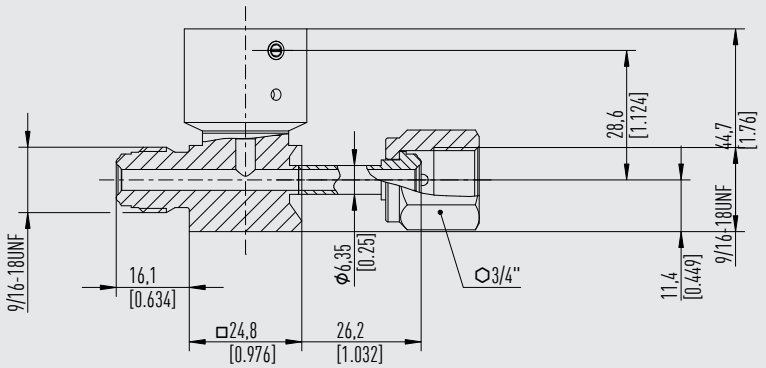
¼" fixed male nut, high flow through
¼" fixed male nut, high flow through
Only available with measuring ranges up to 25 bar/300 psi



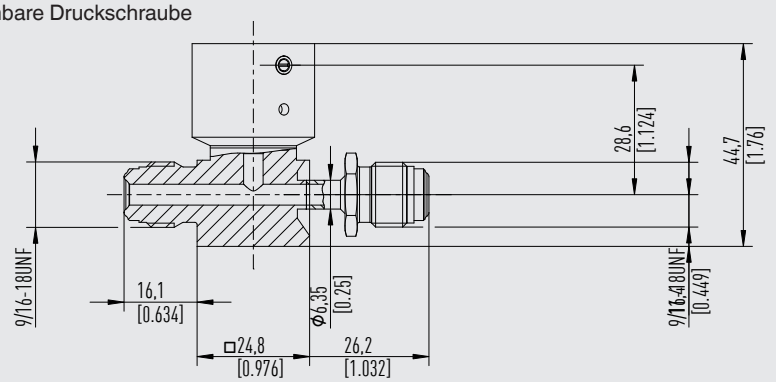
¼" swivel union nut
¼" male swivel nut



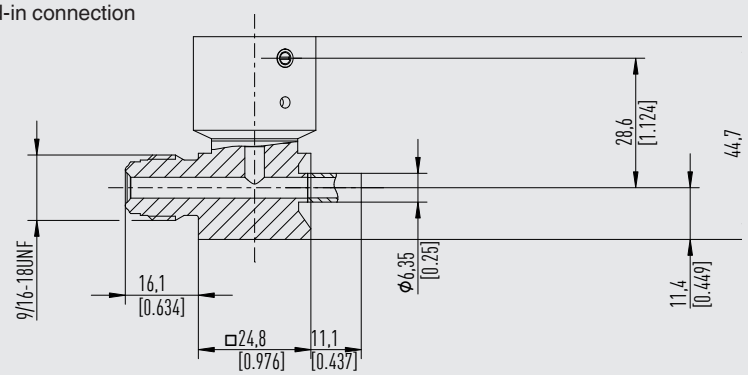
¼" fixed male nut
¼" swivel union nut



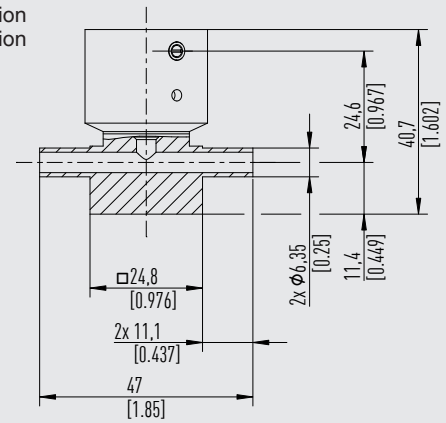
¼" feste Druckschraube
¼" drehbare Druckschraube



¼" fixed male nut
¼" weld-in connection



¼" weld-in connection
¼" weld-in connection

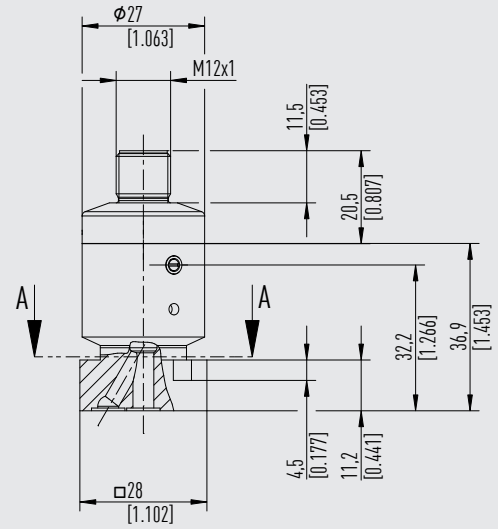


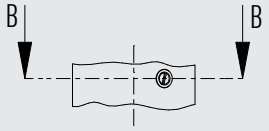
Dimensions in inch [mm] WUC-16

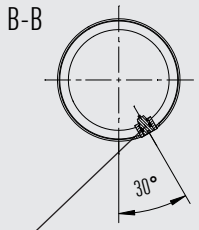
Electrical connections

Rundstecker M12 x 1

MSM C 1 ⅛"

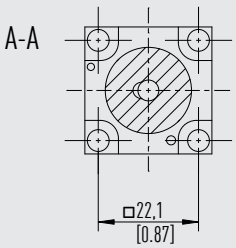




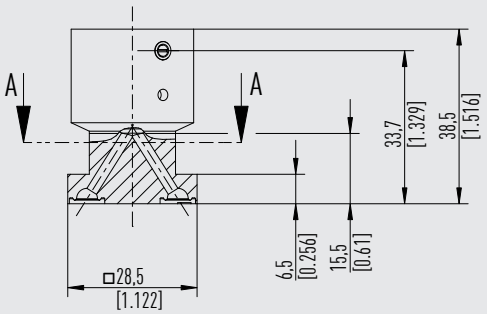


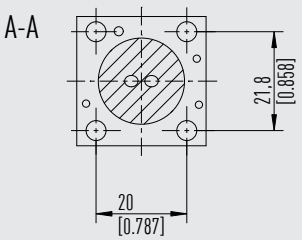
Nullpunkteinstellung

Gewicht: ca. 0,1 kg
Totraumvolumen: < 1 cm³



Process connections





Ordering information

Model / Measuring range / Process connection / Output signal / Auxiliary power / Electrical connection / Cable length / Approval

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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.

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