

# Ultra high purity transducer

## For hazardous areas, Ex ia IIC

### Models iWU-20, iWU-25 and iWU-26

WIKA data sheet PE 87.09



#### Applications

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

#### Special features

- Compact design
- ATEX and IECEx zone 0 approval
- Ingress protection IP67 with “side access” zero potentiometer
- Excellent EMC stability
- Active temperature compensation



**Fig. left:** iWU-20, single end

**Fig. centre:** iWU-25, flow through

**Fig. right:** iWU-26, modular surface mount

#### Description

##### Compact

With its small footprint the iWU-2x is the most compact UHP transducer in the market. Thus it is optimally suited for installation in applications with limited mounting space and even in existing plants it can be easily retrofitted.

##### Reliable

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

Pressure measurement, based on a vacuum reference, and electronic measures for interference shielding and for signal noise cancellation ensure high-accuracy pressure measurement and excellent long-term stability.

Active temperature compensation reduces the impact of changing temperatures on the transducer, allowing safe operations even in applications with high fluctuations in temperature (e.g. Joule-Thomson effect in the case of gas expansion) or in non-air-conditioned areas.

iWU-25 (flow through) and iWU-26 (surface mount)

transducers are specifically designed to sustain torsion-applied stresses often incurred during installation. The special design of the thin-film sensor eliminates the risk of sensor failure due to loads at the process connection or welded joints.

##### Versatile

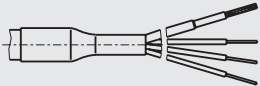
The iWU-2x transducer can be readily installed in indoor or outdoor systems as well as in non-flammable or potentially flammable areas. The hermetically IP67 sealed “side access” zero point setting ensures ingress protection at all times of operation.

The iWU-2x series was developed for pressure measurement in Ex zone 0 applications. The temperature class T4 allows usage with most speciality gases under explosion protection considerations.

| Specifications                                              |                                                                                                                                                                                                                   |       |                     |       |       |       |                                   |       |        |        |        |        |
|-------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---------------------|-------|-------|-------|-----------------------------------|-------|--------|--------|--------|--------|
|                                                             | Models iWU-20, iWU-25                                                                                                                                                                                             |       |                     |       |       |       |                                   |       |        |        |        |        |
|                                                             | Model iWU-26                                                                                                                                                                                                      |       |                     |       |       |       |                                   |       |        |        |        |        |
| Pressure range (psi)                                        | 30                                                                                                                                                                                                                | 60    | 100                 | 160   | 250   | 350   | 500                               | 1,000 | 1,500  | 2,000  | 3,000  | 5,000  |
| Pressure range (bar)                                        | 2                                                                                                                                                                                                                 | 4     | 7                   | 11    | 17    | 25    | 36                                | 70    | 100    | 145    | 225    | 360    |
| Overload safety (psi)                                       | 120                                                                                                                                                                                                               | 120   | 210                 | 320   | 500   | 750   | 1,100                             | 2,100 | 3,000  | 4,200  | 6,600  | 10,000 |
| Burst pressure (psi)                                        | 1,800                                                                                                                                                                                                             | 1,800 | 2,200               | 2,600 | 4,800 | 6,200 | 7,400                             | 8,000 | 10,500 | 10,500 | 10,500 | 10,500 |
|                                                             | Further measuring ranges on request                                                                                                                                                                               |       |                     |       |       |       |                                   |       |        |        |        |        |
| Measuring principle                                         | Metal thin-film sensor                                                                                                                                                                                            |       |                     |       |       |       |                                   |       |        |        |        |        |
| Materials                                                   |                                                                                                                                                                                                                   |       |                     |       |       |       |                                   |       |        |        |        |        |
| Wetted parts                                                | Process connection                                                                                                                                                                                                |       | 316L per SEMI F20   |       |       |       |                                   |       |        |        |        |        |
|                                                             | Thin-film sensor                                                                                                                                                                                                  |       | 2.4711 / UNS R30003 |       |       |       |                                   |       |        |        |        |        |
| Case                                                        | 304 SS                                                                                                                                                                                                            |       |                     |       |       |       |                                   |       |        |        |        |        |
| Helium leak test                                            | < 1 x 10 <sup>-9</sup> mbar l/sec (atm STD cc/sec) per SEMI F1                                                                                                                                                    |       |                     |       |       |       |                                   |       |        |        |        |        |
| Surface treatment                                           | Electropolished, typical Ra ≤ 0.13 µm (RA 5); max. Ra ≤ 0.18 µm (RA 7) per SEMI F19                                                                                                                               |       |                     |       |       |       |                                   |       |        |        |        |        |
| Dead volume                                                 |                                                                                                                                                                                                                   |       |                     |       |       |       |                                   |       |        |        |        |        |
| iWU-20                                                      | < 1.5 cm³                                                                                                                                                                                                         |       |                     |       |       |       |                                   |       |        |        |        |        |
| iWU-25                                                      | < 1 cm³                                                                                                                                                                                                           |       |                     |       |       |       |                                   |       |        |        |        |        |
| iWU-26                                                      | < 1 cm³                                                                                                                                                                                                           |       |                     |       |       |       |                                   |       |        |        |        |        |
| Permissible media                                           | <div><div></div>Speciality gases</div> <div><div></div>Vapours</div> <div><div></div>Liquids</div>                                                                                                                |       |                     |       |       |       |                                   |       |        |        |        |        |
| Supply voltage U <sub>+</sub>                               | DC 15 ... 30 V                                                                                                                                                                                                    |       |                     |       |       |       |                                   |       |        |        |        |        |
| Output signal and permissible max. load R <sub>A</sub> in Ω | 4 ... 20 mA, 2-wire, R <sub>A</sub> ≤ (U <sub>+</sub> – 15 V) / 0.022 A                                                                                                                                           |       |                     |       |       |       |                                   |       |        |        |        |        |
| Ratings for the supply circuit U <sub>+</sub> and U.        |                                                                                                                                                                                                                   |       |                     |       |       |       |                                   |       |        |        |        |        |
| Maximum input voltage (DC)                                  | U <sub>i</sub> = 30 V                                                                                                                                                                                             |       |                     |       |       |       |                                   |       |        |        |        |        |
| Maximum input current                                       | I <sub>i</sub> = 130 mA                                                                                                                                                                                           |       |                     |       |       |       |                                   |       |        |        |        |        |
| Maximum input power                                         | P <sub>i</sub> = 835 mW                                                                                                                                                                                           |       |                     |       |       |       |                                   |       |        |        |        |        |
| Effective internal capacitance                              | <div><div></div>C<sub>i</sub> = 19.5 nF (version circular connector M12 x 1, 4-pin)</div> <div><div></div>C<sub>i</sub> = 21.9 nF (version flying leads)</div>                                                    |       |                     |       |       |       |                                   |       |        |        |        |        |
| Effective internal inductance                               | <div><div></div>Negligible (version circular connector M12 x 1, 4-pin)</div> <div><div></div>L<sub>i</sub> = 12 µH (version flying leads)</div>                                                                   |       |                     |       |       |       |                                   |       |        |        |        |        |
| Adjustability of zero point                                 | -3.5 % ... +3.5 % of span (via potentiometer)                                                                                                                                                                     |       |                     |       |       |       |                                   |       |        |        |        |        |
| Response time (10 ... 90 %)                                 | ≤ 300 ms                                                                                                                                                                                                          |       |                     |       |       |       |                                   |       |        |        |        |        |
| Insulation voltage                                          | DC 850 V                                                                                                                                                                                                          |       |                     |       |       |       |                                   |       |        |        |        |        |
| Accuracy                                                    | <div><div></div>≤ 0.15 % of span (≤ 0.4 % of span for measuring ranges ≤ 2 bar) RSS (root sum squares)</div> <div><div></div>≤ 0.3 % of span (≤ 0.6 % of span for measuring ranges ≤ 2 bar) per IEC 61298-2</div> |       |                     |       |       |       |                                   |       |        |        |        |        |
| Non-linearity per IEC 61298-2                               | <div><div></div>≤ 0.1 % of span (BFSL)</div> <div><div></div>≤ 0.15 % of span (BFSL) for measuring ranges ≤ 2 bar</div>                                                                                           |       |                     |       |       |       |                                   |       |        |        |        |        |
| Hysteresis                                                  | ≤ 0.14 % of span                                                                                                                                                                                                  |       |                     |       |       |       |                                   |       |        |        |        |        |
| Non-repeatability                                           | ≤ 0.12 % of span                                                                                                                                                                                                  |       |                     |       |       |       |                                   |       |        |        |        |        |
| Stability per year                                          | <div><div></div>≤ 0.25 % of span (typ.) at reference conditions</div> <div><div></div>≤ 0.4 % of span for measuring ranges ≤ 2 bar</div>                                                                          |       |                     |       |       |       |                                   |       |        |        |        |        |
| Permissible temperature ranges                              |                                                                                                                                                                                                                   |       |                     |       |       |       |                                   |       |        |        |        |        |
| Medium                                                      | T4, version circular connector M12 x 1, 4-pin                                                                                                                                                                     |       |                     |       |       |       | -20 ... +85 °C [-4 ... +185 °F]   |       |        |        |        |        |
|                                                             | T4, version flying leads                                                                                                                                                                                          |       |                     |       |       |       | -20 ... +65 °C [-4 ... +149 °F]   |       |        |        |        |        |
| Ambient                                                     | T4, version circular connector M12 x 1, 4-pin                                                                                                                                                                     |       |                     |       |       |       | -20 ... +85 °C [-4 ... +185 °F]   |       |        |        |        |        |
|                                                             | T4, version flying leads                                                                                                                                                                                          |       |                     |       |       |       | -20 ... +65 °C [-4 ... +149 °F]   |       |        |        |        |        |
| Storage                                                     | T4, version circular connector M12x1, 4-pin                                                                                                                                                                       |       |                     |       |       |       | -40 ... +100 °C [-40 ... +212 °F] |       |        |        |        |        |
|                                                             | T4, version flying leads                                                                                                                                                                                          |       |                     |       |       |       | -40 ... +100 °C [-40 ... +212 °F] |       |        |        |        |        |

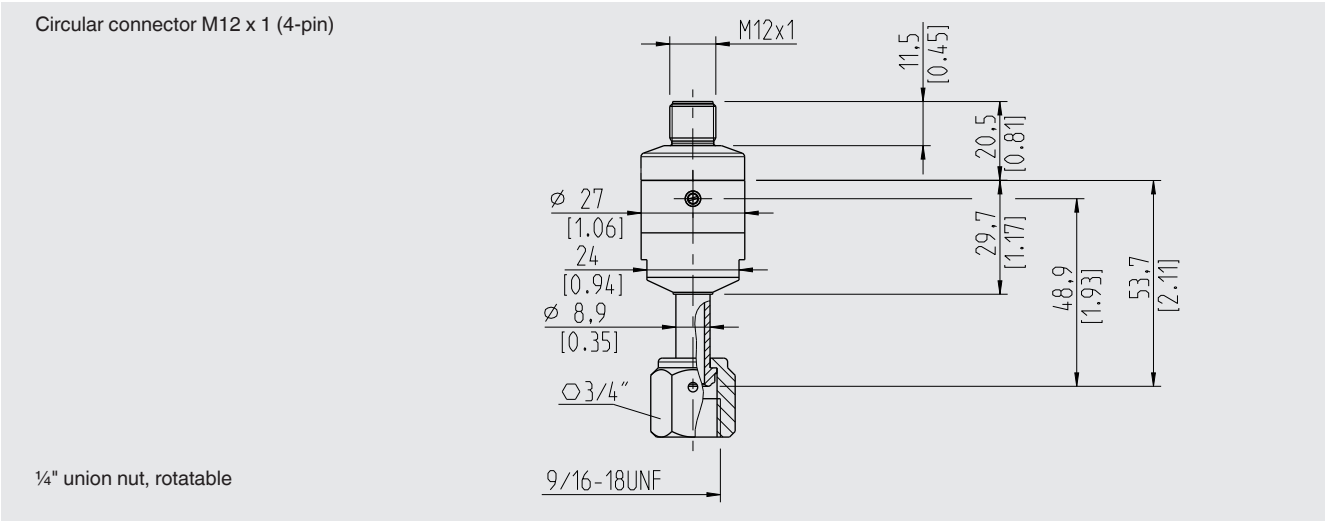
| Specifications                                                                     |                                                                   |
|------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| Rated temperature range                                                            | -20 ... +80 °C [-4 ... +176 °F] (actively compensated)            |
| Temperature coefficients within the rated temperature range (actively compensated) |                                                                   |
| Mean TC of zero point                                                              | $\leq 0.1 / 10 \text{ K}$                                         |
| Mean TC of span                                                                    | $\leq 0.15 / 10 \text{ K}$                                        |
| Production environment                                                             | Clean room class 5 per ISO 14644                                  |
| Packaging                                                                          | Double bagging per SEMI E49.6                                     |
| Shock resistance                                                                   | 500 (1.5 ms) per IEC 60068-2-27                                   |
| Vibration resistance                                                               | 0.35 mm (10 ... 58 Hz) / 5 g (58.1... 2,000 Hz) per IEC 60068-2-6 |
| Reverse polarity protection                                                        | U <sub>+</sub> vs. U <sub>-</sub>                                 |
| Weight                                                                             | Approx. 0.1 kg                                                    |

## Electrical connections

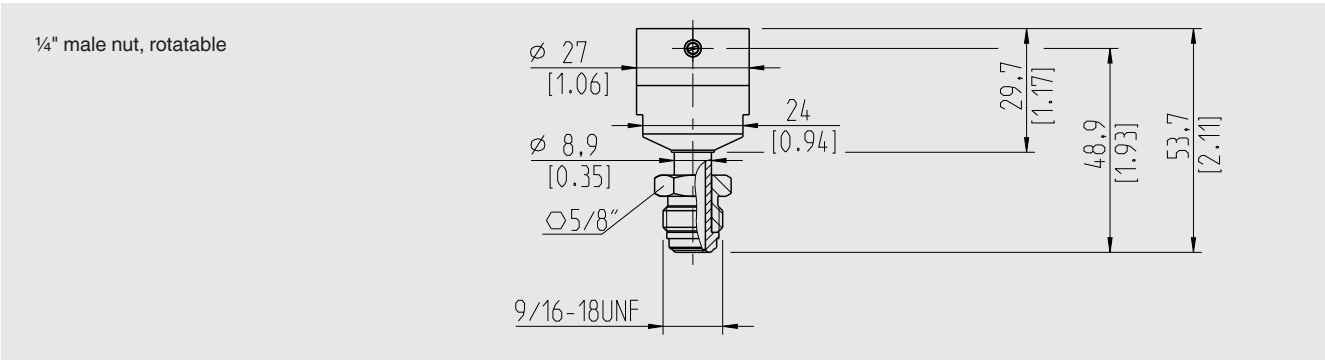
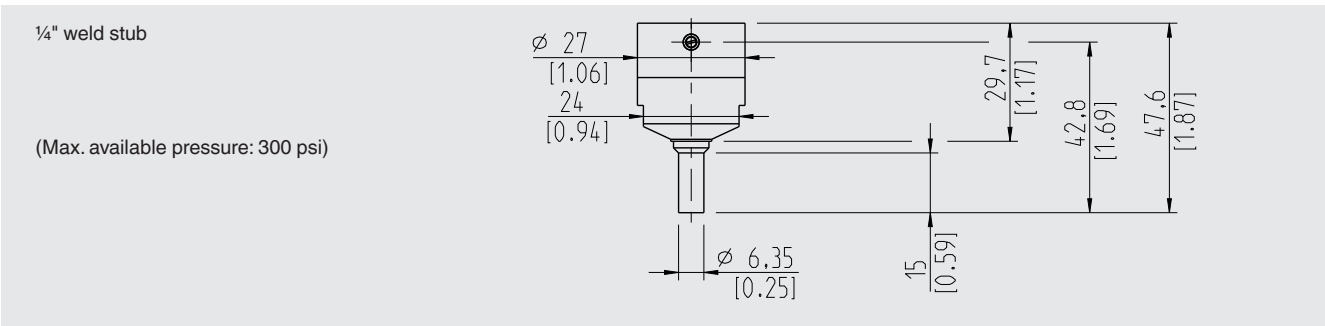
| Electrical connections           |                                                                                                                       |                    |                                                                                                                  |
|----------------------------------|-----------------------------------------------------------------------------------------------------------------------|--------------------|------------------------------------------------------------------------------------------------------------------|
|                                  | Circular connector M12 x 1 (4-pin)                                                                                    |                    | Cable outlet 1.5 m and 3 m                                                                                       |
|                                  | <br>(Dimensions in inch [mm])        |                    | <br>(Dimensions in inch [mm]) |
| 2-wire                           | U <sub>+</sub> = 1                                                                                                    | U <sub>-</sub> = 3 | U <sub>+</sub> = red      U <sub>-</sub> = black                                                                 |
| Conductor cross-section          | -                                                                                                                     |                    | 0.22 mm <sup>2</sup> (AWG 24)                                                                                    |
| Cable diameter                   | -                                                                                                                     |                    | 4.8 mm                                                                                                           |
| Ingress protection per IEC 60529 | IP67                                                                                                                  |                    | IP67                                                                                                             |
|                                  | Ingress protection only applies when plugged in using mating connectors that have the appropriate ingress protection. |                    |                                                                                                                  |

Dimensions in mm [in] iWU-20

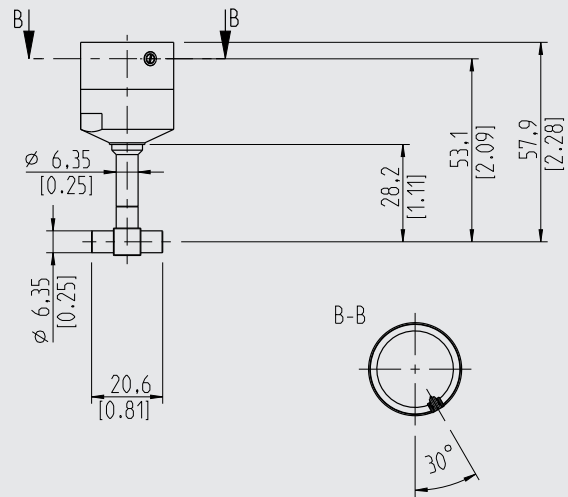
Electrical connections



Process connections



¼" T-connector, weld stub

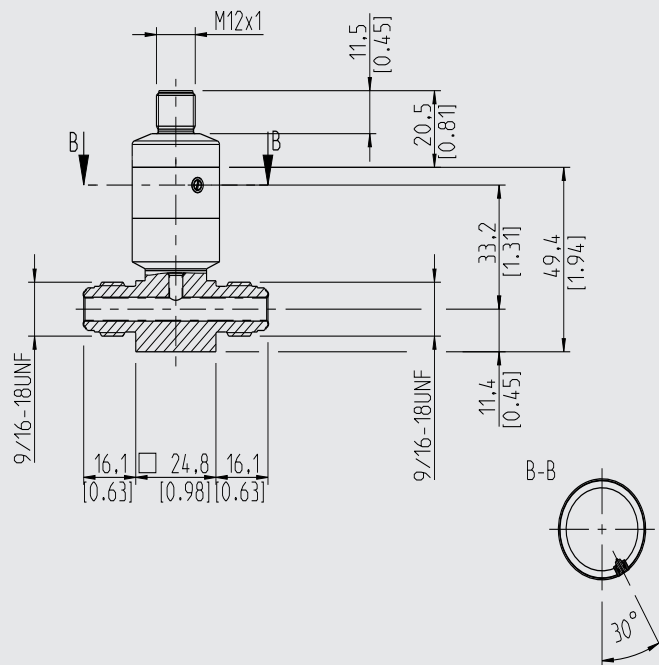


## Dimensions in mm [in] iWU-25

### Electrical connections

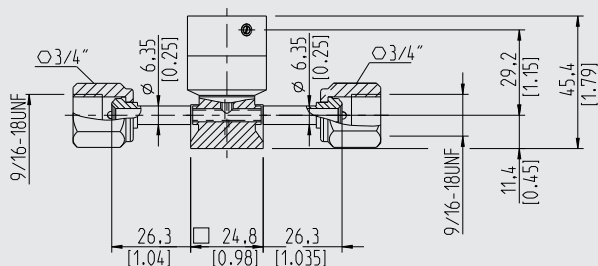
Circular connector M12 x 1 (4-pin)

¼" union nut, fixed

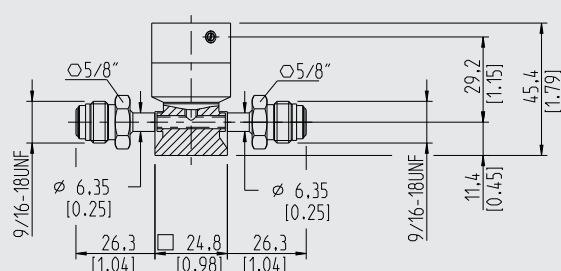


## Process connections

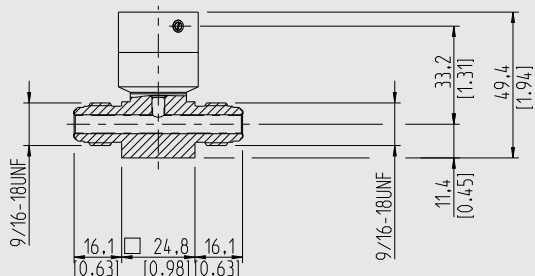
¼" union nut (female), rotatable  
¼" union nut (female), rotatable



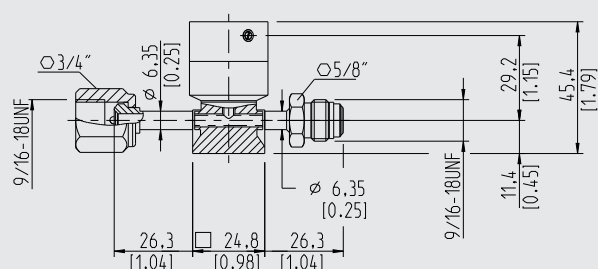
¼" male nut, rotatable  
¼" male nut, rotatable



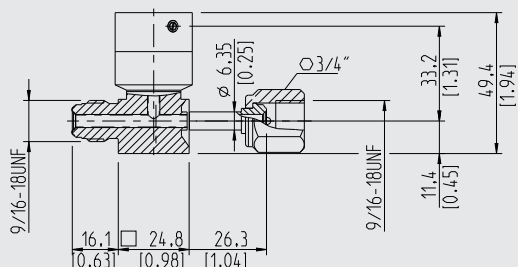
¼" male nut, fixed, high flow through  
¼" male nut, fixed, high flow through



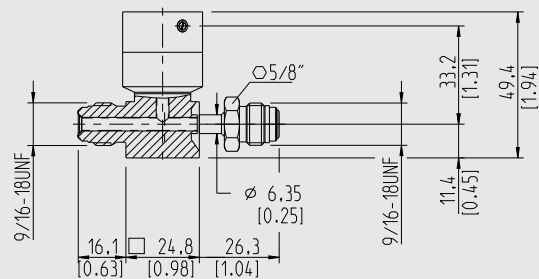
¼" union nut (female), rotatable  
¼" male nut, rotatable



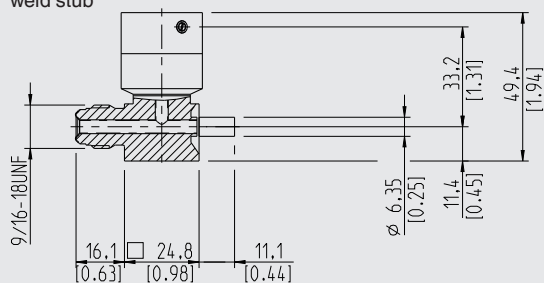
¼" male nut, fixed  
¼" union nut (female), rotatable



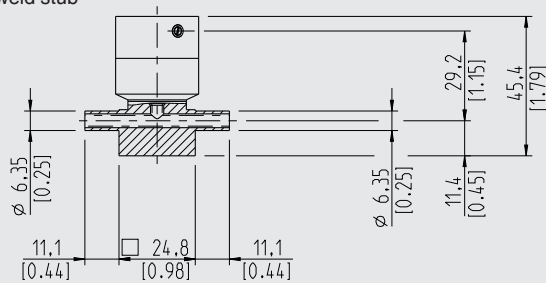
¼" male nut, fixed  
¼" male nut, rotatable



¼" male nut, fixed  
¼" weld stub

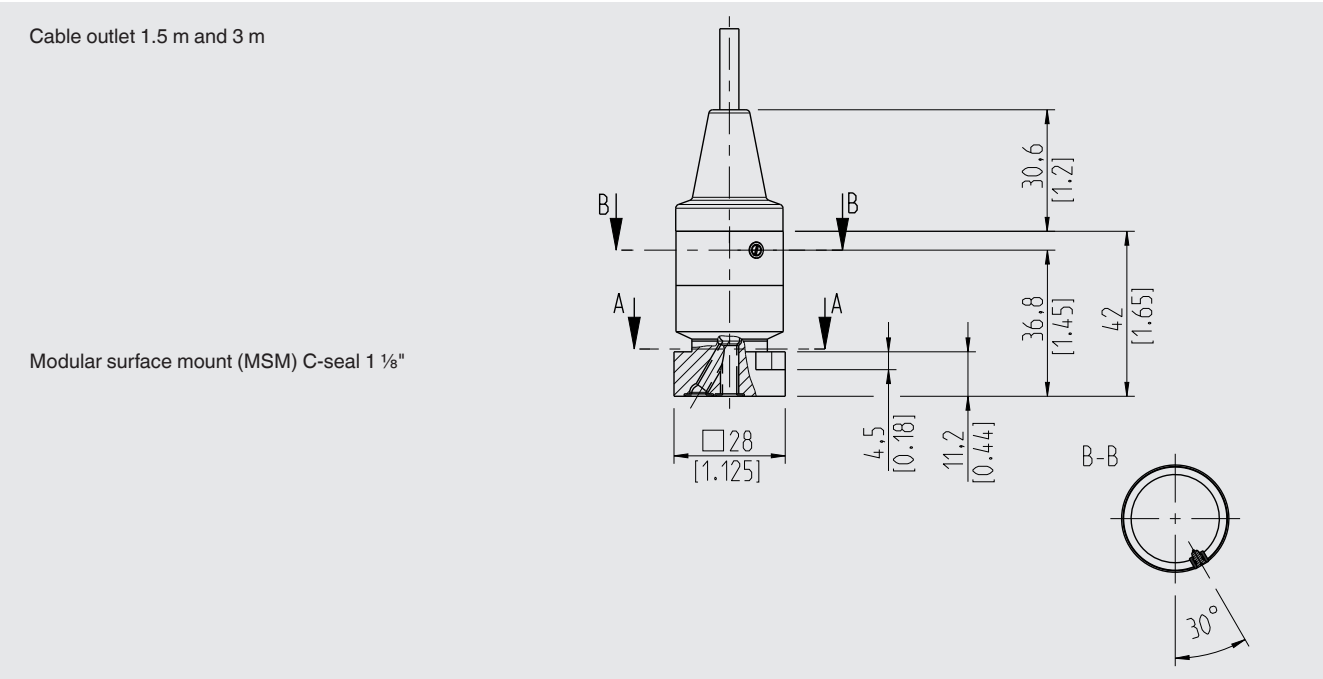


¼" weld stub  
¼" weld stub

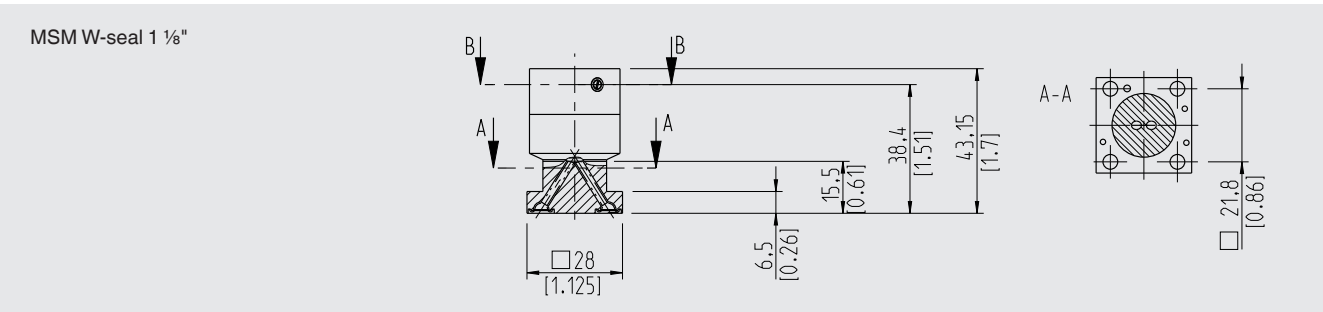
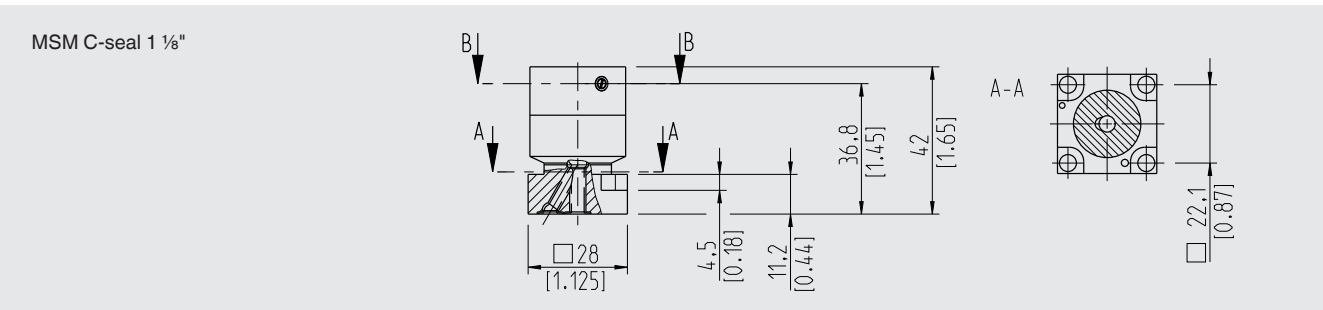


# Dimensions in mm [in] iWU-26

## Electrical connections



## Process connections



## Approvals

| Logo                                                                              | Description                                                                                 | Country        |
|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|----------------|
|  | <b>EU declaration of conformity</b>                                                         | European Union |
|                                                                                   | EMC directive<br>EN 61326 emission (group 1, class B) and immunity (industrial application) |                |
|                                                                                   | Pressure equipment directive                                                                |                |
|                                                                                   | RoHS directive                                                                              |                |
|  | ATEX directive<br>- Ex i Zone 0 gas II 1G Ex ia IIC T4 Ga                                   | International  |
|  | <b>IECEx</b><br>Hazardous areas<br>- Ex i Zone 0 gas Ex ia IIC T4 Ga                        |                |

Approvals and certificates, see website.

## Ordering information

Model / Measuring range / Process connection / Output signal / Supply voltage / Electrical connection / Cable length / Approval

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