Ultra high purity transducer, Ex n
Models WUC-10, WUC-15 and WUC-16

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 zone 2 approval
- Ingress protection IP 67 (NEMA 4)
  with "side access" zero point potentiometer
- Excellent EMC stability
- Active temperature compensation

Description
Compact
The space-saving design of the model WUC-1X provides greater free space in plants and installations.

The WUC-15 and 16 series transducers are notable for their excellent self-draining characteristics. The special sensor connection design eliminates the influence on the sensor signal through loads on the process connections or weld seams.

Versatile
The high IP 67 ingress protection also enables them to be used under harsh conditions on tank farm and specialty gas installations outdoors.

This series of instruments has also been developed for use in Ex zone 2. The T6 temperature class classification ensures that even measurements of media with low self-ignition temperatures, such as PH3 (phosphine), do not present a problem.

Reliable
With cyclic pressure rinsing, high gas throttling values (Joule-Thompson effect) and external operation, high temperature fluctuations can occur. The active temperature compensation detects these changes and minimises their influence. Thus stable measurement is ensured.

Through the sealed "Side-Access" zero point adjustment, the high IP 67 ingress protection is permanently maintained. Simple handling and protection from unintentional adjustment is ensured.

The materials 316L VIM VAR are used for all wetted parts and the special thin film sensors are from 2.4711 / UNSR 30003. All wetted parts are electropolished and cleaned with the latest processes before final assembly.

Through an individual examination of each transducer it is ensured that the required values for leak tightness, overpressure stability, accuracy and particles are met in accordance with the applicable SEMI™ standards.
## Specifications

### Models WUC-10, WUC-15, WUC-16

<table>
<thead>
<tr>
<th>Specifications</th>
<th>WUC-10, WUC-15</th>
<th>WUC-16</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Measuring range</strong></td>
<td>psi</td>
<td>14.5</td>
</tr>
<tr>
<td></td>
<td>bar</td>
<td>1</td>
</tr>
<tr>
<td><strong>Overpressure safety 1)</strong></td>
<td>psi</td>
<td>120</td>
</tr>
<tr>
<td><strong>Burst pressure 1)</strong></td>
<td>psi</td>
<td>1800</td>
</tr>
<tr>
<td>Other measuring ranges and pressure units (e.g. MPa, kg/cm²) on request</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Measuring principle:** Thin-film sensor

**Material:**
- **Wetted parts**
  - Process connection: 316L VIM/VAR
  - Pressure sensor: 2.4711 / UNSR 30003
- **Case:** 304 SS

**Particle test:** ≤ 0.1 µm particle 0.1 ptc / ft³ per Semi E49.8

**Inboard helium leak test:** < 1 × 10⁻⁹ mbar l/sec (atm STD cc/sec) per Semi F1

**Surface finish:** Electropolished, typ. Ra ≤ 0.13 µm (Ra 5); max. Ra ≤ 0.18 µm (Ra 7) per Semi F19

**Dead volume:** cm³  
- WUC-10 < 1.5, WUC-15 < 1, WUC-16 < 1

**Permissible media:** Specialty gases, mist, liquids

**Power supply U⁺:** DC  
- 10 ... 30 V
- 14 ... 30 V with output 0 ... 5 V / 0 ... 10 V

**Output signal and permissible max. load RA:**  
- 4 ... 20 mA, 2-wire: RA ≤ (U⁺ – 10 V) / 0.02 A
- 0 ... 5 V, 3-wire: RA > 5k
- 0 ... 10 V, 3-wire: RA > 10k

**Power Pi:** W  
- 1

**Adjustability of zero point:** % of span  
- -5 to +3.5 (via potentiometer) current output signal
- -2 to +5 (via potentiometer) voltage output signal

**Settling time (10 ... 90 %):** ms ≤ 300

**Insulation voltage:** 500 V

**Accuracy:** % of span  
- ≤ 0.2 (± 0.4 with measuring ranges ≤ 2 bar) RSS (Root Sum Squares) per Semi draft # 3440
- ≤ 0.5 (± 1.0² with measuring ranges ≤ 2 bar) per IEC 61298-2

**Non-linearity:** % of span  
- ≤ 0.1 (± 0.15 with measuring ranges ≤ 2 bar) (BFSL) per IEC 61298-2

**Hysteresis:** % of span ≤ 0.14

**Non-repeatability:** % of span ≤ 0.12

**Long-term stability:** % of span ≤ 0.25 typ. / year (at reference conditions)

**Permissible temperature ranges:**
- **Medium:** °C -20 ... +100 -20 ... +85 -20 ... +0
- **Ambient:** °C -20 ... +85 -20 ... +85 -20 ... +0
- **Storage:** °C -40 ... +100 -40 ... +100 -40 ... +0

**Rated temperature range:** °C -20 ... +80 (actively compensated)

**Temperature coefficients in rated temperature range (actively compensated):**
- **TC of zero point:** % of span ≤ 0.1 / 10 K
- **TC of span:** % of span ≤ 0.15 / 10 K

**ROHS conformity:** Yes (not with bayonet circular connector)

**CE conformity:**
- **Pressure equipment directive:** 97/23/EC
- **EMC directive:** 2004/108/EC, EN 61326 emission (group 1, class B) and immunity (industrial locations)
- **ATEX directive:** 94/9/EC

**Ex protection:** ATEX Category 3G (for transducers with Ex mark)

**Ignition protection type:** II 3G Ex nA nL IIC T4/T5/T6 X (for transducers with Ex mark)

**Ex protection:** FM Class I

**Ignition protection type:** Self-protected energy-limited class I div 2 group A,B,C,D

**Production environment:** Clean room class 5 per ISO 14644

**Packaging:** Double-bagged per SEMI E49.6
### Specifications

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Models WUC-10, WUC-15, WUC-16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shock resistance</td>
<td>g</td>
</tr>
<tr>
<td>Vibration resistance</td>
<td>500 (1.5 ms) per IEC 60068-2-27</td>
</tr>
<tr>
<td>Short-circuit resistance</td>
<td>S⁺ towards U⁻ (short-time)</td>
</tr>
<tr>
<td>Reverse polarity protection</td>
<td>U⁺ towards U⁻</td>
</tr>
<tr>
<td>Weight</td>
<td>kg approx. 0.1</td>
</tr>
</tbody>
</table>

1) 1 psi = 0.069 bar
2) Including non-linearity, hysteresis, zero-point and full scale value deviations (corresponds to measured error per IEC 61298-2).
   Calibrated in vertical mounting position with process connection facing downwards.

### Output signal and permissible load

**Current output (2-wire)**

4 ... 20 mA: \( R_A \leq (U_+ - 10 \text{ V}) / 0.02 \text{ A} \)

**Voltage output (3-wire)**

- 0 ... 5 V: \( R_A > 5 \text{ k} \)
- 0 ... 10 V: \( R_A > 10 \text{ k} \)

with \( R_A \) in ohm and \( U_+ \) in VDC

### Electrical connections

<table>
<thead>
<tr>
<th>Bayonet circular connector</th>
<th>Circular connector</th>
<th>Cable outlet</th>
<th>Sub-D HD connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-pin</td>
<td>M12 x 1, 4-pin</td>
<td>1.5 m</td>
<td>15-pin</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-wire</td>
<td>U⁺ = A, U⁻ = D</td>
<td>U⁺ = 1, U⁻ = 3</td>
<td>U⁺ = red, U⁻ = black</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>U⁺ = 7, U⁻ = 5</td>
</tr>
<tr>
<td>3-wire</td>
<td>U⁺ = A, U⁻ = D</td>
<td>U⁺ = 1, U⁻ = 3</td>
<td>U⁺ = red, U⁻ = black, S⁺ = brown</td>
</tr>
<tr>
<td></td>
<td>S⁺ = B</td>
<td></td>
<td>U⁺ = 7, U⁻ = 5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>S⁺ = 2</td>
</tr>
<tr>
<td>Wire cross-section</td>
<td>-</td>
<td>0.22 mm² (AWG 24)</td>
<td>-</td>
</tr>
<tr>
<td>Cable diameter</td>
<td>-</td>
<td>4.8 mm</td>
<td>-</td>
</tr>
<tr>
<td>Ingress protection per IEC 60529</td>
<td>IP 67 (NEMA 4)</td>
<td>IP 67 (NEMA 4)</td>
<td>IP 54</td>
</tr>
<tr>
<td>The stated ingress protection only applies when plugged-in using mating connectors that have the appropriate ingress protection.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Dimensions in inch [mm] WUC-10

Electrical connections

Bayonet circular connector

1/4" union nut, rotatable

Zero point adjustment

Process connections

1/4" weld stub
1/4" male nut, rotatable
1/4" T-connector, weld stub
Dimensions in inch [mm] WUC-15

Electrical connections

Bayonet circular connector

1/4” male nut, fixed
1/4” male nut, fixed

1/4” male nut, fixed, high flow through
only available with measuring ranges up to 25 bar / 300 psi

Zero point adjustment

Process connections

1/4” union nut (female), rotatable
1/4” union nut (female), rotatable

1/4” male nut, rotatable
1/4” male nut, rotatable

1/4” male nut, fixed, high flow through
1/4” male nut, fixed, high flow through
only available with measuring ranges up to 25 bar / 300 psi

1/4” union nut (female), rotatable
1/4” male nut, rotatable
Dimensions in inch [mm] WUC-16

Electrical connections

Bayonet circular connector

MSM W 1 1/2"

Process connections

MSM C 1 1/2"

MSM C 1 1/8"

Zero point adjustment

Zero point adjustment

Zero point adjustment
## Connector orientation for the mounting of attachable indicators

<table>
<thead>
<tr>
<th>Connector orientation</th>
<th>Standard 0°</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optional 90° 180° 270°</td>
<td></td>
</tr>
</tbody>
</table>

### Accessories

**Attachable indicator with LED (N)WUR-1**

- 4-digit display
- Ingress protection IP 65
- Accuracy: ≤ 0.5 % ± 1 digit
- Up to 2 switching outputs configurable
- 5 different pressure units adjustable

### Order numbers

<table>
<thead>
<tr>
<th>Input</th>
<th>Output</th>
<th>Signal</th>
<th>Model WUR-1</th>
<th>Model NWUR-1 (Ex n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M12 x 1</td>
<td>M12 x 1</td>
<td>4 ... 20 mA, 2-wire</td>
<td>7043425</td>
<td>7330752</td>
</tr>
<tr>
<td>M12 x 1</td>
<td>M12 x 1</td>
<td>DC 0.1 ... 10.1 V, 3-wire</td>
<td>7717683</td>
<td>7495459</td>
</tr>
<tr>
<td>M12 x 1</td>
<td>M12 x 1</td>
<td>DC 0.1 ... 5.1 V, 3-wire</td>
<td>7717594</td>
<td>7717488</td>
</tr>
<tr>
<td>Bayonet</td>
<td>Bayonet</td>
<td>4 ... 20 mA, 2-wire</td>
<td>7291390</td>
<td>7196444</td>
</tr>
<tr>
<td>Bayonet</td>
<td>Bayonet</td>
<td>DC 0.1 ... 10.1 V, 3-wire</td>
<td>7718736</td>
<td>7718689</td>
</tr>
<tr>
<td>Bayonet</td>
<td>Bayonet</td>
<td>DC 0.1 ... 5.1 V, 3-wire</td>
<td>7718701</td>
<td>7718671</td>
</tr>
<tr>
<td>Bayonet</td>
<td>Cable</td>
<td>4 ... 20 mA, 2-wire</td>
<td>7005299</td>
<td>7005311</td>
</tr>
</tbody>
</table>