**NEW PRODUCT BRIEF**

**Bourns® Model BPS110 & BPS120**

**ULTRA-LOW PRESSURE SENSOR**

**INTRODUCTION**

Bourns® Precision Sensor (BPS) pressure sensors are designed for demanding applications in the industrial, medical* and consumer markets. Quality, performance and reliability are the core values of this family of environmental sensors.

**MARKET SEGMENT OVERVIEW**

Sensors have become the most critical component of information collection. Features such as self-diagnostics, network compatibility, small form factor and self-calibration are considered essential. “Real-time” data analytics are driving the evolution of sensors and sensor networks.

Dependable sensors for every type of pressure and environment requiring high precision with ultra-low pressure ranges are used in a myriad of applications across multiple market segments.

**CUSTOM OPTIONS AVAILABLE**

(Contact factory for details)

- Pressure range
- Temperature range
- Accuracy
- Port configuration
- I²C address
- Supply voltage
- Update rate (I²C only)

**FEATURES**

- Ultra-low sensing: 0.15 PSI to 1.0 PSI (10 mbar to 70 mbar)
- Extreme sensitivity and stability: Total Error Band of 1.5 % FS over a temperature range of 0 °C to +60 °C (Six-Sigma process)
- Lifetime drift: 0.5 % FS
- Media compatibility: non-corrosive dry gases
- Analog and digital (I²C) output options
- Differential and gauge options
- Active temperature compensation
- RoHS and REACH compliant**

**BENEFITS**

- Superior performance in ultra-low pressure sensing applications
- Design flexibility - for use in either analog or digital systems
- Compensated plug and play reduces development time
- World-class technical support
- Global supply chain

**PRODUCT FIT & APPLICATIONS**

These products are best suited for applications where precision is essential and customers understand the value proposition of the product in the following market segments:

- **Medical Devices (low/medium risk)***
  - Portable oxygen generators
  - Nebulizer
  - CPAP equipment
  - Diagnostic spirometer
  - Gas chromatography equipment
  - Facility ventilation pressure

- **Industrial**
  - Process control
  - HVAC
  - Pneumatic control
  - Gas flow instrumentation
  - Flow calibrators

- **Consumer**
  - Home appliances

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*Excluding life-critical, life-saving and life sustaining applications.
*** Bourns® products have not been designed for and are not intended for use in “lifesaving” “life-critical” or “life-sustaining” applications nor any other applications where failure or malfunction of the Bourns® product may result in personal injury or death. See Legal Disclaimer Notice: http://www.bourns.com/docs/legal/disclaimer.pdf.
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ULTRA-LOW PRESSURE SENSOR

CIRCUIT DIAGRAMS

PRODUCT CHARACTERISTICS

<table>
<thead>
<tr>
<th>Series</th>
<th>Pressure Range</th>
<th>Compensated Temperature Range</th>
<th>Output</th>
<th>Accuracy</th>
<th>Total Error Band (TEB)</th>
<th>Measurement Type</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>BPS110</td>
<td>0.15 PSI</td>
<td>0 °C to 60 °C</td>
<td>Amplified Analog</td>
<td>0.25 % FS</td>
<td>±1.5 % FS</td>
<td>Differential • Gauge</td>
<td>Ultra-low pressure • Surface mount package • RoHS compliant*</td>
</tr>
<tr>
<td></td>
<td>0.30 PSI</td>
<td></td>
<td>5 % to 95 % V$_S$</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.0 PSI</td>
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</tr>
<tr>
<td>BPS120</td>
<td>0.15 PSI</td>
<td>0 °C to 60 °C</td>
<td>I2C, 13 bit</td>
<td>0.25 % FS</td>
<td>±1.5 % FS</td>
<td>Differential • Gauge</td>
<td>Ultra-low pressure • Surface mount package • RoHS compliant*</td>
</tr>
<tr>
<td></td>
<td>0.30 PSI</td>
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</tr>
<tr>
<td></td>
<td>1.0 PSI</td>
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BPS110 TRANSFER FUNCTION FORMULA

\[
P_{psi} = (P_{max} - P_{min}) \times \left( \frac{V_{out} - V_{minComp}}{V_{maxComp} - V_{minComp}} \right) + P_{min}
\]

Where
- $P_{psi}$ = Measured Pressure in PSI
- $P_{max}$ = Maximum Pressure
- $P_{min}$ = Minimum Pressure
- $V_{minComp}$ = Minimum Voltage (Usually 0.5 V)
- $V_{maxComp}$ = Maximum Voltage (Usually 4.5 V)
- $V_{out}$ = Output Voltage (Pin 6)

BPS120 TRANSFER FUNCTION FORMULA

\[
P_{psi} = (P_{max} - P_{min}) \times \left( \frac{P_{counts} - 0.1 \times Max}{0.8 \times Max} \right) + P_{min}
\]

Where
- $P_{psi}$ = Measured Pressure in PSI
- $P_{counts}$ = Pressure Counts
- $P_{min}$ = Minimum Pressure
- $P_{max}$ = Maximum Pressure
- Max = 16384 = 14 Bits