

MEDICAL AND INDUSTRIAL APPLICATIONS

Application Note

Basic Board Mount Pressure Sensors: NBP Series—Uncompensated/Unamplified

INTRODUCTION

Honeywell's Basic Board Mount Pressure Sensors: NBP Series—Uncompensated/Unamplified are designed for customers who require a simple, cost-effective, basic performance, mV output, unamplified, uncompensated, high quality, high resolution solution for medical and industrial applications. (See Figure 1.)

Figure 1. Basic Board Mount Pressure Sensors: NBP Series—Uncompensated/Unamplified



These unamplified and uncompensated sensors offer infinite resolution of the pressure signal. They will operate as specified from -40 °C to 125 °C [-40 °F to 257 °F].

The NBP Series is ideal for those customers who want to do their own compensation, calibration, and amplification in order to make use of the maximum resolution of the bare sensor output, leveraging a custom algorithm required for the application.

Additionally, the NBP Series offers several package styles and mounting options, making it easier for device manufacturers to integrate the product into their applications.

The NBP Series measures absolute and gage pressures. The absolute versions have an internal vacuum reference and an output value proportional to absolute pressure. Gage versions are referenced to atmospheric pressure and provide an output proportional to pressure variations from atmosphere.

The NBP Series sensors are intended for use with non-corrosive, non-ionic gases, such as air and other dry gases and for non-corrosive, non-ionic liquids. All products are designed and manufactured according to ISO 9001.

VALUE TO CUSTOMERS

- **Cost-effective:** These devices provide a cost-effective pressure sensing solution with a variety of options that allow customers to meet their specific application needs
- **Honeywell brand:**
 - **Manufacturing excellence:** Honeywell has more than 100 years of manufacturing and engineering excellence
 - **Fast Request for Quotes (RFQs):** Responding quickly to your RFQs and product sample needs is a hallmark of Honeywell. Our experienced engineers understand the importance of timely quotes. And because Honeywell is a manufacturer, you can depend on a quick response to your prototype needs.
 - **Fast response for samples:** Dedicated teams and manufacturing processes ensure that product samples are shipped quickly and delivered in time to support your demanding product development cycle
 - **Reliable supply chain:** Honeywell's effective inventory management and dependable supply chain is there throughout your development cycle
 - **Designed to Six Sigma standards:** Six Sigma standards provide the highest level of product quality, performance, and consistency. Six Sigma provides confidence that the sensor will perform to specification. Many competitive products are produced to lower Sigma tolerances, which may result in some products not performing to the specification to which they were designed.
 - **Supporting documentation:** Honeywell's website provides numerous technical materials to assist you in your application needs

Basic Board Mount Pressure Sensors: NBP Series—Uncompensated/Unamplified

FEATURES AND BENEFITS

- **Small Size:** Package size (as small as 7 mm x 7 mm [0.276 in x 0.276 in]) is very small when compared to most board mount pressure sensors, occupying less space on the PCB and typically allowing for easy placement on crowded PCBs or in small devices
- **Durable:** Many features allow for use in tough environments, including:
 - Wide operating temperature range from -40 °C to 125 °C [-40 °F to 257 °F]
 - Media compatibility options:
 - Non-gel coating: The input port is limited to non-corrosive, non-ionic media such as dry air and gases and should not be exposed to condensation; the gases are limited to media that are compatible with the high temperature polyamide, silicone, alumina ceramic, silicon, gold and glass
 - Gel coating: Uses the same materials in the wetted media path but are protected from condensation by a silicone-based gel coating; allows use in applications where condensation can occur but isn't intended for use in applications with liquids
 - ISO 9001 compliance
- **Flexible:** Numerous package styles, pressure ranges, housings, gel coating, and porting options simplify integration into the device manufacturer's application

POTENTIAL APPLICATIONS

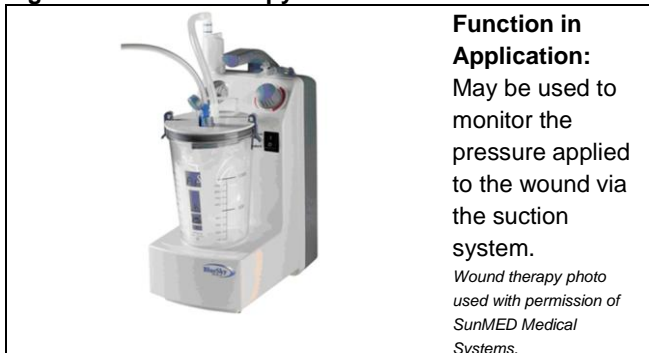
Figures 2 through 5 show a variety of potential applications in which the Basic Board Mount Pressure Sensor-NBP Series may be used.

MEDICAL

Wound Therapy

Wounds may be caused by burns, ulcers, surgery, accidents, or pressure sores (e.g., bedsores). Physicians may use negative-pressure wound therapy (NPWT) to promote healing by creating controlled negative pressure over the wound, helping to promote healing. (See Figure 2.)

Figure 2. Wound Therapy Machine



Benefits to Customer:

- Provides maximum therapeutic effect without causing the patient harm.
- Optimizes therapy so you get the desired suction that won't harm the patient.

Hospital Beds

A hospital bed is designed to be adjustable for patients to ease comfort and to provide patient accessibility by physicians and the nursing staff. The air mattress bed style is generally intended for long-term use by the patient. (See Figure 3.)

Figure 3. Hospital Bed



Benefits to Customer:

- Maintains proper level of pressure so that the firmness can be controlled regardless of patient's weight. The proper control of the pressure improves patient comfort.
- Additionally, by helping to facilitate alternating the pressure in the different zones of the mattress, the incidence of bedsores can be reduced. It has been found that by creating different zones in the bed and by alternating the pressure in the various zones, the pressure points experienced by the patient can be varied, which helps prevent bedsores in patients that use the bed for extended use.

Basic Board Mount Pressure Sensors: NBP Series—Uncompensated/Unamplified

Oxygen Concentrators

An oxygen concentrator reduces the amount of nitrogen in the air, thereby increasing the oxygen level delivered to the patient. Oxygen concentrators are used with patients, such as those with lung disease, who have difficulty absorbing oxygen into the blood stream. (See Figure 4.)

Figure 4. Oxygen Concentrator



Function in Application:

May be used to monitor the pressure internally in the sieve bed so that the sieve bed can generate the required oxygen levels to the patient.

Air is comprised mostly of nitrogen (78%) and approximately 21% oxygen. By removing the nitrogen from the air, the concentration of oxygen is significantly increased. There are two sieve beds with zeolite materials that are pressurized with air. By pressurizing the air, the zeolite sieve bed absorbs the nitrogen. The higher the pressure, the more nitrogen is absorbed by the bed, thereby providing a higher concentration of oxygen to the patient.

May also be used to detect when the patient begins to inhale so that oxygen can then be delivered efficiently and effectively.

Benefits to customer:

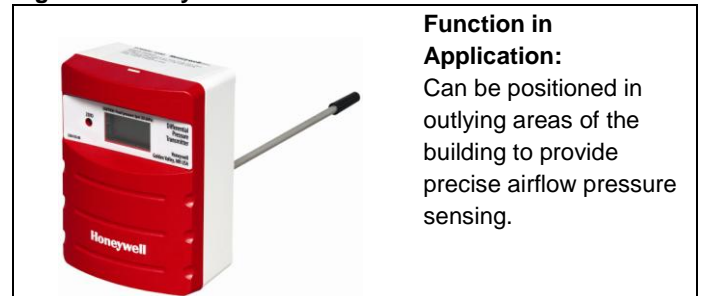
- Controlling the pressure in the sieve bed helps control the concentration of oxygen in the air for the patient. The use of a pressure sensor to monitor when the patient begins to inhale helps to enhance system response time and minimize wasting oxygen when the patient isn't inhaling. This allows the oxygen concentrator to be smaller and to operate more efficiently.
- Smaller equipment size also means lower power consumption, as well as greater portability.

INDUSTRIAL

HVAC Transmitters

Many buildings do not have HVAC system controls in all sections of the building. Instead, transmitters are used in a particular branch of the system so the HVAC master controller can adjust its airflow delivery to those different branches based on information the transmitters send to the HVAC master controller. (See Figure 5.)

Figure 5. Honeywell Transmitter



Function in Application:

Can be positioned in outlying areas of the building to provide precise airflow pressure sensing.

Customer Benefits

- Cost-effective: Reduces system costs by eliminating the need for multiple HVAC system controllers.

Basic Board Mount Pressure Sensors: NBP Series— Uncompensated/Unamplified

WARRANTY/REMEDY

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgement or consult your local sales office for specific warranty details. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace, at its option, without charge those items it finds defective. **The foregoing is buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall Honeywell be liable for consequential, special, or indirect damages.**

While we provide application assistance personally, through our literature and the Honeywell web site, it is up to the customer to determine the suitability of the product in the application.

Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this printing. However, we assume no responsibility for its use.

SALES AND SERVICE

Honeywell serves its customers through a worldwide network of sales offices, representatives and distributors. For application assistance, current specifications, pricing or name of the nearest Authorized Distributor, contact your local sales office or:

E-mail: info.sc@honeywell.com

Internet: www.honeywell.com/sensing

Phone and Fax:

Asia Pacific	+65 6355-2828 +65 6445-3033 Fax
Europe	+44 (0) 1698 481481 +44 (0) 1698 481676 Fax
Latin America	+1-305-805-8188 +1-305-883-8257 Fax
USA/Canada	+1-800-537-6945 +1-815-235-6847 +1-815-235-6545 Fax

Sensing and Control
Honeywell
1985 Douglas Drive North
Golden Valley, MN 55422
www.honeywell.com/sensing

008244-1-EN
July 2012
Copyright © 2012 Honeywell International Inc. All rights reserved.

Honeywell