EMBEDDED PRODUCTS FOR HOSPITAL APPLICATIONS
PRODUCT OVERVIEW

Embedded sensors, switches, scan engines and barcode decoding software may potentially be used throughout a hospital to enhance patient care. Honeywell’s products are designed to provide enhanced quality and durability for the most stringent hospital requirements.
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<th>CUSTOMER BENEFITS</th>
<th>HONEYWELL PRODUCTS</th>
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| **Bed/Chair**    | Electronically adjust bed and chair position and monitor therapeutic mattress air columns. | **Magneto resistive Sensor IC**: provides reliable, accurate output for smooth motor control that reduces noise and vibration.  
**MICRO SWITCH Position Switch**: determines minimum and maximum position.  
**Pressure Sensor - Board Mount**: measures air pressure and controls mattress air column inflation/deflation to prevent bedridden patients from developing bedsores. |
| **Dialysis Machine** | Enhance patient treatment efficiency. | **Force Sensor**: detects the presence/absence of a fresh dialysate cartridge before machine can be used; monitors dialysate flexible tubing pressure so the pressure doesn’t exceed a specified level; monitors dialysate weight to detect whether there is a specified amount in the fresh cartridge.  
**Hall-Effect Magnetic Position Sensor IC**: provides reliable, accurate output for smooth motor control that reduces noise and vibration in the motor assembly.  
**Pressure Sensor – Board Mount**: obtains a direct, in-line continuous dialysate and venous pressure measurement in the dialysis membrane without interrupting flow.  
**Pressure Transducer – Heavy Duty**: helps to monitor fresh dialysate cartridge pressure in the flexible tubing that carries blood or dialysate to provide continuous feedback of line pressures and pump control.  
**Thermistor**: provides temperature measurement for enhanced control of the permeation rate across the dialysis membrane. |
| **Infusion Pump** | More accurately control fluid flow and minimize overheating. | **Device with an Embedded Honeywell Barcode Reader**: tethered barcode readers support identification and delivery process.  
**Force Sensor**: provides an occlusion detector to detect blockage in the pump’s tube that delivers medication to the patient.  
**Hall-Effect Magnetic Position or Magneto resistive Sensor IC**: provides reliable, accurate output for smooth motor control that reduces noise and vibration in the pump’s motor assembly and improves efficiency.  
**Pressure Sensor – Board Mount**: monitors and controls fluid flow. |
| **Oxygen Concentrator** | Enhance response time, minimize oxygen waste, reduce power consumption and improve portability. | **Airflow Sensor**: detects ultra-low levels at 0.1 cm3 to detect when the patient exhales and when the system should reduce airflow.  
**Pressure Sensor – Board Mount**: detects when the patient begins to inhale so that oxygen can be delivered more efficiently and effectively.  
**Pressure Switch**: acts as a high-pressure warning, alerting the user by activating an indicator light if the pressure exceeds a specified limit.  
**Pressure Transducer – Heavy Duty**: senses pressure from the surge tank, providing feedback to the compressor that allows it to maintain the desired pressure level. |
| **Patient Monitoring** | More accurately control blood glucose and temperature monitoring. | **Barcode Decoding Software**: enables tracking of the patient via a mobile device.  
**Pressure Sensor – Board Mount**: controls the pumps used to draw the blood in continuous glucose monitors and returns it to the patient.  
**Thermistor**: monitors patient temperature. |
# CUSTOMER BENEFITS

## Honeywell Products

### Automated Medication Dispensing Cabinets
- More accurate dispensing of medication to the patient.
- Devices with an Embedded Honeywell Barcode Reader or Barcode Decoding Software: enables scanning of the labels for positive confirmation of patient and clinical information
- Hall-Effect Magnetic Position or Magnetoresitive Sensor IC: enables remote locking and unlocking of medication-dispensing cabinet drawers

### Sleep Apnea Machine
- Help sleep apnea sufferers achieve quiet, uninterrupted sleep.
- **Airflow Sensor**: monitors the patient’s breathing and sends an output that reduces the flow of the machine’s internal blower fan when the patient starts to exhale
- **Hall-Effect Magnetic Position Sensor IC**: provides enhanced output accuracy for smooth motor control that reduces noise and vibration in motor assembly fan systems
- **Humidity Sensor**: monitors the amount of humidified air to provide adequate air moisture to the patient
- **Pressure Sensor – Board Mount**: monitors the pressure of air that is delivered to the patient
- **Thermistor/Pre-Packaged Temperature Probe**: provides warm, moist air

### Spirometer
- Enhance treatment efficiency.
- **Airflow Sensor**: measures the airflow from the patient upon exhalation
- **Pressure Sensor – Board Mount**: measures the pressure drop in a flow tube as the patient is inhaling and exhaling, which is used to calculate the volume of air in the lung

### Workflow Solutions
- Verify patient identification.
- Devices with an Embedded Honeywell Barcode Reader: enables scanning of the label for positive confirmation of patient and clinical information

### Wound Therapy
- Optimize therapy and safety with sensors that provide the desired therapy.
- **Pressure Sensor – Board Mount**: monitors the pressure applied to the wound via the suction system, as set by the physician

### Infant Incubator
- Help maintain comfortable conditions and a condensation-free chamber for newborn babies who require controlled environments for observation and care.
- **Humidity Sensor**: monitors the system to maintain a desired level of humidification with accurate dew-point and absolute humidity/moisture measurement
- **Thermistor**: monitors temperature

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**PHARMACY**

**WELL NEWBORN NURSERY**
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| Analyzer Equipment                                     | **Airflow Sensor:** provides sensing for sample injector and mobile/stationary phase (chromatography)  
**Hall-Effect Magnetic Position Sensor IC:** provides open/closed cover, trap or door detection (chemistry analyzer); provides pump unit position detection (chromatography)  
**Humidity Sensor:** provides system leakage detection and measurement of temperature and humidity versus ambient (chemistry analyzer)  
**MICRO SWITCH Basic Switch:** provides detection of covers, doors and drawers (blood/chemistry analyzers, chromatography, cytometry/cellular analysis, molecular diagnostics/PCR)  
**Optical Sensor:** provides sample identification through barcode (blood analyzer, cytometry/cellular analysis, molecular diagnostics/PCR); measures robotic element/vial position (chemistry analyzer); detects sample loading home/autoloading carousel position (chromatography)  
**Pressure Sensor – Board Mount:** regulates pump pressure to draw and transport samples (blood analyzer); measures pipette pressure for air/obstruction detection and pump/flushing systems (chemistry analyzer)  
**Pressure Sensor – Board Mount or Pressure Transducer – Heavy Duty:** measures fluid volume and detection of air and occlusion in pipetting system (blood analyzer, cytometry/cellular analysis, molecular diagnostics/PCR); provides sensing for sample injector and mobile/stationary phase (chromatography)  
**Pressure Transducer – Heavy Duty:** provides an alternative to board mount sensing for pump monitoring and flushing systems (chemistry analyzer)  
**Barcode Scan Engine or Barcode Decoding Software:** obtains positive patient confirmation, and often a brief code of the physician’s order, before sampling (blood/chemistry analyzer, chromatography, cytometry/cellular analysis, molecular diagnostics/PCR)  
**Thermistor or Temperature Sensor:** monitors chamber temperature, diffusion lamps and oil-cooled motors to help prevent overheating (blood analyzer); monitors reagent and sample temperature (chemistry analyzer); cools sample and flow cell; provides temperature sensing (cytometry/cellular analysis) |
| Specimen Warming Incubators                           | **Humidity Sensor:** monitors the system to maintain an accurate dew-point and absolute humidity/moisture measurement in the chamber  
**Thermistor:** measures air stream temperature |
<p>| Protect specimens with sensors that help maintain optimal environmental conditions. |</p>
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| **Anesthesia Delivery System** | Achieve a more accurate, constant supply of gases and vapor with sensors that enhance patient treatment. | **Airflow Sensor**: measures air, oxygen and nitrous oxide flow so specified mixture, as set by the doctor, is delivered  
**Hall–Effect Magnetic Position Sensor IC**: provides enhanced output accuracy for smooth motor control that reduces noise and vibration in motor assembly fan systems  
**Pressure Sensor – Board Mount or Pressure Transducer – Heavy Duty**: measures air and oxygen pressure so that they do not exceed a desired level  
**Thermistor**: monitors and controls air temperature |
| **Patient Monitoring** | Obtain more accurate blood pressure/respiratory monitoring. | **Airflow Sensor**: monitors patient’s respiratory function  
**Pressure Sensor – Board Mount**: measures blood pressure |
| **Surgical Instruments** | Enhance patient treatment with more accurate and reliable sensors. | **Force Sensor**: regulates fluid management system pump head pressure  
**Pressure Sensor – Board Mount**: senses joint pressure during arthroscopic surgery; monitors insufflator pressure during endoscopy |
| **Ventilator** | Rely on sensors that enhance patient comfort and therapy effectiveness. | **Airflow Sensor**: measures air and oxygen flow so specified mixture, as set by the doctor, is delivered  
**Hall–Effect Magnetic Position Sensor IC**: provides enhanced output accuracy for smooth motor control that reduces noise and vibration in motor assembly fan systems  
**Humidity Sensor**: provides warm, moist air when coupled to a microcontroller that measures the air stream humidity and then signals the controller that the desired level of moisture is present  
**Pressure Sensor – Board Mount**: measures air and oxygen pressure so that the pressure doesn’t exceed a desired level  
**Pressure Transducer – Heavy Duty**: provides a sensing solution when high pressure, steel pressure port interface and/or corrosive media are used  
**Thermistor**: monitors and controls the air temperature |
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