

Sensors and Switches for Potential Medical Applications

Pressure Sensors - Board Mount



Force Sensors



Airflow Sensors



Magnetic Sensor ICs



Temperature Sensors



Humidity Sensors



Position Sensors - SMART



Pressure Switches



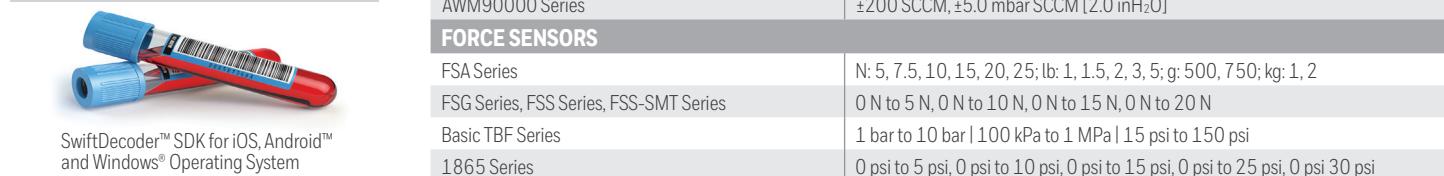
Value-Added Solutions



Barcode Scan Engines



Barcode Decoding and Character Recognition Software



Pressure, Airflow, and Force Sensor Ranges

PRESSURE SENSORS - BOARD MOUNT

TruStability™ RSC, HSC, SSC, TSC, NSC Series	±1.6 mbar to ±10 bar ±160 Pa to ±1 MPa ±0.5 inH ₂ O to ±150 psi
Basic ABP, TBP, NBP Series	±60 mbar to ±10 bar ±6 kPa to ±1 MPa ±1 psi to 150 psi
MicroPressure MPR Series	±40 mbar to ±2.5 bar ±4 kPa to ±250 kPa ±0.6 psi to ±30 psi
24PC Series	0.5 psi to 250 psi (SIP, DIP), 1 psi to 15 psi (SMT)
26PC Series	1 psi to 250 psi (SIP, DIP), 1 psi to 15 psi (SMT)
26PC Flow-Through Series	1 psi to 150 psi

PRESSURE TRANSDUCERS - HEAVY DUTY

13 mm Series	0 psi to 500 psi through 0 psi to 5000 psi
19 mm Series	0 psi to 3 psi through 0 psi to 500 psi
MLH Series	0 psi to 50 psi through 0 psi to 8000 psi
SPT Series	0 psi to 3 psi through 0 psi to 5000 psi

AIRFLOW SENSORS

HAF Series-High Accuracy	±50 SCCM to ±750 SCCM, 10 SLPM to 300 SLPM
AWM40000 Series	±25.0 SCCM, 1.0 SLPM, 6.0 SLPM
AWM700 Series	300 SLPM
AWM90000 Series	±200 SCCM, ±5.0 mbar SCCM [2.0 inH ₂ O]

FORCE SENSORS

FSA Series	N: 5, 7.5, 10, 15, 20, 25; lb: 1, 1.5, 2, 3, 5; g: 500, 750; kg: 1, 2
FSG Series, FSS Series, FSS-SMT Series	0 N to 5 N, 0 N to 10 N, 0 N to 15 N, 0 N to 20 N
Basic TBF Series	1 bar to 10 bar 100 kPa to 1 MPa 15 psi to 150 psi
1865 Series	0 psi to 5 psi, 0 psi to 10 psi, 0 psi to 15 psi, 0 psi to 25 psi, 0 psi to 30 psi

Anesthesia Delivery Machines

- Airflow sensors measure air, oxygen, and nitrous oxide flow
- Magnetic sensor ICs enable smooth motor control that reduces noise/vibration
- Pressure sensors may be used to meter and measure the anesthesia gas so that pressure doesn't exceed the desired level
- Thermistors enable accurate air temperature control
- Value-added TruStability™ board mount pressure sensor assembly transforms anesthesia liquid into a gas

Dental Equipment

- Magnetic sensor ICs enable accurate motion control and positioning of the dental imaging system and promote energy efficiency in hand-held, battery-operated dental equipment
- Pressure sensors keep water flow constant in dental instruments, allowing smooth operation

Hospital Diagnostics

- Airflow sensors in gas chromatography equipment regulate the flow rate to eliminate outgassing
- Barcode scan engine or barcode decoding software obtain 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)
- Pressure sensors in blood analyzer pump systems regulate pressure to draw/transport samples
- Pressure sensors in gas chromatography equipment sense and control gas stream pressure to maintain a constant, precise flow
- Thermistors in blood analyzers monitor chamber, diffusion lamp, and motor temperature to prevent overheating

Hospital Hardware

- Embedded barcode reader or barcode scanning software enables the ability to scan labels for positive patient confirmation and clinician information
- Humidity sensors maintain temperature and humidity levels in incubators and microenvironments
- Magnetic sensor ICs enable locking/unlocking of medication dispensing cabinets
- Magnetic sensor ICs in exercise equipment may be used as an emergency stop switch, to count RPM, and to determine incline position
- Magnetic sensor ICs in hospital beds determine bed adjustment end and beginning positions
- MICRO SWITCH subminiature basic switches determine min/max position of electrically adjustable hospital beds
- Position sensors (SMART Arc) in hospital beds monitor backrest elevation which helps ensure the proper angle is maintained
- Pressure sensors control a hospital bed's air columns to help prevent patients from developing bedsores
- Pressure sensors measure pressure in blood pressure monitors
- Pressure switches in hospital gas distribution systems indicate to a control panel that the main pressure tank is empty and needs to be replaced
- Thermistors monitor the incubator system's temperature
- Thermostats in patient warmers control or limit temperature

Hospital Rooms

- Pressure sensors monitor airflow rates to provide continuous positive or negative air pressure to prevent contamination

Infusion, Insulin, Syringe Pumps

- Force sensors detect blockage in the pump's tube that delivers medication
- Infrared sensors are used with an encoder wheel on the pump shaft to count shaft rotation
- Magnetic sensor ICs enable smooth motor control that reduces noise and vibration (infusion, insulin pumps only)
- Pressure sensors monitor and control the flow of fluid

Kidney Dialysis Machines

- Embedded barcode reader that is tethered to the equipment supports the identification and delivery process
- Force sensors detect the presence/absence/weight of a dialysate cartridge and monitor flexible tubing pressure
- Magnetic sensor ICs enable smooth motor control that reduces noise/vibration
- Pressure sensors obtain dialysate and venous pressure measurements without interrupting flow

For more information

Honeywell Sensing and Internet of Things services its customers through a worldwide network of sales offices and distributors. For application assistance, current specifications, pricing or the nearest Authorized Distributor, visit sensing.honeywell.com or call:

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To learn more about Honeywell's scan engines and barcode software, visit honeywellaidc.com.

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- Pressure transducers monitor pressure in the cartridge's flexible tubing
- Thermistors provide enhanced temperature control of the permeation rate across the dialysis membrane
- Thermostats control or limit temperature
- Thermostats in peritoneal dialysis machines may be used for heater tray control

Oxygen Concentrators

- Airflow sensors detect ultra-low airflow levels that sense when the patient exhales for efficient oxygen delivery
- Pressure sensors detect when the patient begins to inhale for efficient oxygen delivery
- Pressure sensors sense surge tank pressure for accurate compressor pressure levels
- Pressure switches alert the user when the pressure exceeds a specified limit

Patient Monitoring Systems

- Barcode scanner software enables the ability to track the patient via a mobile device
- Pressure sensors in blood glucose monitoring equipment control the pumps used to extract and return blood so that the pressure doesn't rupture the veins
- Pressure sensors in nebulizers carefully monitor airflow rates so that the specified amount of medicine, amid a humid environment, is delivered to the patient
- Pressure sensors in spirometers measure in/out patient airflow
- Pressure sensors monitor blood pressure
- Thermistors in temperature monitoring equipment monitor temperature

Pneumatic Circuit Control

- Pressure sensors control pneumatic flow and system pressure for efficient performance in respiratory breathing circuits (nebulizers, spirometers, patient monitoring), flow/pressure control (therapeutic hospital beds), gas collection/delivery (hospital gas supply, oxygen concentrators) and sampling/gas flow (blood analysis, gas chromatography, analytical instrument sampling systems)

Sleep Apnea Machines

- Airflow sensors monitor breathing and send an output to reduce airflow when the patient exhales
- Bimetallic commercial thermostats on-board (stand-alone) devices on flexible heaters control temperature without adding associated software or electronics
- Humidity sensors monitor the air to provide adequate moisture
- Magnetic sensor ICs enable smooth motor control that reduces noise/vibration
- Pressure sensors monitor the delivered air pressure
- Thermistors and pre-packaged temperature probes provide warm, moist air

Spirometers

- Airflow sensors measure the airflow from the patient upon exhalation
- Pressure sensors measure in/out patient airflow

Surgical Equipment

- Force sensors regulate a fluid management system's pump head pressure
- Position sensors (SMART Arc) in robotically assisted surgery equipment control robotic arms that hold the articulated instrument tips
- Pressure sensors in surgical fluid management systems sense joint site pressure during arthroscopic surgery

Ventilators

- Airflow sensors measure air and oxygen flow so the correct amount is delivered to the patient
- Humidity sensors deliver warm, moist air to the patient
- Magnetic sensor ICs enable smooth motor control, reducing noise/vibration
- Pressure sensors detect when the breath changes from inhalation to exhalation to measure in/out patient airflow
- Pressure transducers allow use in corrosive media
- Thermistors monitor and control air temperature

Consumer Medical (Pressure Sensors)

- Measure pressure in non-invasive blood pressure monitoring
- Monitor pressure applied to the wound via the suction system in negative-pressure wound therapy
- Measure partial vacuum on the suction side of miniature pumps, such as breast pumps, to provide continuous suction pressure monitoring
- Monitor water level in CPAP water tanks
- Provide pressure measurement in medical wearables

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