

Honeywell Medical Industry Products

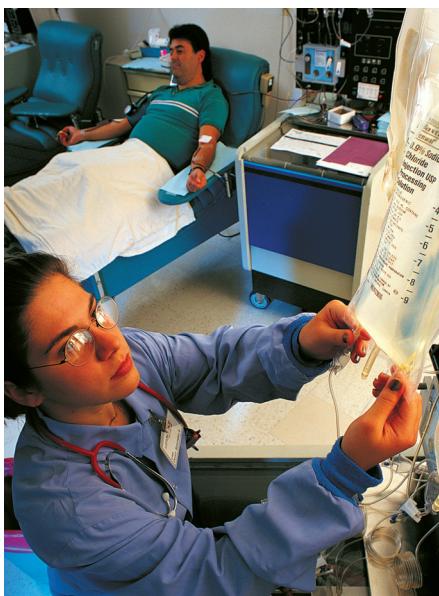


SENSING AND CONTROL

**Your Partner in Innovation and
Custom Assemblies**

Honeywell

Medical Application Solutions



In the medical equipment business, product quality and reliability are top priorities.

Honeywell Sensing and Control offers a wide variety of sensing and control products that provide greater reliability, longer product life and greater accuracy... all at the lowest total cost. Our Six Sigma Plus culture enables our sensors, custom subassemblies and control products to provide quality right out of the box along with superior, lasting performance down the line.

You won't need to compromise when selecting a solution from our variety of technology platforms. They're backed by Honeywell's continual technology development, which has been producing innovative customer solutions for more than 150 years. You'll get products designed to survive in your demanding environments because of our expertise integrating sensing technologies into application-specific packaging.

Experience Matters.

Our robust product designs and extensive testing facilities bring you products from Honeywell that have the quality you have come to depend on. We have built a reputation you can trust.

- Over 65 years in the sensor business
- Experience in the medical, automotive-on-board and aviation industries
- A 25-year history of providing sensors to the medical equipment industry



We offer one of the broadest product portfolios in the world.

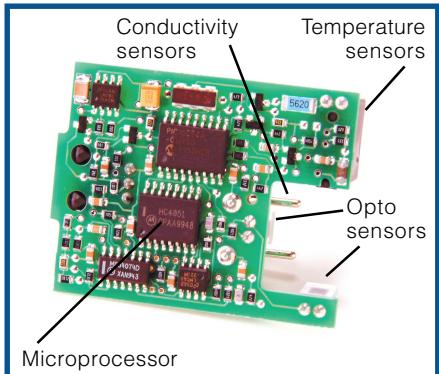


We provide sensing and control solutions through:

- **Collaboration** – more efficient design and manufacturing
- **Support** – unsurpassed application expertise
- **Product Choice** – broadest product portfolio in the industry
- **Customization** – customer-specific solutions and subassemblies
- **Consolidation** – multiple sensing technologies in a single device
- **Six Sigma Plus** – cost-effective solutions that work
- **Globalization** – we are where you are

Customer-Specific Assemblies...

Choice. Design. Support. Expertise. Customization.



Multiple sensing technologies...
incorporated into one
assembly



Custom packaging...
ASIC integrated into a
pressure sensor



Custom assembly...
calibrated and ready to install

Customer-Specific Assembly (CSA) is an innovative program designed to meet the needs of companies that would prefer to have a PCB or sensor subassembly designed specifically for them.

Improved time-to-market and lower costs...

- Reduce production cycle time – we do the sensor interface and calibration.
- Ease of manufacturing – we provide a plug-and-play assembly to your control circuitry.
- Vendor reduction – we produce both the PCB assembly and multiple sensor technologies.

Calibrated, tested, and ready to plug in...

Honeywell can provide sensor subassemblies with integrated calibration, signal filtering and self-diagnostics, as well as custom packaging.

- Design solutions that you can simply plug into your equipment.
- Multiple sensing technologies incorporated in one package, including an ASIC for ease of interface.

Broad sensing and control portfolio created with experience...

Customers looking for more efficient design and manufacturing turn to us.

- Choose from one of the broadest sensing and control product portfolios in the industry.
- Utilize our unsurpassed applications expertise.
- Rely on us when you need something special. Unique medical applications cannot always be solved with standard products.

What Are Customer-Specific Assemblies?

Customer-specific assembly, plus calibration and/or “intelligence” integrated on a sensor

- Data transformation
- Signal filtering
- Analog-to-digital conversion
- Self-diagnostics
- Control logic
- Memory
- Bus communication compatibility

Custom packaged, multiple sensors in one package

- For example, a pressure/temperature sensing combination

Custom assembly

- Including packaged sensor, leads/harness and calibration ready for installation

Benefits:

Subassembly functionality verified by the sensor experts

Minimal redundancy in signal conditioning on the transducer

- Microprocessor driven

Optimizing performance

- Multiple sensing technologies calibrated to your interface circuitry

Pressure, Airflow & Force Solutions

The right products for your applications

By offering you one of the broadest sensing portfolios in the world — and by offering you expert advice through our global sales and distribution channels, we help you get the right product for your application.



Microstructure Technology

Pressure Sensors

Contain sensing elements that consist of four piezoresistors buried in the face of a thin, chemically-etched silicon diaphragm. A pressure change causes the diaphragm to flex, inducing a stress or strain in the diaphragm and the buried resistors. The resistor values change in proportion to the stress applied and produce an electrical output.

- Unamplified or signal conditioned amplified pressure sensors cover a pressure range of 0 bar to 17.24 bar [0 psi to 250 psi]
- Absolute, differential, gage or vacuum gage
- Variety of mounting and package styles
- Digital output

Airflow Sensors

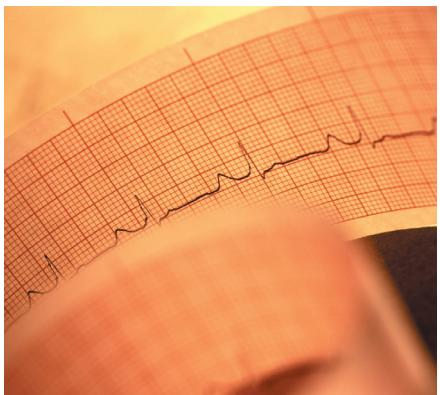
Contain a silicon chip based on advanced microstructure technology consisting of a thin film, thermally-isolated bridge structure with heater and temperature sensing elements. The bridge structure provides a sensitive and fast response to the flow, amount and direction of air or other gas over the chip and provides a proportional output voltage.

- Amplified or unamplified microbridge airflow sensors
- State-of-the-art silicon micromachining
- Sensitive to low flows [0.1 sccm to 20 SLPM]
- Accurate low pressure sensing: 0.003 mBar to 10 mBar [0.0001 in H₂O to 4.0 in H₂O]
- Analog output

Force Sensors

Concentrate force from the application, through the stainless steel plunger, directly to the silicon sensing element. The amount of resistance changes in proportion to the amount of force being applied. This change in circuit resistance results in a corresponding mV output level.

- Stainless steel ball actuator provides excellent mechanical stability and is adaptable to a variety of applications.
- Various electric interconnects include pre-wired connectors, printed circuit board mounting and surface mounting for application flexibility.
- Operating force: 500 g to 1500 g
- Sensitivity: 0.12 mV/g to 0.24 mV/g typical
- Operating temperature range: -40 °C to 85 °C [-40 °F to 185 °F]



Typical Product Applications

Dialysis Treatment, Hemodialysis and Peritoneal Dialysis

- Pressure of blood flow or dialysate flow measurement
- Leak detection
- Fluid movement monitoring

Non-Invasive Blood Pressure

- Blood pressure measurement (pressure or force)

Spirometers

- Airflow measurement

Nebulizers

- System airflow monitoring and measurement

CPAP-BIPAP

- Airflow volume measurement

Oxygen Concentrators and Conservers

- Closed-loop control
- Oxygen supplied on-demand

Sleep Apnea Monitors

- Airflow and pressure measurement

Ventilators

- Leak detection

Infusion Pumps

- Fluid line blockages prevention

Diagnostics and Analytical Equipment

- Pressure and flow monitoring/control

Sensing Solutions for Optoelectronic &

Delivered on time

Through work with Six Sigma Plus and lean manufacturing programs, Honeywell is able to boast on-time-to-promise delivery statistics over 95%. Many of our locations operate at 100%. With an average lead time of only 5 days and distributor stocking programs, we can meet the most stringent of deadlines.



Optoelectronic & Environmental Condition Technology

Infrared Sensors

Integrate optical principles and semiconductor electronics to emit/detect radiant energy in wavelengths over 770 nm (light is not visible). Used for object presence, limit and motion sensing, position encoding and movement counting.

- IREDS (Infrared Emitting Diodes), photodiodes, phototransistors, transmissive and reflective sensors, photodarlington and Optoschmitt detectors
- Components or subassemblies and custom assemblies
- Variety of package styles, materials, and terminations

Relative Humidity Sensors

Contain a capacitive sensing die set in thermoset polymers that interact with platinum electrodes. On-chip signal processing ensures linear voltage output versus % RH (Relative Humidity). Absorption-based humidity sensors provide both temperature and % RH outputs.

- Linear voltage output vs % RH
- Laser trimmed interchangeability
- Low power design
- High accuracy
- Fast response time
- Stable, low drift performance
- Chemically resistant

Temperature Sensors

Use thin film platinum RTDs (Resistance Temperature Detector) that detect a change in temperature and provide a proportional change in output voltage.

- 100 Ω or 1000 Ω versions
- Laser trimmed for accuracy, interchangeability and stable linear outputs
- Supply voltage range: 4 Vdc to 9 Vdc
- Operating speed range: 1 sec to 4 sec
- PCB termination
- Molded plastic package

Hall Effect

Respond to the presence or the interruption of a magnetic field by producing either a digital or an analog output proportional to the magnetic field strength. Digital and analog sensor-only devices are operated by the magnetic field from a permanent magnet or electromagnet.

Hobbs Hour Meters

Elapsed time measurement devices for testing, leasing, maintenance and warranty programs. The meter family includes LCD, Counter, Battery Controller, AC Electromechanical and DC Electromechanical.

Environmental Conditions



Thermal Products

Hermetic, non-hermetic, environmentally-sealed and commercial thermostats, thermal cutoffs/thermal links, heaters, motor and transformer protectors meet a variety of end-product needs.

- Automatic and manual reset versions offer a choice of operating modes
- Very small sensor size and weight
- High capacity up to 40 A resistive
- Environmental exposure range: -62 °C to 316 °C [-80 °F to 600 °F]



Typical Product Applications

- Process monitoring to ensure the system is working accurately
- Position sensing to precise measurements of 1/1000 inch
- Accurate blood glucose monitoring
- Dialysis heating control
- Blood analyzer heating control
- Hypothermia IV: flex heater on heat exchanger
- CAT scan heater-thermal management of X-ray
- Incubator warming
- Respiratory equipment counters and heaters

Honeywell Sensing and Control designs, manufactures and markets the industry's most extensive line of sensing and control technologies available from a single switch or sensor manufacturer. You can trust Honeywell for developing the right products for your applications.

Warranty/Remedy

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Contact your local sales office for warranty information. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace 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.**

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
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