Controls, Monitors, and Pressure Switches   **Honeywell**

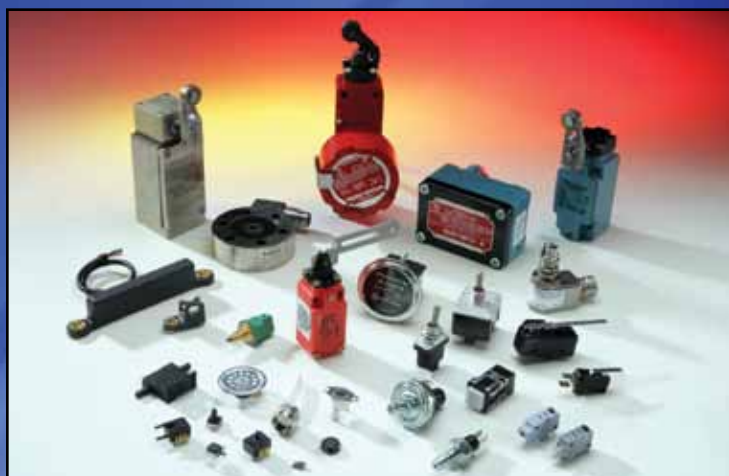**SENSING AND CONTROL**

Product Range Guide

For innovation that's well apart, there's only Honeywell Sensing and Control.

With more than 50,000 products ranging from snap-action, limit, toggle, and pressure switches to position, speed, pressure, and airflow sensors, Honeywell Sensing and Control (S&C) has one of the broadest sensing and switching portfolios available.

Honeywell sensor, switch, and control components are tailored to exact specifications for stronger performance, longer productivity, and increased safety. Enhanced accuracy and durability are built into every part, improving output and endurance. For our customers, this can reduce expenditures and operational costs. Our global footprint and channels help to competitively price such components for your chosen application and provide immediate technical support.

Our expertise in aerospace and defense, transportation, medical, and industrial industries means we offer products and solutions for a wide range of applications. But, an impressive product line is only one part. We possess unique engineering expertise and value-added capabilities.

While Honeywell's switch and sensor solutions are suitable for a wide array of basic and complex applications, our custom-engineered solutions offer enhanced precision, repeatability, and ruggedness. We offer domain knowledge and technology resources, along with a close working relationship, to develop and deliver cost-effective, individually tailored solutions. Whether clean-slate development or simple modifications to an existing design are needed, our expertly engineered solutions help to meet the most stringent requirements with worldclass product designs, technology integration, and customer-specific manufacturing.

With a 75-year legacy in the switch and sensor business, Honeywell S&C has earned a reputation for reliability and excellence. Our strong product designs, Six Sigma Plus manufacturing environment, and robust testing facilities help provide quality out of the box, as well as enhanced, sustainable performance down the line.

Global service, sourcing, and manufacturing. Industry-leading engineers. Value-added assemblies and solutions. Construction to required specifications. A one-stop, full-service, globally competitive supplier... Honeywell Sensing and Control.

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Often used on control panels or machinery in harsh environments, Honeywell key and rotary switches use o-rings to help keep dirt and moisture out of the contact chamber and prolong the switch's life.

Key Series	Integral Connector	Screw Terminal
Connector	MetriPak 280 and Sumitomo	screw
Electrical ratings (res.)	12 Vdc, 20 A; 24 Vdc, 8 A	12 Vdc, 20 A; 24 Vdc, 10 A; 48 Vdc, 4 A
Operating temperature	-40 °C to 85 °C [-40 °F to 185 °F]	-40 °C to 85 °C [-40 °F to 185 °F]
Cycle life at electrical load	25000 cycles	25000 cycles
Position	2 position (off-on); 3 position (off-on-start); 3 position (off-on-start), magnetoground; 4 position (off-on-preheat-start)	2 position (off-on); 3 position (off-on-start); 3 position (on-off-on)
Mounting	panel	panel
Approvals	UL available	UL available
Measurements	Ø 1.62 in x 2.95 in L	Ø 1.62 in x 2.85 in L
Features	can be designed to match existing keys; options for up to 300 unique key codes per part number; environmentally sealed; recoil spring allows momentary positions	can be designed to match existing keys; options for up to 300 unique key codes; environmentally sealed; recoil spring allows momentary positions; sliding precious metal contacts

Rotary Series	Integral Connector
Connector	MetriPak 280 and Sumitomo
Electrical ratings (res.)	12 Vdc, 20 A; 24 Vdc, 8 A
Operating temperature	-40 °C to 85 °C [-40 °F to 185 °F]
Cycle life at electrical load	25000 cycles
Position	3 position (on-off-on); 3 position (off-on-start); 3 position (off-on-on); 4 position (off-on-acc-start); 4 position (off-ignition-ignition heat-start)
Actuator	lever or knob
Mounting	panel
Approvals	UL available
Measurements	Ø 1.62 in x 2.95 in L
Features	environmentally sealed; recoil spring allows momentary positions

Honeywell

Crafted for enhanced off-highway application performance, precision, direction, and speed control. Sealed and built to withstand rugged conditions and harsh environments. Often used in agricultural equipment, construction and material handling equipment, on-highway and military vehicles, motor coaches, and ground support.

Series	Shifter	Turn Signal
Mounting	left, right	–
Column size	38 mm, 45 mm, 55 mm	38 mm, 45 mm, 55 mm
Neutral lock	none, drop-down	–
Speeds	2, 3, 4, and 6	–
Lights	–	turn signal, head lamp switch/dimmer, flash to pass, hazard warning
Wiper speeds	–	1 speed, hi/lo, intermittent
Buttons	horn, wash, drop-down	wash, horn
Connectors	integral Packard, integral Deutsch, wire harness	integral Packard, integral Deutsch, wire harness
Expected life cycle	1 million (rotary); 500000 (shifter handle)	50000 cycles
Lever	3 million (with drop-down neutral lock); 1 million (without drop-down neutral lock)	–
Operating temperature range	-40 °C to 85 °C [-40 °F to 185 °F] (0 % to 95 % relative humidity)	-40 °C to 85 °C [-40 °F to 185 °F] (0 % to 95 % relative humidity)
Operating volt. range	3 V to 32 V	3 V to 32 V
Handle dead weight	160 lb [712 Newtons]	160 lb [712 Newtons]
Solenoid load	2 A @ 12.8 V with arc suppression	2 A @ 12.8 V with arc suppression
Measurements	Ø 65,02 mm x 220,47 mm L [Ø 2.56 in x 8.68 in L]	Ø 65,02 mm x 232,16 mm L [Ø 2.56 in x 9.14 in L]
Features	IP67; turn signals are built to complement the shifter, or can also be mounted as stand alone	

Series	Proportional Retarder
Travel	25° maximum angle travel
Supply voltage	9 Vdc to 32 Vdc (12 Vdc to 24 Vdc operating system)
Base frequency	500 Hz, ±10 % over temperature and input voltage
Duty cycle	10 % to 90 %, ±5 % at limits of travel
Output voltage	pulse-width-modulated, 0 V to 7 V amplitude
Wiring and connection	receptacle compatible with positive locking Deutsch DT06-6S connector with 18 AWG (minimum wiring to conform to 1E815)
Measurements	Ø 65,02 mm x 220,47 mm L [Ø 2.56 in x 8.68 in L]
Features	sealed, positive-locking connector; reverse voltage, short circuit, and over voltage protection

Robust, environmentally sealed, sliding contact switch incorporating two circuits with multiple combinations. Potential applications include control panels or machinery in harsh environments, including construction, agriculture, marine, material handling, military, machine tools, and mining.

Series	Push-Pull
Connector	screw
Position	2NO circuits in push; 2NC circuits in push; 1NO/1NC circuit
Cycle life	25000 cycles (rotary)
Mounting	panel
Chamber sealing	o-ring (IP67 sealing)
Measurements	Ø 45,21 mm [Ø 1.78 in]
Temperature	-40 °C to 100 °C [-40 °F to 212 °F]
Electrical rating	12 Vdc to 14 Vdc, 20 A; 24 Vdc, 10 A
Features	UV resistant button for outdoor use; moisture, contamination, and vibration resistant; sliding contacts; momentary switch option; knob available in a variety of colors

Series	Handlebar and Custom Controls
Features	custom controls designed for most applications requiring multi-functional electrical/electromechanical applications: throttle controls, indicator lights, custom switches, and integrated panel assemblies. Honeywell possesses switch design and packaging expertise when engineering complete, competitive, custom designs. all custom control products are designed to meet customers' specifications.

Description of controls and indicator panels

LEFT HAND CONTROL
- Compact design offers small profile control with high functionality

Offers up to seven independent functions
- Electrical loads up to 14 A, 12 V, varies by function

Wire harness
- Length, wire colors, and connector type fully customizable

Accessory mounting features
- Located on bottom of control
- Allows for optional accessory modules such as: airflow choke (standard offering option), custom auxiliary function

Electrical circuit customizations
- Custom circuit designs allow for customer specific electrical customization while leveraging cost benefits of using platform components for the rest of a control assembly

RIGHT HAND CONTROL
- Two- or three-position switch available
- Adjustable cable travel

Wire harness
- Length, wire colors, and connector type fully customizable

Throttle cable seating
- Can be customized to fit any size or thread type

Micro switch
- Provision for optional micro switch

Electrical circuit customizations
- Custom circuit designs allow for customer specific electrical customization while leveraging cost benefits of using platform components for the rest of a control assembly

Honeywell

Pressure and Vacuum Switches

Feature set points ranging from 0.5 psi to 3000 psi. These rugged components have enhanced repeatability of set points and wide media capability. Potential applications include transmissions, hydraulics, brakes, power steering, fuel pressure, oxygen concentrators, dental air, generators/compressors, and pool/spa water pressure.

Series	Series 1000	5000 Pressure
Type	hydraulic brake pressure switch	direct action blade contact
Set point range	20 psi ±10 psi [1,37 bar ±0,69 bar]	factory set: 0.5 psi to 150 psi
Vacuum	–	–
Contacts	silver-plated copper contacts	composite-gold plate
Oper. pressure	1200 psi	150 psi for 0.5 psi to 24 psi; 250 psi for 25 psi to 150 psi
Proof pressure	2400 psi	500 psi
Burst pressure	4800 psi	750 psi for 0.5 psi to 24 psi; 1250 psi for 25 psi to 150 psi
Connector	M10 x 1.25 banjo fitting (single or double); M10 x 1; 1/8-27 NPT	1/8-27 NPT male thread; piston 1/2-20 UNF
Terminals	1/4 in blade	#8-32 screws, 1/4 in blade, MetriPak 280
Dimensions	Ø 18 mm hex x 54,10 mm [2.13 in] L	Ø 1.47 in x 2.3 in L (screw); Ø 1.47 in x 2.9 in L (MetriPak 280)
Features	IP65; low set point; high burst rating; banjo bolt fitting	stands up to extended-duty applications; factory set, capable of field adjustment; direct acting blade; no dead band; Kapton™ diaphragm

FOR SALE IN EMEA ONLY

FOR SALE IN EMEA ONLY

Series	PBN1	PBN3
Type	direct action blade contact	snap-action switch
Set point range	0.018 psi to 1.8 psi	0.036 psi to 40.0 psi
Contacts	gold inlay	silver
Operating pressure	6 psi for 0.018 psi to 0.108 psi; 12 psi for 0.144 psi to 1.8 psi	12 psi for 0.036 psi to 2.71 psi; 60 psi for 3.0 psi to 40.0 psi
Proof pressure	8 psi for 0.018 psi to 0.108 psi; 15 psi for 0.144 psi to 1.8 psi	15 psi for 0.036 psi to 2.71 psi; 100 psi for 3.0 psi to 40.0 psi
Burst pressure	30 psi	60 psi for 0.036 psi to 2.71 psi; 150 psi for 3.0 psi to 40.0 psi
Connector	5 mm smooth perpendicular, 5 mm barbed radial	5 mm smooth perpendicular, 5 mm barbed radial
Terminals	4,8 mm x 0,5 mm blades	6,3 mm x 0,8 mm blades
Approvals	FOR SALE IN EMEA ONLY	FOR SALE IN EMEA ONLY
Features	sensitive to ultra-low pressures; gage, vacuum, and differential measurement	high current switching capacity; sensitive to low gage pressures

III Pressure	V Pressure	5000 Vacuum	III Vacuum
snap-action switch	snap-action switch	direct-action blade contact	snap-action switch
factory set: 1 psi to 70 psi	factory set: 35 psi to 300 psi; 100 psi to 3000 psi	factory set: 1.1 in-Hg to 22 in-Hg	factory set: 1.1 in-Hg to 22 in-Hg
–	–	1.1 in-Hg to 22 in-Hg	2 in-Hg to 22 in-Hg, 15 in-H_2O to 36 in-H_2O
fine silver-gold plate	fine silver-gold plate	composite-gold plate	fine silver-gold plate
200 psi	300 psi (diaphragm); 3000 psi (piston)	30 in-Hg max.	200 psi
350 psi	500 psi (diaphragm); 5000 psi (piston)	–	–
500 psi	2000 psi (diaphragm); 10000 psi (piston)	150 psi	500 psi
1/8-27 SAE short male thread standard (others, including metric, available)	diaphragm; 1/8-27 PTF SAE standard; piston 3/4-16 UNF standard; (others, including metric, available)	1/8-27 NPT male thread standard (others, including metric, available)	1/8-27 PTF SAE short male thread standard (others, including metric, available)
8 in wire leads, 18 ga.	8 in wire leads, 18 ga.	#8-32 screws, 1/4 in blade, MetriPak 280	8 in wire leads, 18 ga.
Ø 1.69 in x 2.5 in L	Ø 1.187 in x 3.19 L (diaphragm); Ø 1.187 in x 3.34 in L (piston)	Ø 1.47 in x 2.3 in L (screw); Ø 1.47 in x 2.9 in L (MetriPak 280)	Ø 1.69 in x 2.5 in L
non-ferrous chamber; enhanced set-point integrity; snap-action switch; dead band; low contact resistance; wiping action	snap-action switch; dead band; water dunk proof; enhanced set-point integrity; wide fluid compatibility	stands up to extended-duty applications; factory set; fluorosilicone rubber diaphragm; various terminations	non-ferrous chamber; enhanced set-point integrity; low contact resistance; wiping action; fast transfer time

Records and tracks total elapsed time of equipment usage. All parts are in-process tested for functionality and timing accuracy before shipping. Often used in lawn and garden, generators, compressors, panel assemblies, sport/utility vehicles, on-and-off highway, transportation, mining, lifts, and recreational vehicles.

Series	Diochron	20000
Type	Diochron	ac
Counting range	0 to 9,999.9	records up to 99,999.9 hours with automatic roll over to zero
Sealing	IP66	IP65
Voltage range	10 Vdc to 80 Vdc	24 Vac, 120 Vac, 240 Vac/50 Hz, 60 Hz
Accuracy	±0.2 %	±0.02 %
Termination	1/4 in blade terminals	screw, 7 in lead wires
Approvals	UL, CSA	UL, CSA, CE
Mount/panel cutout opening	2-screw, rectangular, 3-screw and round: 36,8 mm x 24,1 mm [1.45 in x 0.95 in]; round: 50,8 mm [2.0 in] dia.	2-screw, rectangular and square: 36,8 mm x 24,1 mm [1.45 in x 0.95 in]; round: 50,8 mm [2.0 in] dia.
Operating temperature	-40 °C to 85 °C [-40 °F to 185 °F]	-54 °C to 68 °C [-65 °F to 154 °F]
Number size	3 mm [0.12 in]	3 mm [0.12 in]
Case material	polycarbonate	polycarbonate
Measurements	rectangular: 27,4 mm H x 40,6 mm W x 55,6 mm D [1.08 in H x 1.60 in W x 2.19 in D] round: Ø 71,1 mm x 55,1 mm D [Ø 2.80 x 2.17 in D]	rectangular: 25,9 mm H x 35,5 mm W x 64,8 mm D [1.02 in H x 1.40 in W x 2.55 in D] round: Ø 68,60 mm x 60,50 mm D [Ø 2.70 in x 2.38 in D]
Features	quartz accuracy; sealed, shock-resistant case	shock-resistant, tamper-proof case; sealed; single phase, synchronous, lubricated motor

28100	301	98200
ac	ac	dc
0 to 99,999.9 hours with automatic roll over to zero	0 to 99,999.90 hours	0 to 99,999.9 hours, running indicator optional maintenance alert at 50-hour intervals
IP66 front (IP40 rear)	IP40 front (IP00 terminals)	IP66
90 Vac to 264 Vac/50 Hz, 60 Hz	120 Vac, 240 Vac/50 Hz, 60 Hz	9 Vdc to 16 Vdc
±0.02 %	±0.02 %	±0.02 %
1/4 in spade	1/4 in spade	1/4 in male blade, suitable for packard connector 2973781
UL, CSA, CE	UL, CE	–
2-screw and rectangular: 36,8 mm x 24,1 mm [1.45 in x 0.95 in]; round: 50,8 mm [2.0 in] dia.	2-screw and rectangular: 36,8 mm x 24,1 mm [1.45 in x 0.95 in]	snap-in case: 36,8 mm x 24,1 mm [1.45 in x 0.95 in]
-40 °C to 85 °C [-40 °F to 185 °F]	-25 °C to 70 °C [-13 °F to 158 °F]	-40 °C to 71 °C [-40 °F to 160 °F]
3 mm [0.12 in]	4 mm [0.16 in]	6 mm [0.24 in]
polycarbonate	polycarbonate	makroblend
rectangular: 27,4 mm H x 40,6 mm W x 55,6 mm D [1.08 in H x 1.60 in W x 2.19 in D] round: Ø 56,9 mm x 55,1 mm D [Ø 2.24 in x 2.17 in D]	27,4 mm H x 40,6 mm W x 55,6 mm D [1.08 in H x 1.60 in W x 2.19 in D]	30,07 mm H x 52,12 mm W x 34,93 mm D [1.184 in H x 2.052 in W x 1.375 in D]
operates over a full range of voltages and frequencies; sealed from dirt and moisture; custom lens and terminal orientation options	reads to 1/100 of an hour for greater resolution; enhanced accuracy and quiet operation	internal battery; snap-in case

Records and tracks total elapsed time of equipment usage. All parts are in-process tested for functionality and timing accuracy before shipping. Often used in lawn and garden, generators, compressors, panel assemblies, sport/utility vehicles, on-and-off highway, transportation, mining, lifts, and recreational vehicles.

Series	HB	98000
Type	dc battery controller	dc hour and volt hour meter
Counting range	0 to 99,999.9 (optional some models)	display: 0 to 99,999.9 hours counter: 0 to 999,999
Sealing	IP65	IP66
Voltage range	12 Vdc, 24 Vdc, 36 Vdc, 48 Vdc	4.5 Vdc to 16 Vdc, 9 Vdc to 64 Vdc, > 64 Vdc (consult factory)
Accuracy	±0.02 %	±0.02 %
Termination	round meter 8 pin integral, rectangular meter, 1/4 in blade	1/4 in blade, 3/16 in blade (optional)
Approvals	CE	UL
Mount/panel cutout opening	rectangular 36,8 mm x 24,1 mm [1.45 in x 0.95 in] and 45 mm x 22 mm [1.77 in x 0.87 in]; round: 52 mm [2.05 in] dia.	2-screw, retainer: 36,8 mm x 24,1 mm [1.45 in x 0.95 in]; round: 50,8 mm [2.0 in] dia.
Operating temperature	-30 °C to 70 °C [-22 °F to 158 °F]	-40 °C to 85 °C [-40 °F to 185 °F]
Number size	–	6 mm [0.24 in]
Case material	black plastic	polycarbonate
Measurements	rectangular: 31 mm H x 53 mm W x 49 mm D [1.22 in H x 2.09 in W x 1.94 in D] round: Ø 56 mm x 58 mm D [Ø 2.20 in x 2.28 in D]	rectangular: 27,4 mm H x 40,60 mm W x 19,10 mm D [1.08 in H x 1.60 in W x 0.75 in D] round: Ø 57,7 mm [Ø 2.27 in]
Features	relay lockout; multi-LED display	sealed from moisture and dirt

85000	82400	HMD
dc	dc	dc
10,000 hour version standard, with automatic recycle to zero	0 to 9999.9; 0 to 99,999.9 (optional)	0 to 999,999.9 hours
IP66	IP66	IP40 front (IP20 terminals)
5 Vdc to 110 Vdc	10 Vdc to 80 Vdc (polarity insensitive)	10 Vdc to 80 Vdc
±0.02 %	±0.02 %	±0.02 %
1/4 in male blade, #8-32 stud, Deutsch, Packard terminals	1/4 in spade	0.25 in spade (6,3 mm x 0,8 mm)
UL, CSA	–	UL, CE
2-screw, stirrup: 36,8 mm x 24,1 mm [1.45 in x 0.95 in] round, flush; 3-screw: 50,8 mm [2.0 in]	2-screw and rectangular: 36,8 mm x 24,1 mm [1.45 in x 0.95 in]; 3-screw and round: 50,8 mm [2.0 in] dia.	46 mm x 46 mm, Ø 51 mm [1.81 in x 1.81 in, Ø 2.01 in]
-40 °C to 85 °C [-40 °F to 185 °F]	40 °C to 85 °C [-40 °F to 185 °F]	-20 °C to 70 °C [-4 °F to 158 °F]
3 mm [0.12 in]	3 mm [0.12 in]	4 mm [0.16 in]
polyester	polycarbonate	polycarbonate
rectangular: 26,16 mm H x 39,37 mm W x 55,63 mm D [1.03 in H x 1.55 in W x 2.19 in D] round: Ø 57,66 mm [Ø 2.27 in]	rectangular: 26,16 mm H x 39,37 W x 55,63 mm D [1.03 in H x 1.55 in W x 2.19 in D] round: Ø 56,90 mm [Ø 2.70 in]	48 mm H x 48 mm W x 32 mm D [1.89 in H x 1.89 in W x 1.26 in D]
custom CMOS integrated circuit; sealed	non-polarity sensitive design; sealed terms	1/10 hour resolution; enhanced accuracy

Honeywell

As one of the world's leading providers of sensors and switches, Honeywell understands and meets the requirements of a wide variety of industries.

Honeywell Sensing and Control is a global leader in providing reliable, cost-effective sensing and switching solutions for our customers' applications. We serve thousands of customers in four core industry segments: industrial, medical equipment, transportation, and aerospace/military products.

Aerospace

Aerospace applications are among the most demanding for any type of product. Rigorous FAA requirements, extreme environments (temperature, shock, vibration, the need for hermetic sealing), and the ability to customize devices are just a few of the parameters often required of sensors and switches in these applications. Aerospace customers typically value speed in prototyping and development, and Honeywell's vertically integrated, AS9100-approved manufacturing locations enhance our ability to produce devices in a wide variety of packages. The precision output of our products helps reduce risk and cost in key applications while also minimizing the need for unscheduled maintenance.

Honeywell's in-depth aerospace engineering experience allows us to work with customers in the design and development of products that best meet the specified requirements of their individual applications. Making products simple to install makes the job easier every step of the way. And, the odds are that Honeywell is already on the list of trusted suppliers for many aerospace companies, underscoring the decades of experience we bring to this field.

Honeywell products for this industry (many of them PMA-certified) include force sensors, load cells, potentiometers, pilot controls, pressure sensors, pressure switches, resolvers, sensor/actuator assemblies for systems ranging from aerostructures to fuel control to flight surfaces, speed sensors, temperature probes, thermostats, torque sensors, y-guides for cargo systems, MICRO SWITCH™ sealed and high-accuracy switches, MICRO SWITCH™ pushbutton switches, and MICRO SWITCH™ rocker and toggle switches.

Medical

Medical applications typically require sensors and switches that are highly stable and extremely reliable to enhance patient safety and comfort. Stability is often essential to minimize long term drift, reduce the need for recalibration, and improve ease of use for medical equipment operators. Reliability enhances patient safety in life-critical applications, reduces downtime, and improves test throughput in applications such as clinical diagnostics. The product needs to be easy to use and easy to design into a system, so Honeywell's extensive customization and built-in calibration/amplification capabilities are strong benefits. Confidence in Honeywell's product performance, reliability, and availability provide peace of mind for medical equipment manufacturers who choose Honeywell.

Honeywell offerings for this industry include airflow sensors, silicon and stainless steel media isolated pressure sensors, Hall-effect magnetic position sensors, humidity sensors, flexible heaters, force sensors, thermostats, commercial solid state sensors, infrared sensors, oxygen sensors, pressure and vacuum switches, potentiometers and encoders, MICRO SWITCH™ pushbutton, rocker, and toggle switches, and hour meters.

Industrial

The industrial arena can be a rough one. From high-speed food processing to high-force stamping applications, reliable and cost-effective sensors and switches often help minimize repair costs, maximize system life, and reduce overall system expense. Durability can mean the difference between smooth-running processes and expensive downtime. Accurate, repeatable sensor or switch output can reduce the need for calibration once the device is applied. Because of the wide variety of potential applications, Honeywell's ability to deliver a customized product that can meet virtually any size, weight, and power requirement – as well as any packaging stipulations for tough, harsh environments – often makes it easy to incorporate and use our

devices. Safety is another important consideration for industrial users, and our products meet a wide variety of regulatory safety requirements.

Honeywell's industrial product line includes airflow sensors, current sensors, humidity sensors, fiber-optic and liquid-level sensors, linear position sensors, oxygen sensors, pressure sensors, potentiometers and encoders, speed sensors, temperature probes, ultrasonic sensors, wirewound resistors, thermostats, commercial solid state sensors, flex heaters, SMART position sensors, silicon and stainless steel media isolated pressure sensors, force sensors, safety light curtains, push-pull switches, and MICRO SWITCH™ snap-action switches, hazardous area switches, safety switches, key and rotary switches, limit switches, sealed and high-accuracy switches, pushbutton, rocker, toggle switches, and relays.

Transportation

Getting from Point A to Point B is often challenging for end-customers of transportation providers – Honeywell aims to make the trip easier with highly reliable, cost-effective switches and sensors. Our products are designed to support rigorous engine requirements, and their efficiency can also help optimize engine performance. Customization is often required to allow a switch or sensor to be mounted in tight or challenging environments including vibration, temperature extremes, and road contamination. The durability of Honeywell products enhances system reliability, which is also boosted by the stable, accurate output of our devices. All of these capabilities allow demanding customers to rely on Honeywell's many years of experience in the transportation industry.

Honeywell products for transportation applications include Hall-effect rotary position sensors, inertial measurement units, infrared sensors, keyless entry sensors, magnetic position sensors, pressure sensors, speed and direction sensors, ultrasonic sensors, thermostats, temperature probes, commercial solid state sensors, SMART position sensors, and MICRO SWITCH™ pushbutton, rocker, and toggle switches.

Honeywell

Sensing and Control Product Portfolio
Product reliability. Industry knowledge. Expertise. Standard with every order.

With more than 50,000 sensing, switching, and control products ranging from snap-action, limit, toggle, and pressure switches to position, speed, pressure, and airflow sensors, Honeywell Sensing and Control has one of the broadest sensing and switching portfolios available.

SENSORS

Airflow sensors: Advanced microstructure technology. Sensitive and fast response to flow, amount/direction of air or other gas. Proportional output voltage. Thin-film, thermally isolated bridge structure consists of a heater and temperature sensing elements. **May be used in:** HVAC, respirators, process control, oxygen concentrators, gas metering, chromatography, leak detection equipment, medical/analytical instrumentation, and ventilation equipment.

Current sensors: Accurate and fast response. Almost no thermal drift or offset with temperature. Adjustable linear, null balance, digital, and linear current sensors. **May be used in:** Variable speed drives, overcurrent protection, power supplies, ground fault detectors, robotics, industrial process control, and wattmeters.

Flexible heaters: Flat, molded-to-shape, spiral wrap, transparent, composite, and high temperature configurations with single, multiple, and variable watt densities. Can be bonded parts or combined. **May be used in:** Airborne valves, outdoor cameras, LCD displays, scanners, and telecommunication.

Force sensors: Variety of package styles and various electrical interconnects including pre-wired connectors, printed circuit board mounting, and surface mounting for flexibility. **May be used in:** Infusion and syringe pumps, blood pressure equipment, pump pressure, drug delivery systems, occlusion detection, and kidney dialysis machines.

Humidity sensors: Configured with integrated circuitry. Provide on-chip signal conditioning with interchangeability of ±3 % accuracy and out-of-the-box reliability. Standardized, platform-based sensors. **May be used in:** Air compressors, food and beverage packaging and processing, HVAC, printing presses, and office equipment.

Infrared sensors: IREDs, sensors, and assemblies for object presence, limit and motion sensing, position encoding, and movement encoding. Variety of package styles, materials, and terminations. **May be used in:** Printers/copiers, motion control systems, metering, data storage systems, scanning, automated transaction, drop sensors, and non-invasive medical equipment.

Magnetic sensors: Digital and analog Hall-effect position sensor ICs, magnetoresistive position sensor ICs, Hall-effect vane, gear-tooth, and magnetic sensors. **May be used in:** Speed and RPM sensing, motor/fan control, magnetic encoding, disc speed, tape, flow-rate sensing, conveyors, ignitions, motion control/detection, power/position, magnetic code reading, vibration, and weight sensing.

Position sensors: SMART position sensor: **S**uperior **M**easurement, **A**ccuracy, **R**eliability, and **T**hinking. The most accurate linear position sensor available in the industry (0,05 mm [0.002 in]), enabling highly accurate motion control, and improving efficiency and safety. Non-contact design eliminates mechanical failure mechanisms, reducing wear and tear, improving reliability and durability, and minimizing downtime. Robustness in most harsh environments. Easy to install, reducing set-up costs. Potentiometric sensors withstand harsh chemicals and immersion into oils or water. Extended life PTFE bearings, precious metal multi-finger contact wipers, and MYSTR® conductive plastic thick-film elements. Analog output correlated to location. **May be used in:** Injection molding, printing presses, cylinder positioning, gauges, controls, aircraft, elevators, material handling, packaging, molding, valves, wafer handling, and woodworking machinery.

Pressure sensors - silicon: Full line of industrial-grade sensors: media-isolating design, multiple ports and outlets, and electrical configurations. **May be used in:** Pneumatic controls, air compressors, process monitoring, hydraulic controls, VAV controls, clogged filter detection, presence/absence of flow, transmissions, and refrigeration.

Pressure sensors - stainless steel media isolated: Bonded strain gage technology. Very resistant to effects of shock, vibration, and hostile environments. **May be used in:** HVAC, hydraulic controls, suspensions, agricultural equipment, engines, compressors, robotics, industrial and automotive systems, pressure transmitters, process controls, and medical diagnostics.

Proximity sensors: Designed to meet demanding temperature, vibration, shock, and EMI/EMP interference requirements. Number of housing materials and termination styles. **May be used in:** Aircraft landing gear, gun turret position control, and door and hatch open/closed monitoring.

Rotary position sensors: Digital and analog Hall-effect, magnetoresistive, and potentiometric devices for sensing presence of a magnetic field or rotary position. Directly compatible with other electronic circuits for application flexibility. **May be used in:** Audio and lighting, frequency, temperature, position, time, medical/instrumentation, computer peripherals, manual controls, joysticks, telecommunication, welding, heating, and aerospace.

Speed sensors: Measure speed, position, and presence detection utilizing magnetoresistive, variable reluctance, Hall-effect, variable inductance, and Spiral technologies. **May be used in:** Cam and crankshafts, transmissions, fans, pumps, mixers, rollers, compressors, industrial process control, engines/motors, wheels, and tachometers.

Temperature sensors: Customized probes, thermistors, and RTD sensors. Plastic/ceramic, miniaturized, surface-mount housings, and printed circuit board terminations. **May be used in:** Semi-conductor protection, vending machines, power generation, hydraulic systems, thermal management, and temperature compensation.

Thermostats: Commercial and precision snap-action. Automatic or manual reset options, phenolic or ceramic housings. **May be used in:** Telecommunications, battery heater controls, computers, copy machines, fax machines, food service, food carts, small and major appliances, heat and smoke detectors, and HVAC equipment.

ELECTROMECHANICAL SWITCHES

MICRO SWITCH™ snap-action series: Snap-action precision switches. Compact. Lightweight. Designed for repeatability and enhanced life. Premium and standard snap-action switches: standard, miniature, subminiature, hermetically sealed, and high-temperature versions. **May be used in:** Vending machines, communication equipment, HVAC, appliances, electronic gaming machinery, valve controls, irrigation systems, foot switches, pressure, and temperature controls.

MICRO SWITCH™ hazardous area switches: Flame path designed to contain and cool escaping hot gases that could cause an explosion. MICRO SWITCH™ EX, BX, CX, and LSX Series. **May be used in:** Grain elevators and conveyors, off-shore drilling, petrochemical, waste-treatment plants, control valves, paint booths, and hazardous waste handling facilities.

Key and rotary switches: Used on machinery in harsh environments. O-rings help keep dirt and moisture out and prolong life. **May be used in:** All-terrain vehicles, golf carts, snowmobiles, scissor lifts, telehandlers, construction and marine equipment, skid loaders, agricultural equipment, material handlers.

MICRO SWITCH ™ limit switches: Broadest and deepest limit switch portfolio. Rugged, dependable position detection solutions. MICRO SWITCH™ heavy-duty limit switches (HDLS) and global limit switches. Hermetically and environmentally sealed switches. **May be used in:** Machine tools, woodworking, textile, and printing machinery, metal fabrication, balers/compactors, forklifts, bridges, robotics, wind turbines, elevators, moving stairs, doors, dock locks/levelers, aerial lifts, cranes, conveyors, rail, shipboards, and dock side.

MICRO SWITCH™ sealed and high accuracy switches: Precision 'snap action' mechanisms. Wide variety of actuators, terminations, circuitry configurations, electrical ratings, contract materials, and operating characteristics. **May be used in:** Landing gear, flap/stabilizer controls, thrust reversers, space vehicles, armored personnel carriers, de-icer controls, wingfold actuators, industrial environments, valves, and underwater.

MICRO SWITCH™ pushbutton switches: Lighted or unlighted. Wide range of electrical and display design, pushbuttons, and manual switches. Many shapes, sizes, and configurations. Easy to apply, operate, and maintain. **May be used in:** Control boards and panels, industrial and test equipment, computers, medical instrumentation, and aerospace.

MICRO SWITCH™ rocker switches: Wide range of electrical and display design. Many shapes, sizes, and configurations to enhance manual operation. **May be used in:** Transportation, agricultural and construction equipment, test equipment, heavy-duty machinery, marine equipment, small appliances, telecom, medical instrumentation, and commercial aviation.

MICRO SWITCH™ toggle switches: Wide range of electrical and display design. Available in many shapes, sizes, and configurations. **May be used in:** Aerial lifts, construction equipment, agriculture and material-handling equipment, factory-floor controls, process control, medical instrumentation, test instruments, and military/commercial aviation.

MICRO SWITCH™ aerospace-grade pressure switches: lightweight, compact pressure switches sense changes in gas/pressure. Qualified to MIL-PFR-8805 and its lower operating force provides application versatility with enhanced precision. Design modularity allows for configuration of the switch, facilitating rapid customization to the precise, demanding requirements. **May be used in**: aerospace systems -including engines, fuel pressure, and hydraulic systems, military ground vehicles, ordnance and munitions release systems, military maritime systems.

Pressure and vacuum switches: Feature set points from 0.5 psi to 3000 psi. Rugged components have enhanced repeatability, flexibility, and wide media capability. **May be used in:** Transmissions, hydraulics, brakes, steering, generators/compressors, dental air, embalming equipment, oxygen concentrators, air cleaners, fuel filters, and pool water pressure.

SAFETY PRODUCTS

MICRO SWITCH™ safety switches: For operator point-of-operation protection, access detection, presence sensing, gate monitoring, and electrical interfacing. High-quality, dependable, cost-effective solutions. **May be used in:** Packaging and semi-conductor equipment, plastic-molding machinery, machine tools, textile machines, lifts, industrial doors, bailers, compactors, aircraft bridges, telescopic handlers, refuse vehicles.

Safety light curtains: Different resolutions permit detection of an approaching finger, hand, limb, or body. Separate or self-contained control units, various housing sizes, resolutions, scanning ranges, and protection heights. **May be used in:** Point-of-operation protection, access detection, presence sensing, gate monitoring, electrical-to-machine-circuitry interfacing, emergency stop circuits on machines, sliding door protection, conveyors, and transfer lines.

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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.

⚠ **WARNING**
MISUSE OF DOCUMENTATION

- The information presented in this literature is for reference only. DO NOT USE this document as product installation information.
- Complete installation, operation and maintenance information is provided in the instructions supplied with each product.

Failure to comply with these instructions could result in death or serious injury.

For products not designed for safety applications:

⚠ **WARNING**
PERSONAL INJURY

DO NOT USE these products as safety or emergency stop devices or in any other application where failure of the product could result in personal injury.

Failure to comply with these instructions could result in death or serious injury.

For products designed for safety applications:

⚠ **WARNING**
RISK TO LIFE OR PROPERTY

Never use this product for an application involving serious risk to life or property without ensuring that the system as a whole has been designed to address the risks, and that this product is properly rated and installed for the intended use within the overall system.

Failure to comply with these instructions could result in death or serious injury.

Find out more

To learn more about Honeywell's sensing and control products, call **+1-815-235-6847**, email inquiries to **info.sc@honeywell.com**, or visit **www.honeywell.com/sensing**

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