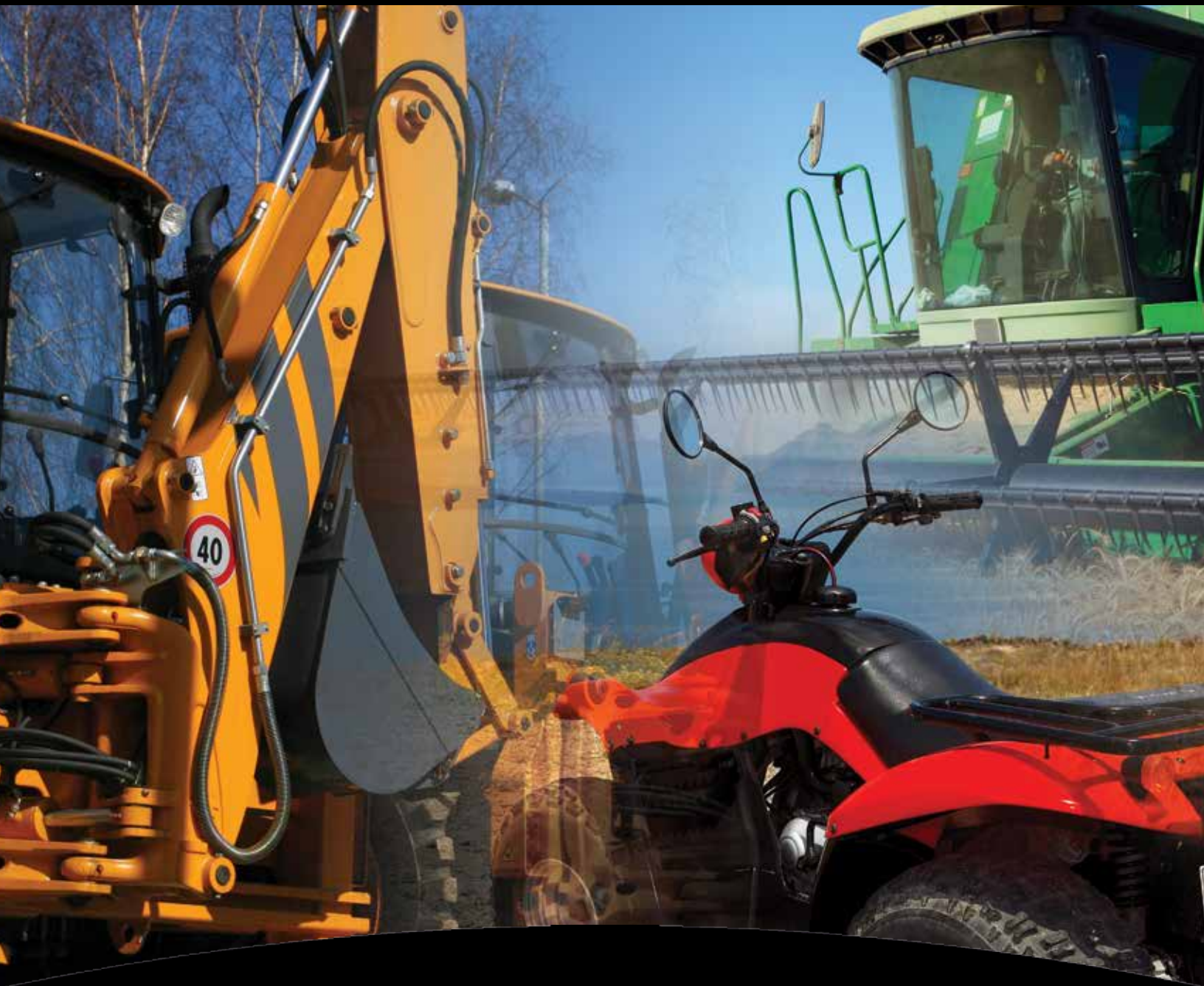


**Controls, Monitors, & Pressure Switches**

**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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# Controls

## Key and Rotary Switches



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
<b>Connector</b>	MetriPak 280 and Sumitomo	screw
<b>Electrical ratings (res.)</b>	12 Vdc, 20 A; 24 Vdc, 8 A	12 Vdc, 20 A; 24 Vdc, 10 A; 48 Vdc, 4 A
<b>Operating temperature</b>	-40 °C to 85 °C [-40 °F to 185 °F]	-40 °C to 85 °C [-40 °F to 185 °F]
<b>Cycle life at electrical load</b>	25000 cycles	25000 cycles
<b>Position</b>	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)
<b>Mounting</b>	panel	panel
<b>Approvals</b>	UL available	UL available
<b>Measurements</b>	Ø 1.62 in x 2.95 in L	Ø 1.62 in x 2.85 in L
<b>Features</b>	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
<b>Connector</b>	MetriPak 280 and Sumitomo
<b>Electrical ratings (res.)</b>	12 Vdc, 20 A; 24 Vdc, 8 A
<b>Operating temperature</b>	-40 °C to 85 °C [-40 °F to 185 °F]
<b>Cycle life at electrical load</b>	25000 cycles
<b>Position</b>	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)
<b>Actuator</b>	lever or knob
<b>Mounting</b>	panel
<b>Approvals</b>	UL available
<b>Measurements</b>	Ø 1.62 in x 2.95 in L
<b>Features</b>	environmentally sealed; recoil spring allows momentary positions

# Controls

## Shifters and Turn Signals



*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
<b>Mounting</b>	left, right	–
<b>Column size</b>	38 mm, 45 mm, 55 mm	38 mm, 45 mm, 55 mm
<b>Neutral lock</b>	none, drop-down	–
<b>Speeds</b>	2, 3, 4, and 6	–
<b>Lights</b>	–	turn signal, head lamp switch/dimmer, flash to pass, hazard warning
<b>Wiper speeds</b>	–	1 speed, hi/lo, intermittent
<b>Buttons</b>	horn, wash, drop-down	wash, horn
<b>Connectors</b>	integral Packard, integral Deutsch, wire harness	integral Packard, integral Deutsch, wire harness
<b>Expected life cycle</b>	1 million (rotary); 500000 (shifter handle)	50000 cycles
<b>Lever</b>	3 million (with drop-down neutral lock); 1 million (without drop-down neutral lock)	–
<b>Operating temperature range</b>	-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)
<b>Operating volt. range</b>	3 V to 32 V	3 V to 32 V
<b>Handle dead weight</b>	160 lb [712 Newtons]	160 lb [712 Newtons]
<b>Solenoid load</b>	2 A @ 12.8 V with arc suppression	2 A @ 12.8 V with arc suppression
<b>Measurements</b>	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]
<b>Features</b>	IP67; turn signals are built to complement the shifter, or can also be mounted as stand alone	

# Controls

## Push-Pull Switches and Custom Controls



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/e-Stop
Connector	screw, wire-out
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

# Pressure

## 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.

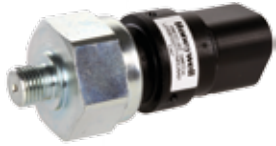


Series	Series 1000	LP Series
<b>Type</b>	hydraulic brake pressure switch	low pressure premium
<b>Set point range</b>	20 psi $\pm$ 10 psi [1,37 bar $\pm$ 0,69 bar]	3.5 psi to 150 psi
<b>Vacuum</b>	–	–
<b>Contacts</b>	silver-plated copper contacts	silver
<b>Oper. pressure</b>	1200 psi	250 psi max.
<b>Proof pressure</b>	2400 psi	500 psi
<b>Burst pressure</b>	4800 psi	750 psi for 3.5 to 22; 1250 psi for > 22 psi
<b>Connector</b>	M10 x 1.25 banjo fitting (single or double); M10 x 1; 1/8-27 NPT	1/4-18 NPT, 1/8-27 NPT, 1/2-20 UNF, 1/8-27 PTF, M12 x 1.5, M14 x 1.5, 9/16-18 UNF, 3/4-16 UNF, G1/8 BSPP, M18 x 1.5, 7/16-20 UNF, R1/8 BSPT, M10 x 1.0, R1/2 BSPT, G1/4 BSPP, R1/4 BSPT
<b>Terminals</b>	1/4 in blade	same terminations as LE, HP, and HE Series
<b>Dimensions</b>	$\varnothing$ 18 mm hex x 54,10 mm [2.13 in] L	varies, depends upon configuration
<b>Features</b>	IP65; low set point; high burst rating; banjo bolt fitting	up to 2 million life cycle rating; IP67 sealing rating; up to $\pm$ 2 % switching point accuracy



FOR SALE IN EMEA ONLY

Series	PBN1
<b>Type</b>	direct action blade contact
<b>Set point range</b>	0.018 psi to 1.8 psi
<b>Contacts</b>	gold inlay
<b>Oper. pressure</b>	6 psi for 0.018 psi to 0.108 psi; 12 psi for 0.144 psi to 1.8 psi
<b>Proof pressure</b>	8 psi for 0.018 psi to 0.108 psi; 15 psi for 0.144 psi to 1.8 psi
<b>Burst pressure</b>	30 psi
<b>Connector</b>	5 mm smooth perpendicular, 5 mm barbed radial
<b>Terminals</b>	4,8 mm x 0,5 mm blades
<b>Approvals</b>	FOR SALE IN EMEA ONLY
<b>Features</b>	sensitive to ultra-low pressures; gage, vacuum, and differential measurement



LE Series	HP Series	HE Series	5000 Vacuum
low pressure economy	high pressure premium	high pressure economy	direct-action blade contact
3.5 psi to 150 psi	150 psi to 4500 psi	150 psi to 4500 psi	factory set: 1.1 in-Hg to 22 in-Hg
–	–	–	1.1 in-Hg to 22 in-Hg
silver	silver / gold inlay	silver	composite-gold plate
250 psi max.	5000 psi max.	5000 psi max.	30 in-Hg max.
500 psi	10000 psi	10000 psi	–
750 psi for 3.5 to 22; 1250 psi for > 22 psi	20000 psi	20000 psi	150 psi
1/4-18 NPT, 1/8-27 NPT, 1/2-20 UNF, 1/8-27 PTF, M12 × 1.5, M14 × 1.5, 9/16-18 UNF, 3/4-16 UNF, G1/8 BSPP, M18 × 1.5, 7/16-20 UNF, R1/8 BSPT, M10 × 1.0, R1/2 BSPT, G1/4 BSPP, R1/4 BSPT	M14 × 1.5, M18 × 1.5, 1/2-20 UNF, 9/16-18 UNF, 3/4-16 UNF, 7/8-14 UNF	M14 × 1.5, M18 × 1.5, 1/2-20 UNF, 9/16-18 UNF, 3/4-16 UNF, 7/8-14 UNF	1/8-27 NPT male thread standard (others, including metric, available)
spade terminals, screw terminals, integrated Deutsch DT04-3P, integrated Amp Super Seal 1.5 (3-Pin Connector), cable (wire out no connector), cable w/Deutsch DT04-3P-E003 (16 AWG), cable w/Amp Super Seal 1.5 (3-Pin Connector), cable w/Metripack 150, cable w/ Din4365D-C (3-pin connector), cable w/M12x1 (3-pin connector), cable w/ Packard Weatherpack male terminal (3-pin connector), cable w/ Deutsch DT04-2P-E005, cable w/ Packard 2P tower connector (18 AWG), cable w/ Packard 2P shroud connector (18 AWG), cable w/ Packard 2P shroud connector (16 AWG), cable w/ ITT Cannon 2p Sure Seal Circular connector (18 AWG), cable w/ ITT Cannon 3p Sure Seal circular connector (16 AWG), cable-vacuum impregnated w/Deutsch DT06-3S-EP06 (16 AWG), cable-vacuum impregnated w/ Deutsch DT04-3P- (16 AWG), cable w/ blade terminal (16 AWG), cable w/Deutsch DT04-2P-EP06, cable w/Amp Super Seal 1.5 (2-pin connector), cable w/ DT06-2SCE06, integrated Deutsch DT04-2P, cable w/ Metripack 150 Delphi 12129615, wireout with AMP blade terminal 6.3x0.8, wire out with AMP 1-967402-1 connector , wire out with Packard connector 12015792, cable w/ Metripack 150 Delphi 12052641			#8-32 screws, 1/4 in blade, MetriPak 280
varies, depends upon configuration	varies, depends upon configuration	varies, depends upon configuration	Ø 1.47 in x 2.3 in L (screw); Ø 1.47 in x 2.9 in L (MetriPak 280)
up to 1 million life cycle rating; IP67 sealing rating; up to ±2 % switching point accuracy	up to 2 million life cycle rating; IP67 sealing rating; up to ±2 % switching point accuracy	up to 1 million life cycle rating; IP67 sealing rating; up to ±2 % switching point accuracy	stands up to extended-duty applications; factory set; fluorosilicone rubber diaphragm;



**FOR SALE IN EMEA ONLY**

PBN3
snap-action switch
0.036 psi to 40.0 psi
silver
12 psi for 0.036 psi to 2.71 psi; 60 psi for 3.0 psi to 40.0 psi
15 psi for 0.036 psi to 2.71 psi; 100 psi for 3.0 psi to 40.0 psi
60 psi for 0.036 psi to 2.71 psi; 150 psi for 3.0 psi to 40.0 psi
5 mm smooth perpendicular, 5 mm barbed radial
6,3 mm x 0,8 mm blades
FOR SALE IN EMEA ONLY
high current switching capacity; sensitive to low gage pressures

# Monitors

## Hour Meters



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	LM Series	20000
<b>Type</b>	ac or dc micro-controller LCD unit	ac
<b>Counting range</b>	0 to 99,999.9 hours	records up to 99,999.9 hours with automatic roll over to zero
<b>Sealing</b>	IP67	IP65
<b>Voltage range</b>	9 V to 64 V dc/ac (50 Hz to 500 Hz)	24 Vac, 120 Vac, 240 Vac/50 Hz, 60 Hz
<b>Accuracy</b>	±200 ppm/hour	±0.02 %
<b>Termination</b>	1/4 in blades; 3/16 in blades	screw, 7 in lead wires
<b>Approvals</b>	UL, CE	UL, CSA, CE
<b>Mount/panel cutout opening</b>	diamond and diamond (no bezel): 24,13 mm x 44,45 mm [0.95 in H x 1.75 in W] standard: 24,13 mm x 36,83 mm [0.95 in H x 1.45 in W] round: Ø 50,8 mm [Ø 2.00 in] rectangle: 22,35 mm x 44,96 mm [0.88 in H x 1.77 in W]	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.
<b>Operating temperature</b>	-40 °C to 85 °C [-40 °F to 185 °F]	-54 °C to 68 °C [-65 °F to 154 °F]
<b>Number size</b>	7 mm	3 mm [0.12 in]
<b>Case material</b>	Makroblend	polycarbonate
<b>Measurements</b>	diamond: 31,75 mm x 54,10 mm x 34,29 mm [1.25 in H x 2.13 in W x 1.35 in D] standard: 27,43 mm x 40,64 mm x 34,29 mm [1.08 in H x 1.60 in W x 1.35 in D] round: Ø 57,66 mm x 33,78 mm [Ø 2.27 in x 1.33 in D] rectangle: 24,13 mm x 48,26 mm x 32,77 mm [0.95 in H x 1.90 in W x 1.29 in D] diamond (no bezel): 26,16 mm x 52,07 mm x 34,29 mm [1.03 in H x 2.05 in W x 1.35 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]
<b>Features</b>	backlight and large 7 mm display; digital, micro-control unit LCD; durable design of mounting assembly, IP67 environmental sealing	shock-resistant, tamper-proof case; sealed; single phase, synchronous, lubricated motor





28100	301	85000	82400
ac	ac	dc	dc
0 to 99,999.9 hours with automatic roll over to zero	0 to 99,999.90 hours	10,000 hour version standard, with automatic recycle to zero	0 to 9999.9; 0 to 99,999.9 (optional)
IP66 front (IP40 rear)	IP40 front (IP00 terminals)	IP66	IP66
90 Vac to 264 Vac/50 Hz, 60 Hz	120 Vac, 240 Vac/50 Hz, 60 Hz	5 Vdc to 110 Vdc	10 Vdc to 80 Vdc (polarity insensitive)
±0.02 %	±0.02 %	±0.02 %	±0.02 %
1/4 in spade	1/4 in spade	1/4 in male blade, #8-32 stud, Deutsch, Packard terminals	1/4 in spade
UL, CSA, CE	UL, CE	UL, CSA	–
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]	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 & 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.
-40 °C to 85 °C [-40 °F to 185 °F]	-25 °C to 70 °C [-13 °F to 158 °F]	-40 °C to 85 °C [-40 °F to 185 °F]	40 °C to 85 °C [-40 °F to 185 °F]
3 mm [0.12 in]	4 mm [0.16 in]	3 mm [0.12 in]	3 mm [0.12 in]
polycarbonate	polycarbonate	polyester	polycarbonate
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]	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]
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	custom CMOS integrated circuit; sealed	non-polarity sensitive design; sealed terms



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.



## SENSORS



**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  
 • HVAC Equipment



**Pressure transducers – heavy duty:**

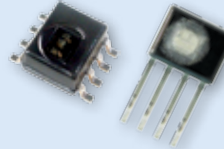
Provides a complete amplified and compensated pressure measurement solution. Choice of ports, connectors, outputs and pressure ranges, engineered to be resistant to a wide variety of media for use in most harsh environments.

**May be used in:** Industrial HVAC/R and Air Compressors • General System and Factory Automation Pump, Valve and Fluid Pressure  
 • Transportation (Heavy Equipment and Alternative Fuel Vehicles) System  
 • Pneumatics • Hydraulics



**Pressure sensors – heavy duty:** Small, allowing use on their own in tight packages or as the building block for a complete transducer. Developed for potential use in pressure applications that involve measurement of hostile media in harsh environments compatible with 316 stainless steel.

**May be used in:** Industrial Controls • Process Control Systems • Industrial Automation



**Humidity sensors:** Digital, analog, and combined humidity/temperature sensing versions. Provide on-chip signal conditioning with accuracy capability to  $\pm 1.7\%$  RH. Stable, reliable, low-drift performance. Standardized, platform-based sensors.

**May be used in:** Medical • HVAC/R  
 • Weather Stations • Air Compressors  
 • Telecommunications • Grain Storage  
 • Incubators



**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 • Wattmeters



**Flexible heaters:** Flat or custom geometry configurations with single, multiple and variable watt densities. Stable, uniform heating. Can be bonded parts or combined in value-added assemblies.

**May be used in:** Medical • HVAC/R  
 • LCD Displays • Power Generation  
 • Telecommunication



**Pressure sensors – board mount:**

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



**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  
 • Temperature Compensation



**Magnetic sensors:** Digital and analog Hall-effect position ICs, magnetoresistive position 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  
 • Weight Sensing



**Position sensors:** The **SMART position sensor** measures linear, angular or rotary position of a magnet attached to a moving object so that the object's position can be determined or controlled. Its simple, non-contact design eliminates mechanical failure mechanisms, reduces wear and tear, and improves reliability and durability.

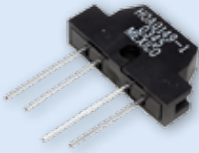
**May be used in:** Valve Position • Material Handling • Plastic Molding • Passenger Bus Level Position • Truck-Mounted Crane Outrigger Position • Aerial Work Lift Platform • Front Loader and Digger/Excavation Boom Position

**Potentiometer sensors:** Measure linear, rotary position or displacement. Honeywell's proprietary conductive plastic delivers extensive temperature range and infinite resolution, and provides precision position measurement.

**May be used in:** Robotic Motion Control • Marine Steering • In-Tank Level Sensing

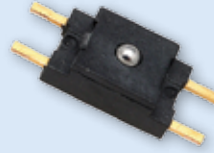
**Ultrasonic sensors:** Measure time delays between emitted and echo pulses, often accurately determining the sensor-to-target distance.

**May be used in:** Level Measurement • Height and Thickness Sensing • Diameter Control



**Infrared sensors:** IREs, 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  
• Non-Invasive Medical Equipment



**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  
• Kidney Dialysis Machines



**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  
• Door/Hatch Monitoring



**Speed sensors:** Measure speed, position and presence detection utilizing magnetostrictive, variable reluctance, Hall-effect, variable inductance and spiral technologies.

**May be used in:** Cam and Crankshafts  
• Transmissions • Fans • Pumps  
• Mixers • Rollers • Motors



**Airflow sensors:** Advanced microstructure technology. Sensitive and fast response to flow, amount/direction of air or other gas. Analog or digital output. 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 • Ventilation Equipment



**Rotary position sensors:** Digital and analog Hall-effect, magnetostrictive and potentiometric devices and resolvers for sensing presence of a magnetic field or rotary position. Directly compatible with electronic circuits for application flexibility.

**May be used in:** Audio and Lighting  
• Frequency • Temperature • Position  
• Medical/Instrumentation • Computer  
• Peripherals • Manual Controls • Joysticks  
• Telecom • Welding • Heating • Aerospace

## ELECTROMECHANICAL SWITCHES



**MICRO SWITCH™ basic switches:** Snap-action precision switches. Compact. Lightweight. Designed for repeatability and enhanced life. Basic switches: large, standard, miniature, subminiature, hermetically sealed, water-tight and high temperature versions.

**May be used in:** Vending Machines  
 • Communication Equipment • HVAC  
 • Appliances • Automotive • Electronic Gaming Machinery • Valve Controls  
 • Irrigation Systems • Foot Switches  
 • Pressure • Temperature Controls



**MICRO SWITCH™ sealed and high accuracy switches:** Precision “snap action” mechanisms. Wide variety of actuators, terminations, circuitry configurations, electrical ratings, contact 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 • Underwater



**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 • Hazardous Waste Handling Facilities



**Key and rotary switches:** Environmentally sealed, 2-3-4 position switches. 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



**Pressure and vacuum switches:** Feature setpoints from 3 psi to 4500 psi. Rugged components have enhanced repeatability, flexibility and wide media capability. Uses diaphragm or quad seal/piston.

**May be used in:** Transmissions • Hydraulics  
 • Brakes • Steering • Generators/Compressors  
 • Dental Air • Embalming Equipment • Oxygen Concentrators • Air Cleaners • Fuel Filters  
 • Pool Water Pressure



**MICRO SWITCH™ toggle switches:** Hermetic and environmentally sealed options. Enhanced reliability. Center pin for ultimate stabilization. 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 • Military/Commercial Aviation

## LIMITLESS™ WIRELESS SOLUTIONS



**Limitless™ switches and receivers:** Combines the best of MICRO SWITCH™ limit switches with commercial wireless technology. Beneficial for remote monitoring where wiring/maintenance is not physically possible or economically feasible. Used for position sensing and presence/absence detection.

**Limitless™ Operator Interface:** Adds a human interface device to the product-driven interfaces of Limitless™ switches and receivers. Choose and install a desired operator or utilize one of Honeywell’s pushbuttons.

**May be used in:** Valve Position • Crane Boom/Jib/Skew Position • Lifts • Material Handling • Presses • Construction/Ag Machines  
 • Conveyors • Industrial Environments • Remote/Temporary Equipment • Grain Diverters or Flaps • Door Position



**MICRO SWITCH™ aerospace-grade pressure switches:** Lightweight, compact pressure switches. Meets military and DO-160 standards. Lower operating force provides application versatility with enhanced precision. Design modularity allows for configuration of the switch, facilitating rapid customization.

- May be used in:** Aerospace Systems
- Engines, Fuel Pressure and Hydraulic Systems
  - Military Ground Vehicles
  - Ordnance and Munitions Release Systems
  - Military Maritime Systems



**MICRO SWITCH™ limit switches:** Broadest and deepest limit switch portfolio. Rugged, dependable position detection solutions. MICRO SWITCH™ heavy-duty limit switches (HDLS), medium-duty and global limit switches. Hermetically and environmentally sealed switches.

- May be used in:** Machine Tools • Woodworking
- Textile • Printing Machinery • Metal Fabrication
  - Balers/Compactors • Forklifts • Bridges
  - Robotics • Wind Turbines • Elevators
  - Moving Stairs • Doors • Dock Locks/Levelers
  - Aerial Lifts • Cranes • Conveyors • Rail
  - Shipboards • Dock Side



**MICRO SWITCH™ pushbutton switches:** Lit or unlit. 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 • Flight Decks
  - Medical Instrumentation • Process Control



**MICRO SWITCH™ sealed and standard rocker switches:** Wide range of electrical and display design. Many shapes, sizes, buttons 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 • Commercial Aviation

## 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

## 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 acknowledgment 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.

## 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 **sensing.honeywell.com**

## Honeywell Sensing and Control

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### **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.**

# Honeywell