



The IP&E Specialist

# Honeywell Transportation



Mil-Std and Hi-Rel  
In Stock and  
Available to Sell



Reach your local  
TTI Specialist at  
1.800.CALL.TTI

[tti.com](http://tti.com)

# Honeywell



## TTI STOCKS THE HONEYWELL COMPONENTS THAT MOVE THE WORLD

TTI distributes Honeywell components for a vast range of applications across a broad spectrum of vehicle types. In commercial and construction vehicles where hydraulics are a major part in their working applications, Honeywell pressure sensors, position sensors and temperature sensors help protect against over-heating or overstressing implements and the vehicle systems to keep equipment working and operators safe.

In recreational vehicles, you can find a variety of Honeywell switches, toggles and sensors keeping the fun going under all manner of extreme conditions. From frozen snow machines, to saltwater immersed watercraft, to the dusty sand dunes where quads go to play, the Honeywell brand name stands for long-life in harsh environments.

From the air in the tires to the air conditioning in the cab, Honeywell and TTI have the right component for the application your transportation equipment demands.



## SERVING THE TRANSPORTATION INDUSTRY

### Brake Systems

- Pressure Sensor
- Pressure Switch
- Speed Sensing

### Engine Systems

- Pressure Sensor
- Pressure Switch
- Speed Sensor
- Temperature Probe
- Thermostat

### Fuel Systems

- Pressure Transducer
- Temperature Sensor

### Hydraulic Systems

- Pressure Sensor
- Pressure Switch
- Speed Sensor
- Temperature Probe

### Operator Controls

- Key Switch
- Push-pull Switch
- Shifter
- Toggle Switch
- Turn Signal Control

### Vehicle Position and Tilt

- Limit Switch
- Position Sensor
- Sealed Switch
- Inertial Measurement Unit
- Wireless Solutions



EV Sensors



Heavy Duty On- and Off-Road



Material Handling Equipment

### EV Sensors

- Current Sensor
- Pressure Sensor

### Wheels and Suspension Systems

- Limit Switch
- Position Sensor Assemblies
- Potentiometer
- Pressure Transducer
- Pressure Switch
- Resolver
- Sealed Switch
- Speed Sensor
- Thermostat



Mining and Construction



Recreational Vehicles



Lawn and Garden



Power Generation



Rail



Agricultural

## TABLE OF CONTENTS

Serving Transportation	2
Component Locations	4, 5
Speed and Distance Sensors	6
SMART Position Sensors	7
Rotary Position Sensors	8
Magnetic Sensors	9
Pressure Sensors	10
Magnetic Sensors	11
EV Sensors	12, 13
Temperature Sensors	14, 15
Pressure and Vacuum Switches	16
MICRO SWITCH Toggle Switches	17
MICRO SWITCH Basic Switches	18, 19
MICRO SWITCH Limit Switches	20
Controls – Push/Pull, eStop and Hour Meters	21
Controls – Key and Rotary Switches, Shifters	22, 23

PART DESCRIPTION	
1	<b>Temperature Sensor</b> (Cabin Temperature Sensing) LTP Series and ES-110 Series
2	<b>Temperature Sensor</b> (Air Inlet Sensing) LTP Series and ES-110 Series
3	<b>Temperature Sensor</b> (Oil, Coolant and Fuel Temperature Sensing) LTP, R300 and 500 Series
4	<b>Temperature Sensor</b> (Hydraulic Oil Temp Sensing) R300 Series
5	<b>Temperature Sensor</b> (Exhaust Gas Recirculation Sensing) R300 Series
6	<b>Thermostat</b> (Fan Control and Fire Suppression Sensing) 3000 Series
7	<b>Hall Effect Position Sensor</b> (Jack Position Sensing) 103SR Series
8	<b>Position Sensor</b> (Boom Angle Position Sensing) SPS and RPN Series
9	<b>Speed Sensor</b> (Wheel Speed Sensing) SNDH Series
10	<b>Speed Sensor</b> (Wheel and Hydraulic Pump Speed Sensing) SNDH Series
11	<b>Angular or Linear Hall Effect Position Sensor IC</b> (Power Steering Control System Sensing) – APS00B, SS490 and RPN Series
12	<b>Hall Effect Speed Sensor</b> (Camshaft/Crankshaft Sensor/ABS) SNDH-H Series
13	<b>Speed Sensor</b> (RPM and Speedometer/MPH Sensing) VRS, SNDH, and LCZ Series
14	<b>Speed Sensor</b> (RPM/Speedometer/MPH, Camshaft/Crankshaft, and Turbocharger Speed Sensing) SNDH-H Series
15	<b>Bipolar Hall Effect Sensor IC</b> (Power Seat Motor) SS400 Series
16	<b>Linear Hall Effect Sensor IC</b> (Stability Control System and Remote Mirror with Memory Control) SS490 Series
17	<b>Angular or Linear Hall Effect Sensor IC</b> (Power Steering Control System) APS00B and SS490 Series
18	<b>Speed/Direction Sensor</b> (Forward/Reverse Sensing) SNDH-T Series
19	<b>Linear Hall Effect Sensor IC</b> (Throttle Position Sensing) SS490 Series
20	<b>Rotary Position Sensor</b> (Gear Position Detection/Throttle by Wire) RTY Series



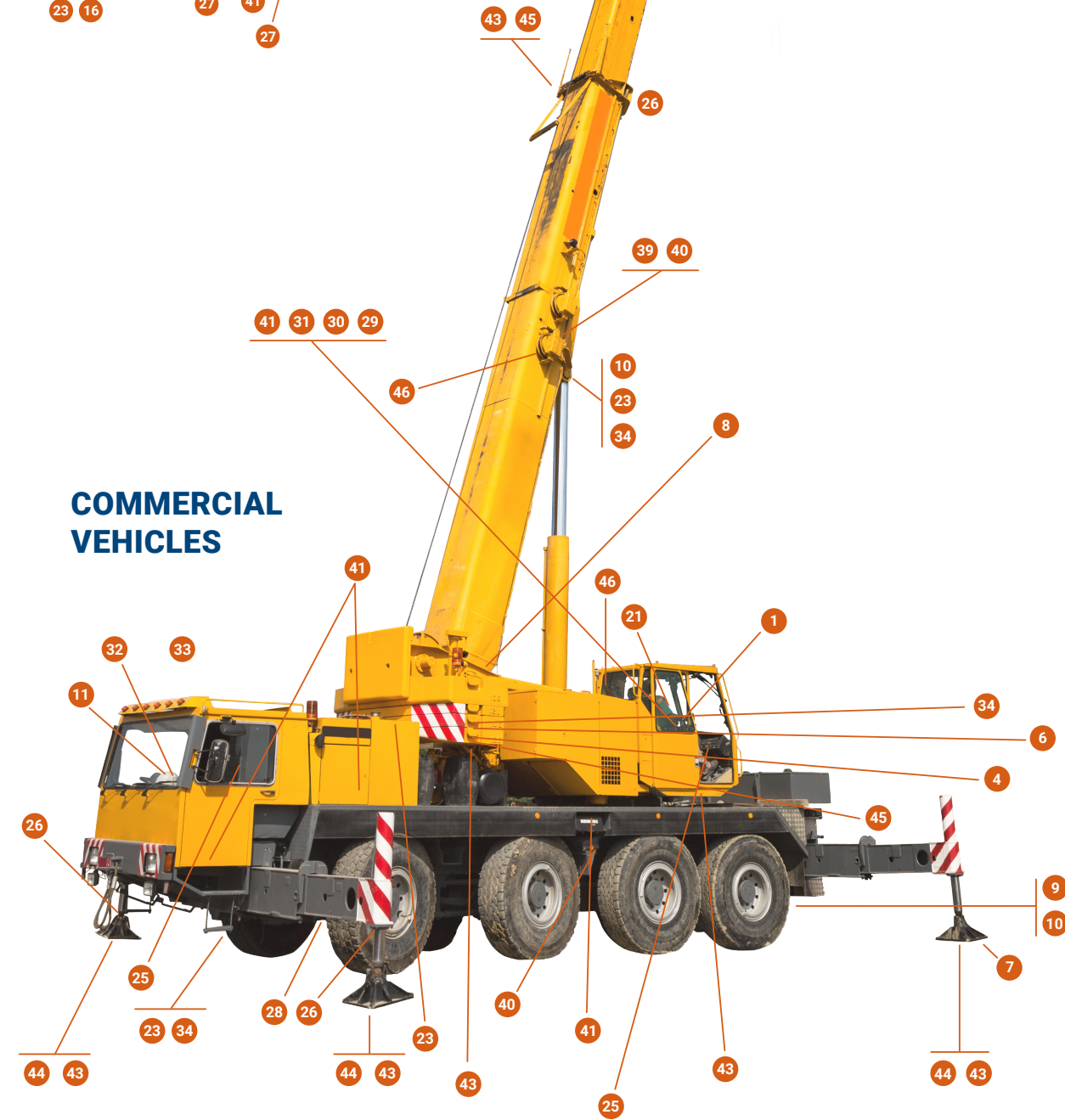
### RECREATIONAL VEHICLES

21	<b>Infrared Sensor</b> (Hand-Grip Joystick Control Sensing) SMD2440, SME2470 Series
22	<b>Liquid Level Sensor</b> (Fuel, Oil, or Brake Fluid Sensing) LLE Series
23	<b>Heavy-Duty Pressure Transducer</b> 23a. Hydraulic Sensing; 23b. Fuel Tank Level Sensing; 23c. Braking System Sensing PX3, PX2, MLH, 13mm, 19mm, and SPT Series
24	<b>Handlebar Controls</b> (Multi-Function Switch) – 1080HD Series and Custom
25	<b>Smart Key</b> (Limits Function by Operator's Certification Level)
26	<b>Heavy-Duty Pressure Transducer or T&amp;M Pressure Sensor</b> (Outrigger Load Sensing - Minimum of Four, Maximum of Six) – MLH Series
27	<b>SMART Position Sensor</b> (Vehicle and Load Sensing) 27a. SPS Linear; 27b. SPS Rotary
28	<b>SMART Position sSensor</b> (Steering Angle Sensing) SPS Series
29	<b>Hour meter</b> (Usage Tracking) LM Series
30	<b>Key Switch</b> (On/Off)
31	<b>Push-Pull Switch</b> (Emergency Stop)
32	<b>Shifter</b> (Forward, Neutral and Reverse) 81248 Series
33	<b>Turn Signal</b> Multi-Purpose
34	<b>Pressure Switch</b> (Hydraulic System and Engine Oil Monitoring) HP, HE, MH, ME, LP and LE Series
35	<b>Pressure Switch</b> (Brake Switch Indicator) Series 1000
36	<b>Vacuum Switch</b> (Airflow Monitoring) 5000 Series
37	<b>MICRO SWITCH™ Limit Switch</b> (Back-up Alarm) BZE Series
38	<b>MICRO SWITCH™ Limit Switch</b> (Level Sensor for Cab Position) GLS Series
39	<b>MICRO SWITCH™ Limit Switch</b> (Machine Position) HDLS Series
40	<b>MICRO SWITCH™ Limit Switch</b> (Jib, Wheelbock, and Outrigger Position Indicator) GLS Series
41	<b>MICRO SWITCH™ Toggle Switch</b> (Manual Operator Switch) NT Series
42	<b>MICRO SWITCH™ Basic Switch</b> (Watertight) (Brake Switch Indicator) V15W Series
43	<b>Limitless™ Switches</b> 43a. (Replaces Wired 2-block Jib); 43b. (Boom Position Sensing – Full Retraction/Full Extension); 43c. (Outrigger Position Sensing: Full/Half Extension; Full Retraction); 43d. (Confirms Mechanical Locks are in Place); 43e. (Adjustable Min./Max. Cab Position Sensing)
44	<b>Load Cell or Load Pins</b> 44a. (Hook Load Sensing); 44b. (Outrigger Load Sensing, Minimum of 4, Maximum of 6)
45	<b>Load Cell</b> 45a. (Torsion or Boom Side Load Sensing); 45b. Provides Counterweight Information to Operator)
46	<b>Load Pin</b> (Replaces Hydraulic Cylinder Pins)

### CONSTRUCTION EQUIPMENT






### COMMERCIAL VEHICLES







### SPEED AND DIRECTION SENSORS

Provide true zero speed capability, direction sensing and precise switch point measurement. Speed sensor diagnostics provide information on air gap and sensor failure for increased reliability and functionality. A comprehensive lineup of Hall effect, magnetoresistive and variable reluctance sensors.




SERIES	LCZ 	SNDH-T 	SNDH-H 
<b>Description</b>	Single Hall effect Zero Speed Sensor	Dual Differential Hall effect Quadrature Speed and Direction Sensor	Hall effect Speed Sensor
<b>Housing</b>	Stainless Steel	Stainless Steel, Plastic	Stainless Steel, Plastic
<b>Supply Voltage Range</b>	4.5 Vdc to 26 Vdc	4.5 Vdc to 18 Vdc	4 Vdc to 24 Vdc, 4.5 Vdc to 24 Vdc, 6.5 Vdc to 24 Vdc
<b>Supply Current</b>	20 mA	18 mA Max.	6 mA Max., 14 mA Max., 20 mA Max.
<b>Output Type</b>	Digital Sinking	Square Wave	Digital Sinking
<b>Operating Frequency Range</b>	0 Hz to 15 kHz	1 Hz to 15 kHz	0 Hz to 12 kHz 0 Hz to 15 kHz 2 Hz to 15 kHz
<b>Operating Temperature Range</b>	-40 °C to 125 °C [-40 °F to 257 °F]	-40 °C to 150 °C [-40 °F to 302 °F]	-40 °C to 150 °C [-40 °F to 302 °F] Inclusive
<b>Features</b>	Omni-directional Sensor to Target; Low Power Consumption; Zero Speed; Digital Output	Advanced Performance Dynamic Offset Self-calibration; Short Circuit and Reverse Voltage Protection; Low Jitter Output; Near Zero Speed	Rotationally Insensitive Versions Available; Zero Speed Sensing Versions Available; Range of Connector Options

SERIES	VRS GENERAL PURPOSE 	VRS HIGH TEMPERATURE 
<b>Output Voltage Range</b>	8 Vp-p to 40 Vp-p (Inclusive)	4.7 Vp-p to 125 Vp-p (Inclusive)
<b>Housing Diameter</b>	5/8 in, 3/8 in, 1/4 in, and 10/32 in	5/8 in, 3/8 in, and 1/4 in
<b>Housing Material/Style</b>	Stainless Steel Threaded or Smooth	Stainless Steel Threaded
<b>Termination</b>	MS3106 Connector, Preleaded	MS3106 Connector, Preleaded
<b>Operating Temperature Range</b>	-55 °C to 120 °C [-67 °F to 250 °F] (Inclusive)	-73 °C to 230 °C [-100 °F to 450 °F] (Inclusive)
<b>Features</b>	Self-powered Operation; Simple Installation; No Moving Parts; Operates Over Wide Speed Range; Customized Versions Available	

### SMART POSITION SENSORS

Honeywell's SMART Position Sensors are some of the most durable and adaptable position devices available in the industry today. Their simple, non-contact design eliminates mechanical failure mechanisms, reduces wear and tear, improves reliability and durability and enhances operator efficiency and safety, while minimizing downtime.



SERIES	SPS LINEAR 	SPS ARC 	SPS ROTARY 
<b>Description</b>	Measures Linear Movement of a Magnet Attached to a Moving Object	Measure Angular Movement of a Magnet Attached to a Moving Object	Measure Rotary Movement of a Magnet Attached to a Moving Object
<b>Configuration</b>	Linear	Arc	Rotary
<b>Sensing Range</b>	75 mm: 0 mm to 75 mm [0 in to 3.0 in]; 225 mm: 0 mm to 225 mm [0 in to 8.86 in]	100°: 0° to 100° 180°: 0° to 180°	0° to 360°
<b>Resolution</b>	75 mm Analog: 0,05 mm [0.002 in]; 225 mm Analog: 0,14 mm [0.0055 in]; 225 mm Digital: 0,0035 mm [0.000137 in]	100°: 0.06° 180°: 0.11°	0.01°
<b>Supply Voltage</b>	6 Vdc to 24 Vdc	6 Vdc to 24 Vdc, 18 Vdc to 24 Vdc	12 mA to 30 mA
<b>Output</b>	75 mm and 225 mm Analog: 0 Vdc to 5 Vdc 225 mm Digital: RS-232 Type	0.5 Vdc to 4.5 Vdc	4 mA to 20 mA
<b>Operating Temperature Range</b>	-40 °C to 125 °C [-40 °F to 257 °F]	-40 °C to 85 °C [-40 °F to 185 °F]	-40 °C to 85 °C [-40 °F to 185 °F]
<b>Termination</b>	Flying Leads	M12 Connector (4-pin), Flying Leads	M12 Connector (Male 5-pin)
<b>Sealing</b>	IP67, IP69K	IP67, IP69K	IP69K
<b>Housing Material</b>	Thermoplastic	Thermoplastic	Aluminum with Powder Coating
<b>Approvals</b>	CE	CE	CE
<b>Features</b>	Analog or Digital Output; Small Size; Self Diagnostics; IP67 and IP69K Sealing	Analog Output; Self Diagnostics; IP67 and IP69K Sealing	Analog Output, IP67 and IP69K Sealing



## ROTARY POSITION SENSORS

### Non-Contact Hall Effect Sensors and Potentiometers

Mechanical versions with 2-bit and 4-bit gray code outputs for potential use in incremental and absolute electrical reference applications. The Series is available with PC terminals or cable leads. Lever option on RTY Series may reduce number of mechanical linkages required for the application.



SERIES	RTY	HRS
<b>Sensing Range</b>	50° (±25°), 60° (±30°), 70° (±35°), 90° (±45°), 120° (±60°), 180° (±90°), 270° (±135°), 360° (±180°)	90° ±2°, 180° ±2°
<b>Input Voltage</b>	LV: 5 Vdc ±0.5 Vdc; HV: 10 Vdc to 30 Vdc	5 Vdc ±10%
<b>Output</b>	LV & HV: 0.5 V to 4.5 V Ratiometric (Standard); 4.5 V to 0.5 V Ratiometric (Inverted)	5% to 95% of applied Vdd, Approximately (Ratiometric)
<b>Input Current (Max.)</b>	LV: 20 mA; Output to Ground Short, 25 mA HV: 32 mA; Output to Ground Short, 47 mA	5 mA Typ.
<b>Life</b>	35 M Cycles	10 M Cycles
<b>Sealing</b>	IP67	N/A
<b>Operating Temperature Range</b>	-40 °C to 125 °C [-40 °F to 257 °F]	-40 °C to 85 °C [-40 °F to 185 °F]
<b>Features</b>	Variety of Supply Voltages and Output Configurations; Rugged Sealed Package with Integral Connector	90° Degree Rotation; Maximum ESD Sensitivity of ±7 kV



SERIES	392/RV6	640	380/RV4	388
<b>Type</b>	392: Original Version RV6: Military Version	Through-shaft	380: Original Version RV4: Military Vers. 380 485: Cust. Vers. 380 53C: Cost Effect. 380 385: Cust. Vers 53C	Multiple Sections Available
<b>Rotational Life</b>	50K Cycles	>1 Million Cycles	Tested to 25K Cycles	50K Cycles
<b>Terminal Type</b>	Solder Hook, PC Pin, Custom	20 AWG; 152,4 mm [6.0 in] Leads	Solder Lug, PC Pin, Fast-on, Custom	PC, Solder Hook
<b>Elemental Type</b>	Conductive Plastic	Conductive Plastic	Conductive Plastic	Conductive Plastic
<b>Power Rating</b>	0.5 W	0.5 W	2 W	0.5 W
<b>Resistance Range</b>	100 Ohm to 5 MOhm (Inclusive)	1 kOhm to 1 MOhm	100 Ohm to 5 MOhm (Inclusive)	100 W to 5 MW; Tapered: 500 W to 2 MW
<b>Bushing Type</b>	Threaded Metal	None	Standard, High Torque, Custom	Standard
<b>Electrical Taper</b>	Log, Reverse Log, Linear	Linear, Quadrature	Log, Reverse Log, Linear	Linear, Quadrature



## MAGNETIC SENSORS

### Hall Effect and Magneto-resistive Sensors

Consists of sensors packaged in a variety of housings. Includes vane sensors, digital position sensors, and solid-state switches. Packaged with Honeywell's first level Hall effect or magneto-resistive sensor ICs with additional wiring, circuitry, or connectors to provide more application functionality.

SERIES	103SR	SR16/SR17	SR3	SR4
<b>Description</b>	Hall effect Digital or Linear Position Sensor	Low-cost Hall effect Vane Sensor	Hall effect Digital Position Sensor	Magneto-resistive Digital Position Sensor
<b>Package Material and Style</b>	Aluminum-threaded Barrel	SR16: Plastic Dual Tower with Variety of Terminations SR17: Plastic Sidemount Wire Exit	Plastic-threaded Barrel	Plastic-threaded Barrel
<b>Magnetic Actuation Type</b>	Unipolar, Bipolar, Bipolar Latching, Linear	N/A	Unipolar, Bipolar	Omnipolar
<b>Operation</b>	Proximity to External Magnet	Ferrous Metal Actuator	Proximity to External Magnet	Proximity to External Magnet
<b>Supply Voltage Range</b>	Digital: 4.5 Vdc to 24 Vdc 4.5 Vdc to 10.5 Vdc	3.8 Vdc to 30 Vdc	4.5 Vdc to 24 Vdc	3.8 Vdc to 30 Vdc
<b>Output Type</b>	Digital: Digital Sinking Linear: Ratiometric Sinking/Sourcing	Digital Sinking	Digital Sinking	Digital Sinking
<b>Operating Temperature Range</b>	-40 °C to 100 °C [-40 °F to 212 °F]	-20 °C to 85 °C [-4 °F to 185 °F]	-40 °C to 85 °C [-40 °F to 185 °F]	-40 °C to 85 °C [-40 °F to 185 °F]
<b>Features</b>	Color-coded Jacketed Cable; Adjustable Mounting	Sinking Output; Non-contact Position Sensing; Environmentally Sealed; Three Terminations	NEMA 3, 3R, 3S, 4, 4X, 12 and 13; Unipolar and Bipolar Magnetics; Sinking Output; Frequencies Exceeding 100 Hz	NEMA 3, 3R, 3S, 4, 4X, 12 and 13; Omnipolar Magnetics; Sinking Output



## PRESSURE SENSORS

### Heavy-Duty Transducers

Complete amplified and compensated pressure measurement. With a choice of ports, connectors, outputs and pressure ranges, transducers can be configured. Heavy-duty pressure transducers are engineering to be resistant to aggressive media in most harsh environments.

SERIES	MLH	PX2	PX3
<b>Pressure Port Type</b>	1/4-18 NPT, 1/8-27 NPT, 7/16-20 UNF 1/4 inch 45° Flare Female Schrader (SAE J512), 1/2-14 NPT, R 1/4-19 BSPT (ISO 7-1 Tapered Thread), R 1/8-28 BSPT (ISO 7-1 Tapered Thread)	7/16-20 UNF 1/4 in 45° Flare Female Schrader (SAE J512), 7/16-20 UNF 45° Flare Male (SAE J513), 7/16-20 UNF 37° Flare Male (SAE J514), G1/4 (ISO 1179-3), G1/8 (ISO 1179-3), M12 x 1.5 (ISO 6149-3), 1/4-18 NPT, 1/8-27 NPT, 9/16-18 UNF, (SAE J1926-3), 7/16-20 UNF (SAE J1926-3)	7/16-20 UNF 1/4 inch 45° Flare Female Schrader (SAE J512), G1/4 (ISO 1179-3), M12 x 1.5 (ISO 6149-3), 1/4-18 NPT, 1/8-27 NPT, Brazable Tube
<b>Measurement Type</b>	Gage, Sealed Gage	Absolute, Sealed Gage, Vented Gage	Absolute, Sealed Gage
<b>Construction</b>	Port: 304L Stainless Steel; Diaphragm: Haynes 214 Alloy	Port and Housing: 304 Stainless Steel, Connector: PBT 30% GF	Threaded Ports: Brass C36000 (Lead (Pb) Content: 3.7% Max.) Tube Port: Copper UNS C12200 (Lead (Pb) Free)
<b>Pressure Range</b>	0 psi to 50 psi through 0 psi to 8000 psi	1 bar to 70 bar   100 kPa to 7 MPa   15 psi to 1000 psi	1 Bar to 50 Bar   15 psi to 700 psi
<b>Output Signal</b>	Ratiometric (from 5 Vdc excitation): 0.5 Vdc to 4.5 Vdc regulated: 1 Vdc to 6 Vdc, 0.25 Vdc to 10.25 Vdc, 0.5 Vdc to 4.5 Vdc, 1 Vdc to 5 Vdc Current: 4 mA to 20 mA	Ratiometric: 5.0 V, 10% Vs to 90% Vs; 5.0 V, 5% Vs to 95% Vs; 3.3 V, 10% Vs to 90% Vs; 3.3 V, 5% Vs to 95% Vs Regulated: 1 Vdc to 6 Vdc, 0.25 Vdc to 10.25 Vdc, 0.5 Vdc to 4.5 Vdc, 1 Vdc to 5 Vdc Current: 4 mA to 20 mA	Ratiometric: 0.5 Vdc to 4.5 Vdc, 0.33 Vdc to 2.97 Vdc
<b>Accuracy</b>	±0.25 %FSS (±0.5 %FSS on Ranges Below 100 psi)	±0.25% FSS	±0.25% FSS
<b>Total Error Band</b>	±2% FSS to ±15% FSS, Depending on Temperature Range and Termination Type	±2% FSS at -40 °C to 125 °C [-40 °F to 257 °F]	±1.0% FSS at -20 °C to 85 °C [-4 °F to 185 °F] ±2.0% FSS at <-20 °C, >85 °C [-4 °F, >185 °F]
<b>Amplified</b>	Yes	Yes	Yes
<b>Compensated Temperature Range</b>	Ratiometric Output: -40 °C to 125 °C [-40 °F to 257 °F]; Regulated and 4 mA to 20 mA Outputs: -40 °C to 125 °C [-40 °F to 257 °F]	-40°C to 125°C [-40°F to 257°F]	-40 °C to 125 °C [-40 °F to 257 °F]
<b>Electrical Connector Type</b>	Metri-Pack 150, Hirschmann (Mates with G4W1F), M12 x 1 (Brad Harrison Micro), DIN 43650-C, 8 mm male, AMP Superseal 1.54, Cable (24 AWG, 1 meter), Cable (24 AWG, 3 meter), Flying Leads (20 AWG, 6 in), Deutsch DTMO4-3P (Integral)	Metri-Pack 150 (UL 94 HB or V-0 Options), Micro M12, DIN, Deutsch, Cable Harness (1 m, 2 m, 3 m, or 5 m)	Metri-Pack 150 (UL V-0), cable harness (PVC or XLPE)
<b>Approvals</b>	UL Component Recognition for USA/ Canada: File No. E258956	IP65 or IP69K, Depending on connector	Ingress Protection up to IP67, RoHS, REACH, and CE Compliant

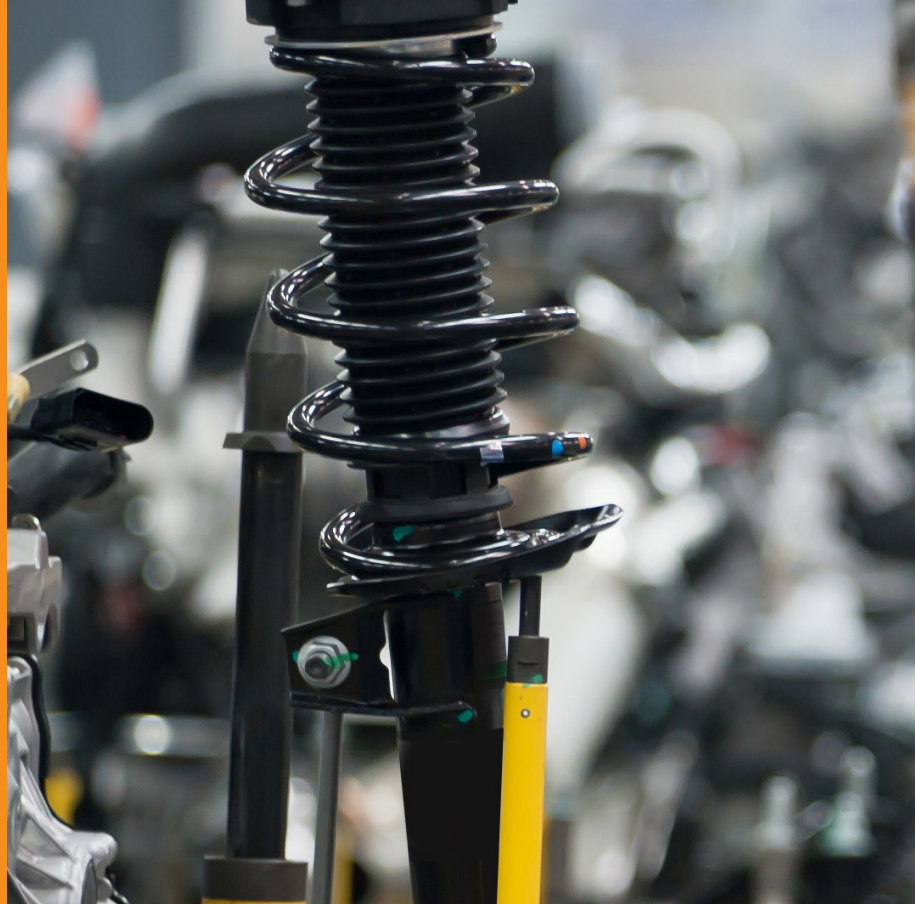


## MAGNETIC SENSORS

### Magneto-resistive Sensor ICs

With a built-in magneto-resistive bridge integrated on silicon and encapsulated in a plastic package, magneto-resistive sensor ICs feature an integrated circuit that responds to low fields at large distances. Low gauss operation extends sensing distance to one inch or more, depending on strength of magnetic field.

SERIES	2SS52M	VF401	APS00B
<b>Description</b>	Omnipolar Magneto-resistive Digital Sensor IC	2-wire MR Fine Pitch Ring Magnet Sensor IC	High-resolution Magnetic Displacement Sensor IC
<b>Magnetic Actuation Type</b>	Omnipolar	Differential Bridge	Analog, Saturated Mode
<b>Package Material and Style</b>	2SS52M: Plastic Radial Leads SS552MT: Plastic Surface Mount (SOT-89B)	Plastic Flat, TO-92-style	Plastic Surface Mount (SOIC-8)
<b>Supply Voltage Range</b>	3.8 Vdc to 30 Vdc	4.5 Vdc to 16 Vdc	1 Vdc to 12 Vdc
<b>Supply Current</b>	11 mA Max.	Icc Operate: 16.8 mA max. Icc Release: 8.4 mA max.	7 mA Max.
<b>Output Type</b>	Digital Sinking	Digital Current Source	Sin(2θ), Cos(2θ)
<b>Operating Temperature Range</b>	-40 °C to 150 °C [-40 °F to 302 °F]	-40 °C to 150 °C [-40 °F to 302 °F]	-40 °C to 150 °C [-40 °F to 302 °F]
<b>Features</b>	Omnipolar Magnetics; Sinking Output, Low Gauss Operation (25 G Max.); Operating Speed of 0 KHz to Over 100 KHz; Tape and Reel Available	Wide Speed Capability; Output Pattern Independent of Gap Between Target and Sensor; Improved Insensitivity to Run-out, Tilt and Twist; Reverse Polarity Protection	Dual Analog Voltages Responding to Changes in Magnetic Field Angle; Sine and Cosine Output; Accurate to 0,102 Mm [0.004 In]; Tape and Reel Available










## TEMPERATURE SENSORS

### Packaged Temperature Probes

Compact, lightweight sensors operate with enhanced sensitivity, reliability, and stability under diverse conditions of shock, vibration, humidity and corrosion. Variety of custom packages available for air, liquid and solid temperature sensing applications.



SERIES				
<b>Temperature Sensing Type</b>	Immersion, Air/Gas	Immersion	Air/Gas	Immersion
<b>Thermistor Type</b>	NTC	RTD	NTC	NTC or KTY
<b>Nominal Resistance at 25 °C [77 °F]</b>	1000 Ohm, 2252 Ohm, 2057 Ohm, 2795 Ohm	100 Ohm	2000 Ohm	2000 Ohm
<b>Operating Temperature Range</b>	-40 °C to 150 °C [-40 °F to 302 °F]	-40 °C to 275 °C [-40 °F to 572 °F] Continuous, Excursion to 300 °C [572 °F] for 10 Minutes Max.	-40 °C to 150 °C [-40 °F to 302 °F]	-40 °C to 150 °C [-40 °F to 302 °F]
<b>Housing Material</b>	Stainless Steel, Brass	Stainless Steel	Brass	Brass
<b>Electrical and Mechanical Interface</b>	Bosch Kompakt, Metri-Pack 150 Series, AMP Seal 16, AMP Minitimer, AMP Superseal and Deutsch DT04-2P; M10 to M18, 3/4 UNF, or G 1/4 Threads, Two Hex Options	Overmolded Connector with M14 x 1.50 Thread	Overmolded Connector with M10 x 1.25 or M12 x 1.50 Thread	Overmolded Connector with M10 x 1.25, M10 x 1.0, M12 x 1.5, M14 x 1.50 Thread, or 1/8 PTF
<b>Features</b>	Quick Response Time, Configurable Probe Lengths, Sensing Element Options, Hex Sizes, Thread Options, and Connectors	Enhanced Response, Reliability, and Accuracy; Stainless Steel Construction	Exposed Thermistor; Rugged Design; Brass Encapsulation	Exposed Thermistor; Rugged Design; Brass Encapsulation

SERIES				
<b>Temperature Sensing Type</b>	Air/Gas, Immersion, Surface, and Liquid Level	Surface	Surface	Surface
<b>Thermistor Type</b>	NTC	NTC	NTC	NTC
<b>Nominal Resistance at 25 °C [77 °F]</b>	200 Ohm to 1,000,000 Ohm (Inclusive)	Various	Various	Various
<b>Operating Temperature Range</b>	-40 °C to 300 °C [-40 °F to 572 °F] (Inclusive)	-60 °C to 204 °C [-76 °F to 399 °F]	-60 °C to 160 °C [-76 °F to 320 °F]	-60 °C to 125 °C [-76 °F to 257 °F]
<b>Housing Material</b>	Plastic, Aluminum, Stainless Steel, Epoxy Filled, Tin or Nickel-plated Copper, Ceramic or Kynar-filled Tubing	Aluminum	Aluminum or Stainless Steel	Aluminum or Stainless Steel
<b>Electrical and Mechanical Interface</b>	Wide Variety of Connectors, Lead Types, Materials and Insulation	Ring tongue #5 with Two Flying Leads	Adhesion with Two Flying Leads; Bullet Housing with Two Flying Leads (Termination Available)	Adhesion with Two Flying Leads; Ring Tongue (#5, #6, #10) with Two Flying Leads; Ring Tongue with Molex Connector; Threaded Body with Flying Leads
<b>Features</b>	Wide Selection of Housing, Resistance, and Termination Options	Wide Variety of Probe Assembly Styles; Choice of Custom or Existing Designs; Enhanced Sensitivity, Accuracy, Stability/Low Drift; Rtd Linear Output Available		



### EV SENSORS

Honeywell's new suite of sensor offerings for enhanced safety in electric vehicle (EV) batteries and energy storage systems bring the best combination of reliability, high performance and sustainability. These industry-leading sensors provide high-accuracy readings with low-temperature drift to the batter management system for electrical management protection and state-of-charge monitoring.



#### BAS Series

- Aerosol threshold value of 5000µg/m³ allows early detection of thermal runaway events
- CAN communication protocol
- ECO mode enables continuous system monitoring in low-power mode
- High accuracy low-temperature drift
- Lower total system cost and enhanced reliability
- Thermal runaway detection sensor allows compliance with international regulations
- Wake-up output and request input for high-reliability system integration



PARAMETERS	VALUES
Average Current Consumption – Eco Mode	<0.5mA
Average Current Consumption – Continuous Working Mode	<30mA
Eco Mode Wake-Up Threshold	5000µg/m³
Operating Temperature Range	-40°C to +85°C
Particulate Matter Measurement Range	200µg/m³ to 10000µg/m³

#### CSHV Series

- ±100A to ±1500A DC current measurement range
- Active open loop current sensing using hall-effect technology
- AEC-Q100 qualified integrated circuits for higher reliability
- Analog voltage output
- CE and UKCA certification
- REACH and RoHS compliant



PARAMETERS	VALUES
Maximum Output Current	10mA
Maximum Output Voltage	10V
Minimum Load Resistance	10kΩ
Operating Temperature Range	-40°C to +125°C

#### BPS Series

- Controller Area Network (CAN) communications protocol
- Customizable for exact specifications for improved time to market
- ECO mode enables continuous system monitoring in low-power mode
- High accuracy and low temperature drift
- Lower total system costs and enhanced reliability
- Wake-up output and request input for high-reliability system integration



PARAMETERS	VALUES
Absolute Pressure Detection Range	50kPa to 300kPa
Baud Rate	500kbps
Maximum Failure Pressure	500kPa
Maximum Withstand Pressure	400kPa
Operating and Storage Temperature Ranges	-40°C to +105°C
Supply Voltage	6V to 18V

#### CSNV Series

- Active flux gate current sensing
- AEC-Q100 qualified for higher reliability
- CAN bus output with configurable ID
- Different configuration options like mounting type, baud rate, CAN ID
- High accuracy and low-temperature drift
- Multi-point temperature characterization and calibration for improved accuracy
- UL, CE, UKCA certifications; REACH and RoHS compliant



PARAMETERS	VALUES
Creepage Distance	10mm
Insulation Resistance	>500MΩ
Operating Temperature Range	-40°C to +85°C
Primary Current, Nominal Measuring Range (dc)	-700A to +700A
RMS Voltage	5kV
Supply Voltage Range	7V to 18V @ 25°C



## PRESSURE AND VACUUM SWITCHES

Feature set points ranging from 0.5 psi to 4500 psi and 1.1 in-Hg to 22 in-Hg, and enhanced repeatability of set points and wide media capability. IP67 environmental sealing and high proof pressure and burst pressure ratings allow for use in many rugged applications that require the making or breaking of an electrical connection in response to a pressure change.



SERIES	HP	HE	ME	MH
<b>Type</b>	High Pressure	High Pressure	Medium Pressure	Medium Pressure
<b>Set Point Range</b>	100 psi to 4500 psi	150 psi to 4500 psi	25 psi to 350 psi	40 psi to 500 psi
<b>Contacts</b>	Silver/Gold Inlay	Silver	Gold Plated	Gold Plated
<b>Operating Pressure</b>	5000 psi	5000 psi	500 psi	600 psi
<b>Proof Pressure</b>	10000 psi (Base Style A) 6500 psi (Base Style B)	10000 psi	4000 psi	60000 psi
<b>Burst Pressure</b>	20000 psi (Base Style A) 9000 psi (Base Style B)	20000 psi	8000 psi	90000 psi
<b>Smart Diagnostic Technology</b>	Yes	Yes	Yes	No
<b>Hysteresis</b>	5% to 55% (Based on Set Point Range)	3% to 65% (Based on Set Point Range)	N/A	N/A
<b>Sealing</b>	IP67 (Connectors) IP67 (Wire/Base A) IP69K (Wire/Base B) IP00 (Blade/Screw)	IP67 (Connectors) IP00 (Blade/Screw)	IP67 (Connectors) IP67 (Wire Out) IP00 (Blade/Screw)	IP67 (Connectors) IP00 (Blade/Screw)
<b>Connector</b>	M14 x 1.5, M18 x 1.5, 1/2-20 UNF, 9/16-18 UNF, 3/4-16 UNF, 7/8-14 UNF	1/2-20 UNF, M14x1.5, 9/16-18 UNF, 3/4-16 UNF, M18x1.5, 7/8-14 UNF	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, 7/16-20 UNF, R1/8 BSPT, M10 x 1.0, R1/2 BSPT, G1/4 BSPP, R1/4 BSPT	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, 3/8-24 UNF, 7/16- 20 UNF, 1/2-14 NPT, R1/8 BSPT, M10 x 1.0, R1/2 BSPT, G1/4 BSPP, R1/4 BSPT
<b>Terminals</b>	Spade Terminals, Screw Terminals, Cable, Deutsch DT04-3P, AMP Superseal 1.5, Cable with Deutsch DT04-3P, Cable with Deutsch DT04-2P, Cable with AMP Superseal 1.5, Cable with Packard Metripak 150, Cable with DIN 4365D-C, Cable with M12 x 1, 150 mm Cable with Packard Weatherpack Male Terminal			Spade Terminals, Screw Terminals, Amp Super Seal, Cable, Cable w/Metripack 280 Delphi, Cable with Deutsch, Cable with Packard, cable with ITT Cannon 2P Sure-Seal, Cable with Amp Super Seal, Deutsch DT04-2P-E005 cable with AMP 2,5 mm System, cable with Metripack 150 Delphi

SERIES	LP	LE	1000	5000 VACUUM
<b>Type</b>	Low Pressure	Low Pressure	Hydraulic Brake Pressure Switch	Direct Action Blade Contact
<b>Set Point Range</b>	3.5 psi to 150 psi	3.5 psi to 150 psi	20 psi ±10 psi [1,37 bar±0,69 bar]	Factory Set: 1.1 in Hg to 22 in Hg
<b>Contacts</b>	Gold Plated	Gold Plated	Silver-plated Copper	Silver-plated Copper
<b>Operating Pressure</b>	250 psi	250 psi	1400 psi	30in - Hgmax
<b>Proof Pressure</b>	500 psi	500 psi	2973 psi	N/A
<b>Burst Pressure</b>	1250 psi	1250 psi	3500 psi	150 psi
<b>Smart Diagnostic Technology</b>	Yes	Yes	No	No
<b>Hysteresis</b>	5% to 55% (Based on Set Point Range)	N/A	N/A	N/A
<b>Sealing</b>	IP67 (Connectors) IP67 (Wire Out) IP00 (Blade/Screw)	IP67 (Connectors) IP67 (Wire Out) IP00 (Blade/Screw)	IP00	IP65
<b>Connector</b>	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	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	M10 x 1.25 Banjo Fitting (Single or Double); M10 x 1; 1/8-27 NPT	1/8-27 NPT Male Thread Standard (Others, Including Metric, Available)
<b>Terminals</b>	Spade Terminals, Screw Terminals, Cable, Deutsch DT04-3P, AMP Superseal 1.5, Cable with Deutsch DT04-3P, Cable with AMP Superseal 1.5, Cable with Packard Metripak 150, Cable with DIN 4365D-C, Cable with M12 x 1, 150 mm Cable with Packard Weatherpack Male Terminal		1/4 in Blade	#8-32 screws, 1/4 in Blade, MetriPak 280



## MICRO SWITCH TOGGLE SWITCHES

### Sealed and Standard Toggles

Hermetic and environmentally sealed toggle switches offer enhanced reliability with MICRO SWITCH technology. Can be used in a variety of applications where a panel-mount switch with an environment-proof rating is needed, including industrial equipment, military and commercial aviation and agriculture.

SERIES	TS	MT	NT	TL
<b>Type</b>	Stainless Steel, Phenolic Toggle	Miniature Toggle	Industrial-grade Toggle	Military-grade Toggle
<b>Sealing</b>	N/A	IEC 60529-2001, IP67, IP68 (Except Terminal Parts)	IP67/68; NEMA 3, 3R, 4 and 13	Qualified to MILDTL-3950
<b>Operating Temperature</b>	-54 °C to 71 °C [-65 °F to 160 °F]	-40 °C to 85 °C [-40 °F to 185 °F]	-40 °C to 71 °C [-40 °F to 160 °F]	-65 °C to 71 °C [-85 °F to 160 °F]
<b>Actuator/Lever</b>	Standard	Standard	Standard, Locking, Special Design, Tab	Standard, Special Design, Tab, Paddle, None
<b>Action</b>	2- or 3-position, Momentary and Maintained			
<b>Mounting</b>	15/32 in Bushing			
<b>Termination</b>	Solder, Screw, Quick Connect	Solder	Solder, Screw, Quick Connect	IWTS, Solder, Screw, Quick Connect, Leadwire
<b>Circuitry</b>	SPST, SPDT, DPST, DPDT	SPST, SPDT, DPST, DPDT	SPST, SPDT, DPST, DPDT, 4PST, 4PDT	SPST, SPDT, DPST, DPDT, 3PST, 3PDT, 4PST, 4PDT
<b>Contacts</b>	Silver Cadmium Oxide	Silver Alloy, Gold-plated	Silver Alloy	Silver Alloy, Gold-plated
<b>Amp Rating</b>	Up to 15 A	5 A, 28 Vdc with Silver Contacts 100 mA, 28 Vdc with Gold-plated Contacts	Up to 20 A (Resistive)	Up to 20 A (Resistive)
<b>Measurements</b>	Various	43,1 mm H x 19,05 mm W x 14,55 mm D [1.697 in H x 0.75 in W x 0.573 in D]	58,4 mm H x 33,5 mm W x 22,6 mm D [2.3 in H x 1.32 in W x 0.89 in D]	58,4 mm H x 33,5 mm W x 22,6 mm D [2.3 in H x 1.32 in W x 0.89 in D]
<b>Approvals</b>	UL, CSA	UL, CE	UL, CSA, CE	UL, CSA, CE, Qualified to MILDTL-3950
<b>Features</b>	Lever-to-bushing Seal	Miniature Behind-panel Size (Case) Enables Overall Control Box or Panel Use	Completely Sealed Switching Chamber; Enhanced Tactile Feedback	Environment-Proof Sealing; Qualified to MILDTL-3950

## MICRO SWITCH BASIC SWITCHES

### Water-tight and Premium Basics

Simple or precision on/off, end of limit, presence/absence, pressure, temperature and manual operator interface application needs. Watertight/dust-tight series provide IP67 protection to operate under difficult environmental conditions. Premium series delivers a broad range of ratings, operating actions and terminations.



SERIES	V15W	ZW	ZD	BZ/BA/BM/BE	V7
<b>Type</b>	Water-tight	Water-tight	Water-tight	Premium	Premium
<b>Amp Rating</b>	0.1 A, 5 A, 10 A	0.1 A, 5 A	0.1 A, 3 A	15 A (BZ), 22 A (BM), 20 A (BA), 25 A (BE)	0.1 A to 25 A
<b>Circuitry</b>	SPDT, SPNO, SPNC	SPDT, SPNO, SPNC	SPDT	SPDT	SPDT, SPNO, SPNC
<b>Operating Force</b>	15 g, 25 g, 50 g, 100 g, 200 g	1.94 oz to 7.16 oz	130 gf to 195 gf	1.0 oz to 28 oz	0.7 oz Max. to 14.6 oz Max.
<b>Terminations</b>	Preleaded; Terminals: 4,8 mm x 0.8 mm or 4,8 mm x 0.5 mm	Quick Connect, Solder, Cable Bottom/End, Cable Side Exit	Solder, PCB Straight, PCB Left Angle, PCB Right Angle, Pre-wired	Quick Connect, Solder, Screw	Quick Connect, Pc Board, PCB Straight Angle Left
<b>Actuators/Levers</b>	Pin Plunger, Straight, Roller, Sim. Roller, Special	Pin Plunger, Straight, Roller, Sim. Roller	Pin Plunger, Straight, Roller, Sim. Roller	Pin Plunger, Overtravel Plunger, Straight, Roller, Flexible Roller Leaf, Flexible Leaf	Pin Plunger, Straight, Short Flag, Roller, Sim. Roller, Curved Tip, Loop, Paddle
<b>Voltage</b>	125 Vac, 250 Vac, 30 Vdc, 48 Vdc	125 Vac, 250 Vac	125 Vac, 12 Vdc	115 Vac, 125 Vac, 250 Vac	125 Vac, 250 Vac, 277 Vac
<b>Approvals</b>	UL, cUL, ENEC, CQC	UL, cUL, CE, ENEC	UL, cUL, CE, ENEC	UL, CSA, ENEC, CE (Varies by Model)	UL, CSA, ENEC
<b>Operating Temperature Range</b>	-40 °C to 85 °C [-40 °F to 185 °F]	-25 °C to 80 °C [-13 °F to 176 °F]	-40 °C to 85 °C [-40 °F to 185 °F]	-55 °C to 85 °C [-67 °F to 185 °F]	-40 °C to 150 °C [-40 °F to 302 °F]
<b>Contacts</b>	Silver Nickel, Gold-plated Option	Silver, Gold-plated Silver	Silver, Gold-plated Silver	Silver, Silver Cadmium Oxide	Silver, Silver Cadmium Oxide, Gold
<b>Housing Material</b>	PBT Polyester Thermoplastic	PBT (Polyester)	PBT (Polyester)	General Purpose Phenolic	PCT Polyester Thermoplastic
<b>Features</b>	Designed for Harsh duty, Wash Down Areas; High-sealing Capability with an IP67 Rating (Pre-Leaded Only)	IP67 Available; Low Energy or Power-Duty Electrical Ratings; Goldplated or Silver Contacts; PBT Polyester Housing Material	Low Energy or Power-Duty Electrical Ratings; Goldplated or Silver Contacts; PBT Polyester Housing Material	Worldwide Standard "Large Basic" Switch; Low Operating Force and Travel; Extended Mechanical Life; Momentary or Maintained Actions	Extended Mechanical and Electrical Life; Custom Engineered Solutions



## MICRO SWITCH LIMIT SWITCHES

### Medium-Duty, Global and Heavy-Duty Switches

Meet IEC standards for world-wide acceptance — often used in lifts and elevators, electronic assembly, construction and agriculture equipment, material handling and rail. EN50041 and EN50047 mounting pattern options. Global approvals, support and sourcing.



SERIES	14CE/914CE	NGC	E6/V6	GLA
<b>Housing Type</b>	N/A	N/A	Split Housing, Side Mount; Split Housing, Flange Mount	EN 50041
<b>Sealing</b>	IP65, IP66, IP67; NEMA 1, 3, 4, 6, 6P, 12, 13	NEMA 1, 4, 12, 13; IP67 Sealing	E6/V6-RQ: IP40; NEMA 1 E6/V6-RN: IP66; NEMA 1, 3, 4	IP67; NEMA 1, 3, 4, 12, 13
<b>Temperature Range</b>	0 °C to 70 °C [35°F to 160°F] -40 °C [-40°F] Low Temp (Optional)	-25 °C to 75 °C [-13 °F to 167 °F]	-32 °C to 71 °C [-25 °F to 160 °F] -40°C [-40°F] Low Temp (Optional)	-25 °C to 85 °C [-13 °F to 185 °F] Side Rotary: -40 °C to 85 °C [-40 °F to 185 °F]
<b>Housing Material</b>	Zinc Die-cast	Zinc Die-cast, Plastic	Zinc Die-cast	Zinc Die-cast
<b>Actuators/Levers</b>	Side Rotary, Top Plunger, Roller Plunger, Pushbutton, Wobble	Side Rotary, Plunger	Top Plunger, Maint. with Reset Plunger, Wobble, Lever Actuated	Side Rotary, Top Plunger, Top Roller Lever, Roller Plunger, Wobble
<b>Termination</b>	Cable, Micro-connector	Normal cable, PUR Cable, Special Application Cable, Railway Cable Connector, 4-pin Male, M12 Thread Connector, 5-pin Male, M12 Thread	0.5 in - 14NPT (or NPSM) Conduit, Mini-connector, Cable	0.5 in - 14NPT Conduit, 20 mm, PG13.5
<b>Approvals</b>	14CE: CE, IEC947-5-1, EN60947-5-1 914CE: UL, CE, CSA, IEC947-5-1, EN60947-5-1	UL, CE, cUL, and CCC	UL, CSA	UL, CE, CSA, CCC, IEC 947- 5-1, EN60947-5-1, UL508
<b>Circuitry</b>	SPDT	SPDT, DPDT	SPDT, DPDT	SPDT Snap Action DB, SPDT Slow Action BBM/ MBB, DPDT Snap Action DB, DPDT Sequential, DPDT Center Neutral, 2NO and 2NC
<b>Contacts</b>	Silver, Gold	Silver, Gold	Silver	Silver, Gold
<b>Amp Rating</b>	5 A (Thermal)	5A, 10A	10 A, 15 A, 22 A	10 A (Thermal)
<b>Features</b>	Rugged Housing; Miniature Size; Pre-Leaded or Various Quick-Connect Terminations; Low-temperature Available	Snap Action, Positive-break Contacts, Metal and Plastic Housing Available, Low- and High-Temperature Variants, Cable and Connector Terminations, Variety of Heads and Actuator Levers	Rugged Electrostatic, Epoxy-Coated Housing; Side or Flange Mount; Low-temperature Options; Hermetic Seal Optional; Models In Service for More Than 60 Years	→ Positive-opening NC Contacts



SERIES	GLC	GLD	GLE	HDLS
<b>Housing Type</b>	EN 50047 (Metal)	EN 50047 (Plastic)	EN 50047 Compatible	HDLS Plug-in and Non-plug-in
<b>Sealing</b>	IP66/IP67; NEMA 1, 4, 12, 13	IP66/IP67; NEMA 1, 12, 13	IP66; NEMA 1, 4, 12, 13	IP65/66/67; NEMA 1, 3, 4, 4X, 6, 6P, 12, 13
<b>Temperature Range</b>	-40 °C to 85 °C [-40 °F to 185 °F]	-40 °C to 85 °C [-40 °F to 185 °F]	-40 °C to 85 °C [-40 °F to 185 °F]	-12 °C to 93 °C [10 °F to 200 °F] (Standard) -40 °C to 121 °C [-40 °F to 250 °F] (Low-temp Optional)
<b>Housing Material</b>	Zinc Die-cast	High-strength Thermoplastic	Zinc Die-cast	Zinc Die-cast
<b>Actuators/Levers</b>	Side Rotary, Top Plunger, Top Roller Lever, Roller Plunger, Wobble	Side Rotary, Top Plunger, Top Roller, Wobble	Side Rotary, Top Plunger, Top Roller, Wobble	Top Plunger, Top Roller, Top Rotary, Side Rotary, Side Plunger, Side Rotary, Wobble
<b>Termination</b>	0.5 in - 14NPT Conduit, 20 mm, PG13.5	0.5 in - 14NPT Conduit, 20 mm, PG13.5	0.5 in - 14NPT Conduit, 20 mm, PG13.5	0.5 in/0.75 in - 14NPT Conduit; 20 mm Conduit; PG13.5; 12 ft Cable; 4, 5, and 9-pin Mini-connector
<b>Approvals</b>	UL, CE, CSA, CCC, IEC 947- 5-1, EN60947-5-1, UL508	UL, CE, CSA, CCC, IEC 947- 5-1, EN60947-5-1, UL508, UL746-C	UL, CE, CSA, CCC, IEC 947- 5-1, EN60947-5-1, UL508	UL, CE, CSA, CCC, EN60947-1, EN60947-5-1
<b>Circuitry</b>	SPDT Snap Action DB, SPDT Slow Action BBM/ MBB, 1NC/1NO, 2NC/2NO	SPDT Snap Action DB, SPDT Slow Action BBM/MBB, 1NC/1NO, 2NC/2NO	SPDT Snap Action DB, SPDT Slow Action BBM/ MBB, DPDT Snap action DB, 2NO and 2NC	1NC 1NO SPDT, 1NC Direct Acting, 2NC 2NO DPDT, 2NC 2NO DPDT Sequential, 2NC 2NO DPDT Center Neutral
<b>Contacts</b>	Silver, Gold	Silver, Gold	Silver, Gold	Silver, Gold
<b>Amp Rating</b>	10 A (Thermal)	10 A (Thermal)	10 A (Thermal)	10 A (Thermal)
<b>Features</b>	→ Positive-opening NC Contacts	→ Positive-opening NC Contacts	→ Positive-opening NC Contacts	Wide Variety of Actuators, Circuitry Options and Connectivity; Rugged and Dependable, Models in Service for over 40 Years

## CONTROLS

### Push-Pull/eStop Switches • Hour Meters

Robust, environmentally sealed, sliding contact switch incorporating two circuits with multiple combinations. eStops are available with five different circuitry options. Hour meters feature accuracy to ±0.02% with various mounting configurations. Excellent vibration and shock resistance.



SERIES	PUSH-PULL/ESTOP
<b>Connector</b>	Screw Terminal, Pigtail Harness with Connector (Deutsch)
<b>Position</b>	2NO Circuits in Push; 2NC Circuits in Push; 1NO/1NC Circuit
<b>Cycle Life</b>	25000 Cycles (Rotary)
<b>Chamber Sealing</b>	O-ring (IP67 Sealing)
<b>Measurements</b>	Ø 45,21 mm [Ø 1.78 in]
<b>Temperature</b>	-40 °C to 100 °C [-40 °F to 212 °F]
<b>Electrical Rating</b>	12 Vdc to 14 Vdc, 20 A; 24 Vdc, 10 A
<b>Feature</b>	UV Resistant Button for Outdoor Use; Moisture, Contamination and Vibration Resistant; Sliding Contacts; Momentary Switch Option; Knob Available in a Variety of Colors



SERIES	LM	28100	82400
<b>Type</b>	AC or DC	AC	DC
<b>Counting Range</b>	0 to 99,999.9 Hours	0 to 99,999.9 Hours with Automatic Roll over to Zero	0 to 9999.9; 0 to 99,999.9 (Optional)
<b>Sealing</b>	IP67 (Front); IP66 (Rear)	IP66 Front (IP40 Rear)	IP66
<b>Voltage Range</b>	9 V to 64 V	90 Vac to 264 Vac/ 50 Hz, 60 Hz	10 Vdc to 80 Vdc (Polarity Insensitive)
<b>Accuracy</b>	±200 ppm/hour	±0.02%	±0.02%
<b>Termination</b>	1/4 in blades; 3/16 in blades	1/4 in spade	1/4 in spade
<b>Approvals</b>	UL, CE	UL, CSA, CE	N/A
<b>Mount/Panel Cutout Opening</b>	2-screw and Standard: 36, 8 mm x 24,1 mm [1.45 in x 0.95 in] Round: 50,8 mm [2.0 in] dia. Rectangular: 45,0 mm x 22,4 mm [1.77 in x 0.88 in]	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]; 3-screw and Round: 50,8 mm [2.0 in] dia.
<b>Operating Temperature</b>	-40 °C to 85 °C [-40 °F to 185 °F]	-40 °C to 85 °C [-40 °F to 185 °F]	-40 °C to 85 °C [-40 °F to 185 °F]
<b>Number Size</b>	7 mm [0.28 in]	3 mm [0.12 in]	3 mm [0.12 in]
<b>Features</b>	Backlight and Large 7 mm Display Ease Readability; Digital, Microcontrol Unit LCD; Durable Design of Mounting assembly	Operates over a Range of Voltages and Frequencies; Sealed from Dirt and Moisture; Custom Lens and Terminal Orientation Options	Non-polarity Sensitive Design; Sealed Terms

## CONTROLS

### Key and Rotary Switches, Shifters

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. Custom switches and controls are "standard" for Honeywell S&C.



SERIES	INTEGRAL CONNECTOR (KEY)	SCREW TERMINAL (KEY)	ROTARY/KEYLESS SWITCH
<b>Connector</b>	MetriPak 280 and Sumitomo	Screw	MetriPak 280, 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	12 Vdc, 20 A; 24 Vdc, 8 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]	-40 °C to 85 °C [-40 °F to 185 °F]
<b>Cycle Life at Electrical Load</b>	25,000 Cycles	25,000 Cycles	25,000 Cycles
<b>Position</b>	2 Position (Off/On); 3 Position (Off/On/Start), (Off/On/Start), Magnetoground; 4 Position (Off/On/Preheatstart)	2 position (Off/On); 3 position (Off/On/Start); 3 position (On/Off/On)	3 Position (On/Off/On), (Off/On/Start), (Off/On/On); 4 Position (Off/On/Accstart), (Off/On/Start)
<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		Environmentally Sealed; Recoil Spring Allows Momentary Positions

SERIES	HEAVY-DUTY SHIFTER	HEAVY-DUTY TURN-SIGNAL
<b>Column Size</b>	38 mm, 45 mm, 55 mm	38 mm, 45 mm, 55 mm
<b>Neutral Lock</b>	None, Drop-down	N/A
<b>Speeds</b>	2, 3, 4, and 6	N/A
<b>Lights</b>	N/A	Turn Signal, Head Lamp Switch/Dimmer, Flash to Pass, Hazard Warning
<b>Wiper Speeds</b>	N/A	1 Speed, Hi/Lo, Intermittent
<b>Buttons</b>	Horn, Wash, Drop-down	Wash, Horn
<b>Connectors</b>	Integral Packard, Integral Deutsch, Wire Harness	
<b>Expected Life Cycle</b>	1 million (Rotary); 500,000 (Shifter Handle)	50,000 cycles
<b>Operating Temperature Range</b>	-40 °C to 85 °C [-40 °F to 185 °F] (0% to 95% Relative Humidity)	
<b>Operating Voltage Range</b>	3 V to 32 V	3 V to 32 V
<b>Solenoid Load</b>	2 A @ 12.8 V with Arc Suppression	2 A @ 12.8 V with Arc Suppression
<b>Features</b>	IP67; Turn Signals are Built to Complement the Shifter, or Mounted as Stand Alone	

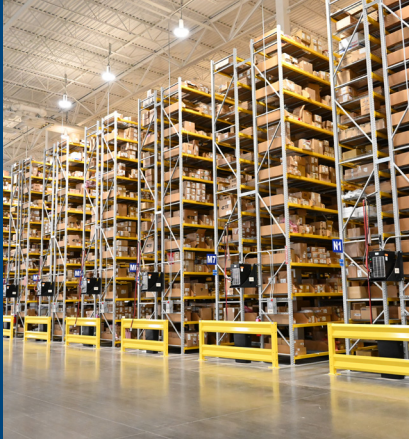


The IP&E Specialist

## Why Buy from the Specialist in Electronic Component Distribution?

Founded in 1971, TTI has steadily grown to become the world's leading interconnect, passive, electromechanical and discrete component distributor in the industry.

The company was founded on the premise that passive component purchasing could be made more efficient by offering product specialization, customer-driven service, and proprietary supply chain solutions – and do it all with secure 24/7 access.



## Knowledgeable Product Experts

Specialization allows TTI product managers to provide much better product insight to support your manufacturing from design through production. TTI Specialists' commitment to our customers is key to our continued success.

## Broader and Deeper Inventories

TTI maintains extensive component inventories, stocking more than 500,000 part numbers in North America and over 850,000 globally – that's more interconnect, passive, electromechanical and discrete inventory available than from any other source.

## AIM - Advanced Inventory Management Platform

TTI's proprietary supply chain system is specifically designed for managing IP&E products and partnerships with premier manufacturers. This allows us to provide the BOM coverage necessary to deploy comprehensive solutions that reduce total cost of ownership and mitigate line down risk.

## QUALITY AND RELIABILITY

TTI is the first distributor to have all global warehouse locations ISO registered and currently are certified to ISO 9001 with AS9100C and ISO 14001 in North America, ISO 9001, EN 9100, ISO 14001 and EN 9120 in TTI Europe and ISO 9001 in TTI Asia.

Year after year, customers rate our inventory availability, on-time delivery and accuracy among the very best in the industry – call your local TTI Specialists at 1.800.CALL.TTI and discover why.

