



Honeywell

Transportation Guide



Honeywell

Reach your local sales team at 1.800.CALL.TTI



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

- Hour Meter
- 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

Vehicle Temperature Sensing, and Engine Testing

- Force Sensor
- Pressure Sensor
- Torque Sensor
- Wireless Data Telemetry

Wheels and Suspension Systems

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



Heavy Duty On and Off-road



Material Handling Equipment



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	5
SMART Position Sensors	6, 7
Rotary Position Sensors	8
Magnetic Sensors	9
Pressure and Vacuum Switches	10,11
Pressure Sensors	11
Magnetic Sensors	12, 13
Temperature Sensors	14, 15
MICRO SWITCH Toggle Switches	16
MICRO SWITCH Basic Switches	17
MICRO SWITCH Limit Switches	18, 19
Controls – Push/Pull, eStop, and Hour Meters	20
Controls – Key and Rotary Switches, Shifters	21
Test and Measurement	22

Component Locations

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.

Commercial Vehicles



Part Description	
1	Temperature Sensor (Cabin Temperature Sensing) LTP Series and ES-110 Series
2	Temperature Sensor (Air Inlet Sensing) LTP Series and ES-110 Series
3	Temperature Sensor (Oil, Coolant, and Fuel Temperature Sensing) LTP, R300, and 500 Series
4	Temperature Sensor (Hydraulic Oil Temp Sensing) R300 Series
5	Temperature Sensor (Exhaust Gas Recirculation Sensing) R300 Series
6	Thermostat (Fan Control and Fire Suppression Sensing) 3000 Series
7	Hall effect Position Sensor (Jack Position Sensing) 103SR Series
8	Position Sensor (Boom Angle Position Sensing) SPS and RPN Series
9	Speed Sensor (Wheel Speed Sensing) SNDH Series
10	Speed Sensor (Wheel and Hydraulic Pump Speed Sensing) SNDH Series
11	Angular or Linear Hall effect Position Sensor IC (Power Steering Control System Sensing) – APS00B, SS490, and RPN Series
12	Hall effect Speed Sensor (Camshaft/Crankshaft Sensor/ABS) SNDH-H Series
13	Speed Sensor (RPM and Speedometer/MPH Sensing) VRS, SNDH, and LCZ Series
14	Speed Sensor (RPM/Speedometer/MPH, Camshaft/Crankshaft, and Turbocharger Speed Sensing) SNDH-H Series
15	Bipolar Hall effect Sensor IC (Power Seat Motor) SS400 Series
16	Linear Hall effect Sensor IC (Stability Control System and Remote Mirror with Memory Control) SS490 Series
17	Angular or Linear Hall effect Sensor IC (Power Steering Control System) APS00B and SS490 Series
18	Speed/Direction Sensor (Forward/Reverse Sensing) SNDH-T Series
19	Linear Hall effect Sensor IC (Throttle Position Sensing) SS490 Series
20	Rotary Position Sensor (Gear Position Detection/Throttle by Wire) RTY Series
21	Infrared Sensor (Hand-grip Joystick Control Sensing) SMD2440, SME2470 Series

Part Description

22	Liquid Level Sensor (Fuel, Oil, or Brake Fluid Sensing) LLE Series
23	Heavy-duty Pressure Transducer 23a. Hydraulic Sensing; 23b. Fuel Tank Level Sensing; 23c. Braking System Sensing PX3, PX2, MLH, 13mm, 19mm, and SPT Series
24	Handlebar Controls (Multi-function Switch) – 1080HD Series and Custom
25	Smart Key (Limits Function by Operator's Certification Level)
26	Heavy-duty Pressure Transducer or T&M Pressure Sensor (Outrigger Load Sensing - Minimum of Four; Maximum of Six) – MLH Series
27	SMART Position Sensor (Vehicle and Load Sensing) 27a. SPS Linear; 27b. SPS Rotary
28	SMART position sensor (Steering Angle Sensing) – SPS Series
29	Hour meter (Usage Tracking) – LM Series
30	Key Switch (On/Off)
31	Push-pull Switch (Emergency Stop)
32	Shifter (Forward, Neutral, and Reverse) 81248 Series
33	Turn Signal Multi-purpose
34	Pressure Switch (Hydraulic System and Engine Oil Monitoring) HP, HE, MH, ME, LP, and LE Series
35	Pressure Switch (Brake Switch Indicator) Series 1000
36	Vacuum Switch (Airflow Monitoring) 5000 Series
37	MICRO SWITCH™ Limit Switch (Back-up Alarm) BZE Series
38	MICRO SWITCH™ Limit Switch (Level Sensor for Cab Position) GLS Series
39	MICRO SWITCH™ Limit Switch (Machine Position) HDLS Series
40	MICRO SWITCH™ Limit Switch (Jib, Wheelback, and Outrigger Position Indicator) GLS Series
41	MICRO SWITCH™ Toggle Switch (Manual Operator Switch) NT Series
42	MICRO SWITCH™ Basic Switch (Watertight) (Brake Switch Indicator) V15W Series
43	Limitless™ Switches 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	Load Cell or Load Pins 44a. (Hook Load Sensing); 44b. (Outrigger Load Sensing, Minimum of 4, Maximum of 6)
45	Load Cell 45a. (Torsion or Boom Side Load Sensing); 45b. Provides Counterweight Information to Operator)
46	Load Pin (Replaces Hydraulic Cylinder Pins)

Recreational Vehicles



Construction Equipment



Speed & 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, magneto-resistive, and variable reluctance sensors.



SERIES

LCZ

SNDH-T

SNDH-H

Description	Single Hall effect Zero Speed Sensor	Dual Differential Hall effect Quadrature Speed and Direction Sensor	Hall effect Speed Sensor
Housing	Stainless Steel	Stainless Steel, Plastic	Stainless Steel, Plastic
Supply Voltage Range	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
Supply Current	20 mA	18 mA Max.	6 mA Max., 14 mA Max., 20 mA Max.
Output Type	Digital Sinking	Square Wave	Digital Sinking
Operating Frequency Range	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
Operating Temperature Range	-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
Features	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

Output Voltage Range	8 Vp-p to 40 Vp-p (Inclusive)	4.7 Vp-p to 125 Vp-p (Inclusive)
Housing Diameter	5/8 in, 3/8 in, 1/4 in, and 10/32 in	5/8 in, 3/8 in, and 1/4 in
Housing Material/Style	Stainless Steel Threaded or Smooth	Stainless Steel Threaded
Termination	MS3106 Connector, Prelead	MS3106 Connector, Prelead
Operating Temperature Range	-55 °C to 120 °C [-67 °F to 250 °F] (Inclusive)	-73 °C to 230 °C [-100 °F to 450 °F] (Inclusive)
Features	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**

Description	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
Configuration	Linear	Arc	Rotary
Sensing Range	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°
Resolution	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°
Supply Voltage	6 Vdc to 24 Vdc	6 Vdc to 24 Vdc, 18 Vdc to 24 Vdc	12 mA to 30 mA
Output	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
Operating Temperature Range	-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]
Termination	Flying Leads	M12 Connector (4-pin), Flying Leads	M12 Connector (Male 5-pin)
Sealing	IP67, IP69K	IP67, IP69K	IP69K
Housing Material	Thermoplastic	Thermoplastic	Aluminum with Powder Coating
Approvals	CE	CE	CE
Features	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

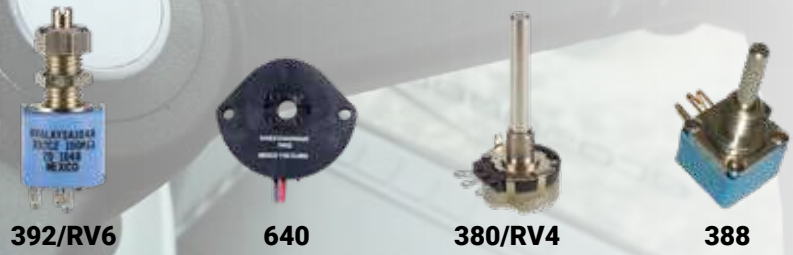
Rotary Position Sensors

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. Series are 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
Sensing Range	50° (±25°), 60° (±30°), 70° (±35°), 90° (±45°), 120° (±60°), 180° (±90°), 270° (±135°), 360° (±180°)	90° ±2°, 180° ±2°
Input Voltage	LV: 5 Vdc ±0.5 Vdc; HV: 10 Vdc to 30 Vdc	5 Vdc ±10 %
Output	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)
Input Current (Max.)	LV: 20 mA; Output to Ground Short, 25 mA HV: 32 mA; Output to Ground Short, 47 mA	5 mA Typ.
Life	35 M Cycles	10 M Cycles
Sealing	IP67	N/A
Operating Temperature Range	-40 °C to 125 °C [-40 °F to 257 °F]	-40 °C to 85 °C [-40 °F to 185 °F]
Features	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
Type	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
Rotational Life	50K Cycles	>1 Million Cycles	Tested to 25K Cycles	50K Cycles
Terminal Type	Solder Hook, PC Pin, Custom	20 AWG; 152.4 mm [6.0 in] Leads	Solder Lug, PC Pin, Fast-on, Custom	PC, Solder Hook
Elemental Type	Conductive Plastic	Conductive Plastic	Conductive Plastic	Conductive Plastic
Power Rating	0.5 W	0.5 W	2 W	0.5 W
Resistance Range	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
Bushing Type	Threaded Metal	None	Standard, High Torque, Custom	Standard
Electrical Taper	Log, Reverse Log, Linear	Linear, Quadrature	Log, Reverse Log, Linear	Linear, Quadrature

Magnetic Sensors

Hall Effect and Magnetoresistive 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 magnetoresistive sensor ICs with additional wiring, circuitry, or connectors to provide more application functionality.



SERIES	103SR	SR16/SR17	SR3	SR4
Description	Hall effect Digital or Linear Position Sensor	Low-cost Hall effect Vane Sensor	Hall effect Digital Position Sensor	Magnetoresistive Digital Position Sensor
Package Material and Style	Aluminum-threaded Barrel	SR16: Plastic Dual Tower with Variety of Terminations SR17: Plastic Sidemount Wire Exit	Plastic-threaded Barrel	Plastic-threaded Barrel
Magnetic Actuation Type	Unipolar, Bipolar, Bipolar Latching, Linear	N/A	Unipolar, Bipolar	Omnipolar
Operation	Proximity to External Magnet	Ferrous Metal Actuator	Proximity to External Magnet	Proximity to External Magnet
Supply Voltage Range	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
Output Type	Digital: Digital Sinking Linear: Ratiometric Sinking/Sourcing	Digital Sinking	Digital Sinking	Digital Sinking
Operating Temperature Range	-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]
Features	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 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
Type	High Pressure	High Pressure	Medium Pressure	Medium Pressure
Set Point Range	100 psi to 4500 psi	150 psi to 4500 psi	25 psi to 350 psi	40 psi to 500 psi
Contacts	Silver/Gold Inlay	Silver	Gold Plated	Gold Plated
Operating Pressure	5000 psi	5000 psi	500 psi	600 psi
Proof Pressure	10000 psi (Base Style A) 6500 psi (Base Style B)	10000 psi	4000 psi	60000 psi
Burst Pressure	20000 psi (Base Style A) 9000 psi (Base Style B)	20000 psi	8000 psi	90000 psi
Smart Diagnostic Technology	Yes	Yes	Yes	No
Hysteresis	5% to 55 % (Based on Set Point Range)	3% to 65% (Based on Set Point Range)	N/A	N/A
Sealing	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)
Connector	M14 × 1.5, M18 × 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 × 1.5, M14 × 1.5, 9/16- 18 UNF, 3/4-16 UNF, G1/8 BSPP, 7/16-20 UNF, R1/8 BSPT, M10 × 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 × 1.5, M14 × 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 × 1.0, R1/2 BSPT, G1/4 BSPP, R1/4 BSPT
Terminals	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**

Type	Low Pressure	Low Pressure	Hydraulic Brake Pressure Switch	Direct Action Blade Contact
Set Point Range	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
Contacts	Gold Plated	Gold Plated	Silver-plated Copper	Silver-plated Copper
Operating Pressure	250 psi	250 psi	1400 psi	30in - Hgmax
Proof Pressure	500 psi	500 psi	2973 psi	N/A
Burst Pressure	1250 psi	1250 psi	3500 psi	150 psi
Smart Diagnostic Technology	Yes	Yes	No	No
Hysteresis	5% to 55% (Based on Set Point Range)	N/A	N/A	N/A
Sealing	IP67 (Connectors) IP67 (Wire Out) IP00 (Blade/Screw)	IP67 (Connectors) IP67 (Wire Out) IP00 (Blade/Screw)	IP00	IP65
Connector	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)
Terminals	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		1/4 in Blade	#8-32 screws, 1/4 in Blade, MetriPak 280

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.

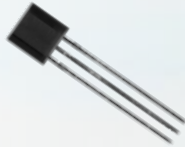


SERIES	MLH	PX2	PX3
Pressure Port Type	1/4-18 NPT, 1/8-27 NPT, 7/16-20 UNF 1/4 inch 45° Flare Female Schrader (SAE J512), 1/2-14 NPT, R 1/4-19 BSPT (ISO 7-1 Tapered Thread), R 1/8-28 BSPT (ISO 7-1 Tapered Thread)	7/16-20 UNF 1/4 in 45° Flare Female Schrader (SAE J512), 7/16-20 UNF 45° Flare Male (SAE 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
Measurement Type	Gage, Sealed Gage	Absolute, Sealed Gage, Vented Gage	Absolute, Sealed Gage
Construction	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)
Pressure Range	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
Output Signal	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
Accuracy	±0.25 %FSS (±0.5 %FSS on Ranges Below 100 psi)	±0.25% FSS	±0.25% FSS
Total Error Band	±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]
Amplified	Yes	Yes	Yes
Compensated Temperature Range	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]
Electrical Connector Type	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 DTM04-3P (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)
Approvals	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.



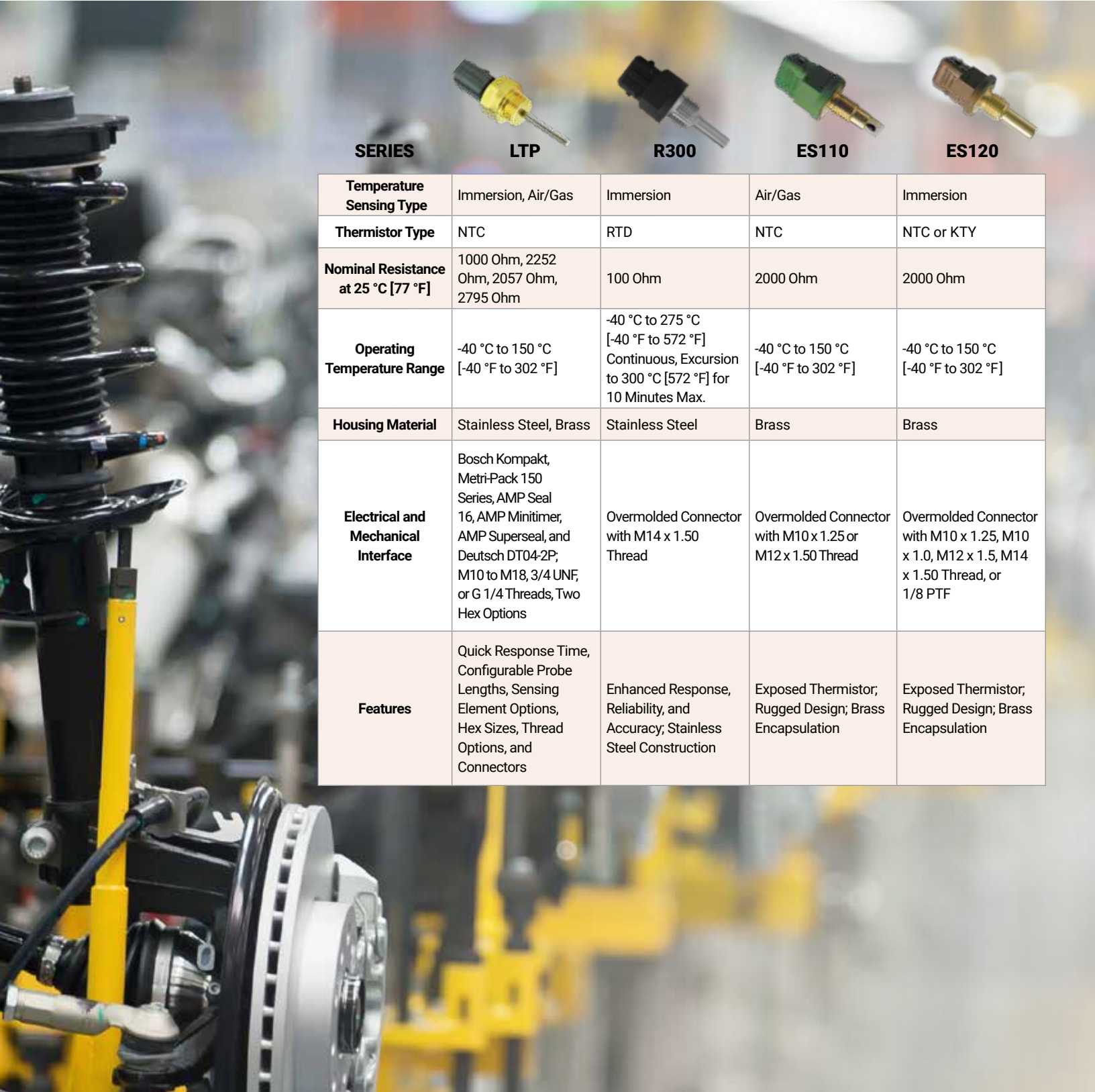
SERIES	2SS52M	VF401	APS00B
Description	Omnipolar Magneto-resistive Digital Sensor IC	2-wire MR Fine Pitch Ring Magnet Sensor IC	High-resolution Magnetic Displacement Sensor IC
Magnetic Actuation Type	Omnipolar	Differential Bridge	Analog, Saturated Mode
Package Material and Style	2SS52M: Plastic Radial Leads SS552MT: Plastic Surface Mount (SOT-89B)	Plastic Flat, TO-92-style	Plastic Surface Mount (SOIC-8)
Supply Voltage Range	3.8 Vdc to 30 Vdc	4.5 Vdc to 16 Vdc	1 Vdc to 12 Vdc
Supply Current	11 mA Max.	Icc Operate: 16.8 mA max. Icc Release: 8.4 mA max.	7 mA Max.
Output Type	Digital Sinking	Digital Current Source	Sin(2θ), Cos(2θ)
Operating Temperature Range	-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]
Features	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	LTP	R300	ES110	ES120
Temperature Sensing Type	Immersion, Air/Gas	Immersion	Air/Gas	Immersion
Thermistor Type	NTC	RTD	NTC	NTC or KTY
Nominal Resistance at 25 °C [77 °F]	1000 Ohm, 2252 Ohm, 2057 Ohm, 2795 Ohm	100 Ohm	2000 Ohm	2000 Ohm
Operating Temperature Range	-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]
Housing Material	Stainless Steel, Brass	Stainless Steel	Brass	Brass
Electrical and Mechanical Interface	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
Features	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

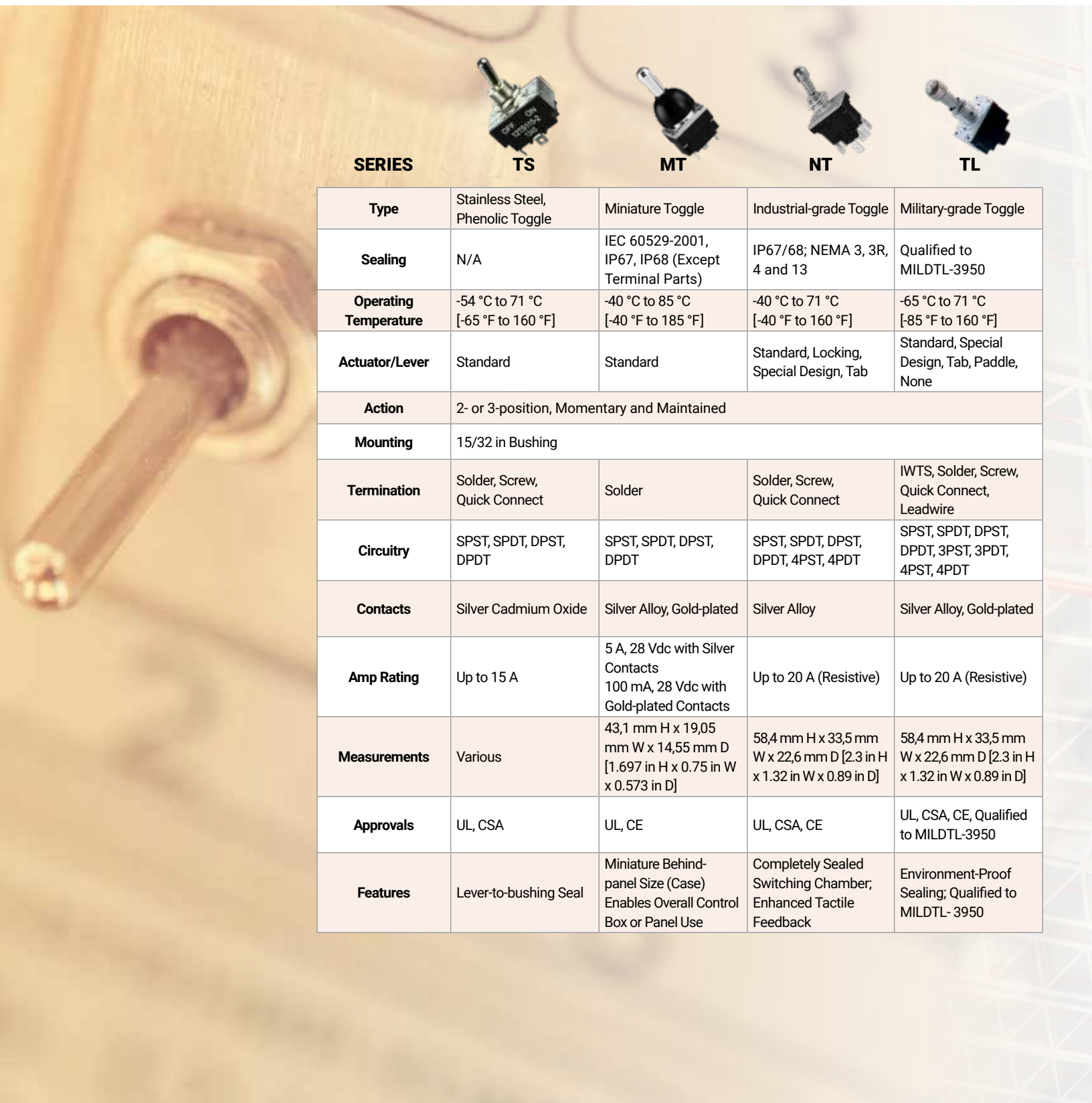


SERIES	500	512	526,535	590
Temperature Sensing Type	Air/Gas, Immersion, Surface, and Liquid Level	Surface	Surface	Surface
Thermistor Type	NTC	NTC	NTC	NTC
Nominal Resistance at 25 °C [77 °F]	200 Ohm to 1,000,000 Ohm (Inclusive)	Various	Various	Various
Operating Temperature Range	-40 °C to 300 °C [-40 °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]
Housing Material	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
Electrical and Mechanical Interface	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
Features	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		

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

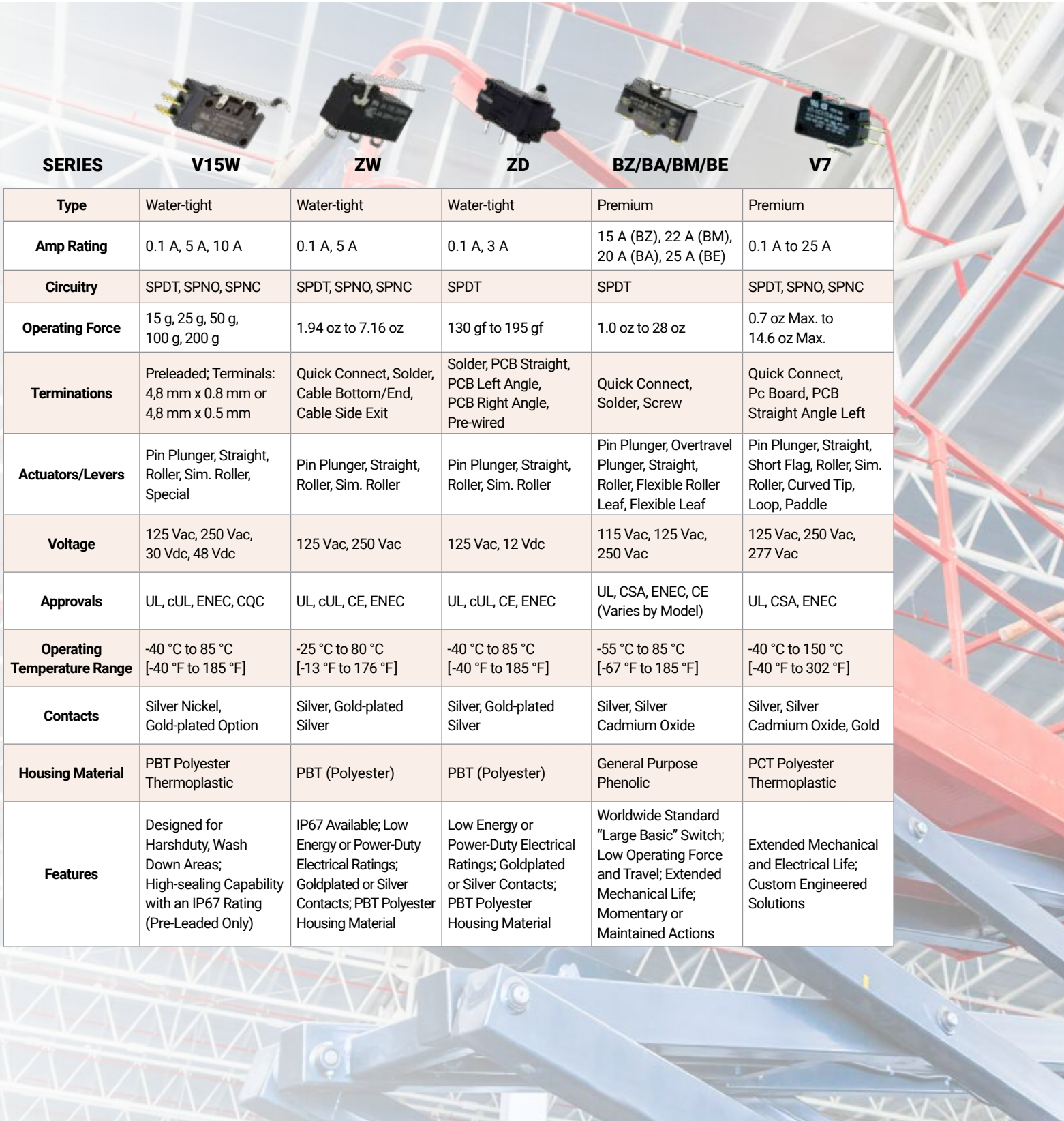
TL

Type	Stainless Steel, Phenolic Toggle	Miniature Toggle	Industrial-grade Toggle	Military-grade Toggle
Sealing	N/A	IEC 60529-2001, IP67, IP68 (Except Terminal Parts)	IP67/68; NEMA 3, 3R, 4 and 13	Qualified to MILDTL-3950
Operating Temperature	-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]
Actuator/Lever	Standard	Standard	Standard, Locking, Special Design, Tab	Standard, Special Design, Tab, Paddle, None
Action	2- or 3-position, Momentary and Maintained			
Mounting	15/32 in Bushing			
Termination	Solder, Screw, Quick Connect	Solder	Solder, Screw, Quick Connect	IWTS, Solder, Screw, Quick Connect, Leadwire
Circuitry	SPST, SPDT, DPST, DPDT	SPST, SPDT, DPST, DPDT	SPST, SPDT, DPST, DPDT, 4PST, 4PDT	SPST, SPDT, DPST, DPDT, 3PST, 3PDT, 4PST, 4PDT
Contacts	Silver Cadmium Oxide	Silver Alloy, Gold-plated	Silver Alloy	Silver Alloy, Gold-plated
Amp Rating	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)
Measurements	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]
Approvals	UL, CSA	UL, CE	UL, CSA, CE	UL, CSA, CE, Qualified to MILDTL-3950
Features	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
Type	Water-tight	Water-tight	Water-tight	Premium	Premium
Amp Rating	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
Circuitry	SPDT, SPNO, SPNC	SPDT, SPNO, SPNC	SPDT	SPDT	SPDT, SPNO, SPNC
Operating Force	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.
Terminations	Pre-lead; 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
Actuators/Levers	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
Voltage	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
Approvals	UL, cUL, ENEC, CQC	UL, cUL, CE, ENEC	UL, cUL, CE, ENEC	UL, CSA, ENEC, CE (Varies by Model)	UL, CSA, ENEC
Operating Temperature Range	-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]
Contacts	Silver Nickel, Gold-plated Option	Silver, Gold-plated Silver	Silver, Gold-plated Silver	Silver, Silver Cadmium Oxide	Silver, Silver Cadmium Oxide, Gold
Housing Material	PBT Polyester Thermoplastic	PBT (Polyester)	PBT (Polyester)	General Purpose Phenolic	PCT Polyester Thermoplastic
Features	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

	14CE/914CE	NGC	E6/V6	GLA
Housing Type	N/A	N/A	Split Housing, Side Mount; Split Housing, Flange Mount	EN 50041
Sealing	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
Temperature Range	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]
Housing Material	Zinc Die-cast	Zinc Die-cast, Plastic	Zinc Die-cast	Zinc Die-cast
Actuators/Levers	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
Termination	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
Approvals	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
Circuitry	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
Contacts	Silver, Gold	Silver, Gold	Silver	Silver, Gold
Amp Rating	5 A (Thermal)	5A, 10A	10 A, 15 A, 22 A	10 A (Thermal)
Features	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

Housing Type	EN 50047 (Metal)	EN 50047 (Plastic)	EN 50047 Compatible	HDLS Plug-in and Non-plug-in
Sealing	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
Temperature Range	-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)
Housing Material	Zinc Die-cast	High-strength Thermoplastic	Zinc Die-cast	Zinc Die-cast
Actuators/Levers	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
Termination	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
Approvals	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
Circuitry	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
Contacts	Silver, Gold	Silver, Gold	Silver, Gold	Silver, Gold
Amp Rating	10 A (Thermal)	10 A (Thermal)	10 A (Thermal)	10 A (Thermal)
Features	➔ 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 $\pm 0.02\%$ with various mounting configurations. Excellent vibration and shock resistance.



SERIES Push-Pull/eStop

Connector	Screw Terminal, Pigtail Harness with Connector (Deutsch)
Position	2NO Circuits in Push; 2NC Circuits in Push; 1NO/1NC Circuit
Cycle Life	25000 Cycles (Rotary)
Chamber Sealing	O-ring (IP67 Sealing)
Measurements	$\varnothing 45,21$ mm [$\varnothing 1.78$ 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
Feature	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

Type	AC or DC	AC	DC
Counting Range	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)
Sealing	IP67 (Front); IP66 (Rear)	IP66 Front (IP40 Rear)	IP66
Voltage Range	9 V to 64 V	90 Vac to 264 Vac/ 50 Hz, 60 Hz	10 Vdc to 80 Vdc (Polarity Insensitive)
Accuracy	± 200 ppm/hour	$\pm 0.02\%$	$\pm 0.02\%$
Termination	1/4 in blades; 3/16 in blades	1/4 in spade	1/4 in spade
Approvals	UL, CE	UL, CSA, CE	N/A
Mount/Panel Cutout Opening	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.
Operating Temperature	-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]
Number Size	7 mm [0.28 in]	3 mm [0.12 in]	3 mm [0.12 in]
Features	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
Connector	MetriPak 280 and Sumitomo	Screw	MetriPak 280, 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	12 Vdc, 20 A; 24 Vdc, 8 A
Operating Temperature	-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]
Cycle Life at Electrical Load	25,000 Cycles	25,000 Cycles	25,000 Cycles
Position	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/Ignition/Ignition Heat/Start)
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		Environmentally Sealed; Recoil Spring Allows Momentary Positions



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





Test & Measurement for Transportation

Load Cells

- Pedal Effort Testing
- Seat Belt Testing
- Tire Uniformity Machine Sensors
- Latch and Lock Testing
- Manual and Automatic Shift Forces
- Cable Testing
- Crimp Forces
- Friction/resistance Weld Quality
- Body Mount Forces
- Seat Tests

Pressure Sensors

- Engine Oil Pressure
- Coolant Pressure
- Fuel Pressure
- Cylinder Compression
- Pressure Decay
- Manifold Vacuum
- Fluid Flow
- Dry Airflow

LVDTs

- Body Panel Gauging
- Shaft Alignment Monitoring
- Valve Guide and Seat Insertion Control
- Dimensional Gauging/ Verification
- Press-fitted Parts Verification
- Electrode Dimensional Inspection

Torque

- Engine and Transmission Dynamometers
- Power-train Testing
- Wheel Torque
- Steering Torque
- Brake Testing
- Pump Testing
- Axle Testing
- Fastener Testing
- Fatigue Component Testing

Wireless Telemetry

- Automotive Test Stands
- Motor and Transmission Dynamometers
- Automotive Brake Testing
- Friction Testing

Accelerometers

- NVH (Noise, Vehicle, Harshness) Testing
- Vehicle Road Testing
- Conditioning Monitoring
- Vibration Monitoring
- Crash Tests
- Preventative Maintenance Monitoring

When you are designing, testing, and building the latest products for the transportation industry, you need sensors that can stand up to the job, able to perform under harsh in demanding conditions, or in extremely tight spaces, rugged enough to withstand multiple testing runs and provide precise, accurate results over time, every time.

See why more people turn to Honeywell, and TTI whenever they need sensors for their transportation test and measurement applications.



Load Cells



Pressure Sensors



Torque



Wireless Telemetry



Accelerometers



Displacement Transducers



The Specialist in Electronic Component Distribution

TTI stocks a broad and deep inventory of Honeywell components for the transportation market.

With Specialists who know and understand the needs of vehicle manufacturers at the OEM and aftermarket levels, TTI can speak your language and ensure that the parts you need get where you need them, when you need them.

Americas

817.740.9000

ttiinc.com

Europe

++ 49.8142.6680.0

ttieurope.com

Asia

+65.6788.9200

ttiasia.com



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.



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 AS9100D 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.



1.800.CALL.TTI • ttiinc.com

