

## MICRO SWITCH™ Sealed and High Accuracy Switch Line Guide



**Engineered smarter. Basically better.** Honeywell Sensing and Control (S&C) offers an impressive collection of environmentally sealed limit switches and basic switches, as well as hermetically sealed products. Many of our environmental sealed limit switches incorporate the gold standard of basic switches – the MICRO SWITCH™ SM/SX Series – resulting in enhanced accuracy and reliability under most extreme conditions. The hermetically sealed

lineup includes switches that maintain the contact in a gas-tight seal, while transmitting force and motion to the mechanism through a metal diaphragm. And our high-temperature products have the switching element mounted on a ceramic base with stainless steel enclosures.

Honeywell S&C's flexible sealed switch line opens the door to new, powerful possibilities for your applications.

### FEATURES

#### SEALED LIMIT SWITCHES

##### EN Series.

**Features:** Environment-proof seal per MIL-PRF-8805, symbol 4 • Qualified to MIL-PRF-8805 • Rugged stainless steel housing • Environment seal resists most severe environments • Different contact materials (silver and gold) allow the control of a logic-level load of up to 15 A at 28 Vdc • Top plunger and roller plunger actuators have an internal ice scraper ring

**Benefits:** Miniature housing constructions are available with similar actuator styles to meet the demand for smaller size and lighter weight without sacrificing performance or electrical capacity. Potential applications include aircraft landing gear and flap/stabilizer controls, aircraft engine thrust reversers, space vehicles, and armored personnel carriers.

##### HE Series.

**Features:** Similar to the construction of the EN series, the HE has a higher level of sealing with the contacts enclosed in a hermetic chamber • Often meets or exceeds mechanical and electrical life as defined in MIL-PRF-8805 • Designed to meet sand and dust, explosion, icing,

minimum current, and moisture resistance requirements • Top plunger and roller plunger actuators have an internal ice scraper ring • Variety of actuators and terminations • Stainless steel housing

**Benefits:** Features true hermetic sealing (metal-to-metal, glass-to-metal construction) designed to ensure maximum sealing effectiveness for long periods of time regardless of constant changes in atmospheric pressures and temperatures. Potential applications include jet aircraft de-icer controls and military aircraft wingfold actuators.

##### HR Series.

**Features:** Designed to meet the requirements of MIL-PRF-8805 standards • Designed to meet moisture resistance, explosion, and salt spray requirements • Top plunger actuator has an internal ice scraper ring • Stainless steel housing • Operates at low temperatures (-65 °C [-85 °F])

**Benefits:** Combines enhanced sealing and high temperature capability into one package. Potential applications include aircraft engine thrust reversers.

#### SEALED BASIC SWITCHES

##### SE/XE Series.

**Features:** Watertight seal per enclosure design MIL-PRF-8805, symbol 3 • Military-standard construction with listings qualified to MIL-PRF-8805 • Power loading switching capability up to 7 A • Temperature tolerance up to 105 °C [221 °F] • High temperature construction for use up to 149 °C [300 °F] • Corrosion resistant aluminum housing seals precision switch contacts from contamination • Several auxiliary actuators and choice of termination • All 4SE switches are UL recognized, CSA certified • All 4XE switches are UL recognized

**Benefits:** SE and XE switches are the smallest environment-sealed switches offered by Honeywell. Different contact materials allow the control of a logic-level resistive load up to 5 A at 28 Vdc for the SE series, and up to 7 A at 28 Vdc for the XE Series. Potential applications include aircraft, ordinance, and moist or dusty industrial environments.

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## Application knowledge. Industry wisdom.

Honeywell S&C sealed switches utilize center-pinned toggles yielding enhanced strength and repeatability. Many years of experience in the most demanding environments on Earth validate our design. You'll find a wide variety of actuators, terminations, circuitry configurations, electrical ratings, contact materials and operating characteristics — for unbeatable flexibility. Each switch meets military standards and/or U.S., European, and CCC approval for global use.

These switches are designed for presence and absence detection, where physical contact with an object is allowed. So they excel in potential applications requiring compactness; lightweight, accurate repeatability; and extended life — including aerospace, agriculture, transportation, construction, marine and ordnance, plus command and control equipment.

Check with Honeywell S&C for the most comprehensive sealed switch line. And for ways to put it all together, better.



Sealed Limit Switches		EN Series	HE Series	HR Series
<b>Type</b>		stainless steel with environmental seals	hermetically sealed stainless steel	hermetically sealed stainless steel
<b>Sealing</b>		sealed to MIL-PRF-8805 symbol 4 hermetic (also MIL-PRF-8805 QPL listings available)	per MIL-PRF-8805, symbol 5 hermetic	per MIL-PRF-8805, hermetic symbol 5
<b>Operating temperature</b>		-55 °C to 85 °C [-65 °F to 185 °F]	-55 °C to 125 °C [-67 °F to 257 °F]	-65 °C to 315 °C [-85 °F to 600 °F]
<b>Actuators/levers</b>		top plunger, top roller, top rotary	top plunger, top roller plunger, nylon button	top plunger, top roller plunger
<b>Termination</b>		screw, leadwire, leadwire with connector, pin receptacle, side receptacle	screw, leadwire, bottom receptacle	screw, leadwire (receptacle termination available)
<b>Circuitry</b>		SPDT, DPDT	two or four SPDT circuits	SPNO, DPDT
<b>Contacts</b>		silver, gold	silver, gold	silver, gold
<b>Amp rating</b>		1 A to 15 A (resistive)	1 A, 5 A, 7 A (resistive)	5 A (resistive)



Sealed Basic Switches		SE/XE Series	HM Series	HS Series
<b>Housing material</b>		anodized aluminum	stainless steel	stainless steel, phenolic
<b>Sealing</b>		MIL-PRF-8805, symbol 3, watertight	per MIL-PRF-8805, symbol 5 hermetic	per MIL-PRF-8805, symbol 5 hermetic
<b>Operating temperature</b>		-53 °C to 105 °C [-65 °F to 221 °F]	-65 °C to 121 °C [-85 °F to 250 °F] high temp available: 500 °F	-54 °C to 121 °C [-65 °F to 250 °F]
<b>Actuators/levers</b>		auxiliary actuators available	integral lever; aux. actuators: leaf, roller leaf, straight, roller lever	integral lever
<b>Termination</b>		solder, quick-connect, leadwire	solder, leadwire	screw, leadwire
<b>Circuitry</b>		SPDT	SPDT	SPDT
<b>Contacts</b>		silver, gold, bifurcated gold	silver, gold, bifurcated gold	silver
<b>Amp rating</b>		0.5 A to 7 A max.	0.5 A to 3 A	1 A to 25 A



## Sealed Toggle Switches

	AT Series	TS Series	TW Series
<b>Type</b>	stainless steel toggle	stainless steel, phenolic toggle	miniature stainless steel toggle
<b>Sealing</b>	MIL-PRF-8805/26/98	–	qualified to MIL-DTL-83781
<b>Operating temperature</b>	various	-54 °C to 71 °C [-65 °F to 160 °F]	-65 °C to 71 °C [-85 °F to 160 °F]
<b>Actuator/lever</b>	standard, locking, tab, special design	standard	standard, locking, special design, tab
<b>Mounting</b>	15/32 in bushing, 1/4 in bushing, three-hole, above panel	15/32 in bushing	bushing 15/32 in or 1/4 in
<b>Termination</b>	solder, solder T2, screw, quick-connect, leadwire, H58	solder, screw, quick-connect	IWTS, solder, screw, quick-connect, H58, T2
<b>Circuitry</b>	SPDT, DPDT, DPNO, 3PDT, 4PDT, 6PDT, 7PDT, 8PDT, 10PDT 2-position, momentary and maintained	SPST, SPDT, DPST, DPDT 2-3 position, momentary and maintained	SPST, SPDT, DPST, DPDT 2-3 position, momentary and maintained
<b>Contacts</b>	silver, gold	silver cadmium oxide	silver alloy, gold-plated
<b>Amp rating</b>	0.01 A to 5 A (resistive)	up to 15 A	0.1 A to 5.0 A at 0.5 Vdc to 28 Vdc, 0.1 A to 5.0 A at 0.5 Vac to 115 Vac



## Sealed Toggle Switches

	ET Series	NT Series	TL Series
<b>Type</b>	magnetically held toggle	industrial-grade toggle	military-grade toggle
<b>Sealing</b>	most listings qualified to MIL-S-5594	IP67/67; NEMA 3, 3R, 4, 13	qualified to MIL-DTL-3950
<b>Operating temperature</b>	-65 °C to 71 °C [-85 °F to 160 °F]	-40 °C to 71 °C [-40 °F to 160 °F]	-65 °C to 71 °C [-85 °F to 160 °F]
<b>Levers</b>	standard, pull-to-unlock, push-to-unlock, tab	standard, locking, special design, tab	standard, special design, tab, paddle, no lever
<b>Mounting</b>	bushing 15/32 in	bushing 15/32 in	bushing 15/32 in
<b>Termination</b>	screw, leadwire, turret	solder, screw, quick-connect	IWTS, solder, screw, quick-connect, leadwire
<b>Circuitry</b>	SPDT, DPDT, 4PDT 2-3 position, momentary and maintained	SPST, SPDT, DPST, DPDT 4PST, 4PDT 2-3 position, momentary and maintained	SPST, SPDT, DPST, DPDT 3PST, 3PDT, 4PST, 4PDT 2-3 position, momentary and maintained
<b>Contacts</b>	silver alloy, gold-plated	silver cadmium oxide, gold-plated	silver alloy, gold-plated
<b>Amp rating</b>	7 A max. (resistive)	0.5 A at 250 Vdc, 0.5 A to 15 A at 0.5 Vac to 277 Vac, 0.5 A to 20 A at 0.5 Vdc to 28 Vdc, 0.75 A at 115 Vdc	0.5 A at 250 Vdc, 0.75 A at 115 Vdc, 0.5 A to 15 A at 0.5 Vac to 277 Vac, 0.5 A to 20 A at 0.5 Vdc to 28 Vdc

## HM Series.

**Features:** Hermetically sealed per MIL-PRF-8805, design symbol 5 • MIL-PFR-8805 qualified listing • Broad temperature range of -65 °C to 121 °C [-85 °F to 250 °F] • High temperature construction, -65 °C to 260 °C [-85 °F to 500 °F] • Reduced sensitivity to changes in altitude or pressure • Compact size, light weight • Choice of actuation and termination

**Benefits:** Some special versions operate as high as 400 °C [752 °F] or as low as -184 °C [-299 °F]. Different contact materials (gold and silver) allow the control of a logic-level resistive load up to 4 A at 28 Vdc. Contains contacts in a sealed chamber. Gas-tight seal is maintained while transmitting force and motion to the switch mechanism through a metal diaphragm. Not recommended for 115 Vac, 60 Hz. Potential applications include adverse gas or vapor environments, oil drilling installations, marine environments, submarines and stationary undersea equipment, refrigeration units, aircraft and spacecraft, earth moving machinery, desert vehicles, and cement mills.

## HS Series.

**Features:** Hermetically sealed per MIL-PRF-8805, design symbol 5 • Power load switching capability to 25 A at 28 Vdc • Broad temperature range -55 °C to 125 °C [-67 °F to 250 °F] • High temperature construction, 149 °C [300 °F] • Reduced sensitivity to changes in altitude or pressure • Choice of actuation

**Benefits:** HS Series is a larger version of the HM Series. Allows control of a logic-level resistive load up to 25 A at 28 Vdc. Potential applications include adverse gas or vapor environments, aircraft and helicopters, steam cleaning of food processing machines, moist, dusty, or oily environments, and industrial valve controls.

## SEALED TOGGLE SWITCHES

### AT Series.

**Features:** Gold or silver contacts • Choice of sealed bushing • Standard or pull-to-unlock toggle lever • Short behind-panel depth • Solder or quick-connect termination • 2, 4, 6, or 8 SPDT precision basic switches • 2- or 3-position, momentary and maintained action

**Benefits:** Precision switch conserves space and weight. Pull-to-unlock lever prevents accidental operation: the lever must be pulled approximately 2,3 mm [0.09 inches] to change the positions. Hermetic basic switches are available. Potential applications include industrial machinery and equipment, military and commercial aviation, construction equipment, test instruments, agricultural machinery, process control, and medical instrumentation.

### TS Series.

**Features:** 2- or 3-position, momentary and maintained action • 1- and 2-pole circuitry • Solder, screw, or quick-connect terminals • Rated up to 20 A • Lever-to-bushing seal

**Benefits:** Generally used in low-cost commercial applications. Not recommended for use where sealing is critical. Potential applications include industrial machinery and equipment, military and commercial aviation, construction equipment, test instruments, agricultural machinery, process control, and medical instrumentation.

### TW Series.

**Features:** Qualified to MIL-DTL-83731 • IWTS (Integrated Wire Termination System) • Saves space and weight • SPDT and DPDT circuitry • Temperature range: -65 °C to 71 °C [-85 °F to 160 °F] • Silver alloy or gold-plated contacts • Sealed bushing versions • Choice of 1/4 in or 15/32 in bushing • Color tab available on 15/32 in bushing

**Benefits:** Low profile switches and generally used where space behind the panel is limited. Used in control panel or equipment operation applications where a panel-mount switch with an environment-proof sealing rating is needed. Potential applications include industrial machinery and equipment, military and commercial aviation, construction equipment, test instruments, agricultural machinery, process control, and medical instrumentation.

### ET Series.

**Features:** Most listings qualified to MIL-S-5594 • Environment-proof sealing • Holding coil replaces mechanical holding mechanisms to maintain toggle in operate position • 2- and 3-position maintained and momentary toggle action • SPDT and DPDT circuitry

**Benefits:** With an open circuit, the ET functions as a momentary contact switch. Potential applications include industrial machinery and equipment, military and commercial aviation, construction equipment, test instruments, agricultural machinery, process control, and medical instrumentation.

### NT Series.

**Features:** Completely sealed switching chamber • IP67/IP68 • NEMA 3, 3R, 4, and 13 • Step-design case provides added space between terminals to prevent shorting • 2- and 3-position, maintained and momentary toggle action • Spring-loaded mechanism provides excellent tactile feedback • Features an "easy-start" threaded bushing and thermoplastic case • High impact strength, non-tracking case enhances electrical stability

**Benefits:** Meets a variety of electrical load requirements. Switching chamber is completely sealed in a Thermoset case. Used in a wide variety of industrial and commercial settings. Potential applications include aerial lifts, scissor lifts, truck mounted tele-handlers/cranes, construction equipment, agriculture equipment, material-handling equipment, factory-floor control units, and machine tool equipment manufacturers.

## TL Series.

**Features:** Environment-proof sealing • Qualified to MIL-DTL-3950 • 1-, 2-, and 4-pole circuitry • Standard and pull-to-unlock levers • Silver alloy or gold-plated contacts • 2- and 3-position, maintained and momentary toggle action • Temperature range: -65 °C to 71 °C [-85 °F to 160 °F] • Completely sealed switching chamber • Step-design case provides added space between terminals to help prevent shorting • Available with IWTS (Integrated Wire Termination System), a wired, plug-in connection method

**Benefits:** Meets a variety of electrical load requirements. Switching chamber is completely sealed in a Thermoset case. Used in any military or commercial aviation application where a sealed toggle switch is required. Potential applications include industrial machinery and equipment, military and commercial aviation, construction equipment, test instruments, agricultural machinery, process control, and medical instrumentation.

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### **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.**

### **WARNING** **MISUSE OF DOCUMENTATION**

- The information presented in this catalogue 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.**

Sensing and Control  
Honeywell  
1985 Douglas Drive North  
Golden Valley, MN 55422 USA  
+1-815-235-6847  
[www.honeywell.com/sensing](http://www.honeywell.com/sensing)

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