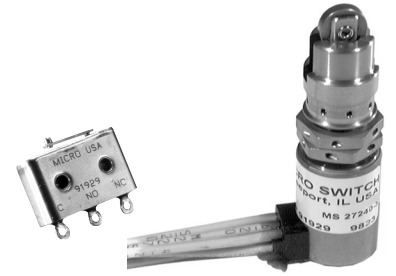


MICRO SWITCH™

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.

MICRO SWITCH™ Sealed and High Accuracy Switch Line Guide

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.

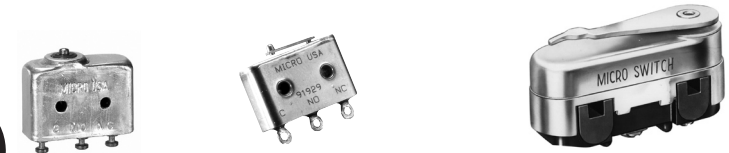
Check with Honeywell S&C for the most comprehensive sealed switch line. And for ways to put it all together, better.

Sealed Limit Switches

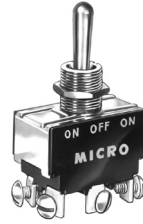


| | EN Series | HE Series | HR Series |
|------------------------------|---|---|--|
| Type | stainless steel with environmental seals | hermetically sealed stainless steel | hermetically sealed stainless steel |
| Sealing | sealed to MIL-PRF-8805 symbol 4 hermetic (also MIL-PRF-8805 QPL listings available) | per MIL-PRF-8805, symbol 5 hermetic | per MIL-PRF-8805, hermetic symbol 5 |
| Operating temperature | -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] |
| Actuators/levers | top plunger, top roller, top rotary | top plunger, top roller plunger, nylon button | top plunger, top roller plunger |
| Termination | screw, leadwire, leadwire with connector, pin receptacle, side receptacle | screw, leadwire, bottom receptacle | screw, leadwire (receptacle termination available) |
| Circuitry | SPDT, DPDT | two or four SPDT circuits | SPNO, DPDT |
| Contacts | silver, gold | silver, gold | silver, gold |
| Amp rating | 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 |
|------------------------------|-------------------------------------|---|-------------------------------------|
| Housing material | anodized aluminum | stainless steel | stainless steel, phenolic |
| Sealing | MIL-PRF-8805, symbol 3 | per MIL-PRF-8805, symbol 5 hermetic | per MIL-PRF-8805, symbol 5 hermetic |
| Operating temperature | -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] |
| Actuators/levers | auxiliary actuators available | integral lever; aux. actuators: leaf, roller leaf, straight, roller lever | integral lever |
| Termination | solder, quick-connect, leadwire | solder, leadwire | screw, leadwire |
| Circuitry | SPDT | SPDT | SPDT |
| Contacts | silver, gold, bifurcated gold | silver, gold, bifurcated gold | silver |
| Amp rating | 7 A max. | 0.5 A to 3 A | 1 A to 25 A |



Sealed Toggle Switches

| | AT Series | TS Series | TW Series |
|------------------------------|---|--|---|
| Type | stainless steel toggle | stainless steel, phenolic toggle | miniature stainless steel toggle |
| Sealing | MIL-PRF-8805/26/98 | — | qualified to MIL-S-83781 |
| Operating temperature | various | -54 °C to 71 °C [-65 °F to 160 °F] | -65 °C to 71 °C [-85 °F to 160 °F] |
| Actuator/lever | standard, locking, tab, special design | standard | standard, locking, special design, tab |
| Mounting | 15/32 in bushing, 1/4 in bushing, three-hole, above panel | 15/32 in bushing | bushing 15/32 in or 1/4 in |
| Termination | solder, solder T2, screw, quick-connect, leadwire, H58 | solder, screw, quick-connect | IWTS, solder, screw, quick-connect, H58, T2 |
| Circuitry | 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 |
| Contacts | silver, gold | silver cadmium oxide | silver alloy, gold-plated |
| Amp rating | 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 |
|------------------------------|--|--|--|
| Type | magnetically held toggle | industrial-grade toggle | military-grade toggle |
| Sealing | most listings qualified to MIL-S-5594 | IP67/67; NEMA 3, 3R, 4, 13 | qualified to MIL-S-3950 |
| Operating temperature | -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] |
| Levers | standard, pull-to-unlock, push-to-unlock, tab | standard, locking, special design, tab | standard, special design, tab, paddle, no lever |
| Mounting | bushing 15/32 in | bushing 15/32 in | bushing 15/32 in |
| Termination | screw, leadwire, turret | solder, screw, quick-connect | IWTS, solder, screw, quick-connect, leadwire |
| Circuitry | 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 |
| Contacts | silver alloy, gold-plated | silver cadmium oxide, gold-plated | silver alloy, gold-plated |
| Amp rating | 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-S-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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For more information about Sensing and Control products, visit www.honeywell.com/sensing or call +1-815-235-6847. Email inquiries to info.sc@honeywell.com

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.

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006166-3-EN IL50 GLO
June 2009
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