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Sensing and Control
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Sensing and Control




Honeywell Inc.

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Limit and Enclosed Switches

Miniature Switch Selection Guide

| | Standard duty | Miniature size | Plastic enclosed |
|---|--|--|---|
| |  SL1 Pg. A84 |  914CE Pg. A87 |  BF Pg. A93 |
| PHYSICAL DESCRIPTION Package size (in.) | 1.27H 1.7W .7L | 2.1H .6W 1.6L | 2.7H 1.2W 2.9L |
| Actuators | Roller plunger, cross roller plunger, plunger, roller lever, one-way roller lever, roller plunger w/seal boot. | Side rotary, plunger, roller plunger, adj. plunger, PB, wobble lever. | Pin plunger, roller levers, one way roller lever, wobble lever. |
| SPECIAL FEATURES | Space-saving size for machine miniaturization. Different contact types and actuation methods available. | Gang-mount capability. Factory wired cable. Connector options available. | Rugged plastic enclosure eliminates need for grounding. Large internal cavity for easy wiring. Pressure plate style wire clamps. |
| CHARACTERISTICS Electrical data (maximum available) | 5A - 125; 250 VAC; 0.1A - 125 VAC; 0.1A - 30 VDC | 5A - 125, 250 VAC | .1A to 11A 125 VAC |
| Circuitry | SPDT | SPDT | SPDT |
| Operating force | Plunger 1200 grams Lever 400 grams | Plunger 2.75 lbs. | Wobble stick 7 oz. max |
| Differential travel (max.) | .004 in. (plunger) .012 in. (lever) | .004 in. | — |
| ENVIRONMENT Temperature Range | Upper Lower 158° F (70° C) 14° F (-10° C) Low temperature versions available | 200° F (93° C)* 10° F (-12° C)* | 160° F (71° C) -25° F (-31° C) |
| Sealing† | NEMA 3, 4, 13; IP 67 | NEMA 1, 3, 4*, 6*, 6P*, 12*, 13* | NEMA 1, 3, 4, 13 |
| Housing Material † For NEMA definitions, see page E7. | Zinc with plastic terminal cover | Zinc * Most listings | Thermoplastic enclosure |
| AGENCY LISTING | UL/CSA listings available. | UL Recognized CSA Certified CE Certified | UL Recognized |
| TYPICAL APPLICATIONS | <ul style="list-style-type: none"> ● Robotics ● Light material handling ● Machine tools ● Low temperature applications down to -60°F | <ul style="list-style-type: none"> ● Processing equipment ● Textile machinery ● Machine tools ● Robotics ● Packaging equipment ● Farm machinery ● Commercial laundry equipment ● Printing trades machinery ● Vehicles | <ul style="list-style-type: none"> ● Overhead cranes and hoists ● Surface transportation equipment ● Special machinery ● Agricultural equipment ● Earth moving equipment |

Limit and Enclosed Switches

General Purpose Switches Selection Guide

| Compact | Standard/versatile | Compact - Double Conduit | High current capacity | Compact LS |
|---|--|--|---|---|
|  |  |  |  |  |
| E6/V6 Pg. A96 | OP Pg. A108 | BZG/BZH Pg. A102 | BAF1 Pg. A105 | LS Pg. A70 |
| 2.7H 1.0W 3.0L Plunger, roller lever, rod, manual button, roller plunger, one-way roller lever, wobble lever. | 2.6H 3.2W 3.7L Plunger, roller lever, paddle lever. | 2.9H 1.0W 3.4L Plunger, roller lever, rod lever. | 3.2H 1.3W 4.0L Plunger, roller lever, flexible rod, manual button, roller plunger, one way roller lever. | 3.7H 2.3W 1.6L Side rotary, plunger, roller plunger, wobble lever. |
| Momentary or maintained contact. Sealed or unsealed actuators. Internal grounding screw. Side or bottom mounting. | Mounts from four sides. Captive cover screws. Internal grounding screw. | Optional: 2 conduit openings, neon pilot light, side or bottom mount. Internal grounding screw. | Right or lefthand actuators. Momentary or maint. contacts. Internal grounding screw. | Small size of compact version. Years of field-proven performance. |
| 15A - 125, 250, 480 VAC SPDT DPDT (Sealed plunger) 9-24 oz. .002 in. | 20A-125, 250, 480 VAC SPDT DPDT 2 CKT DB (Rotary) .5-2.5 lbs. .007 in. | 15A-125, 250, 480 VAC SPDT (Sealed plunger) 9-24 oz. .002 in. | 20A-125, 250, 480 VAC SPDT DPDT (Plunger) 2.5 lbs. max. .010 in. | 10A-120, 240, 480 VAC 2 CKT DB (Standard size rotary) 4.5 in. lbs. (Low force types available) 12° |
| 160° F (71° C) -25° F (-32° C) NEMA 1, 3, 4*, 12*, 13* Zinc * Some listings | 160° F (71° C) -25° F (-32° C) NEMA 1, 3*, 4*, 13* Al or Iron * Except Q-plunger | 160° F (71° C) -25° F (-32° C) NEMA 1, 3*, 4*, 13* Al * Except Q-plunger | 160° F (71° C) -25° F (-32° C) NEMA 1, 3*, 4*, 13* Al * Except BAF1-2RQ9 | 160° F (71° C) -20° F (-29° C) NEMA 1, 3, 4, 6, 13 Al and Zinc |
| UL Recognized CSA Certified | UL Recognized CSA Certified | UL Recognized | UL Recognized CSA Certified | UL Recognized CSA Certified CE Certified |
| <ul style="list-style-type: none"> ● Packaging equipment ● Special machinery ● Textile machinery ● Conveyors ● Construction machinery and equipment ● Printing trades machinery ● Overhead cranes and hoists | <ul style="list-style-type: none"> ● Control valves and actuators ● Material handling ● Conveyors | <ul style="list-style-type: none"> ● Packaging machinery ● Conveyors ● Materials handling ● Food processing ● Machine tools | <ul style="list-style-type: none"> ● Packaging equipment ● Special machinery ● Farm machinery ● Conveyors ● Overhead cranes and hoists | <ul style="list-style-type: none"> ● Machine tools ● Conveyors ● Material handling ● Metal fabrication equipment ● Lift trucks |

Limit/Enclosed



Limit and Enclosed Switches

Heavy Duty Switch Selection Guide

| | Global Limit Switch DIN | Miniature Global Limit Switch | Heavy Duty LS |
|---|--|--|---|
| | <p>GLA/B Pg. A11</p> | <p>GLC/D GLE Pg. A18</p> | <p>HDLS Pg. A30</p> |
| PHYSICAL DESCRIPTION Package size (in.) | 4.05 (102,9)H 1.65 (42)W 1.64 (41,6)L | 3.03 (77)H 1.201 (30,5)W 1.132 (28,75)L | SPDT DPDT 4.2H 4.7H 2.4W 2.4W 1.6L 1.9L |
| Actuators | Side rotary, plunger, roller plunger, roller arm, wobble levers. | Side rotary, plunger, roller plunger, roller arm, wobble levers. | Side and top rotary, plunger, adj. plunger, roller plunger, wobble lever. |
| SPECIAL FEATURES | Designed to newest IEC standard for worldwide acceptance. | Designed to newest IEC standard for worldwide acceptance. GLE 3 cable entry. | All-metal drive train. Integral grounding screw. Interchangeable mounting of all switch types. Identical cam tracking for single and double-pole models. |
| CHARACTERISTICS Electrical data (maximum available) | IEC 947-5-1 I _{th} 10A U _i 660 VAC/VDC | IEC 947-5-1 I _{th} 10A U _i 660 VAC/VDC | 60A make. 6A break — 120 VAC; 10A continuous — 120, 240, 480, 600 VAC. |
| Circuitry | 2 CKT DB 4 CKT DB 2 CKT BBM 2 CKT MBB 2 CKT Bifurcated | 2 CKT DB 4 CKT DB 2 CKT BBM 2 CKT MBB 2 CKT Bifurcated | SPDT, DB DPDT, DB SPDT maintained DPDT maintained Center neutral Solid State, digital output. |
| Operating force | Side rotary 9.7 N Plunger 16 N | Side rotary 2.5 N Plunger 12N | (Standard side rotary) 4 in. lbs. (Low force types available) |
| Differential travel (max.) | 12° | 11.5° | SPDT: 5° DPDT: 7° |
| ENVIRONMENT Temperature range | Upper Lower 85°C -25°C | 85°C -25°C | 250°F (121°C) 10°F (-12°C) -40° See pg. A42 Refer to page A40 for temperatures. |
| Sealing† | IP 67, NEMA 4 | IP 67, NEMA 4 | NEMA 1, 3, 4, 4X, 6, 13. UL Enclosure Types 1, 3, 4, 4X, 6, 6P, 13. |
| Housing material † For NEMA definitions, see page A114. | Metal | Metal, thermoplastic | Zinc |
| AGENCY LISTING | EN50041 UL, CSA and CE | EN50047 UL, CSA and CE | UL Listed CSA Certified CE Certified |
| TYPICAL APPLICATIONS | <ul style="list-style-type: none"> • Machine tool • Material handling • Packaging machinery • Textile machinery • Construction machinery and equipment • PLC Interface | <ul style="list-style-type: none"> • Machine tool • Material handling • Packaging machinery • Textile machinery • Construction machinery and equipment • PLC Interface | <ul style="list-style-type: none"> • Machine tool • Material handling • Packaging • Presses • Pulp and paper • Welding • PLC Interface |

Limit and Enclosed Switches





Harsh Duty Switch Selection Guide

| | Harsh duty epoxy filled HDLS | Corrosion resistant HDLS |
|---|---|---|
| |  <p style="text-align: center;">HDLS Pg. A44</p> |  <p style="text-align: center;">HDLS Pg. A47</p> |
| PHYSICAL DESCRIPTION Package size (in.) | SPDT 4.2H DPDT 4.7H 2.4W 1.6L | 4.2H 2.4W 1.9L |
| Actuators | Side and top rotary, plunger, adj. plunger, roller plunger, wobble lever. | Side and top rotary, plunger, adj. plunger, roller plunger, wobble lever. |
| SPECIAL FEATURES | All non plug-in HDLS features. Switch cavity epoxy filled. All fluorocarbon seals. Exceeds NEMA 6P. Preleaded or connector. | All corrosion resistant type 316 stainless steel construction. All non plug-in HDLS features. All fluorocarbon seals. |
| CHARACTERISTICS Electrical data (maximum available) | 60A make. 6A break — 120 VAC; 10A continuous — 120, 240, 480, 600 VAC. | 60A make. 6A break — 120 VAC; 10A continuous — 120, 240, 480, 600 VAC. |
| Circuitry | SPDT, DB DPDT, DB | SPDT, DB DPDT, DB |
| Operating force | (Standard side rotary) 4 in. lbs. (Low force types available) | (Standard side rotary) 4 in. lbs. (Low force types available) |
| Differential travel (max.) | SPDT: 5° DPDT: 7° | SPDT: 5° DPDT: 7° |
| ENVIRONMENT Temperature range | Upper 250°F (121°C) Lower 10°F (-12°C) -40° See pg. A42 Refer to page A42 for temperatures. | 250°F (121°C) 10°F (-12°C) |
| Sealing† | NEMA 1, 3, 4, 4X, 6, 6P, 13. UL Enclosure Types 1, 3, 4, 4X, 6, 6P, 13. | NEMA 1, 3, 4, 4X, 6, 6P, 13. UL Enclosure Types 1, 3, 4, 6, 6P, 13. |
| Housing material | Zinc | Stainless Steel |
| † For NEMA definitions, see page E7. | | |
| AGENCY LISTING | UL Listed CSA Certified CE Certified | UL Listed CSA Certified |
| TYPICAL APPLICATIONS | <ul style="list-style-type: none"> • Food processing machines and conveying equipment subject to daily washdown. • Automotive machine tools and conveyors subject to various coolants and cutting fluids. | <ul style="list-style-type: none"> • Shipboards and dockside • Power generating plants • Caustic waste handling • Mining • Undersea transit systems • Corrosive valve locations |

Limit/Enclosed


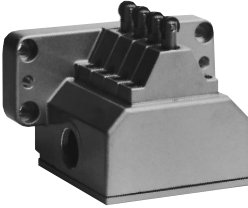

Limit and Enclosed Switches

Explosion Proof Switch Selection Guide

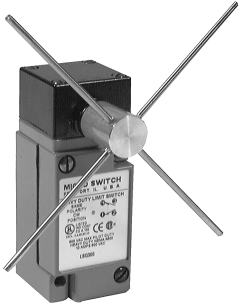
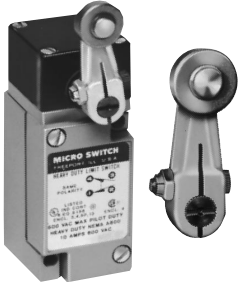

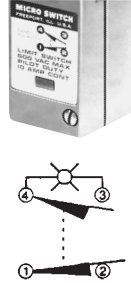
| | Standard explosion proof | Sealed explosion proof | Explosion proof LS | Momentary explosion proof cable pull |
|--|--|--|--|---|
| |  <p>EX Pg. A121</p> |  <p>CX Pg. A127</p> |  <p>LSX Pg. A113</p> |  <p>CLSX Pg. A119</p> |
| PHYSICAL DESCRIPTION Package size (in.) | 2.6H 3.2W 3.7L | 4.0H 6.6W 4.0L | 5.8H 2.4W 3.0L | 5.6H 2.9W 3.0L |
| Actuators | Plunger, roller and one-way roller lever, rod and roller rod lever, and manual paddle. | Plunger, rotary forms. | Same as HDLS. | Cable |
| SPECIAL FEATURES | Single or double conduit connection. Mounts from four sides. Interchangeable with OP. Internal grounding screw. | Sealed for outdoor use. Adjustable P.T., O.T. and operating mode. Mounts from front or four sides. Salt and water resistant marine version. | Sealed and explosion-proof interchangeable with HDLS (w/adaptor plate) and ML-E1. | Explosion proof. Covers cable spans up to 200 ft. |
| CHARACTERISTICS Electrical data (maximum available) | 20A-125, 250, 480 VAC | 20A-125, 250, 480 VAC | 10A-120, 240, 480, 600 VAC | $I_{in} = 10A$ $U_i = 660 VAC/660 VDC$ |
| Circuitry | SPDT DPDT 2 CKT DB | SPDT DPDT | SPDT DPDT | 1NC Direct Acting 1NO - 1NC Direct Acting 1NO - 1NC Snap Action |
| Operating force | (Rotary) .5-2.5 lbs. | (Rotary) 11.1 in. lbs. | (Side rotary) 4 in. lbs. | — |
| Differential travel (max.) | .007-.109 in. | 5-25° | SPDT: 5° DPDT: 7° | — |
| ENVIRONMENT Upper Temperature range Lower | 160°F (71°C) -40°F (-40°C) | 185°F (85°C) -13°F (-25°C) | 250°F (121°C) 10°F (-12°C) | 158°F (70°C) 30°F (-1°C) |
| Sealing† | NEMA 1, 7, 9. | NEMA 1, 3, 4, 4X, 7, 9, 13 | NEMA 1, 3, 4, 6, 7, 9, 13 | NEMA 1, 3, 4, 7, 9, 13 |
| Housing material † For NEMA definitions, see page E7. | Al | Al or Bronze | Al and Zinc | Al and Zinc |
| AGENCY LISTING | UL Listed CSA Certified | UL Listed CSA Certified | UL Listed CSA Certified | UL Listed CSA Certified |
| TYPICAL APPLICATIONS | <ul style="list-style-type: none"> Control valves and actuators Grain handling Conveyors Material handling | <ul style="list-style-type: none"> Control valves and actuators Petroleum plants Chemical plants Waste treatment Hazardous waste handling | <ul style="list-style-type: none"> Control valves and actuators Petroleum plants Chemical plants Waste treatment Hazardous waste handling Power generating Paint booths | For signaling applications: <ul style="list-style-type: none"> Petroleum Plants Chemical Plants Mining Conveyors |

Limit and Enclosed Switches

Special Purpose Switch Selection Guide

| | Impact resistance | Multiplunger | Sealed/Analog output |
|-----------------------------|---|--|---|
| |  <p>LN Pg. A111</p> |  <p>LD Pg. A82</p> |  <p>Linear CX Pg. A128</p> |
| SPECIAL FEATURES | High impact resistance. Factory wired leads. Plunger, roller lever. 15A - 125, 250, 480 VAC Zinc housing | Can replace several individual switches. Numerous conduit arrangements available. Roller plunger, chisel plunger. 0.1A - 125 VAC; 10A - 125, 250, 480 VAC; 0.1A - 30 VDC; 0.5A - 125 VDC; 0.25A - 250 VDC | Sealed for outdoor use. Adjustable P.T., O.T. and operating mode. Mounts from front or four sides. Salt water resistant marine version. 4-20 mA, 12.5 to 40 VDC, Analog output |
| TYPICAL APPLICATIONS | <ul style="list-style-type: none"> High shock and vibration applications. | <ul style="list-style-type: none"> Machine tools Transfer lines | <ul style="list-style-type: none"> Valve position sensing Flow control |

Limit/Enclosed

| | 360° Maintained | High capacity HDLS | Low Torque HDLS | Indicator Light HDLS |
|-----------------------------|---|--|---|--|
| |  <p>LSQ300 Pg. A35</p> |  <p>LSQ Pg. A43</p> |  <p>LSS/LST Pg. A42</p> |  <p>(N.C. Lamp Available, Pg. A34 Assembly Modification #7) See HDLS Order Guides</p> |
| SPECIAL FEATURES | Fixed and adjustable spoke lever available. | High DC current ratings. 20 amp rating at 120 VAC (single pole). Plug in or non-plug in. Positive retention lever arm. | LSS1H gravity return side rotary limit switches have no return spring mechanism. The weight of the actuating lever must provide the force to restore it to the free position. 5 in. oz. max. LST1H extra low torque side rotary limit switches have a low force return spring and a maximum operating torque of 12 in. oz. | 24 volt LED and 120 or 240 volt neon indicator versions available. High efficiency bi-polar LED is not polarity sensitive. Draws less than 1.5mA. Parallel lamp wiring does not require a 3rd wire! Allows upgrading to plug-in lighted version without rewiring base receptacle. |
| TYPICAL APPLICATIONS | <ul style="list-style-type: none"> Turnstile counting Random direction counting | <ul style="list-style-type: none"> Power generating stations Presses and other machinery that create extreme shock/vibration High current capacity applications | <ul style="list-style-type: none"> Monitoring feeder roll take up Fill level sensing 360° rotation with no overtravel stop | <ul style="list-style-type: none"> Applications with high downtime cost, requiring fast troubleshooting |


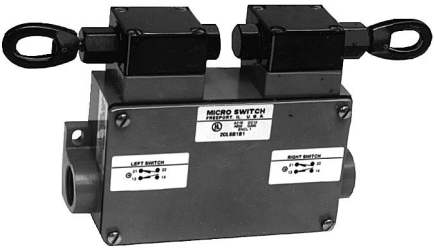
COMPLETELY FLUOROCARBON-SEALED SWITCHES Pg. A42
Completely fluorocarbon (FC)-sealed switches have a full FC body gasket covering the switch cavity. Rotary types have an extra FC seal on the operating shaft, while plunger versions have FC boot seals.

They are for use in applications where the environment includes fire-resistant synthetic fluids. In addition to most all fluids, FC-sealed switches may be used with such industrial fluids as Cellulube, Fyrquell, Houghto-Safe, Pydraul, and other special cutting and hydraulic oils.

LOW TEMPERATURE SWITCHES Pg. A42
All forms of HDLS limit switches are also available in low temperature construction with fluorosilicone diaphragm, shaft seals, and external boot seal (where applicable) plus a low temperature lubricant.

Limit and Enclosed Switches

Momentary Cable Pull Switch Selection Guide

| | Momentary cable pull LS single head | Momentary cable pull LS duplex head |
|--|--|--|
| |  <p style="text-align: center;">CLS Pg. A65</p> |  <p style="text-align: center;">2CLS Pg. A65</p> |
| PHYSICAL DESCRIPTION Package size (in.) | 4.0H 1.8W 1.6L | 4.8H 1.8W 5.9L |
| Actuators | Cable | Cable |
| SPECIAL FEATURES | Covers cable span up to 200 ft. Four conduit thread sizes available. | Covers cable spans up to 400 ft. Optional corner installation. Four conduit thread sizes available. |
| CHARACTERISTICS Electrical data (maximum available) Circuitry | I_{in} 10A U, 660 VAC/660 VDC 1NO 1NC Direct Acting 1NO 1NC Snap Acting | I_{in} 10A U, 660 VAC/660 VDC (Primary) 1NO 1NC Direct Acting (Auxiliary) 1NO 1NC Direct Acting 2NO 2NC Snap Action* 1NO 1NC (SDS)* *For monitoring only. |
| ENVIRONMENT Temperature range Sealing† Housing material † For NEMA definitions, see page E7. | Upper Lower 158°F (70°C) 30°F (-1°C) IP 67, NEMA 1, 3, 4, 13 Metal | 158°F (70°C) 30°F (-1°C) IP 67, NEMA 1, 3, 4, 13 Metal |
| AGENCY LISTING | UL Listed CSA Certified CE Certified | UL Listed CSA Certified CE Certified |
| TYPICAL APPLICATIONS | For signaling applications <ul style="list-style-type: none"> ● Conveyors ● Packaging machinery ● Assembly lines ● Process equipment ● Transfer lines | For signaling applications <ul style="list-style-type: none"> ● Conveyors ● Packaging machinery ● Assembly lines ● Process equipment ● Transfer lines |