

Safety Products and Limit Switches

LS-Titan Safety Interlock Switches



Consult the Sensing Solutions Product Guide **PG08301004E** for complete information on these Safety and Limit Switch products.

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E47 Precision and E49 Mini Metal



Online Publications

For the most current information on all Safety and Limit Switches from Eaton's electrical sector, visit **www.eaton.com**

E50 Heavy Duty and Heavy Duty 6P+



Operators



LS-Titan Safety Interlock Switches



Publication: CA05208002E

Overview

Specifically designed for monitoring the position of protective guards, such as doors, flaps, hoods and grilles. All switches in this family are safety-rated, include positively opening NC contacts, and cannot be defeated using simple tools, such as pliers, screwdrivers and nails.

Applications

Protective guards, doors, flaps, hoods, grilles, hinges and covers.

Product Features

Broad family to industry-standard enclosure sizes: Miniature DIN; full-size DIN; and larger, solenoid key interlocks

Large selection of actuators (keys), including those for sliding, swing and sloppy doors

Miniature DIN models feature five-way adjustable heads; full-size DIN models feature four-way adjustable heads

Specialized door-flap and door-hinge switches provide a unique solution when actuators (keys) cannot be used

IP65 degree of protection

Technical Data and Specifications

Mechanical life—
10,000,000 operations (except solenoid models, rated for 1,000,000 operations)

Contact ratings—
AC-15: 6A at 24V, 6A at 230/240V,
4A at 400V/415V

Enclosure rating—
IP65

Construction—
Insulated material (plastic)

Approvals

UL Listed
CSA Approved
CCC
Positive opening NC contacts
per EN 60947-5-1



Listed

Consult the Sensing Solutions Product Guide, **PG08301004E**, for complete information on sensors, limit switches and machine safety products.

E47 Precision Switches



Publication: PG05C03TE

Overview

Specified when accurate repeatability, choice of operating forces and travel characteristics and tightly controlled action of cam or target in space restricted areas are of prime importance. Cost effective and compact.

Applications

Overhead, folding and elevator doors, sliding gates, automated guided vehicles and commercial instrumentation

Product Features

Self-contained switches or with an enclosed cast housing for increased durability and conduit connection (1/2 in NPT)
 High current capacity for power load switching and motor handling capability
 Screw and solder terminations
 Booted enclosed version shields actuators from debris
 Mounting centers—1.0 in (25.4 mm), #8 screw size

Technical Data and Specifications

Mechanical life: 3,000,000 operations min.
 Electrical life: 500,000 operations min.
 Contact ratings—
 NEMA A600, R300, AC-15, DC-13
 15A/20A, 125 or 250 Vac
 Enclosure ratings—
 Enclosed: NEMA 1
 Construction—
 Basic: Phenolic
 Enclosed: Aluminum die cast

Approvals

UL Recognized
 CSA Certified
 CE



Compact Prewired Switches



Publication: PG05C10TE

Overview

Designed to be a versatile, slim device for hard to fit applications where sealing integrity is required.

Applications

Machine tool, food processing and packaging

Product Features

Rugged aluminum alloy die cast housing
 Sealed construction with enclosure ratings of NEMA 4, 6 and 13
 Prewired with 3m of 18 AWG, AWM 2517, 300V cable
 Stackable ridge for ganged operation

Technical Data and Specifications

Mechanical life: 10,000,000 operations min.
 Electrical life: 200,000 operations
 30 operations min.
 Contact ratings—
 NEMA B300
 Enclosure ratings—
 NEMA 4, 6 and 13; IP67, IP69K
 Construction—
 Aluminum alloy die cast

Approvals

cULus



LS-Titan Miniature DIN Switches



Publication: CA05208001E

Overview

Safety position switches with insulated plastic or rugged metal enclosures. Approved for worldwide safety application.

Applications

Automatic vending machines, electronic assembly machines, elevators and lifts, injection molding, packaging and safety applications

Product Features

Modular plug-in head and body components
 Positive opening NC contacts for safety applications
 Operating heads can be rotated 90 degrees to suit specific direction of operation

Technical Data and Specifications

Mechanical life: 8,000,000 operations
 Contact ratings—
 AC-15, 6A at 24V, 6A at 230/240V,
 4A at 400/415V;
 DC-13, 3A at 24V, 800 mA at 110V,
 300 mA at 220V
 Enclosure ratings—
 IP66, IP67 (by model)
 Construction—
 Plastic or metal (by model)

Approvals

Safety function, IEC/EN 60947-5-1
 TÜV-Rheinland certified (LSE models)
 CSA certified
 UL listed
 CE
 CCC



E49 Mini Metal Switches



Publication: CA05215001E

Overview

Suitable for OEMs who require a small, cost-effective solution but cannot sacrifice durability and mechanical life as they would if they chose a plastic IEC style switch.

Applications

Automatic vending machines, electronic assembly machines, elevators and lifts, injection molding, packaging

Product Features

Pre-wired units with custom cable lengths available for high volume customers
 "Fingerproof" terminals protect against accidental shock
 Double-spring mechanism for contact reliability
 Grounding terminal included
 Captive screws on enclosure cover make wiring hassle-free
 SPDT double break

Technical Data and Specifications

Contact ratings—
 5A @ 250 Vac
 5A @ 30 Vdc
 Enclosure ratings—
 IP65
 Construction—
 Zinc alloy

Approvals

UL Recognized
 CE



Consult the Sensing Solutions Product Guide, **PG08301004E**, for complete information on sensors, limit switches and machine safety products.

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Safety Products and Limit Switches

Limit Switches

E49 Compact Metal Switches



Publication: PG05C02TE

Overview

Designed with high mechanical strength for robust environments. The rugged Aluminum die cast construction provides reliable, oil-tight, waterproof and dustproof sealing for a variety of applications. Snap action 1NO-1NC contacts provide flexibility in design.

Applications

Packaging, material handling conveyors, end-of-travel and guarding operations, baler/compactor, industrial door lifts

Product Features

- Rigid die cast switch housing
- Set position indicator plate for easy maintenance
- High mechanical strength
- Oiltight, waterproof and dustproof construction

Technical Data and Specifications

Mechanical life: 15,000,000 operations min.
 Electrical life: 500,000 operations min. at full load
 Contact ratings—
 NEMA A600, R300; AC-15, DC-13
 Enclosure ratings—
 NEMA 4, 4X, 6, 6P, 12, 13; IP65, IP67
 Construction—
 Aluminum die cast

Approvals

cULus
 IP67



E50 Heavy-Duty Plug-In Switches



Publication: PG05C06TE

Overview

Versatile in design. High reliability. Low maintenance costs with installation ease. BEST CHOICE for Heavy-Duty Limit Switch applications. Withstands physical and chemical abuse of harsh industrial environments.

Applications

Punch presses, waste water treatment, machine tool, automotive, retrieval systems, industrial truck, car wash lines

Product Features

- Modular operating heads, switch bodies and receptacles are interchangeable without field adjustment
- Order as complete assemblies or components for stocking and manufacturing flexibility
- 90 degree total travel, 5 degree pre-travel characteristics are standard features
- VITON gasket, boot, and seal material offers exceptional chemical resistance
- Rotary head operating mode from CW, CCW or CW and CCW is easily changed without tools

Technical Data and Specifications

Mechanical life: 13,000,000 operations min.
 Electrical life: 1,000,000 operations min. at full load (single-pole)
 Contact ratings—
 NEMA A600, R300
 Lighted versions A150, R150
 6A, 120 Vac; 10A continuous
 Enclosure ratings—
 NEMA 1, 3, 3S, 4, 4X, 6, 6P, 13; IP67
 Construction—Zinc die cast

Approvals

UL Listed
 CSA Certified
 IEC 947-5-1
 TUV
 CE (some models)



E50 Heavy-Duty Factory Sealed 6P+ Switches



Publication: PG05C09TE

Overview

Designed specifically to withstand the penetrating properties of new cutting fluids (coolants), acid or caustic washes, salt spray, severe vibration, shock and temperature fluctuations, grit and debris.

Applications

Automotive, pulp and paper, food processing, waste management, primary metals, machine tool (cutting, forming, bending)

Product Features

- Tamperproof, one-piece switch body assembly, epoxy filled
- Factory sealed. 6P submersible. Pre-wired with cable, pigtail or pin connector options. All with ground connection
- Utilizes E50 modular operating heads
- Special V-seal on switch body/head connection provides hermetic barrier against fluid ingress
- LED indicating light, 24V–120 Vac/Vdc neon version too
- Peel off see-through painting mask over nameplate

Technical Data and Specifications

Mechanical life: 35,000,000 operations min.
 Electrical life: 1,000,000 operations min. at full load
 Contact ratings—
 NEMA A600, R300
 Lighted versions A150, R150
 6A, 120 Vac; 10A continuous
 Enclosure ratings—
 NEMA 1, 2, 3, 3S, 4, 4X, 6, 6P, 13; IP67, IP69K
 Construction—Zinc die cast

Approvals

UL Listed
 CSA Certified
 IEC 947-5-1
 TUV
 CE (some models)



Operators



Publication: PG05C04TE

Overview

Wide variety of contactor types for rotary and wobble style limit switches.

Applications

Used with E50, E50 6P+ and 10316 limit switches

Product Features

Rollers and rods available in metal and nonmetal contact surfaces

Technical Data and Specifications

Varies by model

Approvals

Varies by model

Non Plug-In Switches



Publication: PG05C05TE

Overview

The Industrial standard for Non Plug-In Heavy-Duty Limit Switches. Sold as complete assembled units only.

Applications

Serving MRO and USER replacement requirements with broad market coverage

Product Features

Side and top rotary, side and top push or wobble operation
 CW, CCW or CW and CCW operating modes are field convertible
 Double break-make snap action contacts, same polarity each pole
 Captive saddle clamp terminals accept up to #12 wire
 Head can be mounted in any of four discrete positions, intervals of 90 degrees

Technical Data and Specifications

Mechanical life: 10,000,000 operations min.
 Electrical life: 500,000 operations at full load
 Contact ratings—NEMA A600, R300
 6A, 120 Vac; 10A continuous
 Enclosure ratings—NEMA 1, 4, 13
 Construction—
 Zinc die cast

Approvals

UL Listed
 CSA Certified



Hazardous Location Switches



Publication: PG05C07TE

Overview

Designed for severe environmental service in locations where there exists a danger of an internal or external explosion of flammable gases, vapors, metal alloy or grain dust.

Applications

Mining, metal cutting, grain storage, forest products, petrochemical, waste and sewage management, pharmaceutical

Product Features

Sealed and unsealed versions available
 One-way gasket on sealed version keeps liquids out, yet allows a harmless release of gases in the event of an internal explosion
 Silicon bronze housing provides excellent corrosion resistant properties in extreme NEMA 4X applications
 Temperature build-up on limit switch surface is dissipated by housing design and materials used
 Utilizes the operating heads and internal switch mechanisms of the 10316 Non Plug-In line

Technical Data and Specifications

NEMA 7, Div. 1, Class I, BCD
 NEMA 9, Div. 1, Class II, EFG
 Contact ratings—NEMA B600
 3A, 120 Vac; 5A continuous
 Enclosure ratings—LX: NEMA 7, 9
 CX: NEMA 1, 4, 7, 9
 CB: NEMA 1, 4, 4X, 13
 CBX: NEMA 1, 4, 4X, 7, 9, 13
 Construction—LX, CX: Aluminum die cast
 CB, CBX: Silicon bronze

Approvals

cUL Listed



Special Purpose Switches



Publication: PG05C08TE

Overview

Variety of special function limit switch products.

Applications

Serving MRO and USER replacement requirements with broad market coverage

Product Features

Special function switch lines include:
 Cabinet door interlocks — when plunger is pulled out, red band indicator visually shows that interlock is defeated
 Precision switches—1NO-1NC, 2NO-2NC, or operator only. Variety of mounting brackets available
 Pneumatic time delay—ON delay and OFF delay. Timing range—0.05 to 60 seconds
 Rotating cam shaft switches

Technical Data and Specifications

See **PG05C08TE** for more information
 Enclosure ratings—
 NEMA 1 or NEMA 4 versions
 Construction—
 Zinc die cast
 PS: Phenolic

Approvals

UL Listed
 CSA Certified (PS and J only)



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