

**Definition**

These switches are mechanical devices used to make and/or break one or more electrical circuits. They are designed to be solely operated by human hands.

**Operation**

These switches have contact arrangements from one normally closed contact to a variable selector with up to five positions and sixteen poles. Included in this section are the enclosures that will accept all of the switches on the previous pages. A 'Die Safety Block Switch' is offered on page 36 which is normally used on presses with the removable switch key attached to a die safety block (Not Included). In order to place the die block in the die area the key must be removed from the switch thereby breaking and isolating the control circuit. Also included in this section are ring guards, legend plates and adapter plates etc.

**Selection**

The selection and use of a switch etc. involves knowing the details of the particular installation. The following rotary contact selector switches are offered with two positions, two poles or three positions, four poles or two position. Another style comes with two or four poles with a latch and provision for padlock security. Also, a custom order selector switch with or without a keylock is available. It can be produced in two through five positions and two through sixteen poles. These are specials and require a factory quote. For the fastest service, complete the worksheet on page 37 and FAX it to our Customer Service Department at 260-495-2186. The palm switch guard/actuator is available to reduce the operating force of the palm buttons. There are two advantages to using this device.

First of all, there is a mechanical advantage which means it takes less external force to actuate the switch it is mounted to. Secondly, the hand contact area is very large (approx. 20 sq. in.) which dissipates the pushing force into a much lower psi.

**Installation**

Every installation is unique, therefore there are only a very few hard and fast rules to follow. Above all, observe all SAFETY REQUIREMENTS, PROCEDURES and LOCAL CODES. To mount these devices it will be necessary to have a suitable enclosure. These are available from REES (see page 39). On pages 36 through 43 you will find many different items that should satisfy any installation requirements. At the end of this section of this catalog you can find a number of accessory items to facilitate in the installation of these devices.

All mechanical devices, these units included, will wear out and eventually need to be replaced. The estimated minimum mechanical life is 500,000 operations. Regular scheduled Preventative Maintenance inspections are strongly recommended. Some conditions to look for are:

- Physical damage to the device.
- Loose connections or components.
- Broken or weak springs.

REES switches are designed and manufactured to surpass the standards of industry. On the facing page is a brief look at some of these regulations. The testing done by independent facilities is the minimum requirement that the REES switches far exceed. If other assistance is desired please contact the factory.

**Regulations**

Following are excerpts from Domestic and Foreign Regulations that have applicability to Selector Switches, Guards and Enclosures.

- **ANSI B 11.1 - 1988 (4.13.4.1)**

"Stroking Selector . A means of selecting OFF, INCH, SINGLE STROKE, CONTINUOUS, MAINTAINED CONTINUOUS, or other operating modes when such functions are furnished shall be supplied with the clutch/brake control to select the mode of operation of the press. If more than one stroking selector is provided, each shall have a "remote" position, and the design shall require that all except the controlling selector be in the "remote" position before operation can be enabled. Moving any stroking selector from its "remote" position shall result in a stopping action."

- **NEMA ICS 2 - 1988 (2-216.06)**

"Heavy-duty push button stations shall consist of push buttons and/or selector switches rated in accordance with ICS 2-216.22, and/or indicating lights in accordance with ICS 2-216.23, mounted in a suitable enclosure."

- **NEMA ICS 2 - 1988 (2-216.08)**

"Standard-duty selector switches shall have either two or three positions. Heavy-duty selector switches shall have two, three or more positions."

- **NEMA ICS 2 - 1988 (2-216.22)**

"Heavy-duty push buttons and selector switches shall have contact rating designations of A600, A300, A150, N600, N300, or N150 as shown in Table 2-125-1 for alternating current and Table 2-125-2 for direct current."

- **CEN (European Committee for Standardization) EN 418 :1992 (4.1.2)**

"The control device and its actuator shall apply the principle of positive mechanical action."

- **CEN (European Committee for Standardization) EN 418 :1992 (4.4.3)**

"The emergency stop actuators shall be coloured red. As far as a background exists behind the actuator and, as far as it is practicable, it shall be coloured yellow."

- **Ford Manufacturing Standards EA 3 - March 1995 (3.1.6)**

"Enclosure Design & Guarding: Units shall not have any sharp corners or edges, and shall be suitable for use with either a bare or gloved hand. All units shall have integral guards or shall be capable of being fitted with commonly available ring guards. Guards on Mechanical units shall extend a minimum of 3/16-inch, and guards on Capacitive electronic units shall extend a minimum of 1/2 inch, above the top surface of the button in its unactuated state to prevent bridging the buttons with commonly found objects. On Electronic Units, the units configuration and/or guards shall prevent inadvertent operation from small objects and loose clothing (ref: ANSI B11.19, 4.2.4.2.3). All guards required in this Standard shall be either permanently attached to the unit or otherwise removable only with tools. All ring guards shall provide the above stated height above the top of the button without the use of any separate spacers or standoffs. Additionally, units with separate or integral guards shall not be capable of being twisted in their mountings so that a rodlike object can be used to simultaneously actuate both Units used in a Two-Hand Trip or Control Circuit."

**REES switches exceed the following:**

Listed by Underwriters Laboratories per Standard UL 508  
File No. E 58589

Certified by Canadian Standards Association per Standard C 22.2  
File No. LR 3648

Certified by DEMKO to IEC/EN 60947-5-5 or IEC/EN 60947-5-1

Third party certified under DEMKO File #FI-17205

NEMA ICS 2-1988

IEC/EN 60947-5-5: Standard which applies to electrical emergency stop devices with a mechanical latching function. This standard also encompasses all requirements of regular electromechanical switches (60947-5-1)

IEC/EN 60947-5-1: Standard which applies to low-voltage switchgear and controlgear such as the electromechanical switches manufactured by REES, Inc.

**Following are definitions of terms as relating to Push Button and Selector Switches:**

**Push Button** - A push button switch (push button) is a switch having a manually operable plunger, rocker or button for actuating the switch.

**Selector Switch** - a switch having a manually operated lever and shaft arrangement on which is mounted cams that actuate the contacts in different unique sequences.

**Positive Break** - The achievement of contact separation as the direct result of a specified movement of the switch actuator through non-resilient members. (e.g., NOT dependent upon springs)

**Positive Transfer** - A contact system so designed that it remains in one state (NO or NC) until the switch actuator moves to a "point of no return," then the contacts transfer and cannot be teased.

**Slow-Make / Slow-Break** - A contact system that opens and/or closes at the same rate (speed and time) that the actuator is moved.

**Snap Action** - A rapid motion of the contacts from one state to another, that is independent of the rate of travel of the actuator. Similar to "Positive Transfer."

**Safety Block** - means a prop that, when inserted between the upper and lower dies or between the bolster plate and the face of the slide, prevents the slide from falling of its own deadweight."

**Stroking Selector** - means the part of clutch/brake control that determines the type of stroking when the operating means is actuated. The stroking selector generally includes positions for "Off" (Clutch Control), "Inch," "Single Stroke," and "Continuous" (when Continuous is furnished).

**Operating Force** - The amount of pushing or pulling force (in pounds) necessary to change the state of the switch from an at rest condition to one of contact change; that is, to make a set of Normally Open contacts or break a set of Normally Closed contacts.