

OPEN FRAME SWITCHES

Lubrication of Contacts

All switch sections are lubricated using a process which deposits a very thin film on the rotor blades. This film is of sufficient thickness to provide lubrication for the life of a normally hand-operated switch. The film of lubricant will not readily collect dust and dirt, which could lead to reduced switch life.

Various lubricants that are compatible chemically and electrically are used. Lubricant used is dependent on switch specification and operation. If customer switch specification specifically calls for no lubricant, none will be applied.

Soldering to OakGrigsby Switches

Care must be exercised when soldering to *ELECTROSWITCH*'s switches. Soldering irons, which can produce temperatures above 600°F should not be used. Excessive heat or prolonged periods of heating (above 5 seconds) can cause clips to loosen, and contribute to an increase in contact resistance due to a loss of contact pressure.

Never clean rosin from soldered connections on a switch or any other contacting device with solvent. Rosin dissolved by a solvent may float down onto the contacts where it cannot be removed easily, and no amount of contact pressure can cope with a rosin coating.

Type of Detent

Unidex—a dual ball detent indexing on a starwheel. This detent offers 100,000 cycles of mechanical life, with the torque remaining constant and crisp throughout the life of the switch. It should be used in place of ball index where possible.

Ball Index—single, dual or tri-ball indexing with ball bearing indexing over a hill and valley or punched hole plate. This index is common to the Type L and MF switches. The tri-ball index must be used for military switches.

Detenting Torque

Proper detenting torque is necessary to give the right feel to the switch. An approximate torque figure can be obtained by adding all the clips which are in contact with the rotor blade(s), and then adding the maximum number of clips entering in any one detented position. This figure, multiplied by 1 inch-ounce, will give an approximate but usable torque value. In order to mask out this drag, the detent mechanism itself must have at least 1½ times the torque of the section(s). This means that the total switch torque should be at least 2½ times the section torque for a crisp feel. The typical tolerance on the torque requirement is ±40%. If a closer torque tolerance is required, adjustments will be necessary (at additional cost).

In cases where clip and blade drag is greater than can be accommodated by a specific index, definite feel of index position becomes vague and there is a tendency to skip positions. Thus, in order to obtain a definite detent "feel," it is necessary to reduce section drag by using a thinner clip material or special slotted, low torque clips. (Consult our Application Engineering Department. They will gladly provide any information or assistance you might request.)

Maximum torque is related to the size and type of knob being used on the front panel. For a comfortable turning force, the following torque values are recommended:

½ in. dia. knob	8 to 15 in.-oz.
¾ in. dia. knob	10 to 20 in.-oz.
1 in. dia. knob	15 to 35 in.-oz.
1½ in. dia. knob	20 to 50 in.-oz.

(Bar knobs or deeply knurled knobs can be used with higher torques for the same size knob.)

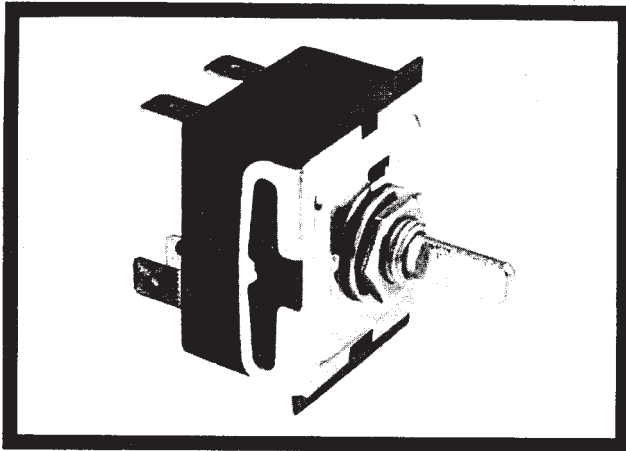
Identification Marking of Switches

Oak switches are marked "249," our registered trademark, or "Oak." Our manufacturer's federal identification code number is 76854. These numbers do not identify any particular switch or item.

When specified, rotary switches may be marked with either the Oak part number or customer's part number. Since changes made in production might cause obsolescence of parts already marked, it is impractical to stamp revision letters.

Rotary Switches

Series 240 & 390



DESIGNED FOR APPLICATIONS REQUIRING COMPACTNESS, HIGH CAPACITY AND LONG SERVICE LIFE.

Our capability in the development of electrical switches over the past 40 years has transcended almost every possible application within the electrical and electronic industry. None has met greater acceptance or achieved more universal popularity than the Series 240 & 390 Rotary Switches. Designed for applications where space limitations require compactness, both are electrically and mechanically interchangeable. They are available single pole or double pole with indexing, in steps of 45, 51, 60, 72, 90, 120 or 180 degrees, operating full rotary or stops as required. Standard A.C. Rating — U.L. approved — range from 7-1/2 amperes to 38 amperes, including motor ratings of 1/4 H.P. to 1 H.P., 120 V., 2 H.P., 240 V. Typical applications include: Air conditioners, X-ray machines, medical, dental and other laboratory equipment, ranges, ovens, battery charges, kilns, space heaters, vending machines, washers, dryers, and a multitude of appliances or devices.

MANUAL MOTOR CONTROLLERS

Many 390 Series Switches are now classified as Manual Motor Controls and recognized under the component programs of Underwriters' Laboratories, Inc. and Canadian Standards Association.

These devices are open type manual motor controls and are rated single phase, same polarity with contact ratings to 38 amps total input and horsepower ratings to 2 H.P., at 240 VAC (resistive) plus locked rotor ratings to 125 amperes at 240 VAC.

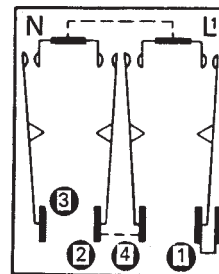
Mounting arrangements, circuitry details, and physical dimensions are the same as those described in this bulletin for 390 Series Rotary Switches.

TYPICAL CIRCUITS

Hundreds of circuit variations are possible

SINGLE POLE CIRCUITS AS USED IN AIR CONDITIONERS

Terminals L1 and N shunted internally. Line Terminal may connect with terminals 1, 2, 3, and 4 in any position with 45, 60, 72 and 90 degrees of throw.



REAR VIEW

DOUBLE POLE CIRCUITS AS USED IN ELECTRIC RANGES

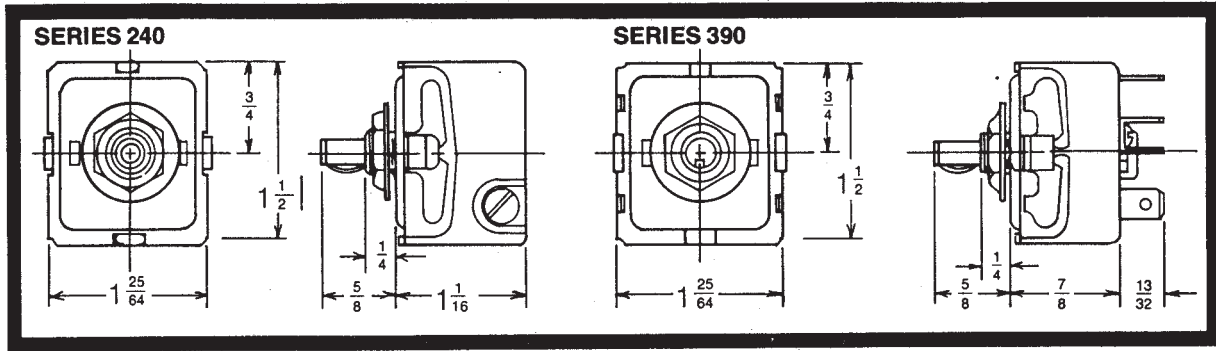
Terminal N may connect with terminals 2 and 3 only, in any position. Terminal L1 may connect with terminals 1 and 4 only, in any position. Available with 45, 51, 60, 72, 90 and 180 degrees of throw.

Electrical ratings vary as to application, and are available to 38 A. 120/240 V. rating with 20 amps. max. on inside terminals (2 & 4) and 25 amps. max. on outside terminals (1 & 3) resistive load. Double pole applications can have 30 amps. max. rating with 20 amps. max. on any one circuit.

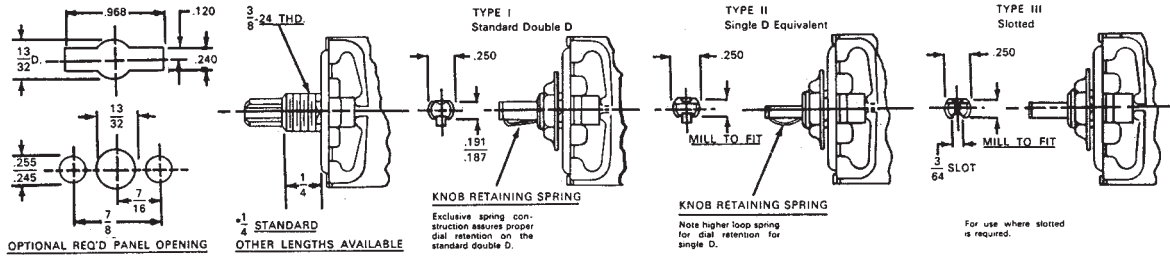
DUMMY AND AUXILIARY TERMINALS

Series 390 Switches may be provided with two, four or six dummy terminals, eliminating the need for auxiliary terminal blocks. Auxiliary terminals can be provided to permit additional connections on load or line terminals. Through the use of many standard cams and both internal and external shunts, the Series 240 and Series 390 small rotary switches can be designed to accommodate a vast number of different circuits.

Illustration shows coaxial spindle arrangement with outer hollow spindle (A) operating the switch itself, while the inner solid spindle (B) provides independent coaxial control of the auxiliary function.

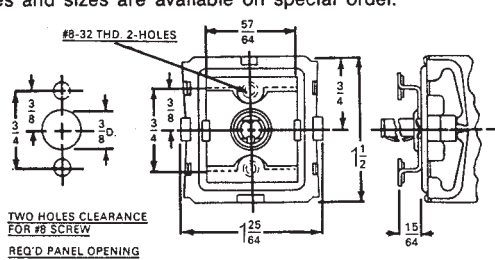


STANDARD MOUNTING ARRANGEMENTS

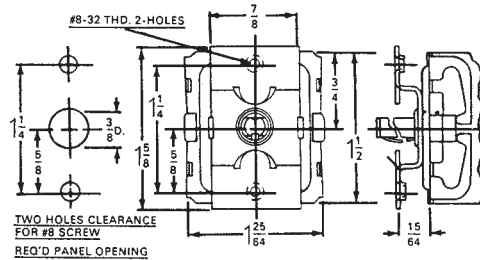


SINGLE HOLE MOUNTING

An exclusive spring arrangement of Types I and II gives uniform tension to hold knobs firmly in place. Various lengths are available. For spindle lengths exceeding 2", nylon back bearings will be supplied for added strength and rigidity. Other types and sizes are available on special order.

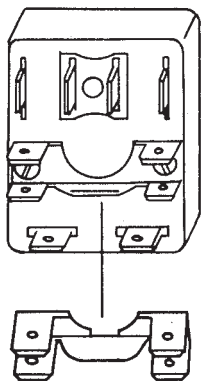


TWO HOLE 3/4" MOUNTING

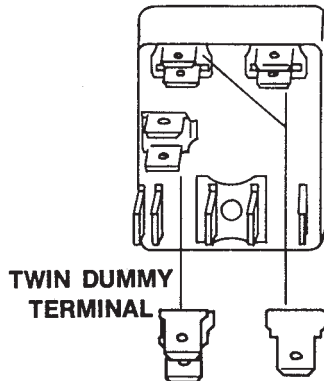


TWO HOLE 1-1/4" MOUNTING

DUMMY AND AUXILIARY TERMINALS



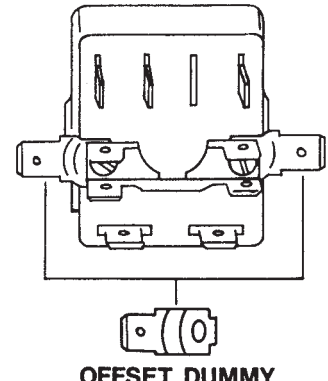
4 PRONG DUMMY TERMINAL



TWIN DUMMY TERMINAL



AUXILIARY TAB TERMINAL



OFFSET DUMMY TERMINAL

T05 Mechanical Drawings

