

MODUTROL* MOTOR—M934A

OBSOLETE

YOUR UNIT CAN BE REBUILT
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application: The M934A is a series 90 Modutrol Motor which provides proportional control for valves or dampers. The motors are available in all the standard voltages with or without two integral, cam driven, auxiliary switches. These MICRO SWITCH* precision switches provide a wide variety of automatic switching combinations for secondary control equipment.

construction: Housed in a sturdy metal case, the motor and the gear train are immersed in oil to provide longer life and quieter operation. The case has four knock-outs, to facilitate wiring, and four mounting lugs to permit secure positioning. The mounting lugs are sized for quarter-inch machine bolts or screws.

The M934A has a reversible shaded pole motor with integral arc suppression and is available in both line- and low-voltage models. Line-voltage models contain an integral 24-volt transformer which provides low voltage for the control circuit.

specifications:

MODEL: M934A Modutrol Motor.

MOTOR RATINGS:

24 v	50/60 cps	1.6 amp	24 watts
120 v	50/60 cps	0.32 amp	24 watts
220 v	50 cps	0.16 amp	24 watts
240 v	50/60 cps	0.16 amp	24 watts

AUXILIARY SWITCH MODELS: The M934 is available in all voltages with a pair of integral auxiliary switches having a fixed differential of approximately ten angular degrees.

INTEGRAL-SWITCH RATINGS (in amperes):

	120 v	240 v
Full Load	8	4
Locked Rotor	48	24

NOTE: If both Normally Open and Normally Closed contacts are used on an individual switch, either contact is rated as shown in the table above, but the opposite contact is rated at 40 VA pilot duty only.

MOTOR TIMING: 1 minute.

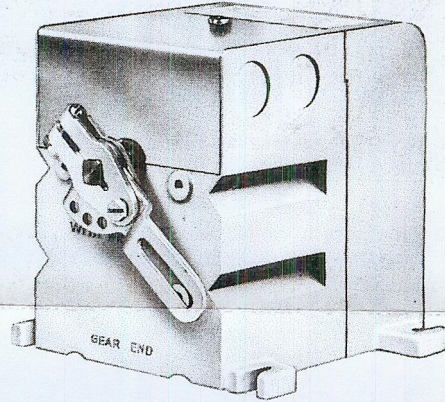
CRANK SHAFT: Double ended, $\frac{3}{8}$ in. square, $\frac{3}{8}$ in. long.

CRANK ARM: Single arm is adjustable from minimum radius of $1\frac{1}{16}$ in. to $2\frac{11}{16}$ in. maximum. Operating stroke is 160 degrees. The arm is adjustable positionally through 360 degrees in $22\frac{1}{2}$ degree increments.

DIMENSIONS: See Fig. 1.

MAXIMUM DEAD LOAD: Cover end—50 pounds; Case end—100 pounds.

TORQUE: 35 inch-pounds at 85% of rated voltage.



DAMPER RATING: 23 square feet maximum.

AMBIENT TEMPERATURE RATING: -30 F to +125 F.

APPROVAL: Listed by Underwriters' Laboratories, Inc.

ACCESSORIES AVAILABLE:

1. Q441B, D Auxiliary Switches (snap-acting type) for operating accessories. See Form 95-2786.
2. Q68B Dual Control Potentiometer for operating Series 90 motors in parallel. See Form 95-1448.
3. Q181 Auxiliary Potentiometer for unison or sequence control of one or two additional motors. See Form 95-1449.
4. Q455 & Q601 Valve Linkages. See Forms 77-5211 & 77-5209.
5. AT72 & AT92 Low-voltage Transformers. See Forms 90-0520 & 90-0588.
6. Q605 Damper Linkage. See Form 95-1347.
7. Q209B Manual Potentiometer. See Form 95-1504.

NOTE: Use accessories which do not require a tapped hole in the end of the motor shaft.

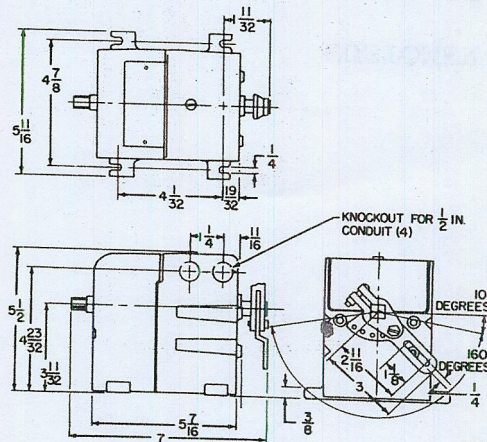


Fig. 1—Approximate Dimensions in Inches.

* TRADE MARK



WHEN SPECIFYING, INDICATE:

1. Model number.
2. Integral auxiliary switching, if required.
3. Voltage and frequency.
4. Accessory(ies), if required.

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typical operation: When used with a Series 90 temperature controller, and connected through a linkage to a damper, the M934A provides the proportional positioning of the damper required to maintain the selected set point temperature. Models with integral switches, or those equipped with Q441B or D auxiliary switches, permit automatic switching of secondary control equipment.

connection diagrams:

The following basic diagrams represent some of the more common hookups used. The many variations and combinations of these elementary systems make possible the proper coordination of the various functions of air conditioning systems, heating systems, etc.

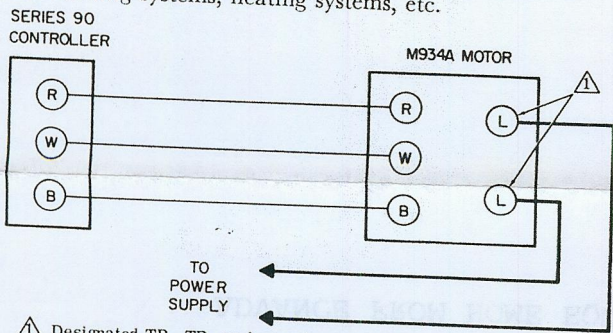


Fig. 2—Connection diagram for an M934A Motor and a Series 90 Controller.

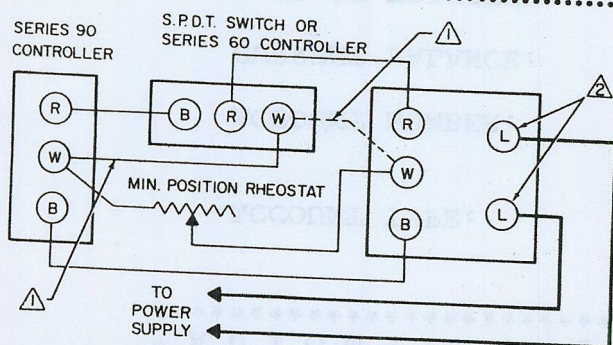


Fig. 3—Connection diagram for an M934A Motor, a Series 90 Controller, a minimum position rheostat, and a S.P.D.T. switch for two-position closure of damper or valve. The S.P.D.T. switch may be a Series 60 Temperature Controller, a relay, or a snap switch.

NOTE: In most applications the limit controller may have a single 135 ohm potentiometer to provide 50 per cent operation of a valve or damper. Where the limit controller must be able to operate the valve or damper to 100 per cent of its capacity it must have either one 280 ohm potentiometer or two 135 ohm potentiometers. If a two-potentiometer limit controller is used, it should be wired into the circuit so the resistance varies over the entire 270 ohms.

In general, a two-position controller, or a controller with a narrow throttling range, should not be used as a high or low limit if the condition (temperature or humidity) of the medium in which they are located is affected to any great extent by the opening and closing of the valve or damper which it controls, as continuous opening and closing may result.

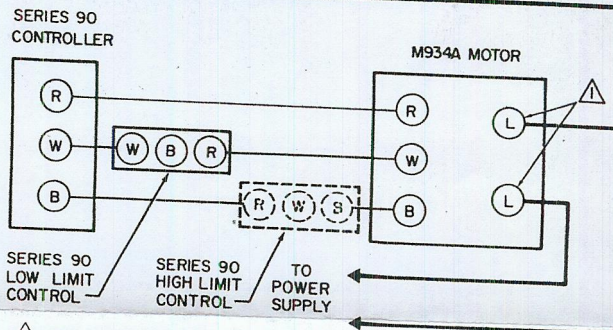


Fig. 4—Connection of an M934A Motor and a Series 90 Controller using a Series 90 Limit Controller to provide either high or low-limit control. The low-limit application is illustrated above; high-limit control may be had by moving the Limit Controller from the W-leg of the circuit to the B-leg and connecting the terminals as illustrated in the dotted-line position above.

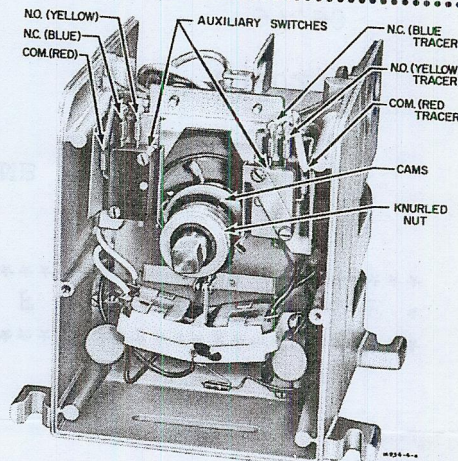


Fig. 5—Model of the M934A with Integral, Auxiliary Switches.

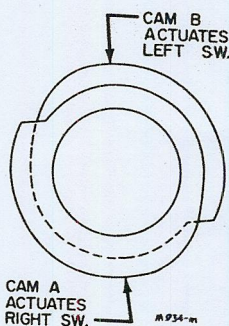


Fig. 6—Cam Arrangement When Shipped from the Factory, as viewed from the Cover End. Both Auxiliary Switches are in their Normal positions.