

MODUTROL* MOTORS—M445, M644, M845, M944 & M945

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application: Modutrol motors are primarily valve and damper operators. Models are available for all modes of control, operating directly from a variety of controllers which sense changes in temperature, pressure, or humidity; or they operate indirectly through appropriate switching relays.

construction: Modutrol motors are housed in a light, rugged die-cast aluminum case with mounting flange. Oil immersed motor and gear train assures long life and quiet operation. Interchangeable with older Honeywell motors, and can be used with existing accessories. Double ended shaft, 3/8-inch square, permits use of accessories and provides a solid mounting for the crankarm. Weatherproof kit, cover/transformer, and other special accessories available.

Additional features available on various models include the following:

specifications:

TABLE I — GENERAL SPECIFICATIONS

MODEL	DESCRIPTION
M445A	Line-voltage, two position, spring return with one internal auxiliary switch (spdt). For dampers on NC valves. Fixed 160 deg. stroke with 60 sec. timing.
M445B	Same as M445A except for M.O. valves.
M445C	Same as M445A except includes internal thermostatically controlled heater.
M644A	Low-voltage. Reversible. Used with Series 60 low-voltage floating controllers (spdt, center off switching). May also be used with Series 20 controllers with snap acting switching. Fixed 90 or 160 deg. stroke with 15 or 30 sec., 1 or 4 min. timing.
M644B	Same as M644A above except for line-voltage. UL Listed.
M644C	Same as M644A except with field adjustable dual stroke (90 or 160 deg).
M644D	Same as M644C except with two internal auxiliary switches. UL Listed.
M845A	Same as M445A except for low-voltage operation.
M845B	Same as M445C except for low-voltage operation.



- Integral spring returns motor to starting position when power fails or is interrupted (mechanism is field removeable)
- Internal auxiliary switches.
- Thermostatically controlled internal heater for low temperature operation (on spring return motors).
- Auxiliary potentiometer.

M944A	Low-voltage, reversible, proportioning with feedback potentiometer. Used in Series 90 control circuit. Positions damper or valve proportionally according to controller demands. Has balancing relay. Fixed 90 or 160 deg. stroke with 15 or 30 sec., 1 or 4 min. timing.
M944B	Same as M944A except does not have balancing relay. Used in Series 70 circuits.
M944C	Same as M944A except with dual 90 or 160 deg. stroke (field adjustable).
M944D	Same as M944C except has two auxiliary switches. UL Listed.
M944E	Same as M944B except with dual 90 or 160 deg. stroke (field adjustable). UL Listed.
M944F	Same as M944A except with auxiliary potentiometer.
M944G	Same as M944B except for line-voltage operation. UL Listed.
M944H	Same as M944G except has one auxiliary switch. UL Listed.
M944J	Same as M944B except has auxiliary potentiometer.

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TABLE 1-(Cont'd)

MODEL	DESCRIPTION
M945A	Low-voltage operation. Proportioning, spring return, with feedback potentiometer. Used where proportional control with spring return to starting point upon power failure or shut down is desired. In Series 90 circuit, positions damper or valve proportionally according to controller demands. Has balancing relay. For damper or N.C. valves. Fixed 160 deg. stroke with 60 sec. timing.
M945B	Same as M945A except without balancing relay. May be used w/Series 70 electronic controller.
M945C	Same as M945B except has two auxiliary switches. UL Listed.
M945D	Same as M945A except has two auxiliary switches. UL Listed.
M945E	Same as M945A except has auxiliary potentiometer.
M945F	Same as M945A except for N.O. valves.
M945G	Same as M945B except for N.O. valves.
M945H	Same as M945D except with internal heater.
M945J	Same as M945A except has one (1) auxiliary switch. UL Listed.
M945K	Same as M945B except with one (1) auxiliary switch.
M945L	Same as M945B except includes a balancing relay for minimum positioning with a remote potentiometer.

TABLE 2 - ELECTRICAL CHARACTERISTICS

Model	Watts	Voltage, ac 50/60 Hz	Aux. Switch Rating (in amperes)			
			Full Load	Locked Rotor	Resistive	Voltage
M445A	18	120, 208,	7.2	43.2		120v ac
M445B	18	220 ^b , 240	3.6	21.6		240v ac
M445C	48 ^a					
M644A	15	24	5.8	34.8	11.0	120v
M644B	14	120, 208,	2.9	17.4	11.0	240v
		220 ^b , 240	—	—	11.0	277v
M644C	15	24				
M644D	15	24				
M845A	20	120, 208,	7.2	43.2		120v ac
M845B	50 ^a	220 ^b , 240	3.6	21.6		240v ac
M944A	20	24				
M944B	15	24				
M944C	15	24				
M944D	15	24	5.8	34.8	11.0	120v
M944E	15	24	2.9	17.4	11.0	240v
			—	—	11.0	277v
M944F	15	24				
M944G	14	120 ^c				
M944H	19	120 ^c	7.2	43.2		120v
			3.6	21.6		240v
M944J	15	24				
M945A	24	24				
M945B	20	24				
M945C	20	24	5.8	34.8	11.0	120v
M945D	24	24	2.9	17.4	11.0	240v
			—	—	11.0	277v
M945E	24	24				
M945F	24	24				
M945G	20	24				
M945H	54 ^a	24	5.8	34.8	11.0	120v
			2.9	17.4	11.0	240v
			—	—	11.0	277v
M945J	24	24	7.2	43.2		120v
			3.6	21.6		240v
M945K	20	24	7.2	43.2		120v
			3.6	21.6		240v
M945L	24	24				

^aIncludes 30 watts for internal heater.^b50 Hz only.^c60 Hz only.

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ELECTRICAL RATING: See Table 2.

POWER CONSUMPTION: See Table 2.

HEATER THERMOSTAT: Automatically "makes" at 20F on temperature fall, "breaks" at 50F on temperature rise.

CRANK SHAFT: Double ended shaft, 3/8 inch square.

TORQUE: See Table 3.

DIMENSIONS: See Fig. 1 and 2.

AMBIENT TEMPERATURE RATING:

Maximum - 125F.

Minimum - 15F (minimum 40F with internal heater).

DAMPER RATING: 40 square feet.

DEAD WEIGHT LOAD ON SHAFT:

Power end - 200 pounds.

Auxiliary End - 10 pounds (M445, M845, M945 models)

100 pounds (M644 and M944 models)

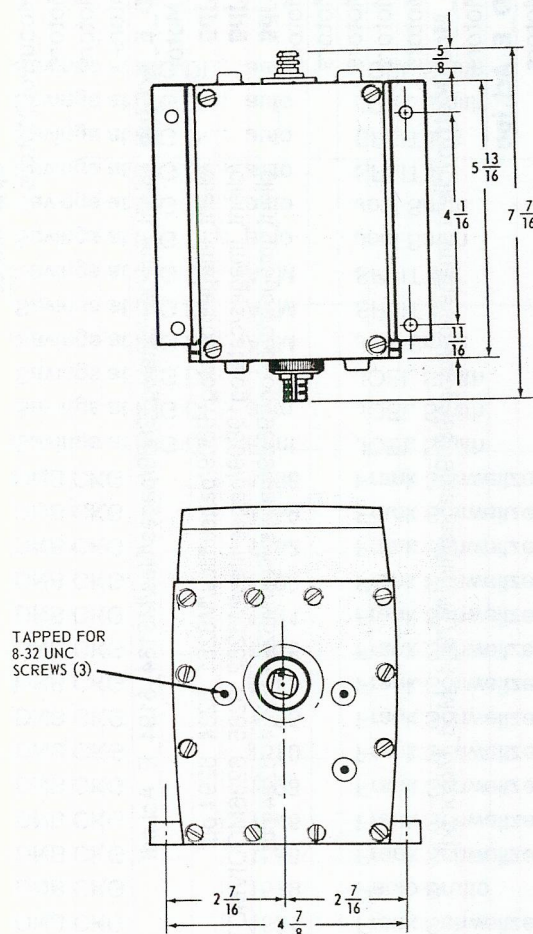


Fig. 1-M644 and M944 Modutrol Motor with dimensions in inches.

TABLE 3 (Torque in inch-pounds)

Model	Timing for 160 Degree Stroke	Normal running Torque	Breakaway Torque
M445	1 min.	50 ^b (max.)	200
M644	15 seconds	37	75
	30 seconds	75	150
	1, 2 & 4 min.	150	300
M845	(Same as M445 Models)		
M944	(Same as for M644 Models)		
M945	(Same as for M445 Models)		

NOTES:

^aThe maximum torque available to overcome occasional large loads such as a seized damper or valve.

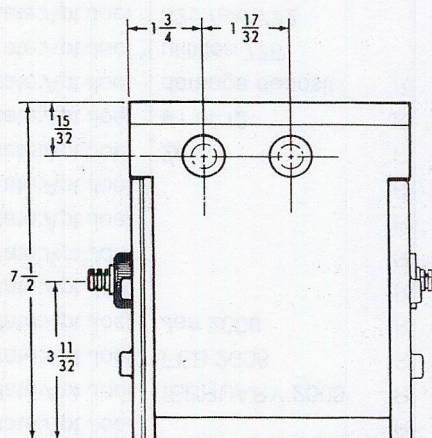
MUST NOT BE USED CONTINUOUSLY AT THIS RATING.

^bMay be divided between the two shaft ends provided no more than 25 pound-inches is applied to the auxiliary end.

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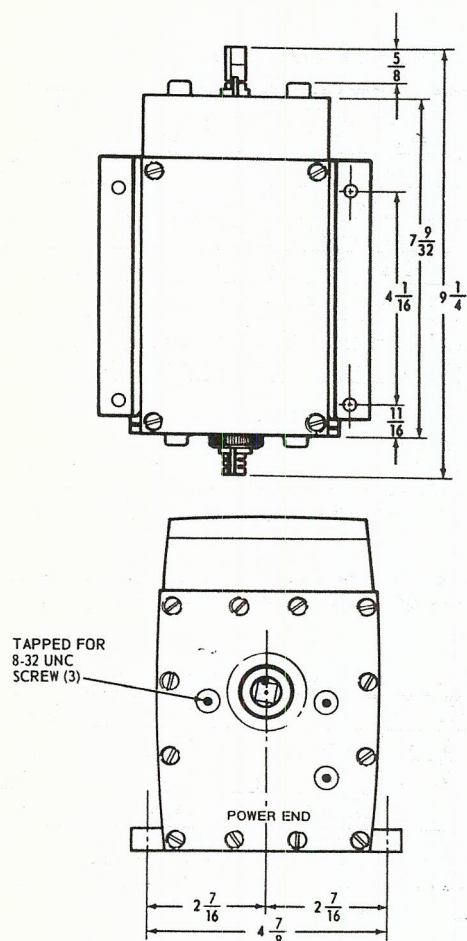
Model	File No.	Guide No.
M644B and D only	4436	400ED
M944D,E,G,H only ^a	4436	400EO
M945C,D,H,J,K only ^a	4436	400EO

^aNOTE: Only those motors for line-voltage or with auxiliary switches are required to be listed by Underwriters' Laboratories, Inc.



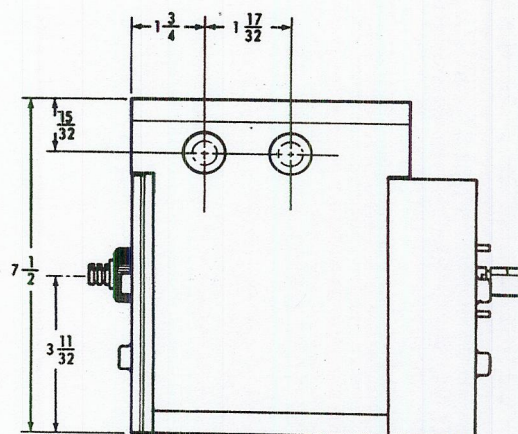
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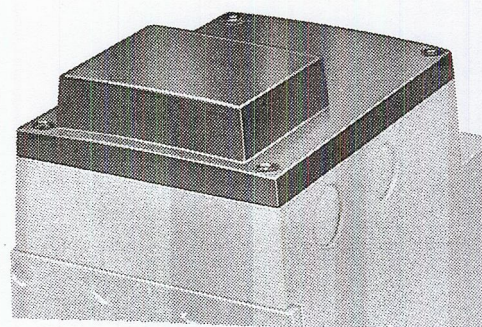
Fig. 2-M445, M845, and M945 with dimensions in inches.

COMMONLY USED ACCESSORIES:

- Q607 Auxiliary Switch—Controls auxiliary equipment as a function of motor position.
- Q605 Damper Linkage—Connects motor to damper. INCLUDES MOTOR CRANK ARM.
- Q601 Linkage—Connects Modutrol Motor to water or steam valve.
- Q455 Linkage—Connects Modutrol Motor to water or steam valve.
- Q100 Linkage—Connects Modutrol Motor to butterfly valve.
- Q104 Linkage—Connects Modutrol Motor to butterfly valve.

Weatherproofing Kits — (Part No. 7640JT).
Weatherproofs the M445 and M845 Modutrol Motors. 7640JS weatherproofs all non-spring return motors.

Motor Crank Arm — (Part No. 7616BR). Included with Q605 but not with motor.



130810A Cover-Transformer — The 130810A is a combination Cover-Transformer that replaces the standard Modutrol Motor top cover. A built-in transformer, rated at 40 va, supplies power to 24 volt motors and eliminates the need for an external transformer. Not applicable to motors with integral heaters. Die-cast aluminum construction.

Specifications:

Model: 130810A Cover-Transformer

Electrical Rating: 120 volts, 50/60 Hertz
Primary.

Output (Secondary voltage): 25 volts, open
circuit.

VA Rating: 40 va.

Dimensions (in inches): 4 x 4-13/16 x 2,
increased motor height 3/4 inch overall.

Mounting: Replaces original motor top and
mounts with same four screws.

For Use With: M644, M845, M944, and M945
(except M845B, M945B, and M944G, H).

Specify: Model number 130810A

ORDERING INFORMATION:

Specify -

1. Model Number.
2. Voltage and frequency.
3. Accessories.
4. Special features.

typical operation:

When the controller is actuated by a change in the controlled space temperature, the Modutrol motor is energized, causing it to operate in a direction appropriate to bring the controlled space temperature back to the set point.

In spring-return models the motor is driven to its "normal" position if a power failure should occur. By the use of end-mounting auxiliary switches, such as the Q441, a variety of automatic switching operations may be performed.

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