

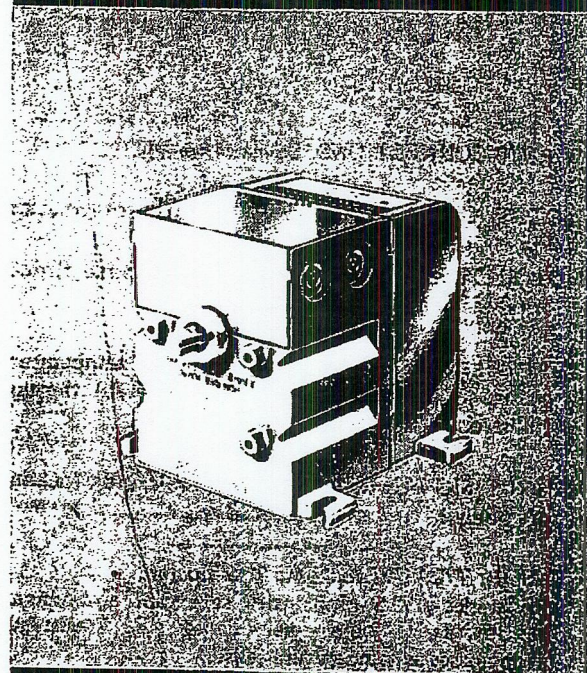
# Honeywell

THE M734B,C ELECTRONIC MOTORS ARE USED IN THE HONEYWELL ELECTRONIC MULTIZONE CONTROL SYSTEM TO OPERATE THE ZONE DAMPERS AND PROVIDE A LOAD SIGNAL TO THE W936 CENTRAL PROCESSOR.

- ☐ M734B drives clockwise (as viewed from power end) on a fall in temperature; M734C drives clockwise (as viewed from power end) on a rise in temperature.
- ☐ Available with 90 or 160 degree stroke.
- ☐ Available for use on 24, 120, or 240V ac input.
- ☐ Operates in response to signal from 2-wire, thermistor-type thermostat.
- ☐ Appropriate zone damper must be full open before load signal is sent to W936 Central Processor.
- ☐ Motor control circuit, when connected with other zone motors, ensures that only load signals from zones of greatest heating and greatest cooling demand will reach central processor.
- ☐ Solid state control circuit.
- ☐ Solid state motor drive circuit.
- ☐ Die-cast zinc housing.
- ☐ Oil immersed, helical gear train.
- ☐ Integral transformer provides 24V power for control and sensor circuits.
- ☐ Includes motor crank arm assembly.

J.A.  
9-73 (005)

## ELECTRONIC MODUTROL MOTORS



## M734B,C

Residential Div. Form Number

60-2328

OBSOLETE

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# SPECIFICATIONS

## MODELS:

M734B Electronic Modutrol Motor—drives clockwise (as viewed from power end) on temperature fall in the zone.

M734C Electronic Modutrol Motor—drives clockwise (as viewed from power end) on temperature rise in the zone.

## ELECTRICAL RATINGS:

VOLTAGE (V)	FREQUENCY (HZ)	CURRENT (AMPS)
24	50/60	1.8
120	50/60	0.36
240	50/60	0.18

POWER CONSUMPTION: 27 watts.

WIRING CONNECTIONS: Screw terminals.

MOTOR STROKE: 90 or 160 degrees of rotation.

MOTOR TIMING: 30 sec. nominal (90 degree stroke) or 60 sec. nominal (160 degree stroke).

THROTTLING RANGE: Nonadjustable; 1 F temperature change in zone causes motor to operate through full stroke.

OUTPUT SIGNAL RANGE: 1.0 to 12-15V dc (heating or cooling).

SENSOR: T7047A Electronic Thermostat.

Resistance—1715 ohms with set point at ambient.  
Sensitivity—15 ohms per degree F. Resistance increases as temperature falls.

MOTOR TORQUE: 35 pound-inches.

MAXIMUM DEAD WEIGHT LOAD ON SHAFT:  
Auxiliary end—50 pounds.  
Power end—100 pounds.

SHAFT: Double-ended, 3/8 in. square, 3/8 in. long.  
106013A Crank Arm Assembly included.

AMBIENT TEMPERATURE RANGE: Minus 40 to plus 150 F at 25 percent duty cycle.

DIMENSIONS: See Fig. 1.

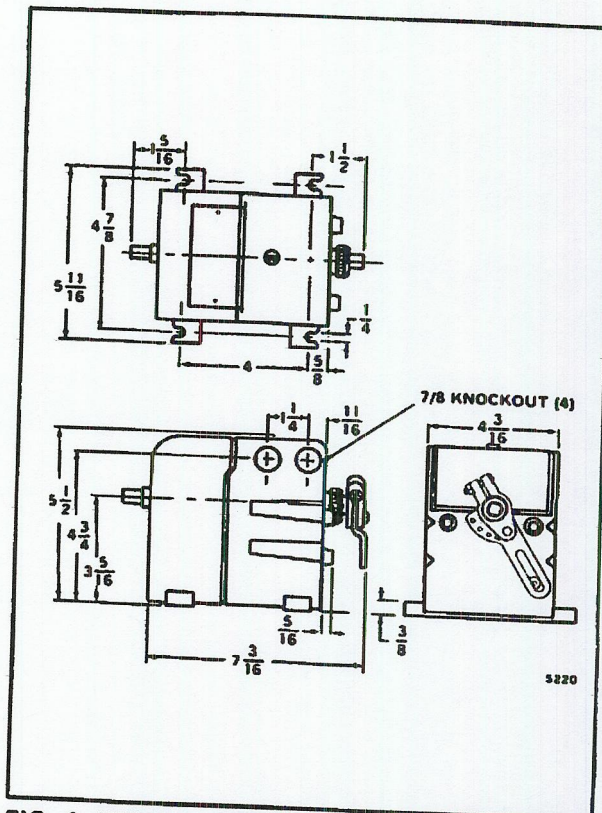


FIG. 1—M734B,C APPROXIMATE DIMENSIONS, IN INCHES.

# ORDERING INFORMATION

WHEN ORDERING REFER TO THE PRICE SHEETS FOR COMPLETE ORDERING SPECIFICATION NUMBER, OR...

SPECIFY—

1. MODEL NUMBER.
2. VOLTAGE AT 50/60 HZ.
3. MOTOR STROKE.

ORDER FROM—

1. YOUR USUAL SOURCE, OR
2. HONEYWELL  
1885 DOUGLAS DRIVE NORTH  
MINNEAPOLIS, MINNESOTA 55422  
(IN CANADA—HONEYWELL CONTROLS LIMITED  
740 EELSMERE ROAD  
SCARBOROUGH, ONTARIO)  
INTERNATIONAL SALES AND SERVICE OFFICES  
IN ALL PRINCIPAL CITIES OF THE WORLD.

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# INSTALLATION

## CAUTION

1. Only a trained, experienced serviceman should install or service this device.
2. Before starting the installation, disconnect the power supply to prevent electrical shock or equipment damage.
3. Do not attempt to turn the motor shaft with a wrench or by hand. Damage to the gear train may result.
4. This device must be installed where the temperature will remain between minus 40 and plus 150 F.

## LOCATION

Install the Modutrol motor in any location except where excessive moisture, acid fumes, or other deteriorating vapors might attack the exposed metal parts of the motor, or where escaping gases or other explosive mixtures might create a fire hazard.

Choose a location which allows enough clearance for servicing.

## MOUNTING

The motor has a flange on the bottom for mounting. The mounting holes are sized for 1/4 inch machine screws or bolts.

The recommended mounting position for maximum life is with the motor shaft horizontal.

The M734 is shipped in the closed position; that is, the position at which the limit of counterclockwise rotation has been reached, viewed from the power end of the motor.

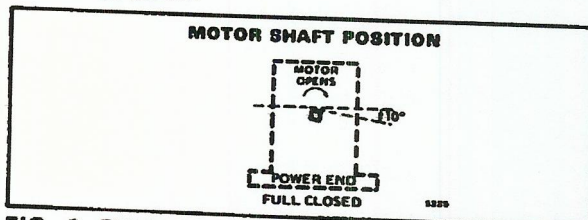


FIG. 2-FULL COUNTERCLOCKWISE POSITION OF THE MOTOR SHAFT, AS VIEWED FROM THE POWER END.

## LINKAGES

For detailed instructions on the assembly of specific linkages, refer to the instruction sheet packed with each individual linkage.

## CAUTION

Do not attempt to turn the motor shaft by hand or with a wrench as damage to the gear train may result.

When planning for and installing a motor and linkage, check the following points of operation:

1. Attach the linkage to the motor shaft so the motor crank arm travels through its full range while the damper moves through only its required maximum distance.
2. The motor must be stopped at the end of its stroke by the limit switch and must not be stalled by the damper.

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3. Do not exceed the load and torque ratings in any application.

4. Best control is achieved with maximum damper opening of about 60 degrees.

## WIRING

## CAUTION

Disconnect power supply before connecting wiring to prevent electrical shock or equipment damage.

All wiring must comply with local codes and ordinances. See Fig. 3 for typical connections to the multizone system. Make certain that the voltage and frequency stamped on the motor correspond to the characteristics of the power supply.

## CAUTION

Do not ground the T, T, H, C, or N terminals as damage to the motor circuit may result.

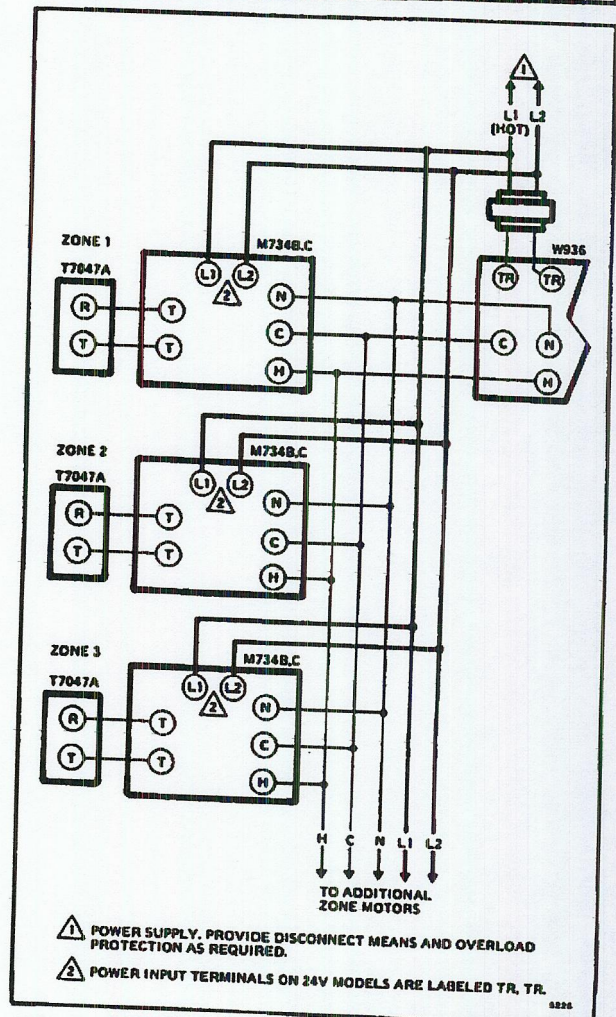


FIG. 3-CONNECTIONS FOR THE M734B,C MODUTROL MOTORS.



## OPERATION

A demand signal from the T7047A zone thermostat causes the motor to position the hot and cold deck zone dampers to meet the zone requirement. If the motor reaches the limit of rotation without satisfying zone demand, a load signal produced by the motor is sent to the W936 Central Processor. The W936 then sequences heating or cooling equipment as required. If more than one motor is calling for heating or cooling, circuits in the zone motors ensure that only the

largest signal will be presented to the W936. Depending on load requirements in the various zones, both a heating and a cooling signal may be sent to the W936 at the same time.

As the zone requirement is satisfied, the M734 signal to the W936 Central Processor decreases and the heating or cooling equipment begins to sequence off. When zone temperature reaches the set point, the M734 motor is positioned approximately midstroke.

## CHECKOUT

1. Remove power, then disconnect wires from terminals T, T, H, C, and N on the motor. Connect a dc voltmeter to terminals H (+) and N (-).
2. Restore power.

### CAUTION

Motor must be powered to make these checks. To avoid electrical shock, BE SURE TO DISCONNECT POWER BEFORE MAKING ANY TERMINAL CONNECTIONS.

3. With terminals T and T open, simulating a call for heat, the M734B will run to the full clockwise position and the M734C will run to the full counter-

clockwise position, both as viewed from the power end of the motor. The voltage across terminals H and N should be 12-15V dc.

4. Move the voltmeter to terminals C (+) and N (-). The voltage should be less than 3.9V dc.

5. Connect a 1000 ohm resistor between terminals T and T. The M734B will run to the full counterclockwise position and the M734C will run to the full clockwise position, both as viewed from the power end of the motor. The voltage across terminals C (+) and N (-) should be 12 to 15V dc.

6. Move the voltmeter to terminals H (+) and N (-). Voltage should be less than 3.9V dc.

7. Remove jumper and reconnect motor.

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**WARRANTY** "Unless otherwise specified, the Company warrants all Residential Division equipment manufactured by it and bearing its nameplate to be free from defects in workmanship and materials under normal use and service as follows:

1. Equipment which is received transportation prepaid at the factory originating shipment (1) within twelve months after date of manufacture, or (2) with a certification by the installer to be within twelve months after date of installation, and found by the Company's inspection to be defective in workmanship or materials within the guarantee, will be repaired or replaced at the Company's option, free of charge and returned lowest cost transportation prepaid. Premium transportation will be used at customer's request and expense.
2. If inspection by the Company does not disclose any defect covered by the guarantee, equipment will be repaired or replaced and the Company's regular service charge will apply.
3. WITH EXCEPTION OF THE FOREGOING AND UNLESS SPECIFICALLY EXPRESSED IN WRITING, THE COMPANY MAKES NO EXPRESS WARRANTIES, NO WARRANTIES OF MERCHANTABILITY AND NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF."

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*SPECIAL  
24V Motor  
w/24V  
Secondary*

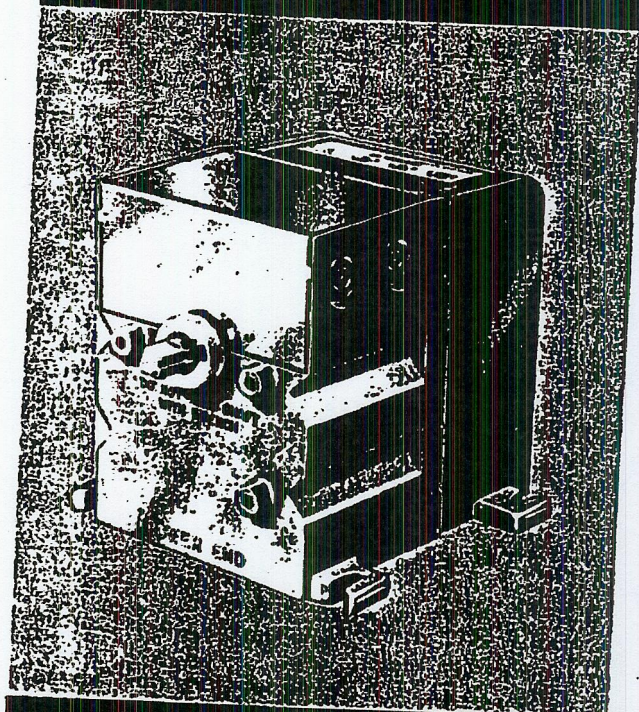
THE M734D,E ELECTRONIC MODUTROL MOTORS ARE USED IN THE HONEYWELL MULTIZONE CONTROL SYSTEM TO PROVIDE PROPORTIONING CONTROL OF DAMPERS AND GAS, HOT WATER, STEAM, OR CHILLED WATER VALVES.

- ☐ M734D is normally closed; M734E is normally open.
- ☐ All models have integral isolation transformer.
- ☐ Medium-duty motor provides 35 pound-inches torque.
- ☐ Solid state control circuit.
- ☐ Solid state motor drive circuit.
- ☐ Die-cast zinc housing.
- ☐ Oil-immersed gear train.
- ☐ Available with 90 or 160 degree fixed stroke.
- ☐ Available with 1 adjustable internal auxiliary switch.
- ☐ Models for use on 24, 120, or 240V ac input.
- ☐ Uses most standard Modutrol motor accessories, except Q601J Valve Linkage.

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## ELECTRONIC MODUTROL MOTORS



### M734D,E

Residential Div. Form Number

60-2345



# SPECIFICATIONS

## MODELS:

**M734D** Electronic Modutrol Motor—normally closed, medium duty motor for use with the W936 Central Processor. Available with 1 internal spdt auxiliary switch.

**M734E** Electronic Modutrol Motor—normally open, medium duty motor for use with the W936 Central Processor. Available with 1 internal spdt auxiliary switch.

## ELECTRICAL RATINGS:

Voltage and frequency—24, 120, or 240V ac, 50/60 Hz.

Power consumption—27 watts, 43.2 VA.

**AUXILIARY SWITCH RATINGS** (in amps): Ratings apply to one contact only; opposite contact rated at 40 VA pilot duty, 120/240V ac.

	120V AC	240V AC
Full load	8	4
Locked rotor	48	24

**STROKE:** 90 or 160 degrees, fixed.

## MOTOR TIMING:

90 degree stroke—30 seconds, nominal.

160 degree stroke—1 minute, nominal.

**TORQUE:** 35 pound-inches.

**MAXIMUM DEAD WEIGHT LOAD ON SHAFT:**

Power end—100 pounds.

Auxiliary end—50 pounds.

**AMBIENT TEMPERATURE RANGE:** Minus 40 to plus 150 F at 25 percent duty cycle.

**MAXIMUM DAMPER AREA:** 23 square feet.

**CRANKSHAFT:** Double-ended, 3/8 inch square, untapped.

**DIMENSIONS:** See Fig. 1.

## ACCESSORIES:

**Q68** Dual Control Potentiometer—controls 1 through 5 additional motors.

**Q181** Auxiliary Potentiometer—controls up to 4 additional motors.

**Q100** Linkage—connects Modutrol motor to butterfly valve.

**Q601** Linkage—connects Modutrol motor to water or steam valve.

**Q605** Damper Linkage—connects motor to damper. INCLUDES MOTOR CRANK ARM.

**Q618** Linkage—connects Modutrol motor to water or steam valve.

**Q607** Auxiliary Switch—controls auxiliary equipment as a function of motor position.

**Motor Crank Arm**—Part No. 7616BR, included with Q605 but not with motor.

**S963A** Remote Minimum Position Potentiometer—135 ohm potentiometer provides 50 percent control; 270 ohm potentiometer provides 100 percent control.

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

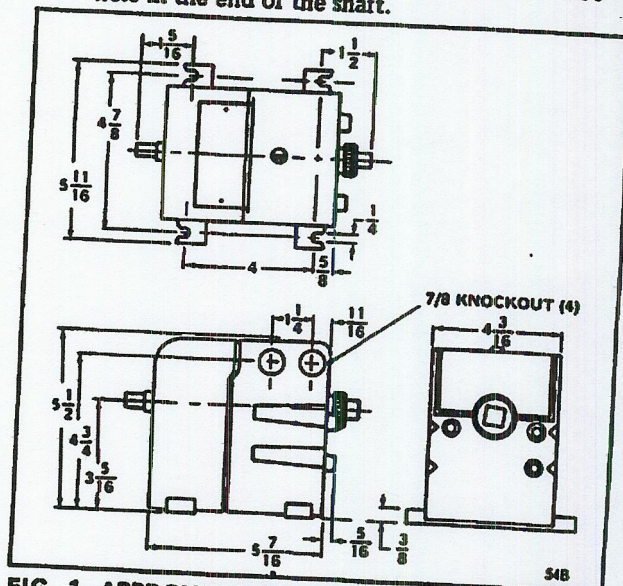


FIG. 1—APPROXIMATE DIMENSIONS, IN INCHES, OF M734D,E.

# ORDERING INFORMATION

WHEN ORDERING REFER TO THE PRICE SHEETS FOR COMPLETE ORDER NUMBER, OR SPECIFY—

1. MODEL NUMBER.
2. VOLTAGE AT 50/60 HZ.
3. MOTOR STROKE.
4. AUXILIARY SWITCH, IF DESIRED.
5. ACCESSORIES, IF DESIRED.

## ORDER FROM—

1. YOUR USUAL SUPPLIER  
2. HONEYWELL  
1855 DOUGLASS DRIVE NORTH  
MINNEAPOLIS, MINNESOTA  
IN CANADA: HONEYWELL  
1855 DOUGLASS DRIVE NORTH  
MINNEAPOLIS, MINNESOTA  
INTERNATIONAL SALES AND  
IN ALL PRINCIPAL CITIES OF

OBSOLETE

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800-356-3774



# INSTALLATION

## CAUTION

1. Only a trained, experienced serviceman should install or service this device.
2. Disconnect power supply before beginning installation.
3. Voltage and frequency of the power source must be the same as that shown on the nameplate of the motor.
4. Do not attempt to turn the motor shaft by hand or with a wrench. Damage to the gear train will result.


## LOCATION


The Modutrol motor may be installed in any location except where excessive moisture, acid fumes, or other deteriorating vapors might attack the metal parts, or in atmospheres of escaping gas or other explosive vapors.

Choose a location which allows enough clearance for mounting accessories and servicing.

## MOUNTING

Mount the motor using the mounting lugs extending from the bottom of the case. These lugs are sized for 1/4 inch machine bolts or screws. The recommended mounting position for maximum life is with the motor shaft horizontal.

The M734D is shipped in the closed position. The closed position is the limit counterclockwise  rotation as viewed from the power end of the motor.

The M734E is shipped in the open position. The open position is the limit of clockwise  rotation as viewed from the power end of the motor.

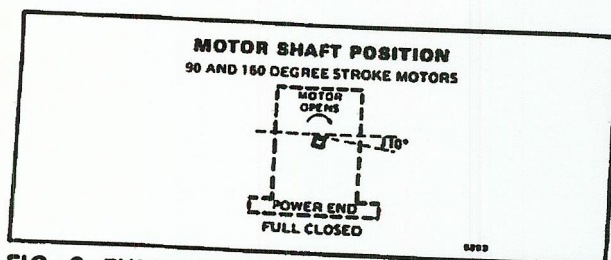


FIG. 2—FULL COUNTERCLOCKWISE POSITION OF THE MOTOR SHAFT AS VIEWED FROM THE POWER END.

## LINKAGES

The motor comes without a crank arm. The motor crank arm is included in the Q605 Linkage or may be ordered separately (see Accessories section).

For detailed instructions on the assembly of specific linkages, refer to the instruction sheet packed with linkage.

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In general, consider the following guidelines, generalizations, and restrictions when planning a motor installation.

1. Attach the linkage to the motor shaft so the motor crank arm travels through its full range while the valve or damper moves through only its required maximum distance.

2. The motor must be stopped at the end of its stroke by the limit switch and must not be stalled by the damper or valve.

3. Do not exceed the load and torque ratings in any application.

## CAUTION

Do not turn the motor shaft manually or with a wrench as damage to the gear train may result.

## WIRING

## CAUTION

Disconnect power supply before connecting wiring to prevent electrical shock or equipment damage.

Make sure that the voltages and frequencies stamped on the transformer for low voltage motors correspond to the characteristics of the power supply.

All wiring must comply with local codes and ordinances. Figs. 3 through 7 show wiring connections. Fig. 8 shows the leadwire color-coding on the auxiliary switch.

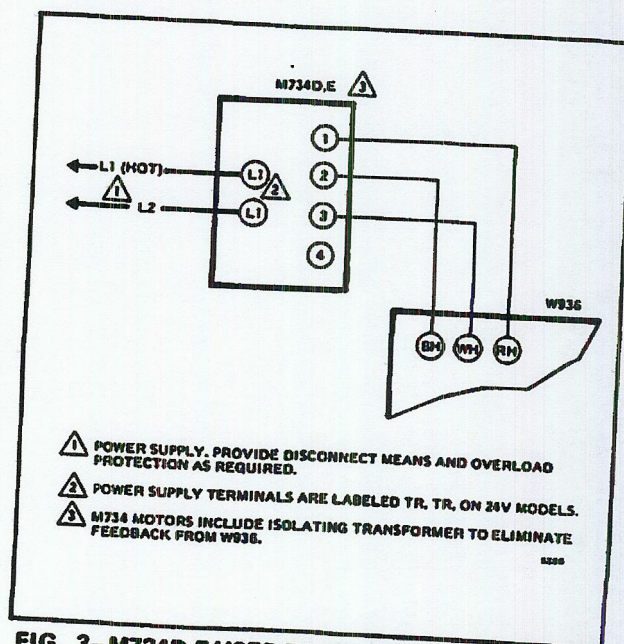


FIG. 3—M734D,E USED TO CONTROL A HOT WATER OR STEAM VALVE.



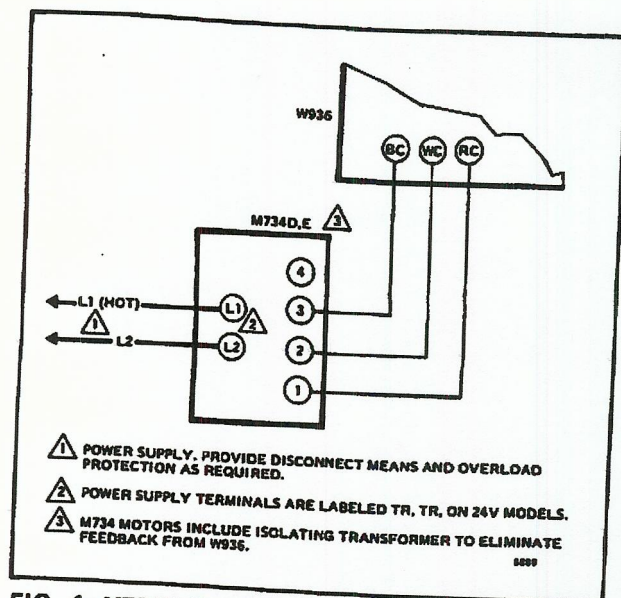


FIG. 4—M734D,E USED TO CONTROL A CHILLED WATER VALVE.

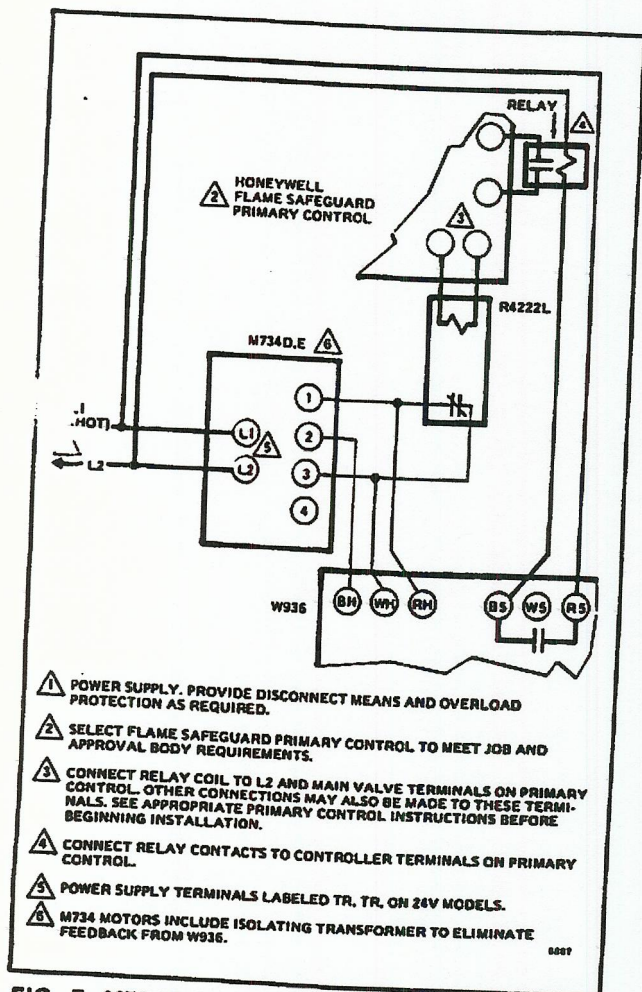


FIG. 5—M734D,E USED WITH A HONEYWELL FLAME SAFEGUARD PRIMARY CONTROL IN A MODULATING GAS SYSTEM.

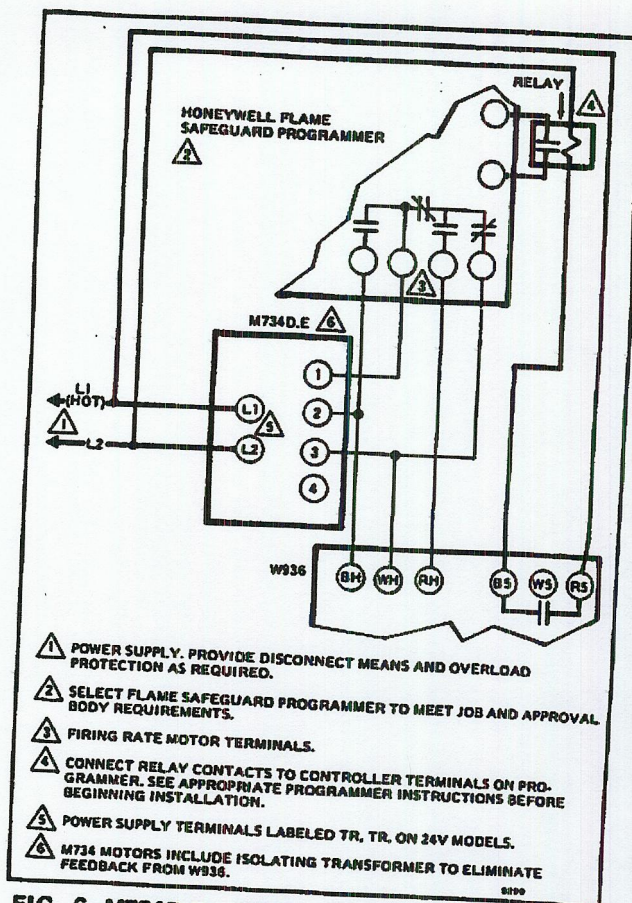


FIG. 6—M734D,E USED WITH A HONEYWELL FLAME SAFEGUARD PROGRAMMER IN A MODULATING GAS SYSTEM.

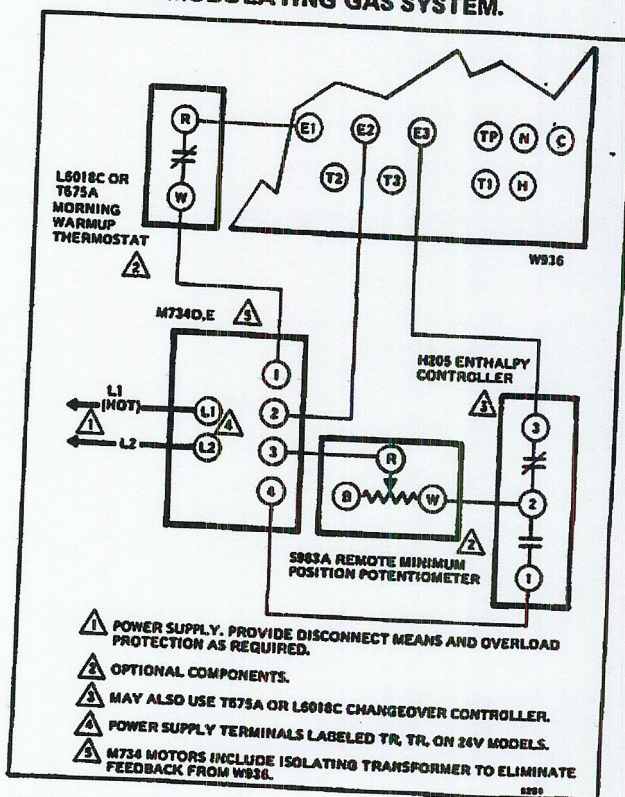


FIG. 7—M734D,E USED AS AN AIR ECONOMIZER MOTOR.

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# AUXILIARY SWITCH ADJUSTMENT

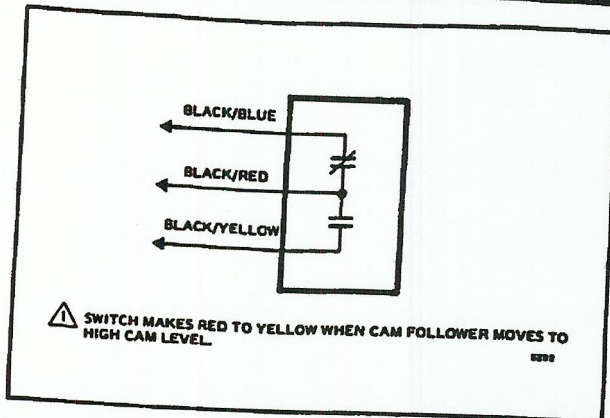


FIG. 8—THE AUXILIARY SWITCH IN THE M734 HAS COLOR-CODED LEADWIRES.

## SWITCH OPERATION

The auxiliary switch in the M734 is operated by a cam on the motor shaft. The switch is made R to Y when the cam follower is on the upper level of the cam and made R to B when the cam follower is on the lower cam level. When the slow-rise portion of the cam is used, the switch differential is about 10 degrees of rotation.

NOTE: Do not use the fast-rise portion of the switch if fast cycling is undesirable.

## ADJUSTMENT PROCEDURE

### IMPORTANT

The following switch adjustment procedure applies to the normally closed motor. To adjust the normally open motor, start with the motor in the full open position and reverse the direction of rotation of the cams during adjustment.

1. Run motor to the full closed position.
  2. Loosen the locking screws on the cam assembly about 1/2 turn.
- NOTE: Do not remove cam assembly from motor.
3. Rotate the cam counterclockwise on the shaft until the switch makes (audible click) on the slow-rise portion of the cam.

4. Determine how many degrees of shaft rotation is desired before the switch makes. Do not set cams less than 5 degrees from the end of the stroke for pilot duty; 20 degrees from end of stroke for motor loads.

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5. Select a reference point and turn cam clockwise the required number of degrees. Each division on the cams equals 15 degrees of motor rotation. EXAMPLE: If 60 degrees of motor rotation is desired before switch operates, turn cam 4 index marks from the reference point.

6. When adjustments are complete, tighten the locking screws on the cam assembly.

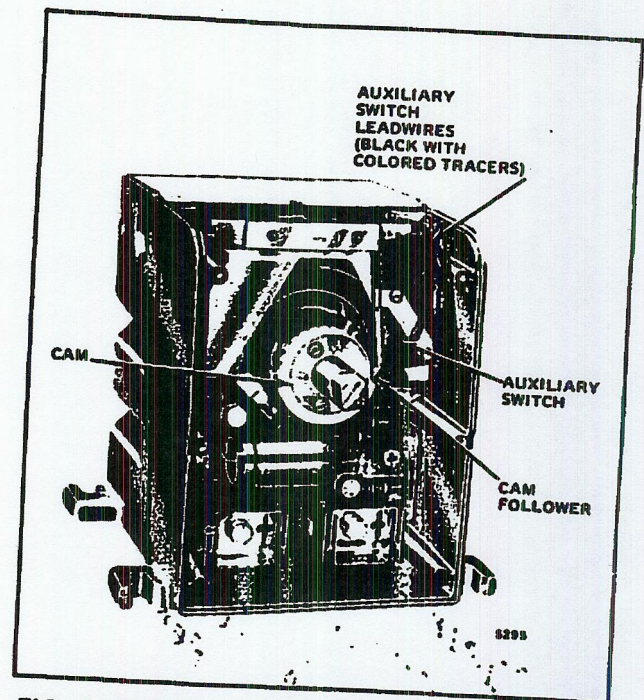


FIG. 9—INTERNAL VIEW OF THE M734 WITH AUXILIARY SWITCH (AUXILIARY END).

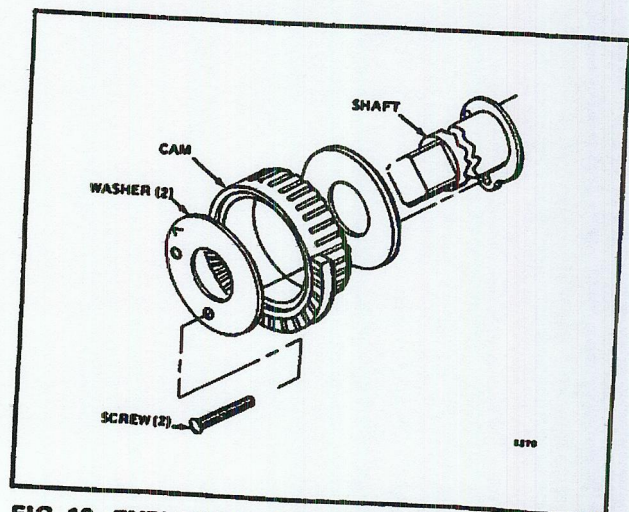


FIG. 10—EXPLODED VIEW OF THE CAM ASSEMBLY.



## OPERATION

The M734D,E operate in response to a modulating voltage signal from the W936 Central Processor, positioning a valve or damper at any position between fully open and fully closed.

The signal from the W936 causes the bridge circuit in the motor to become unbalanced. The small signal

resulting from the bridge unbalance is amplified and energizes one of 2 Triac switches to run the motor. As the motor runs, a feedback potentiometer driven by the motor moves to rebalance the bridge. When the bridge is balanced, the motor stops.

## CHECKOUT

After installation and linkage adjustment, operate the motor through the W936. Make sure that—

- the motor operates the damper or valve properly.
- the motor responds properly to the W936.
- the auxiliary switch, if used, operates at the desired point of motor rotation.

Inspect the motor, linkage, and valve or damper to see that all mechanical connections are correct and secure. In damper installations, the push rod should not extend more than a few inches past the ball joints. Check to see that there is adequate clearance for the linkage to move through its stroke without binding or striking other objects. See system instructions for additional checkout procedures.

### MOTOR OPERATION CHECK

#### M734D

Disconnect leads from terminals 1,2,3,4 on the motor. With the motor powered, jumper terminals 1 and 2 on the motor to drive it open (clockwise rotation as viewed from the power end). Remove the jumper and the motor will drive closed.

#### M734E

Disconnect leads from terminals 1,2,3,4 on the motor. With the motor powered, jumper terminals 1 and 2 on the motor to drive it closed (counterclockwise rotation as viewed from the power end). Remove the jumper and the motor will drive open.

SPECIAL  
270  $\Omega$  POT  
TO FULL  
OPEN

1 - Red  
2 BLUE  
3 - WHITE

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**WARRANTY** "Unless otherwise specified, the Company warrants all Residential Division equipment manufactured by it and bearing its nameplate to be free from defects in workmanship and materials under normal use and service as follows:

1. Equipment which is received transportation prepaid at the factory originating shipment (1) within twelve months after date of manufacture, or (2) with a certification by the installer to be within twelve months after date of installation, and found by the Company's inspection to be defective in workmanship or materials within the guarantee, will be repaired or replaced at the Company's option, free of charge and returned lowest cost transportation prepaid. Premium transportation will be used at customer's request and expense;
2. If inspection by the Company does not disclose any defect covered by the guarantee, equipment will be repaired or replaced and the Company's regular service charge will apply;
3. WITH EXCEPTION OF THE FOREGOING AND UNLESS SPECIFICALLY EXPRESSED IN WRITING, THE COMPANY MAKES NO EXPRESS WARRANTIES. NO WARRANTIES OF MERCHANTABILITY AND NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF."

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