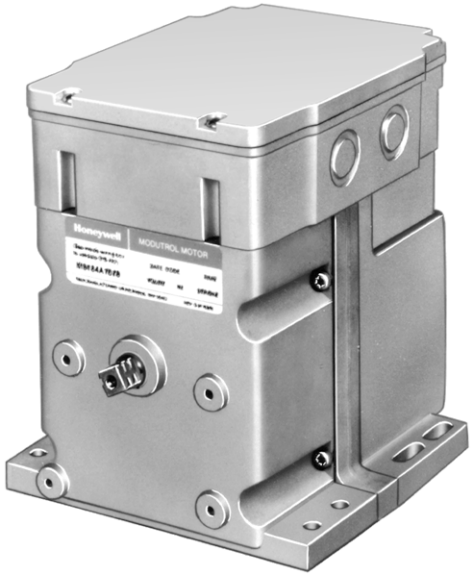
Honeywell

# BCS 7700
# Modutrol Motor M7484A

*The M7484A is a low voltage, reversing proportional modutrol motor used to drive a fuel valve and combustion air damper as commanded by the BCS 7700.*




- Electronic, vibration resistant drive circuit.
- Requires 24 Vac power supply.
- Die-cast aluminum case.
- Feedback potentiometer circuit provides position indication input to the BCS 7700.
- Motor stroke is fixed 90˚, 30 second timing.
- Low and High Fire position proving feedback potentiometer circuit.
- 150 lb.-in. torque.
- Accessories include weather proofing kit.

***CONTENTS***



*T.M. • Rev. 7-92 •* * Form Number 63-2273—1*

# Specifications

| Model | Timing | Internal Electronic Drive Circuit | Internal Auxiliary Switch |
|---|---|---|---|
| M7484A1010 | 30 sec | Yes | No |

CRANKSHAFT: Double ended, 3/8 inch square.
STROKE: 90˚ fixed.
TORQUE: 150 lb.-in.

| Timing [Nominal] 90° Stroke | Normal Running Torque | Breakaway Torque[a] |
|---|---|---|
| 30 sec | 150 lb.-in. | 300 lb.-in. |

[a] Maximum torque available to overcome occasional large loads such as seized damper or valve. MUST NOT BE USED CONTINUOUSLY AT THIS RATING.

DEADWEIGHT LOAD ON SHAFT:
Power End: 200 lb. [91 kg] maximum.
Auxiliary End: 200 lb. [45 kg] maximum.

ELECTRICAL RATINGS:

| Terminal | Description | Rating |
|---|---|---|
| G | Common (Negative Supply) | |
| Y | • Power Supply from BCS 7700<br>• Overvoltage continuous | 8.0V +/- 0.050 Vdc<br>9.0 Vdc maximum |
| T | Signal to BCS 7700 | 1.5-5.5 Vdc |
| 1 | Modutrol Motor closed | 24 Vac 50/60 Hz |
| 2 | Modutrol Motor open | |
| 3 | Modutrol Motor common | |

Current Draw: 0.8A at 24 Vac.
Power Consumption: 18W.

ENVIRONMENTAL RATINGS:
Ambient Temperature:
Operating: 32° F to 150° F.
Storage: -30° F to 150° F.
Humidity:
Operating: 85% RH continuous, noncondensing.
Vibration: Continuous 0.5G environment.
Dimensions: See Fig. 1.

ACCESSORIES:
DHE-94 Explosion-proof Housing— encloses motor for use in explosive atmospheres. Not for use with Q601 and Q455 Linkage. Requires 7617DM Coupling and 220738A Adapter Bracket.
Q607 Auxiliary Switch—controls auxiliary equipment as a function of motor position. (Requires use of 220738A Adapter Bracket.)
Q605 Damper Linkage—connects motor to damper; includes motor crank arm.
Q601 Linkage—connects motor to water or steam valve.
Q618 Linkage—connects motor to water or steam valve.
Q100 Linkage—connects motor to butterfly valve. (Requires use of 220738A Adapter Bracket.)
Q181A Auxiliary Potentiometer—used to control auxiliary motor.
4074ERU Weatherproofing Kit—weatherproofs the motor.
7617ADW Motor Crank Arm—included with Q605 but not with motor.
220741A Screw Terminal Adapter—used to convert motor quick-connect terminals to screw terminals.
220738A Adapter Bracket—adjusts shaft height of M7484A to match M741B.

# Ordering Information

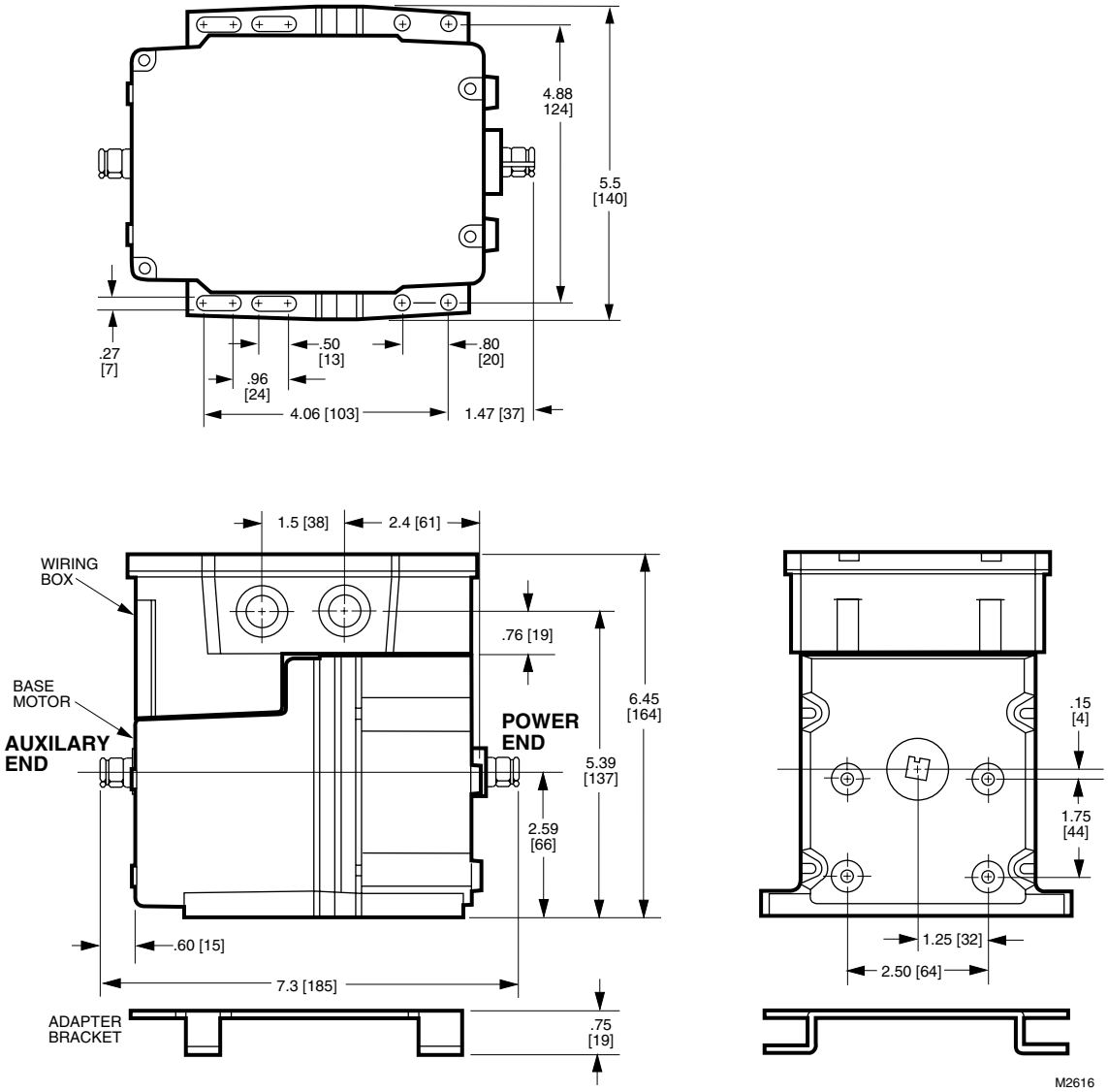
When purchasing replacement and modernization products from your wholesaler or your distributor, refer to the price sheets for complete ordering number.

If you have additional questions, need further information, or would like to comment on our products or services, please write or phone:
1. Your local Honeywell Home and Building Control Sales Office (check white pages of your phone directory).

2. Home and Building Control Customer Satisfaction
Honeywell Inc., 1885 Douglas Drive North
Minneapolis, Minnesota 55422-4386 (612) 542-7500

In Canada—Honeywell Limited/Honeywell Limitee, 740 Ellesmere Road, Scarborough, Ontario M1P 2V9 International Sales and Service Offices in all principal cities of the world. Manufacturing in Australia, Canada, Finland, France, Germany, Japan, Mexico, Netherlands, Spain, Taiwan, United Kingdom, U.S.A.

**Fig. 1—M7484A dimensions in in. [mm].**



# Installation

**WHEN INSTALLING THIS PRODUCT…**

1. Read these instructions carefully. Failure to follow them could damage the product or cause a hazardous condition.
2. Check the ratings given in the instructions and on the product to make sure the product is suitable for your application.
3. Installer must be a trained, experienced service technician.
4. After installation is complete, check out product operation as provided in these instructions.

## ! CAUTION

1. Disconnect power supply before beginning installation to prevent electric shock or equipment damage. More than one disconnect may be required to be opened to remove all power.
2. Do not attempt to turn the motor shaft by hand or with a wrench. Damage to the gear train will result.

**LOCATION**

Install the motor in any location except where acid fumes or other deteriorating vapors might attack the metal parts, or in atmospheres of escaping gas or other explosive vapors. The M7484A is rated for temperatures between 32°F to150° F. If located outdoors, use weatherproofing kit; see Accessories section.

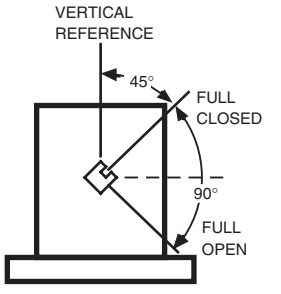
Allow enough clearance for installing accessories and servicing the motor when selecting a location. See Fig. 1.

**MOUNTING**

Always install the motor with the crankshaft horizontal. Mounting flanges extending from the bottom of the motor housing are drilled for 1/4 in. machine screws or bolts.

The M7484A is shipped from the factory in the closed position, which is the limit of counterclockwise rotation as viewed from the power end of the motor, see Fig. 2.

**Fig. 2—Motor shaft position at rotational limits as viewed from the power end of the motor.**




90 DEGREE STROKE E2390

**INSTALLING LINKAGES**

A crank arm is not included with the motor.

In general, check the following points of operation when installing a motor and linkage:

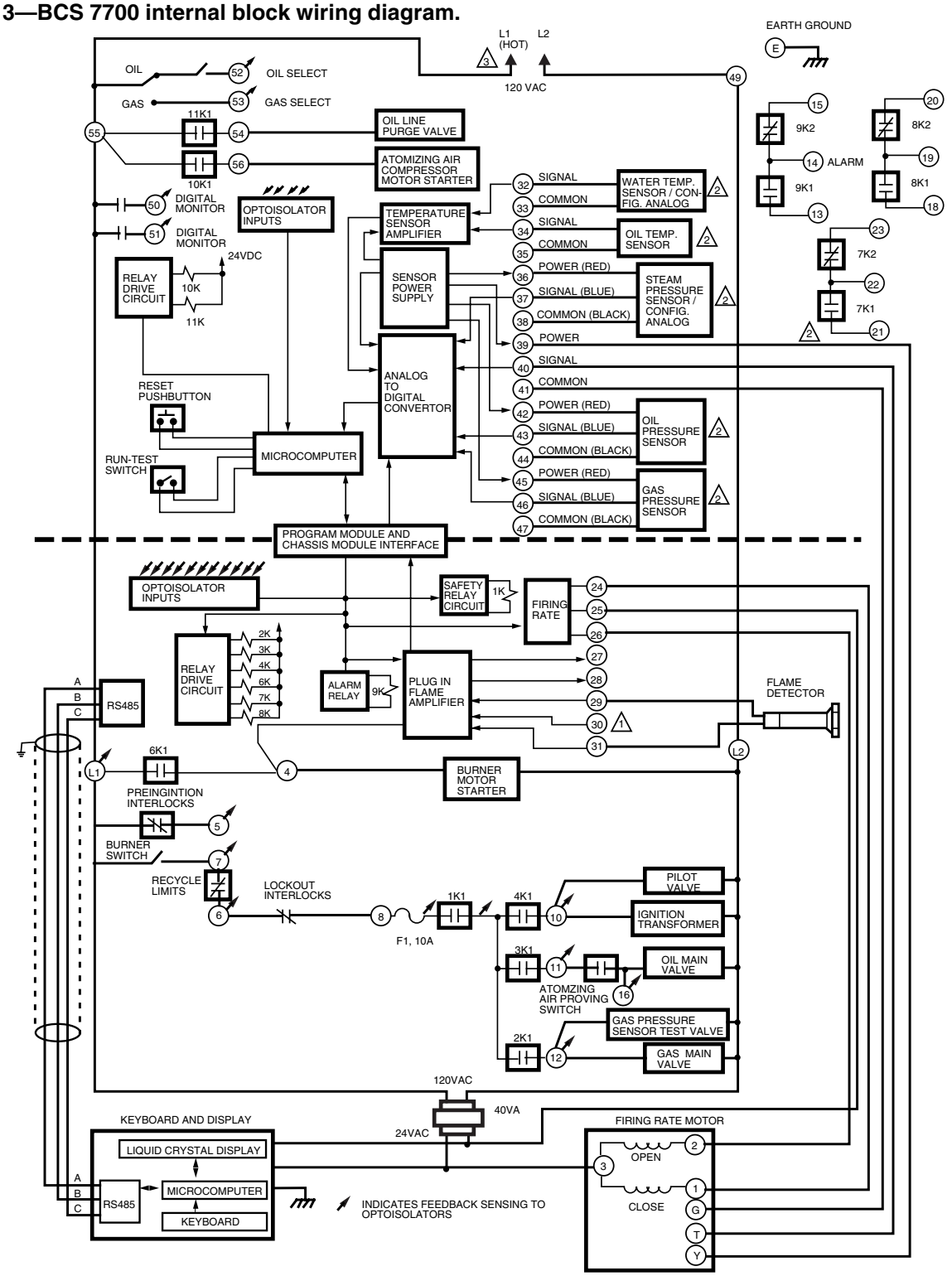
1. Adjust linkages for valves and louver type dampers adjust so that the damper or valve moves through only the maximum required distance when the motor moves through its full stroke.
2. Stop the motor at the end of its stroke by using internal travel limit switch; do not stall the motor by using the damper or valve. CAUTION: The motor will be damaged if it is not permitted to complete its full stroke.
3. For any installation, do not exceed the motor ratings.

**WIRING**

Disconnect power supply before wiring to prevent electrical shock or equipment damage. More than one disconnect may be required to be opened to remove all power.

1. Be sure all wiring agrees with applicable codes, ordinances, and regulations.
2. Make sure that the voltage and frequency stamped on the motor correspond to the characteristics of the power supply.
3. See Fig. 3 for the internal schematics and terminal connections to the M7484A motor.
4. Use the recommended wire size and type:
   - Terminals 1, 2, and 3 require No. 18 wire insulated for voltages and temperatures encountered in the application. Suggested conductor types include TW[60C], THW [75C] and THHN [90C].
   - Terminals G, T, and Y for the motor position indication circuit require a shielded three conductor cable that is UL listed for temperatures and voltages encountered in the application. Suggested cables include Belden 9365 rated for 300V, 105° C or Belden 8770 rated for 300V, 60° C.
5. Do not connect the shield to anything at the motor end; tape the shield to avoid any unintended contact with the motor housing. At the BCS 7700 end, ground the shield to the control panel with as short a*s practical lead wire length.*
6. Do not route the feedback potentiometer circuit leadwires in conduit with line voltage circuits.
7. Avoid routing the feedback potentiometer circuit leadwires close to the ignition transformer leadwires.
8. Feedback potentiometer (low voltage) circuit leadwires can be routed outside of conduit if properly supported and protected from damage.
9. Maximum feedback potentiometer circuit leadwire length of 100 feet.
10. Complete the required checkout as indicated in this specification and return the system to normal operation.

**Fig. 3—BCS 7700 internal block wiring diagram.**




1 WIRING SHOWN FOR INFRED FLAME DETECTOR FOR C7027 ULTRA VIOLET FLAME DETECTOR WIRE AS NOTED BELOW
– ULTRA VIOLETDECTECTOR BLUE LEAD - TERMINAL 31
– ULTRA VIOLET DETECTOR WHOTE LEAD - TERMINAL 30
THE ULTRA VIOLET FLAME DETECTOR WIRING IS POLARITY SENSITIVE, REVERSING THE LEDS WIRES MAY DAMAGE THE SENSOR.
FOR ULTRA VIOLET C7012E,F WIRE AS NOTED BELOW:
– BLUE LEAD - TERMINAL 31
– WHITE LEAD - TERMINAL 27
– BLACK LEAD - L1
– YELLOW LEAD - TERMINAL 29
– WHITE LEAD - L2
– BLACK LEAD - L2

2 WIRE THESE TERMINALS WITH SHIEDLED CABLE PER SPECIFICATION. THE CABLE SHIELD SHOULD NOT BE CONNECTED AT THE SENSOR END AND SHOULD BE TAPED TO AVOID UNINTENTIONAL CONTACT. AT THE BOILER CONTROLLER END, THE SHIELD WIRES MUST BE GROUNDED TO THE CONTROL PANEL WITH AS SHORT AS POSSIBLE A LEAD LENGTH.

3 POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.

4 DO NOT CONNECT WIRES TO ANY UNUSED TERMINALS. TERMINALS 9, 17, 21, 22, 23, 28, 48 ARE NOT USED.

5 POWER SUPPLY FOR SYSTEM SENSORS.

6 —— FIELD WIRING —— INTERNAL CIRCUITRY.

M580A

# Operation and Checkout

## OPERATION

The M7484A is a fixed 90° stroke nonspring return motor. An internal sensing circuit incorporates a feedback potentiometer in a bridge circuit. The feedback potentiometer circuit output is proportional to the mechanical shaft position. An 8 Vdc power source from the BCS 7700 is required for circuit operation.

The M7484A is driven by applying 24 Vac to either the *open* or *closed* motor coils. Position control is accomplished by using the BCS 7700 to monitor the feedback potentiometer circuit and energize or de-energize the drive coil(s) to achieve the required position.

## CHECKOUT

After installation and linkage adjustment, check the entire motor and control hookup to prove that:

— the motor properly operates the damper or valve.

— the motor properly responds to the BCS 7700.

Inspect the motor, linkage and valve or damper to determine that all mechanical connections are correct and secure. Be sure the pushrod does not extend more than a few inches past the ball joints. Check to be sure there is adequate clearance for the linkage to move through its stroke without binding or striking other objects.

The M7484A is shipped in the fully closed position (the limit of counterclockwise rotation as viewed from the power end of the motor).

To check operation of the M7484A:

1. Place the BCS 7700 in Standby; open the Burner Switch.
2. Place the RUN/TEST Switch in the TEST position.
3. Place the BCS 7700 in the Manual mode using the AUTO/MANUAL key of the Keyboard and Display Module.
4. Place the cursor in the Keyboard and Display Module Liquid Crystal Display beneath % Rate, using the (<) key.
5. Using the Keyboard and Display Module (+ or - ) keys, under manual control, drive the motor through its entire stroke to assure the motor is responding to the BCS 7700 commands.
6. While manually adjusting the motor position, observe the position of the motor, as displayed on the Keyboard and Display Module, to assure proper operation of the feedback potentiometer circuit.

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