

## 150 and 300 lb-in. Non-Spring Return Direct Coupled Actuators

ML6184, ML6284, ML7284, ML9184  
ML6194, ML6294, ML7294, ML9194

ISO 9001



The 150 and 300 lb-in. Non-Spring Return Direct Coupled Actuators (DCA) are control motors that provide floating or proportioning control for valves and dampers. The proportioning motors accept a current, voltage, or resistance signal from a controller to position the damper or valve at any chosen point between fully open and fully closed.

### SPECIFICATIONS

#### Electrical Ratings:

Power Input: 24 Vac  $\pm$ 20%, 50/60 Hz

| Model  | Power Consumption |
|--|-------------------|
| ML6184A,C ML6284A,C<br>ML6194A,C ML6294A,C ML9194A,C                                     | 5 VA              |
| ML6184D,F ML6284D,F ML7284A,C<br>ML9184A,C<br>ML6194D,F ML6294D,F ML7294A,C<br>ML9194D,F | 6 VA              |
| ML7284D,F<br>ML7294D,F ML9184D,F   | 6.5 VA            |

Auxiliary Switch Ratings: 24 Vac 3 AFL, 18 ALR, 1A Pilot Duty.  
Control Cable: Nonplenum UL/CSA rated 30V, 60°C,  
20-gauge cable.

Auxiliary Switch Cable: UL/CSA rated 300V, 90°C, 18-gauge  
cable.

#### Torque Ratings (at Rated Voltages):

|  | 150 lb-in. DCA |                | 300 lb-in. DCA |                |
|--|----------------|----------------|----------------|----------------|
|  | Min<br>(140°F) | Max<br>(-40°F) | Min<br>(140°F) | Max<br>(-40°F) |
|  | lb-in. (Nm)    |                |                |                |
| <input type="checkbox"/> Lift, Hold, and Breakaway | 135 (15)       | 190 (21)       | 250 (28)       | 350 (40)       |
| <input type="checkbox"/> Stall                     | 200 (23)       | 270 (30)       | 365 (41)       | 495 (56)       |

#### Actuator Synchronous Timing at 90° Stroke:

|   | At 60 Hz        | At 50 Hz        |
|---|-----------------|-----------------|
| <input type="checkbox"/> 150 lb-in. DCA | 92 $\pm$ 2 sec  | 110 $\pm$ 2 sec |
| <input type="checkbox"/> 300 lb-in. DCA | 165 $\pm$ 3 sec | 200 $\pm$ 3 sec |

NOTE: Timing is non-synchronous below -4°F (-20°C).

### SPECIFICATION DATA

### FEATURES

- Mounts directly on 3/8 in. to 5/8 in. round and square damper shafts and 3/4 in. round damper shafts by using the appropriate insert.
- Magnetic coupling eliminates the need for mechanical stops.
- 95° stroke compresses gaskets commonly used on low leakage dampers.
- Manual clutch allows manual adjustment.
- Removable splined output hub permits premounting of the hub on the damper shaft, providing installation flexibility.
- ML7284 and ML7294 include standard reverse/direct acting rotation switch on the outside cover.
- Designed for single-point and three-point mounting.
- Available with or without time-out feature.
- Two integral 1/2 in. conduit connections.

#### Mounting:

|   | Direct Mount             |                          | Minimum Shaft Length    |                          |
|---|--------------------------|--------------------------|-------------------------|--------------------------|
|   | Round Shaft              | Square Shaft             | Hub Inside <sup>a</sup> | Hub Outside <sup>b</sup> |
|   | in. (mm)                 |                          |                         |                          |
| <input type="checkbox"/> 150 lb-in. DCA | 3/8 to 3/4<br>(10 to 19) | 3/8 to 5/8<br>(10 to 16) | 5/8<br>(16)             | 2-1/2<br>(64)            |
| <input type="checkbox"/> 300 lb-in. DCA | 1/2 to 1<br>(13 to 25)   | 1/2 to 3/4<br>(13 to 19) | –                       | 2-1/2<br>(64)            |

<sup>a</sup> Hub mounted on shaft before actuator installed (150 lb-in. models only).

<sup>b</sup> Actuator between hub and control housing.

#### Actuator Minimum Design Life:

|   | Full-Stroke Cycles | Repositions |
|---|--------------------|-------------|
| <input type="checkbox"/> 150 lb-in. DCA | 100,000            | 2,000,000   |
| <input type="checkbox"/> 300 lb-in. DCA | 50,000             | 1,500,000   |

#### Actuator Stroke:

- 95° nominal  $\pm$ 3°, mechanically limited.

#### Temperature:

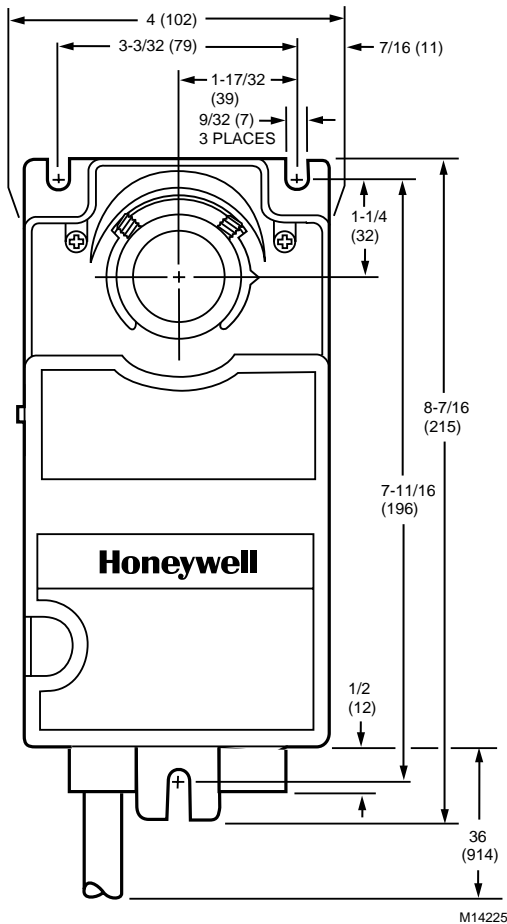
- Ambient: -40°F to +140°F (-40°C to +60°C).
- Storage: -30°F to +150°F (-35°C to +65°C).



**Models:**

| ML                          | Motor Linkage                                      |
|-----------------------------|--|
| <input type="checkbox"/> 61 | Floating Control                                   |
| <input type="checkbox"/> 62 | Floating Control w/500 ohm feedback                |
| <input type="checkbox"/> 72 | 4-20 mA/2-10 Vdc Control w/2-10 Vdc feedback       |
| <input type="checkbox"/> 91 | Series 90 Control (electronic or 135 ohm)          |
| <input type="checkbox"/> 8  | 150 lb-in. (17 Nm)                                 |
| <input type="checkbox"/> 9  | 300 lb-in. (34 Nm)                                 |
| <b>4</b>                    | <b>Non-Spring Return</b>                           |
| <input type="checkbox"/> A  | Standard   |
| <input type="checkbox"/> C  | Includes 2 SPDT 24V auxiliary switches             |
| <input type="checkbox"/> D  | Includes timeout                                   |
| <input type="checkbox"/> E  | Standard w/ European ratings                       |
| <input type="checkbox"/> F  | Includes timeout and 2 SPDT 24V auxiliary switches |
| ML                          | XXXXX Varies by Model                              |

**Dimensions:**



**TYPICAL SPECIFICATION**

Non-spring return actuator shall be direct coupled type that requires neither crankarm nor linkage and be capable of direct mounting to a jackshaft of up to one inch diameter. The actuator shall connect to the shaft using a removable output hub with inserts that match shaft type and size, and provide concentric mounting. The actuator must provide floating or proportional control.

The actuator design must be for use in either clockwise or counterclockwise operation.

Actuators shall use a true synchronous ac stepper motor to drive the output hub. Run time shall be constant and independent of load, temperature and supply voltage (within product-family specifications). Overload protection shall be provided at all angles of rotation by a magnetic clutch mechanism that provides an absolute limit to the output torque without a physical link between the motor and the gear train.

Actuators shall have a minimum performance of 50,000 full-stroke powered cycles, and 1,500,000 repositions documented in the product data literature. Actuators shall be UL and CSA listed, manufactured under ISO 9001 International Quality Control Standards.

**Noise Rating:**

- 45 dBA maximum at 1 meter.

**Humidity:**

- 5 to 95 percent relative humidity, noncondensing.

**Device Weight:**

- 3.0 lb (1.36 kg).

**Position Indicator:**

- Mounted on actuator hub.

**Input Impedance (ML7284 and ML7294):**

- 100K ohms.

**Approvals:**

- UL873 (UL94-5VA Enclosure: Plenum rating).
- UL Listed: File Number E4436, Guide Number XAPX.
- CSA Listed: File Number LR95329-17.

**Environmental Protection Ratings:**

- NEMA1 standard with damper shaft in horizontal position.

**Accessories**

For 150 lb-in. Models *only*:

- 205617 Hub Insert, 3/4 in. round.
- 205685 Crank-Arm Assembly.
- 205753 Hub Insert, 3/8 in.
- 205758 Hub Insert, 5/8 in.

For 300 lb-in. Models *only*:

- 205843B Hub Insert, 1 in. round, with retaining ring.
- 205846 Crank-Arm Assembly.
- 205849A Hub Insert, 5/8 in., round or square, with set screws.
- 205856B Hub Insert, 3/4 in., round or square, with retaining ring.
- 205860 Remote Minimum Position Potentiometer.
- 205860A Remote Minimum Position Potentiometer, NEMA IV rated.

For 150 lb-in. and 300 lb-in. Models:

- 205820A Three-Point Mounting Kit.

