

# LMQB24-MFT

Modulating, Non-Spring Return, 24 V, Multi-Function Technology®



| Technical Data                |  |
|-------------------------------|--|
| Power Supply                  | 24 VAC ± 20%, 50/60 Hz, 24 VDC ± 10%   |
| Power Consumption Running     | 13 W   |
| Power Consumption Holding     | 1.5 W  |
| Transformer Sizing            | 23 VA (class 2 power source) (I max 20A@5ms)   |
| Shaft Diameter                | 1/2" to 1.05" round, centers on 1/2" and 3/4" with insert, 1.05" without insert            |
| Electrical Connection         | 695  |
| Overload Protection           | electronic throughout 0° to 95° rotation   |
| Operating Range Y             | 2 to 10 VDC, 4 to 20 mA w/ ZG-R01 (500 Ω, 1/4 W resistor)                                  |
| Input Impedance               | 100 k Ω (0.1 mA), 500 Ω, 1000 Ω (on/off)   |
| Feedback Output U             | 2 to 10 VDC, 0.5 mA max, VDC variable  |
| Angle of Rotation             | adjustable with mechanical end stop, 30° to 95°  |
| Torque                        | 35 in-lbs [4 Nm] minimum   |
| Direction of Rotation (Motor) | reversible with switch   |
| Position Indication           | reflective visual indicator (snap on)  |
| Manual Override               | external push button   |
| Running Time (Motor)          | 2.5, 5 or 10 sec   |
| Humidity                      | 5 to 95% RH non condensing (EN 60730-1)  |
| Ambient Temperature Range     | -22°F to 122°F [-30°C to 50°C]   |
| Storage Temperature Range     | -40°F to 176°F [-40°C to 80°C]   |
| Housing                       | NEMA 2, IP54, UL enclosure type 2  |
| Housing Material              | UL94-5VA   |
| Agency Listings†              | cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2004/108/EC and 2006/95/EC |
| Noise Level (Motor)           | max. 52 dB (A)   |
| Servicing                     | maintenance free   |
| Quality Standard              | ISO 9001   |
| Weight                        | 2 lb [0.9 kg]  |

†Rated Impulse Voltage 800V, Type of Action 1, Control Pollution Degree 2.

**Torque min. 35 in-lb, for control of damper surfaces up to 11 sq. ft.**

## Application

For proportional modulation of dampers in HVAC systems. Actuator sizing should be done in accordance with the damper manufacturer's specifications. The actuator is mounted directly to a damper shaft from 1/2" up to 1.05" in diameter by means of its universal clamp. The default parameters for 2 to 10 VDC applications of the ...MFT actuator are assigned during manufacturing. If necessary, custom versions of the actuators can be ordered. The parameters can be changed by two means: pre-set and custom configurations from Belimo or on-site configurations using the Belimo PC-Tool software (version 3.3 or later).

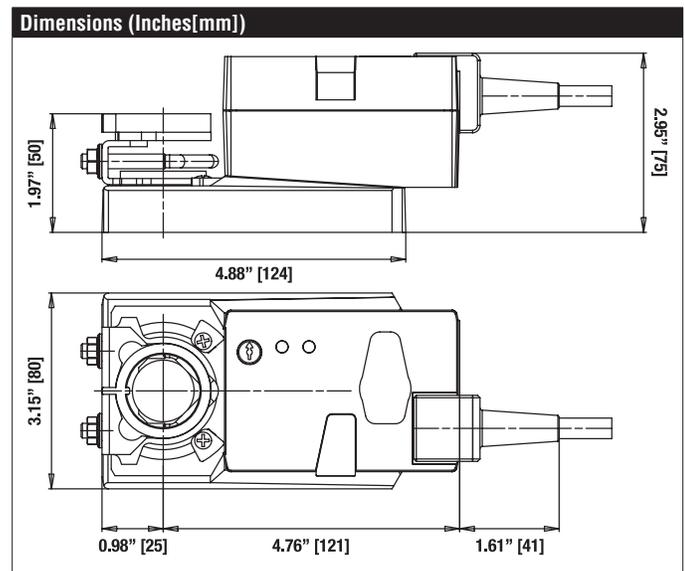
## Operation

The actuator is not provided with and does not require any limit switches, but is electronically protected against overload. The anti-rotation strap supplied with the actuator will prevent lateral movement.

The LMQB(X) series provides 95° of rotation and a visual indicator indicates position of the actuator. When reaching the damper or actuator end position, the actuator automatically stops. The gears can be manually disengaged with a button on the actuator cover.

The LMQB(X)24-MFT actuators use a brushless DC motor, which is controlled by an Application Specific Integrated Circuit (ASIC). The ASIC monitors and controls the actuator's rotation and provides a digital rotation sensing (DRS) function to prevent damage to the actuator in a stall condition. Power consumption is reduced in holding mode.

Add-on auxiliary switches or feedback potentiometers are easily fastened directly onto the actuator body for signaling and switching functions.



**Typical Specification**

Proportional control damper actuators shall be electronic direct-coupled type, which require no crank arm and linkage and be capable of direct mounting to a shaft up to 3/4" diameter. Actuators must provide proportional damper control in response to a 2 to 10 VDC or, with the addition of a 500 Ω resistor, a 4 to 20 mA control input from an electronic controller or positioner. Actuators shall have brushless DC motor technology and be protected from overload at all angles of rotation. Actuators shall have reversing switch and manual override on the cover. Run time shall be constant and independent of torque. Actuators shall be cULus listed, have a 5-year warranty, and be manufactured under ISO 9001 International Quality Control Standards. Actuators shall be as manufactured by Belimo.

**Wiring Diagrams**

- A Actuators with appliance cables are numbered.
- 1 Provide overload protection and disconnect as required.
- 3 Actuators may also be powered by 24 VDC.
- 5 Only connect common to negative (-) leg of control circuits.
- 7 A 500 Ω resistor (ZG-R01) converts the 4 to 20 mA control signal to 2 to 10 VDC.
- 11 Actuators may be connected in parallel if not mechanically linked. Power consumption and input impedance must be observed.
- 12 IN4004 or IN4007 diode. (IN4007 supplied, Belimo part number 40155).

