

## Versatile and Powerful

- Minimum 45 in-lb torque in a compact package.

For damper areas up to 11 sq-ft\*



All Actuators have BDCM

### LM Series - At A Glance

		<i>LMB(X)24-3-T (p. 196)</i>	<i>LMCB24-3 (p. 198)</i>	<i>LMCB24-3-T (p. 198)</i>	<i>LMB24-3-P5-T (p. 196)</i>	<i>LMB24-3-P10-T (p. 196)</i>	<i>LMB24-3-S (p. 196)</i>	<i>LMX24-3-T (p. 200)</i>	<i>LMX120-3 (p. 202)</i>	<i>LMB24-SR (p. 204)</i>	<i>LMCB24-SR (p. 206)</i>	<i>LMX24-SR (p. 208)</i>	<i>LMB24-SR-T (p. 204)</i>	<i>LMCB24-SR-T (p. 206)</i>	<i>LMX24-SR-T (p. 208)</i>	<i>LMX120-SR (p. 210)</i>	<i>LMB(X)24-MFT (p. 212)</i>	<i>LMX24-MFT95 (p. 214)</i>	<i>LMX24-PC (p. 216)</i>	<i>LMQB(X)24-1 (p. 218)</i>	<i>LMQB(X)24-MFT (p. 220)</i>	<i>LMB24-HM (10P-HM) (p. 222)</i>
Basic Product		•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
Flexible Product		•						•				•			•	•	•	•	•	•	•	•
Torque	45 in-lb [5 Nm]	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	35 in-lb [4 Nm]																				•	•
Angle of Rotation	95 degrees	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Power Supply	24 VAC/DC	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
	100 to 240 VAC							•							•							
Control Input	On/Off																			•		•
	On/Off, Floating Point	•	•	•	•	•	•	•														
	2 to 10 VDC (4 to 20mA)								•	•	•	•	•	•	•	•						
	Multi-Function Technology															•					•	
	0 to 135 Ω																•					
Feedback	0 to 20V Phasecut																		•			
	None	•	•	•			•	•				•	•	•						•		
	5 kΩ Potentiometer				•																	
	10 kΩ Potentiometer					•																•
	2 to 10 VDC									•	•					•			•			
Variable (0 to 10 VDC)																•	•				•	
Running Time	95 seconds	•			•	•	•		•			•							•			•
	35 seconds		•	•						•			•									
	Adj. 2.5 to 10 seconds																			•	•	
	Adj. 35 to 150 seconds							•			•			•	•	•	•	•				•
Wiring	Plenum Rated Cable	•	•						•	•	•					•	•	•	•	•	•	•
	Appliance Rated Cable						•								•							
	Terminal Strip	•		•	•	•						•	•	•								
	Conduit Fitting	•	•				•	•	•	•	•				•	•	•	•	•	•	•	•
Auxiliary Switch	Built-In					•																
	Add-On	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Installation and Operation... (page 265).

\*Based on 4 in-lb/ft<sup>2</sup> damper torque loading. Parallel blade. No edge seals.

# A CLOSER LOOK...

- Brushless DC Motor for Added Accuracy and Controllability.
- Cut Labor Costs with Simple Direct Coupling.
- Self-Centers on 5/8" Jackshafts with Standard Clamp or 3/4" with Flexible Line Selection or Accessory Clamp.
- Check Damper Position with Clear Position Indicator.
- Don't Worry about Actuator Burn-Out; Belimo is Overload Proof throughout Rotation.
- Enjoy Added Flexibility with Easy Mechanical Stops to Adjust Angle of Rotation.
- Need to Change Control Direction? Do it easily with a Simple Switch.
- Easily Accessible Manual Override Button helps you Pre-Tension Damper Blades.
- Fully Adjustable Built-In Auxiliary Switch (LMB24-3-S).
- Auxiliary Switch and Feedback Potentiometer Add-Ons Mount Directly on Clamp, Includes Conduit Connector.
- Standard 3ft Plenum Rated Cable and Conduit Connector Provided on Basic Models.
- Added Flexibility to Select Clamp, Electrical Connection, and Running Time to fit your Specific Application with Belimo's New Flexible Line of Actuators.



**Bulk Packaging Offers Big Value for Large jobs, Stocking Orders.**



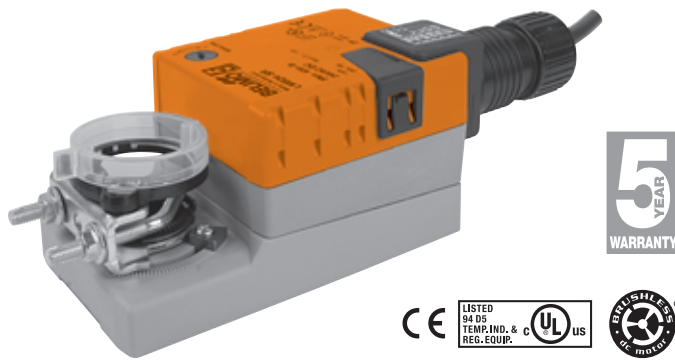
## The Belimo Difference

- **Customer Commitment.**  
Extensive product range. Application assistance.  
Same-day shipments. Free technical support. Five year warranty.
- **Low Installation and Life-Cycle Cost.**  
Easy installation. Accuracy and repeatability.  
Low power consumption. No maintenance.
- **Long Service Life.**  
Components tested before assembly. Every product tested before shipment.  
30+ years direct coupled actuator design.

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# LMB(X)24-3(-T)

On/Off, Floating Point Control, Non-Spring Return, Direct Coupled, 24 V



Technical Data	LMB(X)24-3(-S)(-T)
Power Supply	24 VAC ± 20% 50/60 Hz 24 VDC ± 10%
Power Consumption	1.5 W (0.2 W)
Transformer Sizing	2.5 VA (Class 2 power source)
Electrical Connection	18 GA plenum rated cable ½" conduit connector, Protected NEMA 2 (IP54) □ 3 ft [1m] □ 10 ft [3m] □ 16 ft [5m]
Overload Protection	electronic throughout 0 to 95° rotation
Control	On/Off, Floating Point
Input Impedance	600 Ω
Angle of Rotation	max. 95°, adjust. with mechanical stop
Torque	45 in-lb [5 Nm]
Direction of Rotation	reversible with  switch
Position Indication	reflective visual indicator (snap-on)
Manual Override	external push button
Running Time	□ 150 □ 95 □ 60 □ 45 □ 35 seconds constant independent of load
Humidity	5 to 95% RH non condensing (EN 60730-1)
Ambient Temperature	-22°F to 122°F [-30°C to 50°C]
Storage Temperature	-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 UL 60730-1A/-2-14, CAN/GSA E60730-1:02, CE acc. to 2004/108/EEC and 2006/95/EC
Noise Level	<35dB(A)
Servicing	maintenance free
Quality Standard	ISO 9001
Weight	1.1 lbs [0.5 Kg]

LMB24-3-S	
Electrical Connection	3 ft, 18 GA appliance rated cable 1/2" conduit connector
Auxiliary switch	Adj. 0° to 100°, SPDT 3 A (0.5A) @ 250 VAC
Weight	1.4 lbs [0.6 Kg]

LMB24-3-P10-T	
Electrical connection	Screw terminal (for 26 to 14 GA wire)
Feedback	10 kΩ, 1W potentiometer

LMB24-3-P5-T (bulk pack only)	
Feedback	5 kΩ, 1W potentiometer
Housing	NEMA 1/IP20

LMB24-3-T	
Electrical connection	Screw terminal (for 26 to 14 GA wire)
Housing	NEMA 1/IP20

†Rated Impulse Voltage 800V, Type of action 1, (1.B for -S version), Control Pollution Degree 3.

Torque min. 45 in-lb for control of damper surfaces up to 11 sq ft.

## Models

LMB(X)24-3	LMB24-3.1 (bulk)	LMB24-3-P10-T
LMB(X)24-3-T	LMB24-3-T.1 (bulk)	LMB24-3-S
LMB24-3-P5-T	LMB24-3-P5-T.1 (bulk)	

## Application

For On/Off and floating point control 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 1/4" up to 5/8" in diameter by means of its standard universal clamp. Shafts up to 3/4" diameter can be accommodated by an accessory clamp.

## 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.

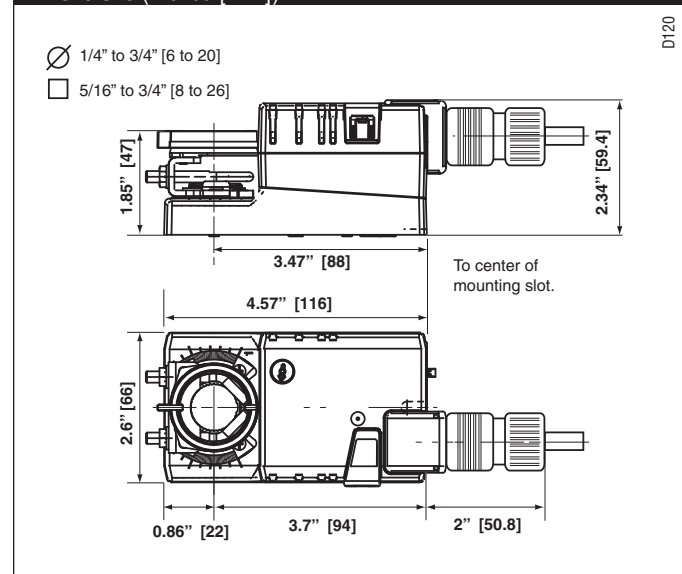
The LMB series provides 95° of rotation and a visual indicator which indicates position of the actuator. When reaching the damper or actuator end position, the actuator automatically stops. The gears can be disengaged with manual release on the actuator cover.

The LMB24-3... actuators use a sensorless 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.

The LMB24-3-S version is provided with 1 built-in auxiliary switch. This SPDT switch is provided for safety interfacing or signaling, for example, for fan start-up. The switching function is adjustable 0 to 95°. The auxiliary switch is double insulated so an electrical ground connection is not necessary.

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

## Dimensions (Inches [mm])



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Accessories	
K-LM20	3/4" [20 mm] Shaft Clamp
AV6-20	Shaft Extension
ZG-LMSA	Shaft Adaptor for 1/2" Diameter Shafts
ZG-LMSA-1	Shaft Adaptor for 3/8" Diameter Shafts
ZS-T	Terminal Cover for NEMA 2
ZS-100	Weather Shield - Steel
ZS-150	Weather Shield - Polycarbonate
Tool-06	8 mm & 10 mm Wrench
S1A, S2A	Auxiliary Switch (es)
P370	Shaft Mount Auxiliary Switch
P...A	Feedback Potentiometers

**NOTE:** When using LMB(X)24-3... actuators, only use accessories listed on this page.

### Typical Specification

Floating point, on/off control damper actuators shall be electronic direct-coupled type, which require no crankarm and linkage and be capable of direct mounting to a shaft from 1/4" to 5/8". Shafts up to 3/4" diameter can be accommodate with an accessory clamp. 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. If required, actuator will be provided with screw terminal strip for electrical connections [LMB(X)24-3-T]. If required, actuators shall be provided with one adjustable SPDT auxiliary switch. Actuators with auxilliary switches must be constructed to meet the requirements for double insulation so an electrical ground is not required to meet agency listings. 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

#### ✂ INSTALLATION NOTES

1 Provide overload protection and disconnect as required.

3 Actuators may also be powered by 24 VDC.

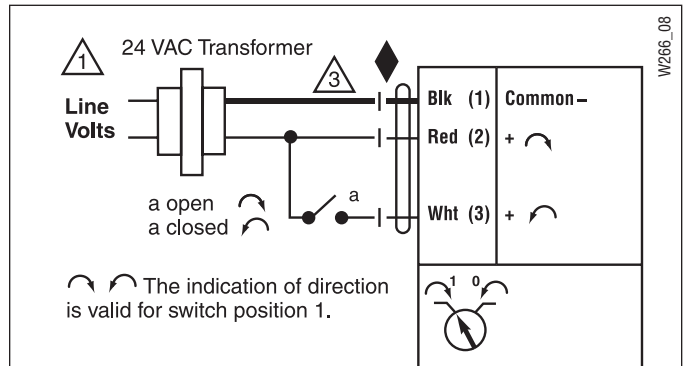
4 For end position indication, interlock control, fan startup, etc., xMB24-3-S incorporates one built-in auxiliary switches: 1 x SPDT, 3A (0.5A) @250 VAC, UL Approved, adjustable 0 to 95.

#### 📄 APPLICATION NOTES

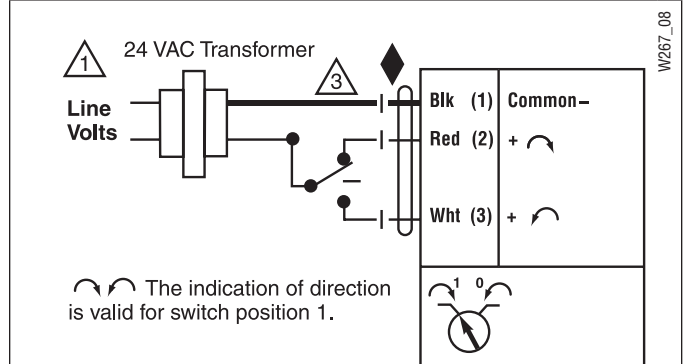
◆ Meets cULus or UL and CSA Standard requirements without the need of an electrical ground connection.

#### ⚠ WARNING Live Electrical Components!

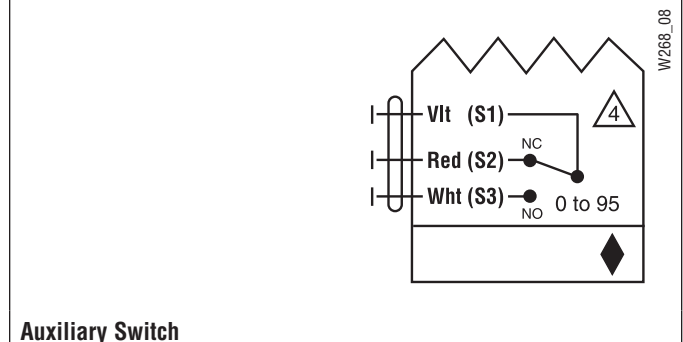
During installation, testing, servicing and troubleshooting of this product, it maybe necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.



#### On/Off control



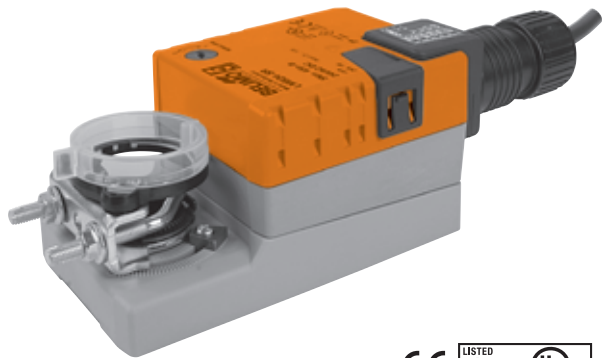
#### Floating Point or On/Off control



#### Auxiliary Switch

# LMCB24-3(-T)

On/Off, Floating Point Control, Non-Spring Return, Direct Coupled, 24V



Technical Data	LMCB24-3(-T)
Power Supply	24 VAC ± 20% 50/60 Hz 24 VDC ± 10%
Power Consumption	1.5 W (0.2 W)
Transformer Sizing	3 VA (Class 2 power source)
Electrical Connection	3 ft, 18 GA plenum rated cable 1/2" conduit connector Protected NEMA 2 (IP54) 3 ft, 18 GA appliance rated cable (-S versions) 1/2" conduit connector Protected NEMA 2 (IP54)
Overload Protection	electronic throughout 0 to 95° rotation
Control	On/Off, Floating Point
Input Impedance	600 Ω
Angle of Rotation	max. 95°, adjust. with mechanical stop
Torque	45 in-lb [5 Nm]
Direction of Rotation	reversible with  switch
Position Indication	reflective visual indicator (snap-on)
Manual Override	external push button
Running Time	35 seconds, constant independent of load
Humidity	5 to 95% RH non condensing (EN 60730-1)
Ambient Temperature	-22°F to 122°F [-30°C to 50°C]
Storage Temperature	-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 UL 60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2004/108/EEC and 2006/95/EC
Noise Level	<45dB(A)
Servicing	maintenance free
Quality Standard	ISO 9001
Weight	1.1 lbs [0.5 Kg]

LMCB24-3-T	
Electrical connection	Screw terminal (for 26 to 14 GA wire)
Housing	NEMA 1/IP20

†Rated Impulse Voltage 800V, Type of action 1, Control Pollution Degree 3.

Torque min. 45 in-lb for control of damper surfaces up to 11 sq ft.

## Models

LMCB24-3  
LMCB24-3-T

## Application

For On/Off and floating point control 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 1/4" up to 5/8" in diameter by means of its standard universal clamp. Shafts up to 3/4" diameter can be accommodated by an accessory clamp.

## Operation

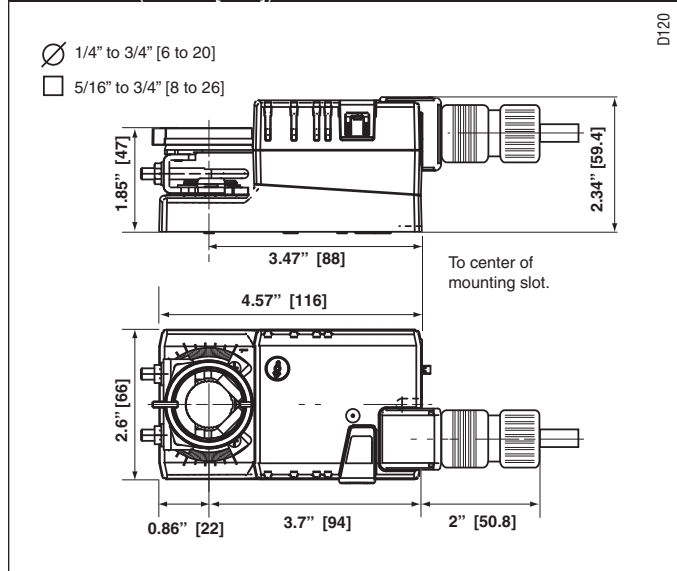
The actuator is not provided with and does not require any limit switches, but is electronically protected against overload. The anti-rotation strap supplied with the actuator will prevent lateral movement.

The LMB series provides 95° of rotation and a visual indicator which indicates position of the actuator. When reaching the damper or actuator end position, the actuator automatically stops. The gears can be disengaged with manual release on the actuator cover.

The LMCB24-3... actuators use a sensorless 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.

## Dimensions (Inches [mm])



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**Accessories**

K-LM20	3/4" [20 mm] Shaft Clamp
AV6-20	Shaft Extension
ZG-LMSA	Shaft Adaptor for 1/2" Diameter Shafts
ZG-LMSA-1	Shaft Adaptor for 3/8" Diameter Shafts
ZS-T	Terminal Cover for NEMA 2
ZS-100	Weather Shield - Steel
ZS-150	Weather Shield - Polycarbonate
Tool-06	8 mm & 10 mm Wrench
S1A, S2A	Auxiliary Switch (es)
P370	Shaft Mount Auxiliary Switch
P...A	Feedback Potentiometers

**NOTE:** When using LMCB24-3... actuators, only use accessories listed on this page.

**Typical Specification**

Floating point, on/off control damper actuators shall be electronic direct-coupled type, which require no crankarm and linkage and be capable of direct mounting to a shaft from 1/4" to 5/8". Shafts up to 3/4" diameter can be accommodate with an accessory clamp. 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. If required, actuator will be provided with screw terminal strip for electrical connections (LMCB24-3-T). If required, actuators shall be provided with one adjustable SPDT auxiliary switch. Actuators with auxilliary switches must be constructed to meet the requirements for double insulation so an electrical ground is not required to meet agency listings. 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**

**✂ INSTALLATION NOTES**

1 Provide overload protection and disconnect as required.

3 Actuators may also be powered by 24 VDC.

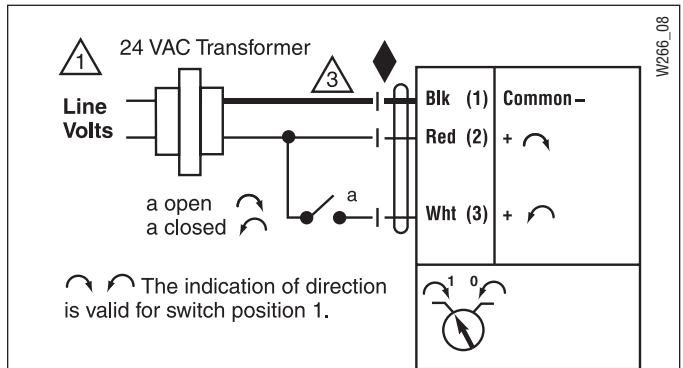
4 For end position indication, interlock control, fan startup, etc., xMB24-3-S incorporates one built-in auxiliary switches: 1 x SPDT, 3A (0.5A) @250 VAC, UL Approved, adjustable 0 to 95.

**📄 APPLICATION NOTES**

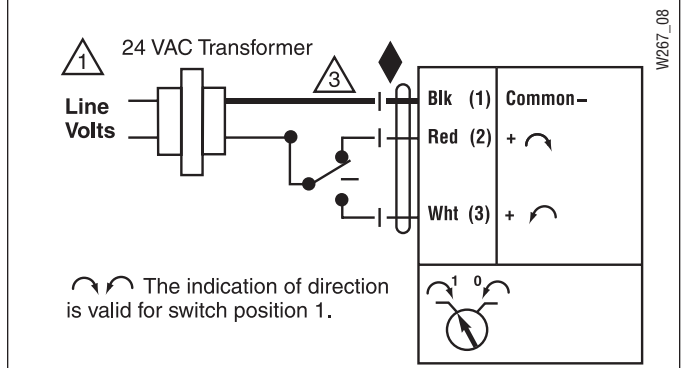
◆ Meets cULus or UL and CSA Standard requirements without the need of an electrical ground connection.

**⚠ WARNING Live Electrical Components!**

During installation, testing, servicing and troubleshooting of this product, it maybe necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.



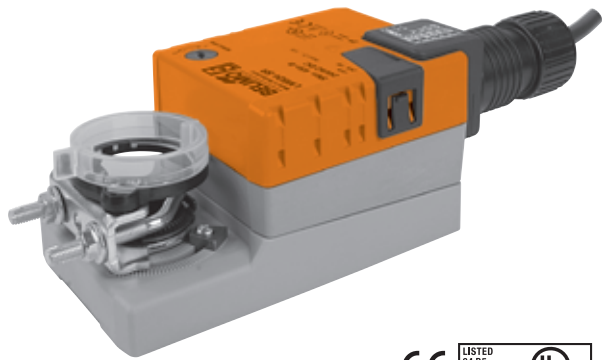
**On/Off control**



**Floating Point or On/Off control**

# LMX24-3(-T)

On/Off, Floating Point Control, Non-Spring Return, Direct Coupled, 24V



Technical Data	LMX24-3(-T)
Power Supply	24 VAC ± 20% 50/60 Hz 24 VDC ± 10%
Power Consumption	1.5 W (0.2 W)
Transformer Sizing	3 VA (Class 2 power source)
Electrical Connection	18 GA plenum rated cable 1/2" conduit connector Protected NEMA 2 (IP54) <input type="checkbox"/> 3 ft [1m] <input type="checkbox"/> 10 ft [3m] <input type="checkbox"/> 16 ft [5m]
Overload Protection	electronic throughout 0 to 95° rotation
Control	On/Off, Floating Point
Input Impedance	600 Ω
Angle of Rotation	max. 95°, adjust. with mechanical stop
Torque	45 in-lb [5 Nm]
Direction of Rotation	reversible with  switch
Position Indication	reflective visual indicator (snap-on)
Manual Override	external push button
Running Time	<input type="checkbox"/> 150 <input type="checkbox"/> 95 <input type="checkbox"/> 60 <input type="checkbox"/> 45 <input type="checkbox"/> 35 seconds constant independent of load
Humidity	5 to 95% RH non condensing (EN 60730-1)
Ambient Temperature	-22°F to 122°F [-30°C to 50°C]
Storage Temperature	-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 UL 60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2004/108/EEC and 2006/95/EC
Noise Level	<35dB(A)
Servicing	maintenance free
Quality Standard	ISO 9001
Weight	1.1 lbs [0.5 Kg]

LMX24-3-T	
Electrical connection	screw terminal (for 26 to 14 GA wire) <input type="checkbox"/> unprotected (NEMA 1) <input type="checkbox"/> protected (NEMA 2)

†Rated Impulse Voltage 800V, Type of action 1, Control Pollution Degree 3.

Torque min. 45 in-lb for control of damper surfaces up to 11 sq ft.

## Models

LMX24-3  
LMX24-3-T

## Application

For On/Off and floating point control 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 1/4" up to 5/8" in diameter by means of its standard universal clamp. Shafts up to 3/4" diameter can be accommodated by an accessory clamp.

## Operation

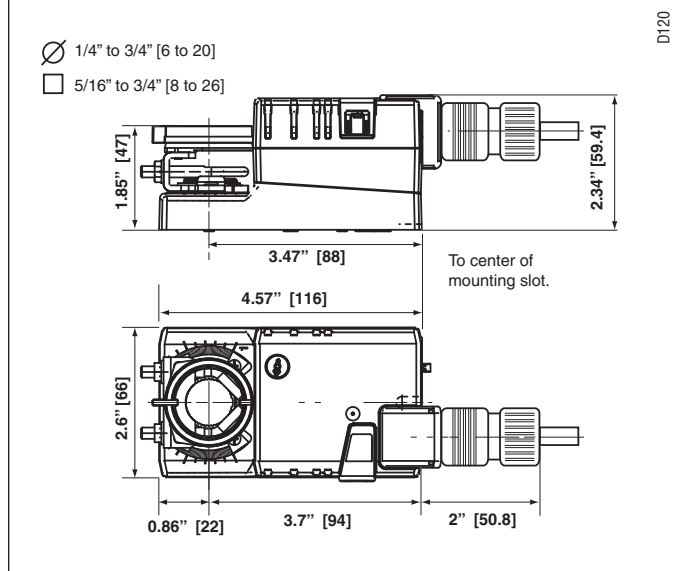
The actuator is not provided with and does not require any limit switches, but is electronically protected against overload. The anti-rotation strap supplied with the actuator will prevent lateral movement.

The LMX series provides 95° of rotation and a visual indicator which indicates position of the actuator. When reaching the damper or actuator end position, the actuator automatically stops. The gears can be disengaged with manual release on the actuator cover.

The LMX24-3... actuators use a sensorless 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.

## Dimensions (Inches [mm])



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### Accessories

K-LM20	3/4" [20 mm] Clamp
AV6-20	Shaft Extension
ZG-LMSA	Shaft Adaptor for 1/2" Diameter Shafts
ZG-LMSA-1	Shaft Adaptor for 3/8" Diameter Shafts
ZS-T	Terminal Cover for NEMA 2
ZS-100	Weather Shield - Steel
ZS-150	Weather Shield - Polycarbonate
Tool-06	8 mm & 10 mm Wrench
S1A, S2A	Auxiliary Switch (es)
P370	Shaft Mount Auxiliary Switch
P...A	Feedback Potentiometers

**NOTE:** When using LMX24-3... actuators, only use accessories listed on this page.

### Typical Specification

Floating point, on/off control damper actuators shall be electronic direct-coupled type, which require no crankarm and linkage and be capable of direct mounting to a shaft from 1/4" to 5/8". Shafts up to 3/4" diameter can be accommodate with an accessory clamp. 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. If required, actuator will be provided with screw terminal strip for electrical connections (LMX24-3-T). 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

#### ✂️ INSTALLATION NOTES

⚠️ 1 Provide overload protection and disconnect as required.

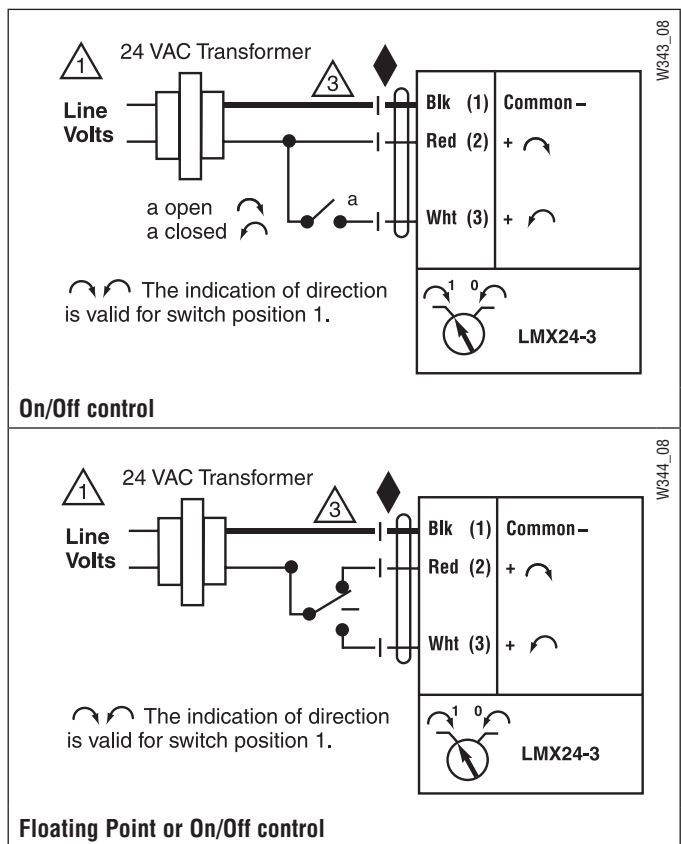
⚠️ 3 Actuators may also be powered by 24 VDC.

#### 📄 APPLICATION NOTES

◆ Meets cULus or UL and CSA Standard requirements without the need of an electrical ground connection.

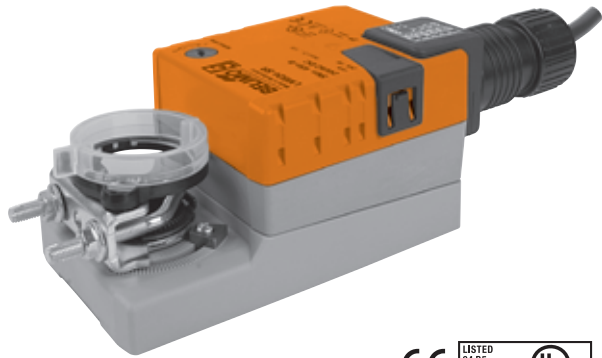
#### ⚠️ WARNING Live Electrical Components!

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# LMX120-3

On/Off, Floating Point Control, Non-Spring Return, Direct Coupled, 100 to 240 VAC



Technical Data		LMX120-3
Power Supply	nominal	100 to 240 VAC, 50/60 Hz
	tolerance	85 to 265 VAC, 50/60 Hz
Power Consumption		2 W (0.5 W)
Transformer Sizing		4 VA (Class 2 power source)
Electrical Connection		18 GA appliance rated cable
		1/2" conduit connector
		Protected NEMA 2 (IP54) □ 3 ft [1m] □ 10 ft [3m] □ 16 ft [5m]
Overload Protection		electronic throughout 0 to 95° rotation
Control		On/Off, Floating Point
Input Impedance		600 Ω
Angle of Rotation		max. 95°, adjust. with mechanical stop
Torque		45 in-lb [5 Nm]
Direction of Rotation		reversible with  switch
Position Indication		reflective visual indicator (snap-on)
Manual Override		external push button
Running Time		□ 150 □ 95 □ 60 □ 45 □ 35 seconds
		constant independent of load
Humidity		5 to 95% RH non condensing (EN 60730-1)
Ambient Temperature		-22°F to 122°F [-30°C to 50°C]
Storage Temperature		-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 UL 60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2004/108/EEC and 2006/95/EC
Noise Level		<35dB(A)
Servicing		maintenance free
Quality Standard		ISO 9001
Weight		1.1 lbs [0.5 Kg]

†Rated Impulse Voltage 4kV, Type of action 1, Control Pollution Degree 3.

Torque min. 45 in-lb for control of damper surfaces up to 11 sq ft.

## Application

For On/Off and floating point control 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 1/4" up to 5/8" in diameter by means of its standard universal clamp. Shafts up to 3/4" diameter can be accommodated by an accessory clamp.

## Operation

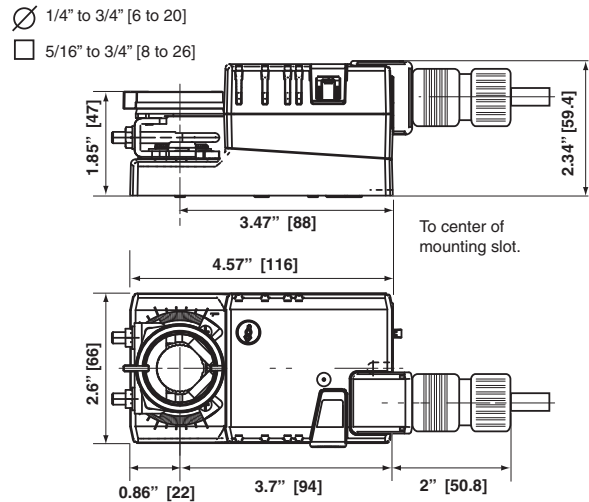
The actuator is not provided with and does not require any limit switches, but is electronically protected against overload. The anti-rotation strap supplied with the actuator will prevent lateral movement.

The LMX series provides 95° of rotation and a visual indicator which indicates position of the actuator. When reaching the damper or actuator end position, the actuator automatically stops. The gears can be disengaged with manual release on the actuator cover.

The LMX120-3 actuators use a sensorless 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.

## Dimensions (Inches [mm])



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### Accessories

K-LM20	3/4" [20 mm] Shaft Clamp
AV6-20	Shaft Extension
ZG-LMSA	Shaft Adaptor for 1/2" Diameter Shafts
ZG-LMSA-1	Shaft Adaptor for 3/8" Diameter Shafts
ZS-100	Weather Shield - Steel
ZS-150	Weather Shield - Polycarbonate
Tool-06	8 mm & 10 mm Wrench
S1A, S2A	Auxiliary Switch (es)
P370	Shaft Mount Auxiliary Switch
P...A	Feedback Potentiometers

**NOTE:** When using LMX120-3 actuators, only use accessories listed on this page.

### Typical Specification

Floating point, on/off control damper actuators shall be electronic direct-coupled type, which require no crankarm and linkage and be capable of direct mounting to a shaft from 1/4" to 5/8". 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

#### ✂️ INSTALLATION NOTES

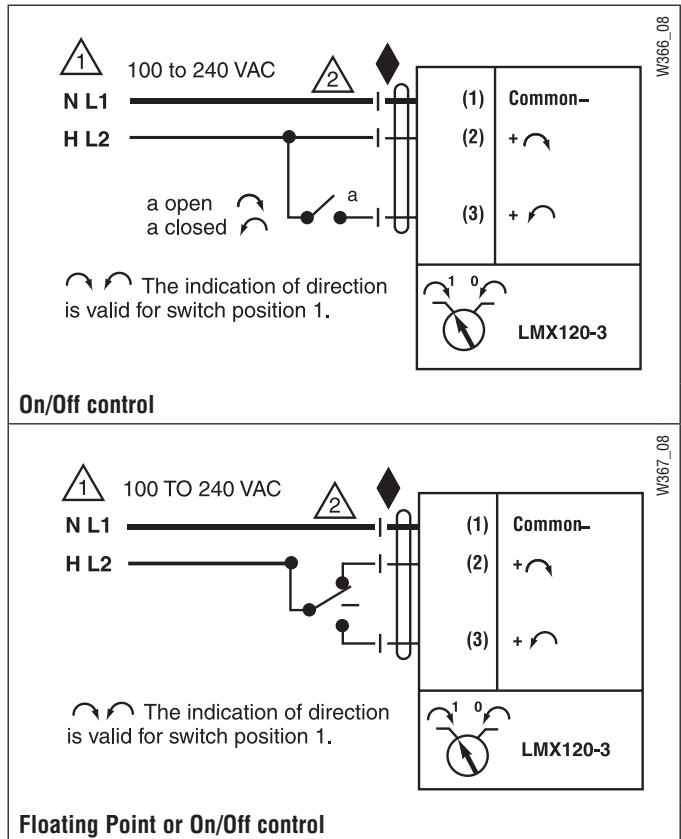
1 Provide overload protection and disconnect as required.

2 **CAUTION Equipment damage!**  
Actuators may be connected in parallel.  
Power consumption must be observed.

#### 📄 APPLICATION NOTES

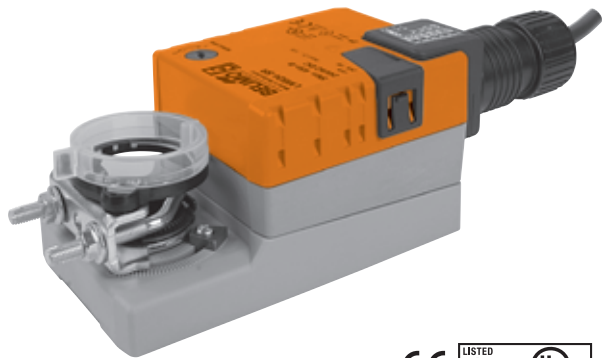
◆ Meets cULus or UL and CSA Standard requirements without the need of an electrical ground connection.

⚠️ **WARNING Live Electrical Components!**  
During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.



# LMB24-SR(-T)

Proportional Control, Non-Spring Return, Direct Coupled, 24V, for 2 to 10 VDC and 4 to 20 mA



Technical Data	LMB24-SR(-T)
Power Supply	24 VAC ± 20% 50/60 Hz 24 VDC ± 10%
Power Consumption	1.5 W (0.4 W)
Transformer Sizing	3 VA (Class 2 power source)
Electrical Connection	3 ft, 18 GA plenum rated cable 1/2" conduit connector Protected NEMA 2 (IP54)
Overload Protection	electronic throughout 0 to 95° rotation
Operating Range Y	2 to 10 VDC, 4 to 20 mA
Input Impedance	100 kΩ (0.1 mA), 500 Ω
Feedback Output U	2 to 10 VDC (max 0.5 mA)
Angle of Rotation	max. 95°, adjust. with mechanical stop
Torque	45 in-lb [5 Nm]
Direction of Rotation	reversible with  switch Actuator will move: =CCW with decreasing control signal (10 to 2V) =CW with decreasing control signal (10 to 2V)
Position Indication	reflective visual indicator (snap-on)
Manual Override	external push button
Running Time	95 seconds, constant independent of load
Humidity	5 to 95% RH non condensing (EN 60730-1)
Ambient Temperature	-22°F to 122°F [-30°C to 50°C]
Storage Temperature	-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 UL 60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2004/108/EEC and 2006/95/EC
Noise Level	<35dB(A)
Servicing	maintenance free
Quality Standard	ISO 9001
Weight	1.7 lbs [0.5 Kg]

LMB24-SR-T	
Electrical connection	screw terminal (for 26 to 14 GA wire)
Housing	NEMA 2/IP20

†Rated Impulse Voltage 800V, Type of action 1, Control Pollution Degree 3.

Torque min. 45 in-lb for control of damper surfaces up to 11 sq ft.

## Models

LMB24-SR	LMB24-SR.1 (bulk)
LMB24-SR-T	LMB24-SR-T.1 (bulk)

## 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 1/4" up to 5/8" in diameter by means of its universal clamp. Shafts up to 3/4" diameter can be accommodated by an accessory clamp.

The actuator operates 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. A 2 to 10 VDC feedback signal is provided for position indication or master-slave applications.

## Operation

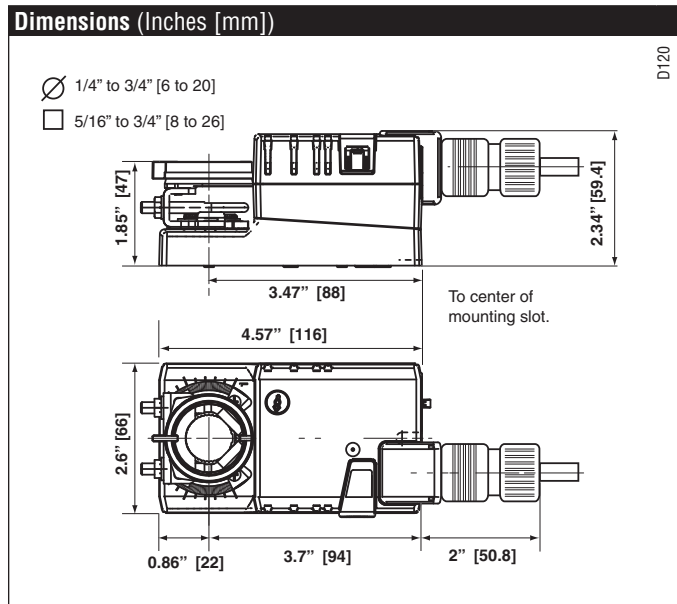
The actuator is not provided with and does not require any limit switches, but is electronically protected against overload. The anti-rotation strap supplied with the actuator will prevent lateral movement.

The LMB 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 LMB24-SR... actuators use a sensorless 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.



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Accessories	
K-LM20	3/4" [20 mm] Shaft Clamp
AV6-20	Shaft Extension
ZG-LMSA	Shaft Adaptor for 1/2" Diameter Shafts
ZG-LMSA-1	Shaft Adaptor for 3/8" Diameter Shafts
ZS-T	Terminal Cover for NEMA 2
ZS-100	Weather Shield - Steel
ZS-150	Weather Shield - Polycarbonate
Tool-06	8 mm & 10 mm Wrench
S1A, S2A	Auxiliary Switch (es)
P370	Shaft Mount Auxiliary Switch
P...A	Feedback Potentiometers
SGA24	Min positioners in NEMA 4 housing
SGF24	Min positioners for flush panel mounting
PTA-250	Pulse Width Modulation Interface
IRM-100	Input Rescaling Module
ADS-100	Analog to Digital Switch
ZG-R01	Resistor for 4 to 20 mA Conversion
NSV24 US	Battery Back-Up Module
ZG-X40	Transformer

**NOTE:** When using LMB24-SR... actuators, only use accessories listed on this page.

### Typical Specification

Proportional control damper actuators shall be electronic direct-coupled type, which require no crankarm and linkage and be capable of direct mounting to a shaft from 1/4" to 5/8". Shafts up to 3/4" diameter can be accommodate with an accessory clamp. 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. If required, actuator will be provided with screw terminal strip for electrical connections (LMB24-SR-T). Run time shall be constant and independent of torque. A 2 to 10 VDC feedback signal shall be provided for position indication. 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 Diagram

#### ✂ INSTALLATION NOTES

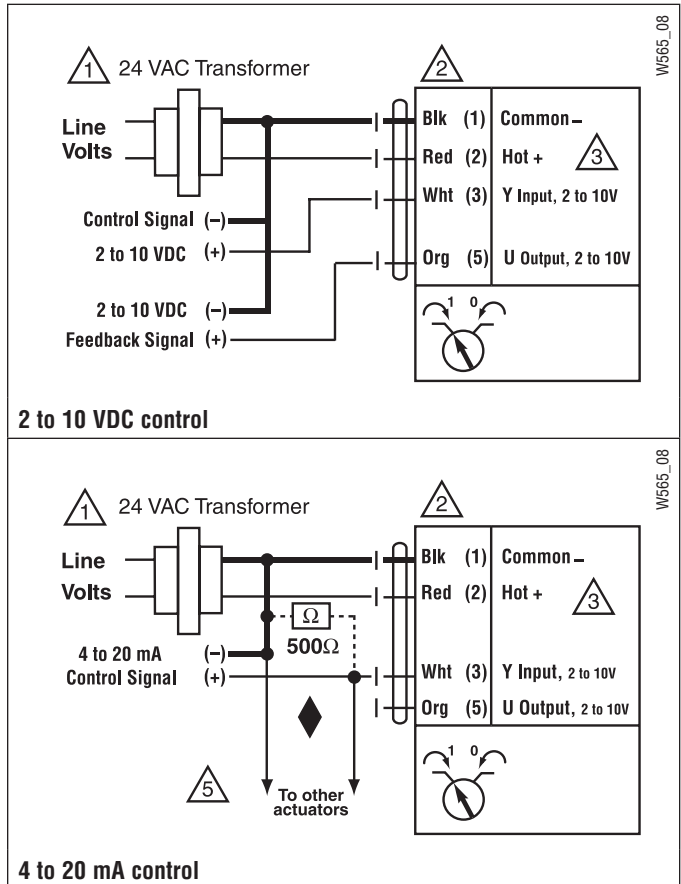
- 1 Provide overload protection and disconnect as required.
- 2 **CAUTION Equipment damage!**  
Actuators may be connected in parallel.  
Power consumption and input impedance must be observed.
- 3 Actuators may also be powered by 24 VDC.
- 5 Only connect common to neg. (-) leg of control circuits.

#### 📄 APPLICATION NOTES

- ◆ The ZG-R01 500 Ω resistor converts the 4 to 20 mA control signal to 2 to 10 VDC, up to 2 actuators may be connected in parallel.

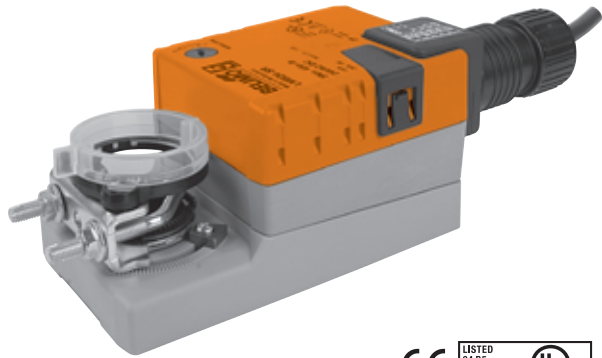
#### ⚠ WARNING Live Electrical Components!

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# LMCB24-SR(-T)

Proportional Control, Non-Spring Return, Direct Coupled, 24V, for 2 to 10 VDC and 4 to 20 mA



Technical Data	LMCB24-SR(-T)
Power Supply	24 VAC $\pm$ 20% 50/60 Hz 24 VDC $\pm$ 10%
Power Consumption	1.5 W (0.4 W)
Transformer Sizing	3 VA (Class 2 power source)
Electrical Connection	3 ft, 18 GA plenum rated cable 1/2" conduit connector Protected NEMA 2 (IP54)
Overload Protection	electronic throughout 0 to 95° rotation
Operating Range Y	2 to 10 VDC, 4 to 20 mA
Input Impedance	100 k $\Omega$ (0.1 mA), 500 $\Omega$
Feedback Output U	2 to 10 VDC (max 0.5 mA)
Angle of Rotation	max. 95°, adjust. with mechanical stop
Torque	45 in-lb [5 Nm]
Direction of Rotation	reversible with  switch Actuator will move: =CCW with decreasing control signal (10 to 2V) =CW with decreasing control signal (10 to 2V)
Position Indication	reflective visual indicator (snap-on)
Manual Override	external push button
Running Time	35 seconds, constant independent of load
Humidity	5 to 95% RH non condensing (EN 60730-1)
Ambient Temperature	-22°F to 122°F [-30°C to 50°C]
Storage Temperature	-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 UL 60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2004/108/EEC and 2006/95/EC
Noise Level	<45dB(A)
Servicing	maintenance free
Quality Standard	ISO 9001
Weight	1.1 lbs [0.5 Kg]

LMCB24-SR-T	
Electrical connection	screw terminal (for 26 to 14 GA wire)
Housing	NEMA 2/IP20

†Rated Impulse Voltage 800V, Type of action 1, Control Pollution Degree 3.

Torque min. 45 in-lb for control of damper surfaces up to 11 sq ft.

## Models

LMCB24-SR  
LMCB24-SR-T

## 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 1/4" up to 5/8" in diameter by means of its universal clamp. Shafts up to 3/4" diameter can be accommodated by an accessory clamp.

The actuator operates in response to a 2 to 10 VDC, or with the addition of a 500  $\Omega$  resistor, a 4 to 20 mA control input from an electronic controller or positioner. A 2 to 10 VDC feedback signal is provided for position indication or master-slave applications.

## 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.

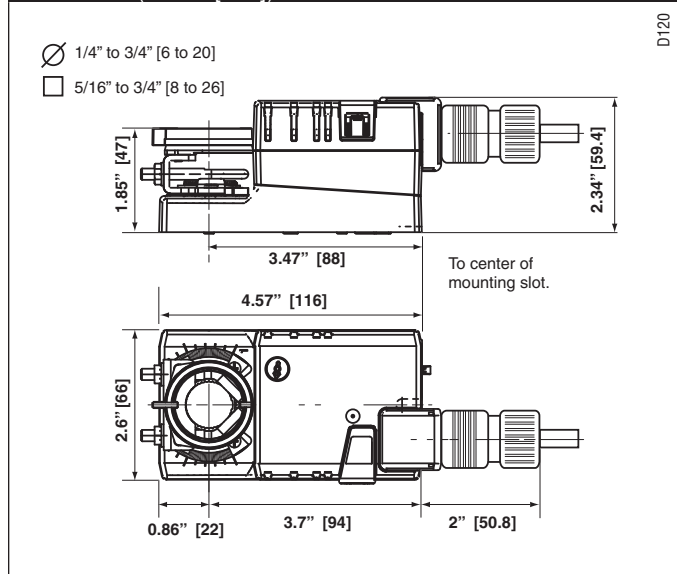
The LMB series provides 95° of rotation and a visual indicator indicates position of the actuator. When reaching the damper or actuator end position, the actuator automatically stops.

The gears can be manually disengaged with a button on the actuator cover.

The LMCB24-SR... actuators use a sensorless 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.

## Dimensions (Inches [mm])



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### Accessories

K-LM20	3/4" [20 mm] Shaft Clamp
AV6-20	Shaft Extension
ZG-LMSA	Shaft Adaptor for 1/2" Diameter Shafts
ZG-LMSA-1	Shaft Adaptor for 3/8" Diameter Shafts
ZS-T	Terminal Cover for NEMA 2
ZS-100	Weather Shield - Steel
ZS-150	Weather Shield - Polycarbonate
Tool-06	8 mm & 10 mm Wrench
S1A, S2A	Auxiliary Switch (es)
P370	Shaft Mount Auxiliary Switch
P...A	Feedback Potentiometers
SGA24	Min positioners in NEMA 4 housing
SGF24	Min positioners for flush panel mounting
PTA-250	Pulse Width Modulation Interface
IRM-100	Input Rescaling Module
ADS-100	Analog to Digital Switch
ZG-R01	Resistor for 4 to 20 mA Conversion
NSV24 US	Battery Back-Up Module
ZG-X40	Transformer

**NOTE:** When using LMCB24-SR... actuators, only use accessories listed on this page.

### Typical Specification

Proportional control damper actuators shall be electronic direct-coupled type, which require no crankarm and linkage and be capable of direct mounting to a shaft from 1/4" to 5/8". Shafts up to 3/4" diameter can be accommodate with an accessory clamp. 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. If required, actuator will be provided with screw terminal strip for electrical connections (LMCB24-SR-T). Run time shall be constant and independent of torque. A 2 to 10 VDC feedback signal shall be provided for position indication. 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 Diagram

#### ✂ INSTALLATION NOTES

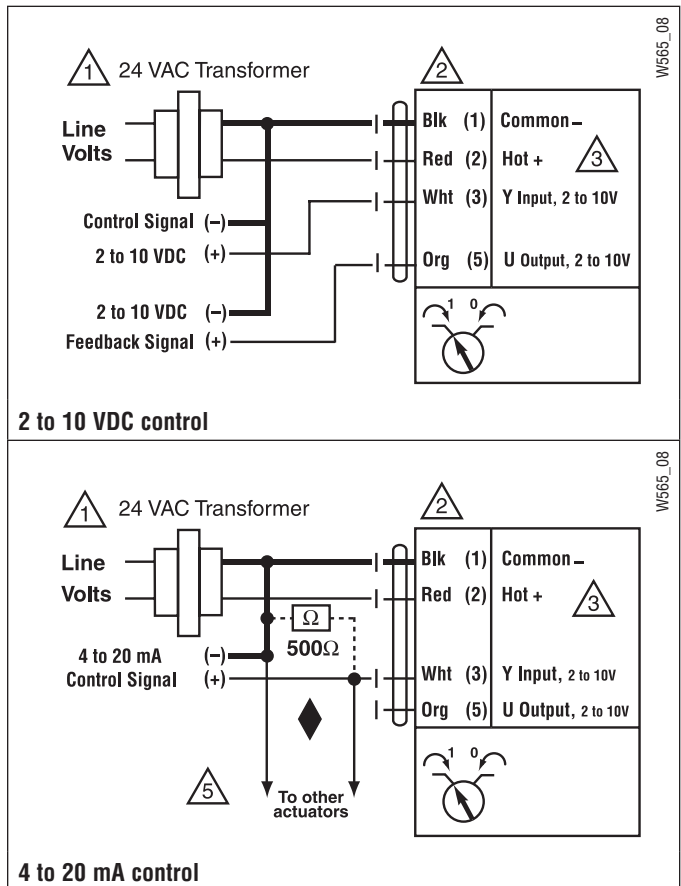
- 1 Provide overload protection and disconnect as required.
- 2 **CAUTION Equipment damage!**  
Actuators may be connected in parallel.  
Power consumption and input impedance must be observed.
- 3 Actuators may also be powered by 24 VDC.
- 5 Only connect common to neg. (-) leg of control circuits.

#### 📄 APPLICATION NOTES

- ◆ The ZG-R01 500 Ω resistor converts the 4 to 20 mA control signal to 2 to 10 VDC, up to 2 actuators may be connected in parallel.

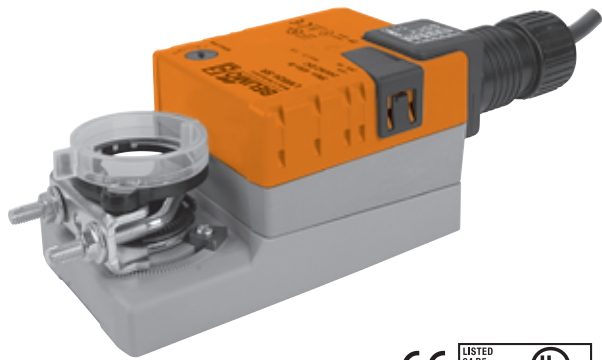
#### ⚠ WARNING Live Electrical Components!

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# LMX24-SR(-T)

Proportional Control, Non-Spring Return, Direct Coupled, 24V, for 2 to 10 VDC and 4 to 20 mA



Technical Data	LMX24-SR(-T)
Power Supply	24 VAC $\pm$ 20% 50/60 Hz 24 VDC $\pm$ 10%
Power Consumption	1.5 W (0.4 W)
Transformer Sizing	3 VA (Class 2 power source)
Electrical Connection	18 GA plenum rated cable 1/2" conduit connector Protected NEMA 2 (IP54) <input type="checkbox"/> 3 ft [1m] <input type="checkbox"/> 10 ft [3m] <input type="checkbox"/> 16 ft [5m]
Overload Protection	electronic throughout 0 to 95° rotation
Operating Range Y	2 to 10 VDC, 4 to 20 mA
Input Impedance	100 k $\Omega$ (0.1 mA), 500 $\Omega$
Feedback Output U	2 to 10 VDC (max 0.5 mA)
Angle of Rotation	max. 95°, adjust. with mechanical stop
Torque	45 in-lb [5 Nm]
Direction of Rotation	reversible with  switch Actuator will move: =CCW with decreasing control signal (10 to 2V) =CW with decreasing control signal (10 to 2V)
Position Indication	reflective visual indicator (snap-on)
Manual Override	external push button
Running Time	<input type="checkbox"/> 150 <input type="checkbox"/> 95 <input type="checkbox"/> 60 <input type="checkbox"/> 45 <input type="checkbox"/> 35 seconds constant independent of load
Humidity	5 to 95% RH non condensing (EN 60730-1)
Ambient Temperature	-22°F to 122°F [-30°C to 50°C]
Storage Temperature	-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 UL 60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2004/108/EEC and 2006/95/EC
Noise Level	<35dB(A)
Servicing	maintenance free
Quality Standard	ISO 9001
Weight	1.1 lbs [0.5 Kg]
<b>LMX24-SR-T</b>	
Electrical connection	screw terminal (for 26 to 14 GA wire) <input type="checkbox"/> unprotected (NEMA 1/IP20) <input type="checkbox"/> protected (NEMA 2/IP20)

†Rated Impulse Voltage 800V, Type of action 1, Control Pollution Degree 3.

Torque min. 45 in-lb for control of damper surfaces up to 11 sq ft.

## Models

LMX24-SR  
LMX24-SR-T

## 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 1/4" up to 5/8" in diameter by means of its universal clamp. Shafts up to 3/4" diameter can be accommodated by an accessory clamp.

The actuator operates in response to a 2 to 10 VDC, or with the addition of a 500  $\Omega$  resistor, a 4 to 20 mA control input from an electronic controller or positioner. A 2 to 10 VDC feedback signal is provided for position indication or master-slave applications.

## 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.

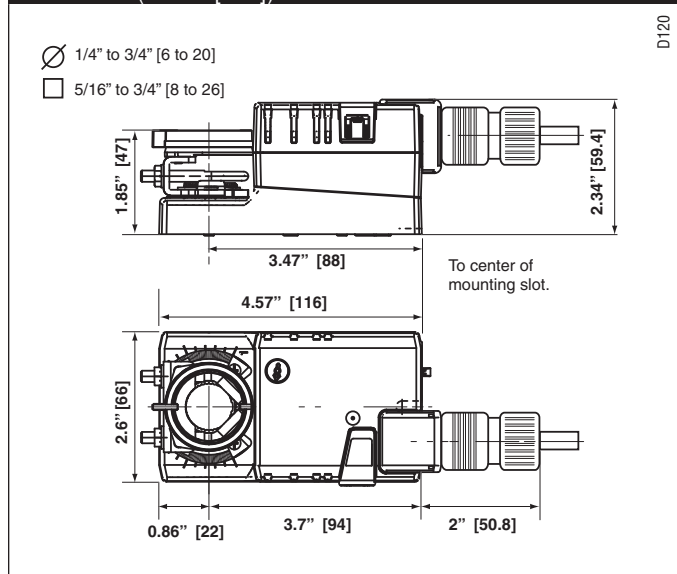
The LMX series provides 95° of rotation and a visual indicator indicates position of the actuator. When reaching the damper or actuator end position, the actuator automatically stops.

The gears can be manually disengaged with a button on the actuator cover.

The LMX24-SR... actuators use a sensorless 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.

## Dimensions (Inches [mm])



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Accessories	
K-LM20	3/4" [20 mm] Clamp
AV6-20	Shaft Extension
ZG-LMSA	Shaft Adaptor for 1/2" Diameter Shafts
ZG-LMSA-1	Shaft Adaptor for 3/8" Diameter Shafts
ZS-T	Terminal Cover for NEMA 2
ZS-100	Weather Shield - Steel
ZS-150	Weather Shield - Polycarbonate
Tool-06	8 mm & 10 mm Wrench
S1A, S2A	Auxiliary Switch (es)
P370	Shaft Mount Auxiliary Switch
P...A	Feedback Potentiometers
SGA24	Min positioners in NEMA 4 housing
SGF24	Min positioners for flush panel mounting
PTA-250	Pulse Width Modulation Interface
IRM-100	Input Rescaling Module
ADS-100	Analog to Digital Switch
ZG-R01	Resistor for 4 to 20 mA Conversion
NSV24 US	Battery Back-Up Module
ZG-X40	Transformer

**NOTE:** When using LMX24-SR... actuators, only use accessories listed on this page.

**Typical Specification**

Proportional control damper actuators shall be electronic direct-coupled type, which require no crankarm and linkage and be capable of direct mounting to a shaft from 1/4" to 5/8". Shafts up to 3/4" diameter can be accommodate with an accessory clamp. 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. If required, actuator will be provided with screw terminal strip for electrical connections (LMX24-SR-T). Run time shall be constant and independent of torque. A 2 to 10 VDC feedback signal shall be provided for position indication. 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 Diagram**

**INSTALLATION NOTES**

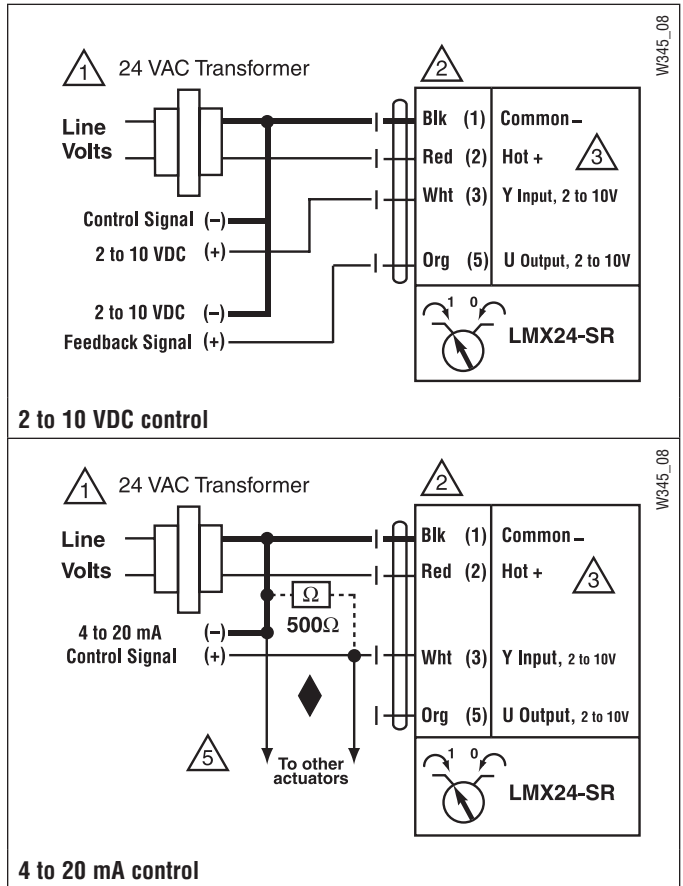
- 1 Provide overload protection and disconnect as required.
- 2 **CAUTION Equipment damage!** Actuators may be connected in parallel. Power consumption and input impedance must be observed.
- 3 Actuators may also be powered by 24 VDC.
- 5 Only connect common to neg. (-) leg of control circuits.

**APPLICATION NOTES**

The ZG-R01 500 Ω resistor converts the 4 to 20 mA control signal to 2 to 10 VDC, up to 2 actuators may be connected in parallel.

**WARNING Live Electrical Components!**

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Technical Data		LMX120-SR
Power Supply	nominal	100 to 240 VAC, 50/60 Hz
	tolerance	85 to 265 VAC, 50/60 Hz
Power Consumption		2.5 W (1 W)
Transformer Sizing		4.5 VA (Class 2 power source)
Electrical Connection		18 GA appliance rated cable
		1/2" conduit connector
		Protected NEMA 2 (IP54) □ 3 ft [1m] □ 10 ft [3m] □ 16 ft [5m]
Overload Protection		electronic throughout 0 to 95° rotation
Operating Range Y		2 to 10 VDC, 4 to 20 mA
Input Impedance		100 kΩ (0.1 mA), 500 Ω
Feedback Output U		2 to 10 VDC (max 0.5 mA)
Angle of Rotation		max. 95°, adjust. with mechanical stop
Torque		45 in-lb [5 Nm]
Direction of Rotation		reversible with  switch
		Actuator will move: =CCW with decreasing control signal (10 to 2V) =CW with decreasing control signal (10 to 2V)
Position Indication		reflective visual indicator (snap-on)
Manual Override		external push button
Running Time		□ 150 □ 95 □ 60 □ 45 □ 35 seconds
		constant independent of load
Humidity		5 to 95% RH non condensing (EN 60730-1)
Ambient Temperature		-22°F to 122°F [-30°C to 50°C]
Storage Temperature		-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 UL 60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2004/108/EEC and 2006/95/EC
Noise Level		<35dB(A)
Servicing		maintenance free
Quality Standard		ISO 9001
Weight		1.1 lbs [0.5 Kg]

†Rated Impulse Voltage 800V, Type of action 1, Control Pollution Degree 3.

Torque min. 45 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 1/4" up to 5/8" in diameter by means of its universal clamp. Shafts up to 3/4" diameter can be accommodated by an accessory clamp.

The actuator operates 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. A 2 to 10 VDC feedback signal is provided for position indication or master-slave applications.

## Operation

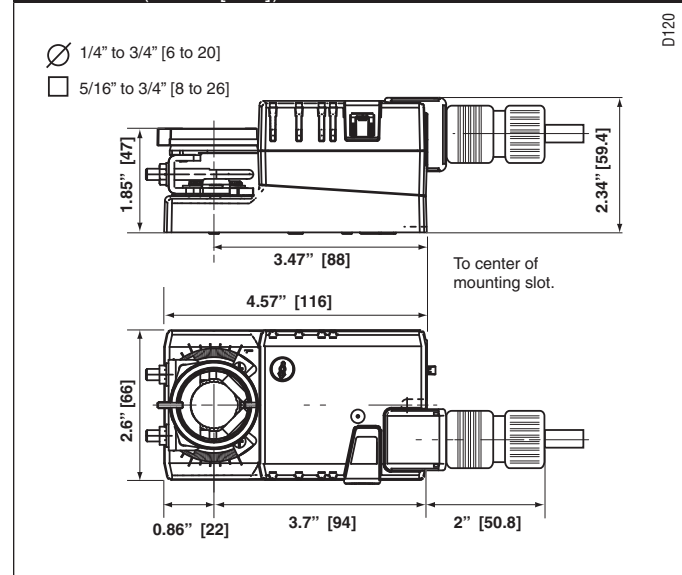
The actuator is not provided with and does not require any limit switches, but is electronically protected against overload. The anti-rotation strap supplied with the actuator will prevent lateral movement.

The LMX 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 LMX120-SR... actuators use a sensorless 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.

## Dimensions (Inches [mm])



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Accessories	
K-LM20	3/4" [20 mm] Shaft Clamp
AV6-20	Shaft Extension
ZG-LMSA	Shaft Adaptor for 1/2" Diameter Shafts
ZG-LMSA-1	Shaft Adaptor for 3/8" Diameter Shafts
ZS-100	Weather Shield - Steel
ZS-150	Weather Shield - Polycarbonate
Tool-06	8 mm & 10 mm Wrench
S1A, S2A	Auxiliary Switch (es)
S1B, S2B	Auxiliary Switch (es)
P370	Shaft Mount Auxiliary Switch
P...A	Feedback Potentiometers
SGA24	Min positioners in NEMA 4 housing
SGF24	Min positioners for flush panel mounting
PTA-250	Pulse Width Modulation Interface
IRM-100	Input Rescaling Module
ADS-100	Analog to Digital Switch
ZG-R01	Resistor for 4 to 20 mA Conversion
NSV24 US	Battery Back-Up Module

**NOTE:** When using LMX120-SR actuators, only use accessories listed on this page.

### Typical Specification

Proportional control damper actuators shall be electronic direct-coupled type, which require no crankarm and linkage and be capable of direct mounting to a shaft from 1/4" to 5/8". 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. A 2 to 10 VDC feedback signal shall be provided for position indication. 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 Diagram

#### ✂ INSTALLATION NOTES

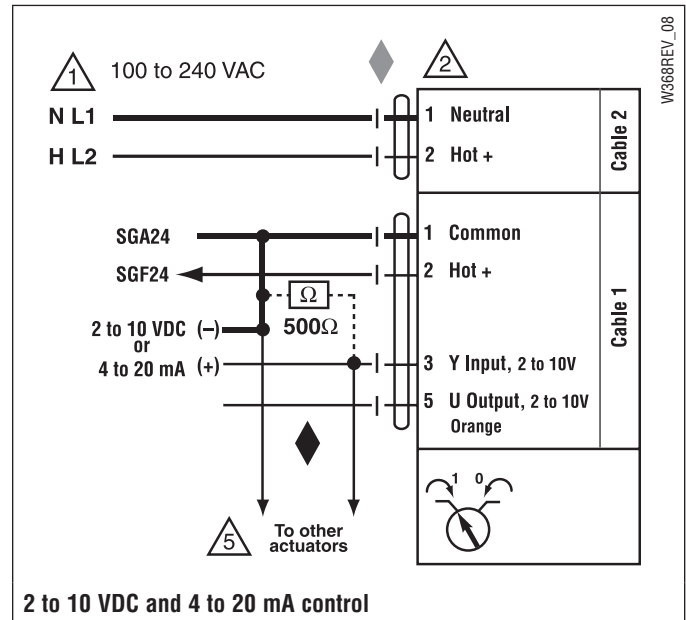
- 1 Provide overload protection and disconnect as required.
- 2 **CAUTION Equipment damage!**  
Actuators may be connected in parallel.  
Power consumption and input impedance must be observed.
- 5 Only connect common to neg. (-) leg of control circuits.

#### 📄 APPLICATION NOTES

- ◆ Meets cULus or UL and CSA Standard requirements without the need of an electrical ground connection.
- ◆ The ZG-R01 500 Ω resistor converts the 4 to 20 mA control signal to 2 to 10 VDC, up to 2 actuators may be connected in parallel.

#### ⚠ WARNING Live Electrical Components!

During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.



# LMB(X)24-MFT

Proportional Control, Non-Spring Return, Direct Coupled, 24V, Multi-Function Technology®



Technical Data	LMBX24-MFT
Power Supply	24 VAC ± 20% 50/60 Hz 24 VDC ± 10%
Power Consumption	2.5 W (1.2 W)
Transformer Sizing	5 VA (Class 2 power source)
Electrical Connection	18 GA plenum rated cable 1/2" conduit connector Protected NEMA 2 (IP54) □ 3 ft [1m] □ 10 ft [3m] □ 16 ft [5m]
Overload Protection	electronic throughout 0 to 95° rotation
Operating Range Y	2 to 10 VDC, 4 to 20 mA (default) Variable (VDC, PWM, Floating Point, On/Off)
Input Impedance	100 kΩ (0.1 mA), 500 Ω 1500 Ω (PWM, Floating Point, On/Off)
Feedback Output U	2 to 10 Vdc, 0.5mA max VDC Variable
Angle of Rotation	max. 95°, adjust. with mechanical stop electronically variable
Torque	45 in-lb [5 Nm]
Direction of Rotation	reversible with  switch
Position Indication	reflective visual indicator (snap-on)
Manual Override	external push button
Running Time	150 seconds (default) Variable (35 to 150 secs)
Humidity	5 to 95% RH non condensing (EN 60730-1)
Ambient Temperature	-22°F to 122°F [-30°C to 50°C]
Storage Temperature	-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 UL 60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2004/108/EEC and 2006/95/EC
Noise Level	<35dB(A)
Servicing	maintenance free
Quality Standard	ISO 9001
Weight	1.5 lbs [0.7 Kg]

Torque min. 45 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 1/4" up to 5/8" in diameter by means of its universal clamp. Shafts up to 3/4" diameter can be accommodated by an accessory 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.

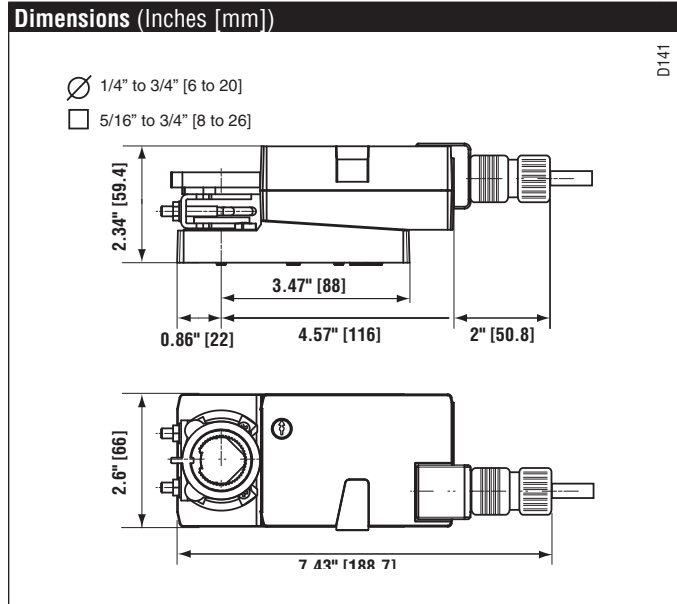
## Operation

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 LMB(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 LMB(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.



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Accessories	
K-LM20	3/4" [20 mm] Shaft Clamp
AV6-20	Shaft Extension
ZG-LMSA	Shaft Adaptor for 1/2" Diameter Shafts
ZG-LMSA-1	Shaft Adaptor for 3/8" Diameter Shafts
ZS-100	Weather Shield - Steel
ZS-150	Weather Shield - Polycarbonate
Tool-06	8 mm & 10 mm Wrench
S1A, S2A	Auxiliary Switch (es)
P370	Shaft Mount Auxiliary Switch
P...A	Feedback Potentiometers
SGA24	Min positioners in NEMA 4 housing
SGF24	Min positioners for flush panel mounting
ADS-100	Analog to Digital Switch
ZG-R01	Resistor for 4 to 20 mA Conversion
NSV24 US	Battery Back-Up Module
ZG-X40	Transformer

NOTE: When using LMB(X)24-MFT actuators, only use accessories listed on this page.

**Typical Specification**

Proportional control damper actuators shall be electronic direct-coupled type, which require no crankarm and linkage and be capable of direct mounting to a shaft from 1/4" to 5/8". Actuators must provide control in response to a 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**

**INSTALLATION NOTES**

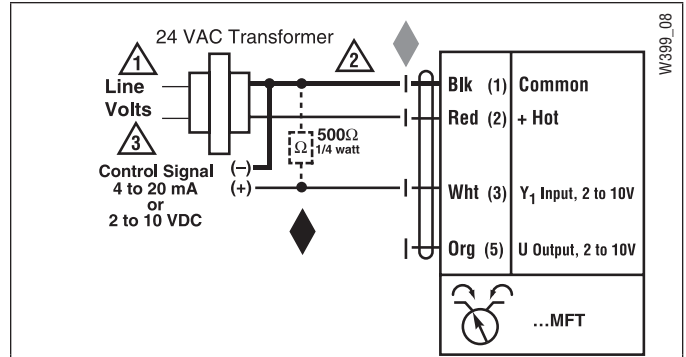
- 1 Provide overload protection and disconnect as required.
- 2 **CAUTION Equipment damage!**  
Actuators may be connected in parallel if not mechanically mounted to the same shaft. Power consumption and input impedance must be observed.
- 3 Actuators may also be powered by 24 VDC.
- 4 Position feedback cannot be used with Triac sink controller. The actuator internal common reference is not compatible.
- 5 Control signal may be pulsed from either the Hot (source) or the Common (sink) 24 VAC line.
- 8 Contact closures A & B also can be triacs.
- 9 For triac sink the common connection from the actuator must be connected to the hot connection of the controller.

**APPLICATION NOTES**

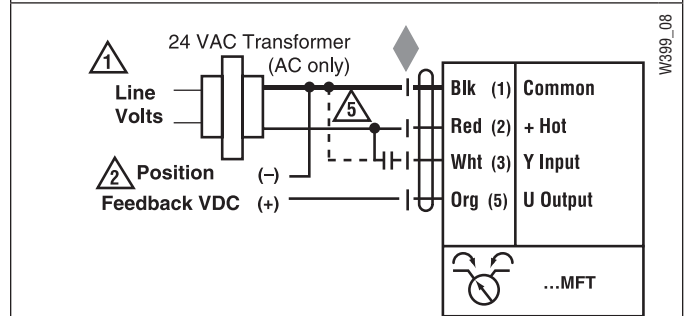
- ◆ The ZG-R01 500 Ω resistor may be used.

**WARNING Live Electrical Components!**

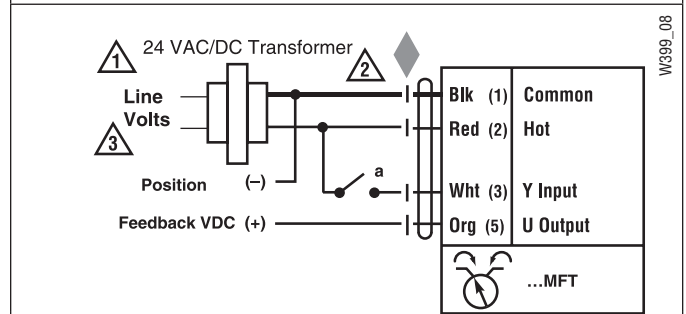
During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.



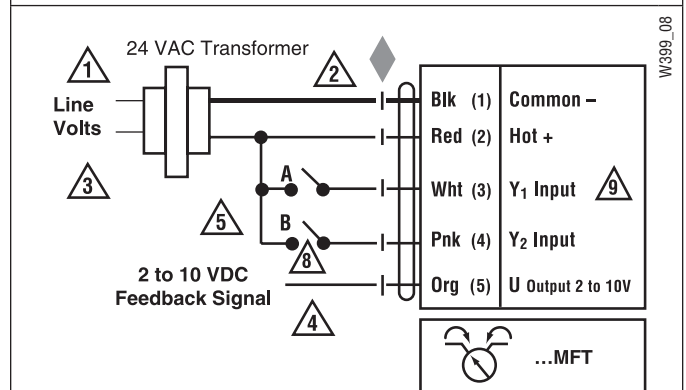
VDC/4-20 mA



PWM



On/Off control



Floating Point control

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MFT



Technical Data	LMX24-MFT95
Power Supply	24 VAC ± 20% 50/60 Hz 24 VDC ± 10%
Power Consumption	2.5 W (1.2 W)
Transformer Sizing	5 VA (Class 2 power source)
Electrical Connection	18 GA plenum rated cable 1/2" conduit connector Protected NEMA 2 (IP54) □ 3 ft [1m] □ 10 ft [3m] □ 16 ft [5m]
Overload Protection	electronic throughout 0 to 95° rotation
Operating Range WRB	0 to 135 Ω Honeywell Electronic Series 90, 0 to 135 Ω Input
Feedback Output U	2 to 10 VDC, 0.5 mA max, VDC Variable
Angle of Rotation	max. 95°, adjust. with mechanical stop electronically variable
Torque	45 in-lb [5 Nm]
Direction of Rotation	reversible with  switch
Position Indication	reflective visual indicator (snap-on)
Manual Override	external push button
Running Time	150 seconds (default) Variable (35 to 150 secs)
Humidity	5 to 95% RH non condensing (EN 60730-1)
Ambient Temperature	-22°F to 122°F [-30°C to 50°C]
Storage Temperature	-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 UL 60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2004/108/EEC and 2006/95/EC
Noise Level	<35dB(A)
Servicing	maintenance free
Quality Standard	ISO 9001
Weight	1.5 lbs [0.7 Kg]

†Rated Impulse Voltage 800V, Type of action 1, Control Pollution Degree 3.

Torque min. 45 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 1/4" up to 5/8" in diameter by means of its universal clamp. Shafts up to 3/4" diameter can be accommodated by an accessory clamp.

The default parameters for 0 to 135 Ω input applications of the ...MFT95 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.

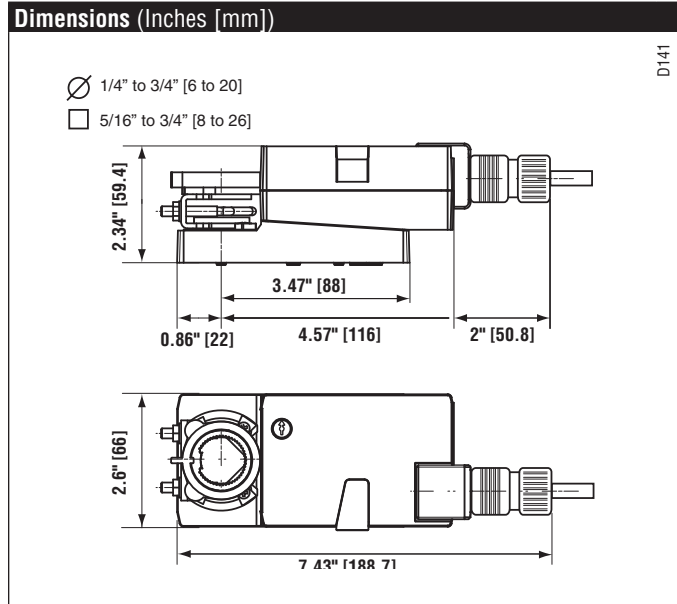
## Operation

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 LMX 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 LMX24-MFT95 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.



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### Accessories

K-LM20	3/4" [20 mm] Shaft Clamp
AV6-20	Shaft Extension
ZG-LMSA	Shaft Adaptor for 1/2" Diameter Shafts
ZG-LMSA-1	Shaft Adaptor for 3/8" Diameter Shafts
ZS-100	Weather Shield - Steel
ZS-150	Weather Shield - Polycarbonate
Tool-06	8 mm & 10 mm Wrench
S1A, S2A	Auxiliary Switch (es)
P370	Shaft Mount Auxiliary Switch
P...A	Feedback Potentiometers
NSV24 US	Battery Back-Up Module
ZG-X40	Transformer

**NOTE:** When using LMX24-MFT95 actuators, only use accessories listed on this page.

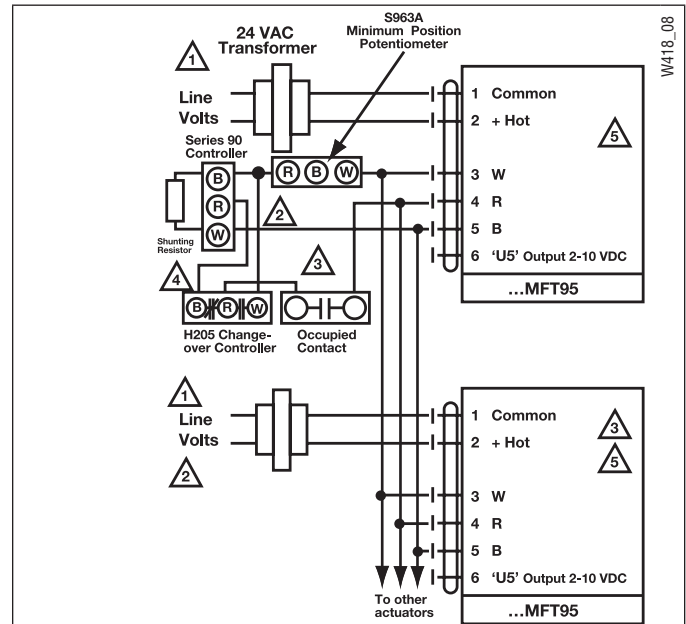
### Typical Specification

Proportional control damper actuators shall be electronic direct-coupled type, which require no crankarm and linkage and be capable of direct mounting to a shaft from 1/4" to 5/8". Actuators must provide control in response to a 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.

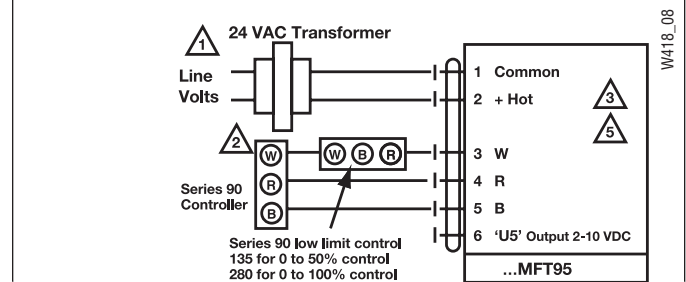
### Wiring Diagrams

#### ✂ INSTALLATION NOTES

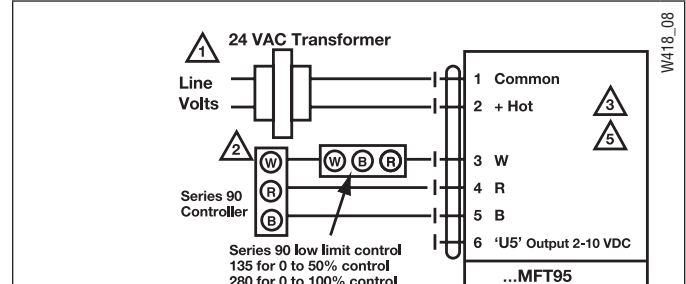
- 1 Provide overload protection and disconnect as required.
- 2 Actuators and controller must have separate transformers.
- 3 Consult controller instruction data for more detailed installation information.
- 4 Resistor value depends on the type of controller and the number of actuators. No resistor is used for one actuator. Honeywell resistor kits may also be used.
- 5 To reverse control rotation, use the reversing switch.



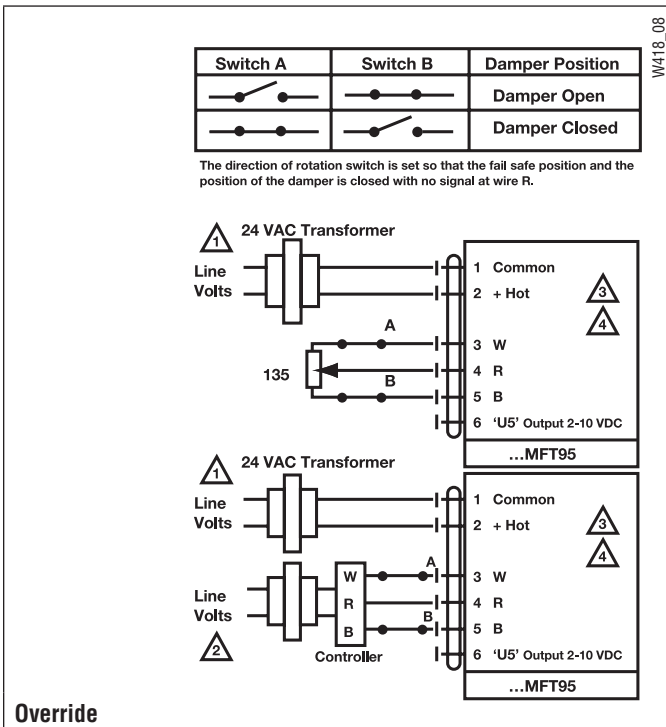
**Wiring multiple actuators to a Series 90 controller using a minimum position potentiometer.**



**Low Limit Control**



**High Limit Control**



**Override**

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MFT



Technical Data	LMX24-PC
Power Supply	24 VAC ± 20% 50/60 Hz 24 VDC ± 10%
Power Consumption	2.5 W (1.2 W)
Transformer Sizing	5 VA (Class 2 power source)
Electrical Connection	18 GA plenum rated cable 1/2" conduit connector Protected NEMA 2 (IP54) □ 3 ft [1m] □ 10 ft [3m] □ 16 ft [5m]
Overload Protection	electronic throughout 0 to 95° rotation
Operating Range Y	0 to 20V phasecut
Input Impedance	8 kΩ (50 mW)
Feedback Output U	2 to 10 VDC, 0.5 mA max
Angle of Rotation	max. 95°, adjust. with mechanical stop electronically variable
Torque	45 in-lb [5 Nm]
Direction of Rotation	reversible with  switch
Position Indication	reflective visual indicator (snap-on)
Manual Override	external push button
Running Time	150 seconds (default)
Humidity	5 to 95% RH non condensing (EN 60730-1)
Ambient Temperature	-22°F to 122°F [-30°C to 50°C]
Storage Temperature	-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 UL 60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2004/108/EEC and 2006/95/EC
Noise Level	<35dB(A)
Servicing	maintenance free
Quality Standard	ISO 9001
Weight	1.5 lbs [0.7 Kg]

†Rated Impulse Voltage 800V, Type of action 1, Control Pollution Degree 3.

Torque min. 45 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 1/4" up to 5/8" in diameter by means of its universal clamp. Shafts up to 3/4" diameter can be accommodated by an accessory clamp.

The actuator operates in response to 0 to 20V phasecut control input from an electronic controller or positioner. A 2 to 10 VDC feedback signal is provided for position indication.

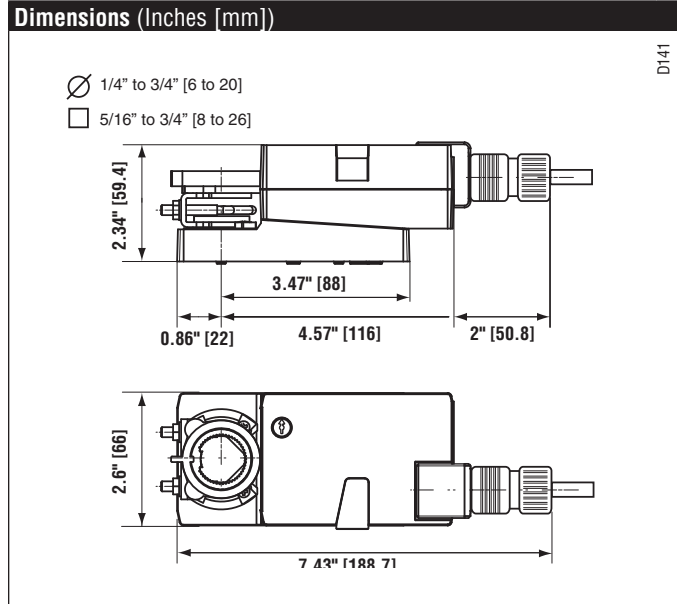
## Operation

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 LMX 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 LMX24-PC 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.



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Accessories	
K-LM20	3/4" [20 mm] Shaft Clamp
AV6-20	Shaft Extension
ZG-LMSA	Shaft Adaptor for 1/2" Diameter Shafts
ZG-LMSA-1	Shaft Adaptor for 3/8" Diameter Shafts
ZS-100	Weather Shield - Steel
ZS-150	Weather Shield - Polycarbonate
Tool-06	8 mm & 10 mm Wrench
S1A, S2A	Auxiliary Switch (es)
P370	Shaft Mount Auxiliary Switch
P...A	Feedback Potentiometers
NSV24 US	Battery Back-Up Module
ZG-X40	Transformer

**NOTE:** When using LMX24-PC actuators, only use accessories listed on this page.

### Typical Specification

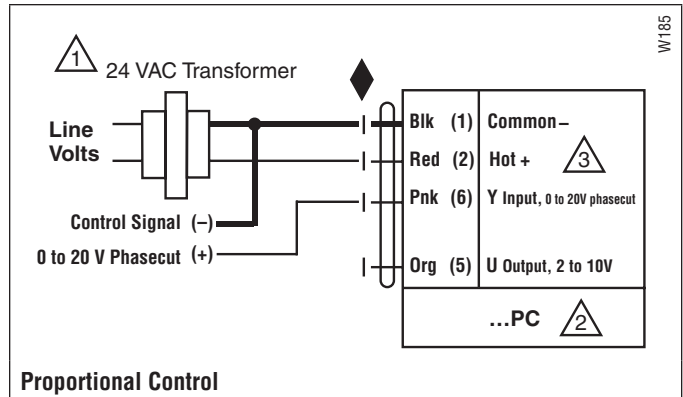
Proportional control damper actuators shall be electronic direct-coupled type, which require no crankarm and linkage and be capable of direct mounting to a shaft from 1/4" to 5/8". Actuators must provide control in response to a control input from an electronic controller or positioner. Actuators shall 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

#### ✂ INSTALLATION NOTES

- 1 Provide overload protection and disconnect as required.
- 2 **CAUTION Equipment damage!**  
Actuators may be connected in parallel.  
Power consumption and input impedance must be observed.
- 3 Actuators may also be powered by 24 VDC.

**⚠ WARNING Live Electrical Components!**  
During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.



# LMQB(X)24-1

On/Off Control, Non-Spring Return, Direct Coupled, 24V



Technical Data	LMQB(X)24-1
Power Supply	24 VAC $\pm$ 20% 50/60 Hz 24 VDC $\pm$ 10%
Power Consumption	12 W (1.5 W)
Transformer Sizing	18 VA (Class 2 power source) (Imax 20A@5ms)
Electrical Connection	
LMQB24-1	3 ft [1m] 18 GA plenum rated cable Protected NEMA 2 (IP54)
LMQX24-1	18 GA plenum rated cable Protected NEMA 2 (IP54) □ 3 ft [1m] □ 10 ft [3m] □ 16 ft [5m]
Overload Protection	electronic throughout 0 to 95° rotation
Control	On/Off
Input Impedance	1000 $\Omega$
Angle of Rotation	min. 30°, max. 95°, adjust. with mechanical stop
Torque	35 in-lb [4 Nm]
Direction of Rotation	reversible with switch
Position Indication	reflective visual indicator (snap-on)
Manual Override	external push button
Running Time	
LMQB24-1	2.5 seconds constant independent of load
LMQX24-1	2.5, 5 or 10 seconds constant independent of load
Humidity	5 to 95% RH non-condensing (EN 60730-1)
Ambient Temperature	-22°F to 122°F [-30°C to 50°C]
Storage Temperature	-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 UL 60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2004/108/EEC and 2006/95/EC
Noise Level	<52 dB(A)
Servicing	maintenance free
Quality Standard	ISO 9001
Weight	1.8 lbs [0.85 kg]

Rated Impulse Voltage 800V, Type of action 1, (1.B for -S version), Control Pollution Degree 3.

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

## Application

For On/Off control 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 standard universal clamp.

## Operation

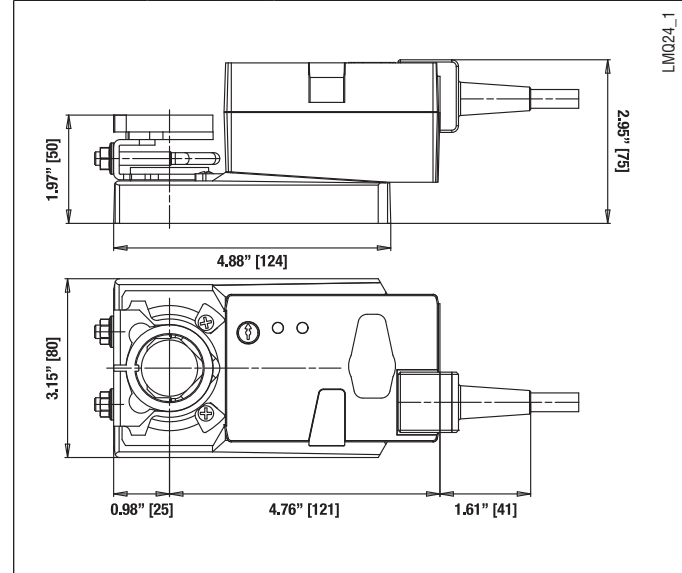
The actuator is not provided with and does not require any limit switches, but is electronically protected against overload. The anti-rotation strap supplied with the actuator will prevent lateral movement.

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

The LMQB(X)24-1 actuators use a sensorless 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.

## Dimensions (Inches [mm])



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#### Accessories

K-NA	Reversible Clamp
ZG-101	Universal Mounting Bracket
ZG-104	Universal Mounting Bracket
ZG-NMA	Crankarm Adapter Kit
AU8-25	Universal Shaft Extension
ZS-100	Weather Shield - Steel
ZS-150	Weather Shield - Polycarbonate
Tool-06	8 mm & 10 mm Wrench
S1A, S2A	Auxiliary Switch (es)
P370	Shaft Mount Auxiliary Switch
P...A	Feedback Potentiometers

**NOTE:** When using LMQB(X)24-1 actuators, only use accessories listed on this page.

#### Typical Specification

On/Off control damper actuators shall be electronic direct-coupled type, which require no crankarm and linkage and be capable of direct mounting to a shaft from ½" to 1.05". 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. Actuators with auxiliary switches must be constructed to meet the requirements for double insulation so an electrical ground is not required to meet agency listings. 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

##### ✂️ INSTALLATION NOTES

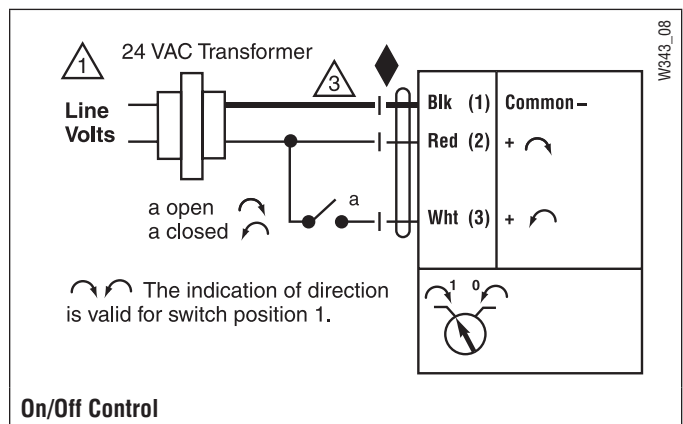
- ⚠️ 1 Provide overload protection and disconnect as required.
- ⚠️ 3 Actuators may also be powered by 24 VDC.

##### 📄 APPLICATION NOTES

- ◆ Meets cULus or UL and CSA Standard requirements without the need of an electrical ground connection.

##### ⚠️ WARNING Live Electrical Components!

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MFT



Technical Data	LMQB(X)24-MFT
Power Supply	24 VAC ±20% 50/60 Hz 24 VDC ±10%
Power Consumption	12 W (1.5 W)
Transformer Sizing	18 VA (Class 2 power source) (Imax 20A@5ms)
Electrical Connection	
LMQB24-MFT	3 ft [1m] 18 GA plenum rated cable Protected NEMA 2 (IP54)
LMQX24-MFT	□ 3 ft [1m] □ 10 ft [3m] □ 16 ft [5m] 18 GA plenum rated cable Protected NEMA 2 (IP54)
Overload Protection	electronic throughout 0 to 95° rotation
Operating Range Y	2 to 10 VDC, 4 to 20 mA (default)
Variable (VDC, On/Off)	On/Off
Input Impedance	100 kΩ (0.1 mA), 500 Ω, 1000 Ω (On/Off)
Feedback Output U	2 to 10 VDC, 0.5mA max, VDC Variable
Angle of Rotation	min. 30°, max. 95°, adjust. with mechanical stop electronically variable
Torque	35 in-lb [4 Nm]
Direction of Rotation	reversible with  switch
Position Indication	reflective visual indicator (snap-on)
Manual Override	external push button
Running Time	
LMQB24-1	2.5 seconds
LMQX24-1	2.5, 5 or 10 seconds
Humidity	5 to 95% RH non-condensing (EN 60730-1)
Ambient Temperature	-22°F to 122°F [-30°C to 50°C]
Storage Temperature	-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 UL 60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2004/108/EEC and 2006/95/EC
Noise Level	<52 dB(A)
Servicing	maintenance free
Quality Standard	ISO 9001
Weight	1.8 lbs [0.85 kg]

Rated Impulse Voltage 800V, Type of action 1, Control Pollution Degree 3.

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 ½" 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

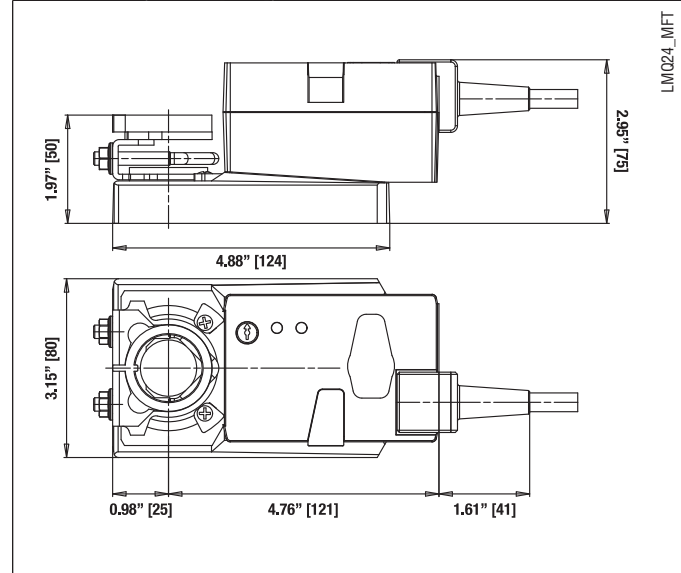
The actuator is not provided with and does not require any limit switches, but is electronically protected against overload. The anti-rotation strap supplied with the actuator will prevent lateral movement.

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.

## Dimensions (Inches [mm])



K20901 - 01/09 - Subject to change. © Belimo Aircontrols (USA), Inc.

Accessories	
K-NA	Reversible Clamp
AV8-25	Universal Shaft Extension
ZG-NMA	Shaft Adaptor
ZG-LMSA-1	Shaft Adaptor for 3/4" Diameter Shafts
ZS-100	Weather Shield - Steel
ZS-150	Weather Shield - Polycarbonate
Tool-06	8 mm & 10 mm Wrench
S1A, S2A	Auxiliary Switch(es)
P370	Shaft Mount Auxiliary Switch
P...A	Feedback Potentiometers
SGA24	Min positioners in NEMA 4 housing
SGF24	Min positioners for flush panel mounting
ADS-100	Analog to Digital Switch
ZG-R01	Resistor for 4 to 20 mA Conversion
NSV24	US Battery Back-Up Module
ZG-X40	Transformer

**NOTE:** When using LMQB(X)24-MFT actuators, only use accessories listed on this page.

### Typical Specification

Proportional control damper actuators shall be electronic direct-coupled type, which require no crankarm and linkage and be capable of direct mounting to a shaft from 1/4" to 5/8". Actuators must provide control in response to a 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

#### ✂ INSTALLATION NOTES

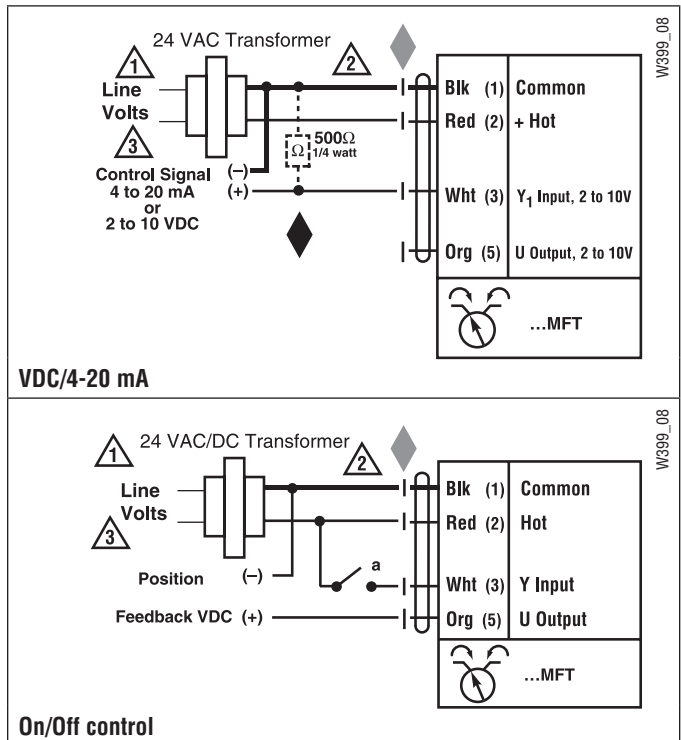
- 1 Provide overload protection and disconnect as required.
- 2 **CAUTION Equipment damage!**  
Actuators may be connected in parallel. Power consumption and input impedance must be observed.
- 3 Actuators may also be powered by 24 VDC.
- 5 Control signal may be pulsed from either the Hot (source) or the Common (sink) 24 VAC line.

#### 📄 APPLICATION NOTES

- ◆ The ZG-R01 500 Ω resistor may be used.

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## Application

The -HM series of actuators are intended for retrofit of Belimo LM24-M and LM24-10P-M actuators used in OEM VAV controllers that have reached the end of their service life. These actuators are specifically designed as a drop-in replacement without any alteration to the existing VAV system.

## Operation

The actuator is mounted in the same location as the current actuator and mates directly to the damper shaft by means of the standard universal clamp. The existing 5 pin Molex connector plugs directly into the replacement actuator and 24 VAC/DC power is applied via a separate plenum rated power cable.

The -HM series utilize Belimo brushless Halomo motor technology. This motor drive technology monitors and controls the actuator position based on an input signal from the VAV controller. When reaching an end position, the actuator automatically stops and reports this condition to the VAV controller. Power consumption is reduced when in holding mode.

## Models

LMB24-HM  
LMB24-10P-HM

Technical Data	LMB24-HM (10P-HM)
Power supply	24 VAC +/- 20% 50/60 Hz 24 VDC +/- 10%
Power consumption	1.5 W (0.2 W)
Transformer sizing	2 VA (Class 2 power source)
Electrical connection	5 pin male Molex connector (Control Signal) 18 GA, 2 Conductor Plenum rated cable for power
Overload protection	Electronic throughout 0 to 95° rotation
Angle of rotation	Max. 95°, adjust with mechanical stop
Torque	45 in-lb
Position indication	Reflective visual indicator (snap-on)
Manual override	External push button
Running time	95 seconds, constant independent of load
Humidity	5 to 95% RH non-condensing (EN 60730-1)
Ambient temperature	-22°F to +122°F [-30°C to +50°C]
Storage temperature	-40°F to +176°F [-40°C to +80°C]
Housing	NEMA 1/ IP20
Housing material	UL54-5VA
Agency listings	cULus
Noise level	<35dB(A)
Servicing	Maintenance free
Quality standard	ISO 9001
Weight	1.1 lbs [0.5 Kg]
Feedback	
LMB24-10P-HM	10 kΩ, 1W potentiometer

## Accessories

Tool-03	#10 Torx driver
Tool-06	8mm & 10mm wrench

## Wiring Directions

1. Disconnect all wires including power to VAV controller.
2. Remove VAV controller from ductwork.
3. Disconnect 5 pin Molex connector from actuator.
4. Using Belimo Tool-03, remove three screws from back of VAV controller housing and remove old actuator.
5. Place VAV controller housing on flat surface.
6. Place rear (Cable end) of new actuator into the housing actuator tray (**see picture below**) and press down on clamp side of actuator until unit "clicks" into place.
7. Connect 5 pin Molex connector to new actuator.
8. Reinstall OEM VAV controller on ductwork.
9. Reconnect all wires to VAV controller.
10. Connect 24V to actuator cable.



## Wiring Diagrams

### INSTALLATION NOTES

- Provide overload protection and disconnect as required.
- Actuators may also be powered by 24 VDC.

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