



**Performance,  
Reliability and Low  
Power Consumption**

## **Belimo Damper Actuators**



Discover the advantages  
[www.belimo.com](http://www.belimo.com)

**BELIMO**<sup>®</sup>

# Versatile and advanced actuator solutions



Belimo damper actuators are designed for use in a wide variety of HVAC applications for ensuring performance, reliability, and lower power consumption. Our comprehensive torque range (9 to 1,400 in-lbs) is suited for damper sizes as small as 4-inch round allowing the ability to mount on standard damper shafts or directly on jackshafts. Actuators are used for control dampers, air handlers, economizer units, VAV terminal units, fan coil units, fan shutters, and unit ventilators.



# Reliable, safe performance

Belimo actuators utilize rugged components for added strength and reliability with NEMA housing options to meet harsh environmental conditions. The actuator series consists of fail-safe, non-fail safe, airflow measurement and control, and fire and smoke safety. Select models are available with NEMA 4 and 4X housing design to protect in extreme environments. Weather-tight and corrosion-resistant housing for the harshest indoor and outdoor conditions with UV protection. For high humidity or low temperature (-40°F) applications, a heater option is available.

“Belimo makes HVAC control devices that we can trust and provide a long lasting system for our clients.”

**Matt Paonessa, Project Engineer**  
**Andersen Construction, Seattle, WA**



## Optimal System Performance

Belimo's actuator communicates directly with the Building Automation System (BAS) using BACnet, Modbus, or MP-Bus. Select models offer Near Field Communication (NFC) for quick programming, commissioning, and troubleshooting.



## Energy Savings

Patented technology provides higher efficiency with lower power consumption and reduces carbon emissions over the product's life.



## Accuracy and Controllability

Brushless DC motor technology controlled by an ASIC guarantees consistent torque over the entire operating range. No loss in performance due to temperature, supply voltage, or speed.

## Non Fail-Safe Damper Actuators

Belimo non fail-safe damper actuators are designed for use in a wide variety of HVAC damper applications. With our comprehensive torque range from 9 in-lb to 1400 in-lb and the ability to direct mount on standard damper shafts or jackshafts, these solutions are ideal for controlling dampers found in built-up or packaged air handlers, VAV terminal units, fan coil units, and unit ventilators used in hospitals, schools/universities, and data centers.



### FEATURES

- Patented brushless DC motor technology ensuring long reliable operation beyond our 5-year warranty
- Various control types or Belimo's Multi-Function Technology provide a flexible signal solution ranging from individual parameter settings to cost-saving, complete system integration
- Guarantees consistent torque over the entire operating range with no loss in performance due to temperature, supply voltage, or speed
- Mechanical end stops to adjust the angle of rotation for added installation flexibility

For more information on Belimo's Non Fail-Safe Damper Actuators, click or scan below.





**Universal clamp**  
 – Fits a wide range of damper shafts

**Clear position indication**

**Switchable direction of rotation**

**Manual override**

**Operation and servicing**  
 – PC-Tool, and ZTH

**Quick Running**  
 – Speed of 2.5 seconds for 90° at 35 in-lb (4 Nm)  
 7 seconds for 90° at 140 in-lb (16 Nm)

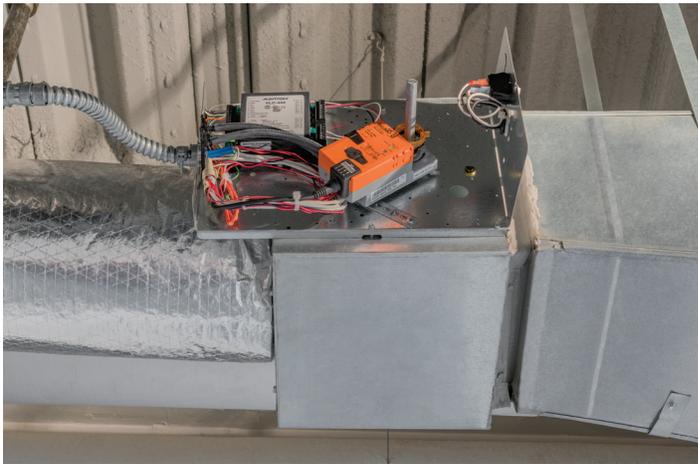
**Communication**  
 – BACnet, Modbus, or MP Bus

| LM                          | Q                                       | B              | 24                            | -1   | Options                          |                                   |
|-----------------------------|---|----------------|-------------------------------|--|----------------------------------|-----------------------------------|
| Torque Rating               | Speed                                   | Version        | Power Required                | Control  | Options                          |                                   |
| <b>Non Fail-Safe Rotary</b> | Q = Quick Running                       | B = Basic      | 24 = AC/DC 24 V, 50/60 Hz     | -1 = On/Off                                      | -T = Terminal Block              | .1 = Bulk Pack                    |
| PM = 1400 in-lb             | C = Fast Running                        | X = Customized |                               | -3 = On/Off, Floating Point                      | Blank = Cable Version            | N4 = NEMA 4/4X                    |
| GM = 360 in-lb              | No Designation = Normal Speed (LMB24-3) |                | 120 = AC 100...240 V 50/60 Hz | -3-P5 = On/Off, Floating Point w/5k Ω Feedback   | -S = Switch                      | X...N4 Types<br>Y = Heater Option |
| AM = 180 in-lb              |   |                | UP = AC 24...240 V*           | -3-P10 = On/Off, Floating Point w/10k Ω Feedback |                                  |                                   |
| NM = 90 in-lb               |   |                |                               |  | -SR = 2...10 V                   |                                   |
| LM = 45 in-lb               |   |                |                               |  | -PC = Phasecut (0.5...20 V)      |                                   |
| CM = 18 in-lb               |   |                |                               |  | -MFT = Multi-Function Technology |                                   |
| UM = 9 in-lb                |   |                |                               | -MFT95 = 0...135 Ω                               |                                  |                                   |
| <b>Non Fail-Safe Linear</b> |   |                |                               | -IP = BACnet/IP, Modbus TCP                      |                                  |                                   |
| AH = 100 lbf                |   |                |                               | -MOD = BACnet MS/TP, Modbus RTU                  |                                  |                                   |
| LH = 34 lbf                 |   |                |                               |  |                                  |                                   |

Note: Q versions have a slightly lower torque rating.  
 \*DC 24...125 V

## Airflow Measurement and Control Damper Actuators

Standalone airflow measurement and control actuators with digital communications are used for rotary, linear, and in-duct applications. The actuator communicates directly with the Building Automation System (BAS) using BACnet, Modbus, or MP-Bus. Select models offer Near Field Communication (NFC) for quick programming, commissioning, and troubleshooting for optimal system performance. Some actuators have pressure independent control characteristics combined with an integrated airflow sensor to calculate and deliver designed flow regardless of pressure fluctuations in the system. Actuators with industry-standard digital communications are the perfect solution for integration in constant or variable air volume systems.

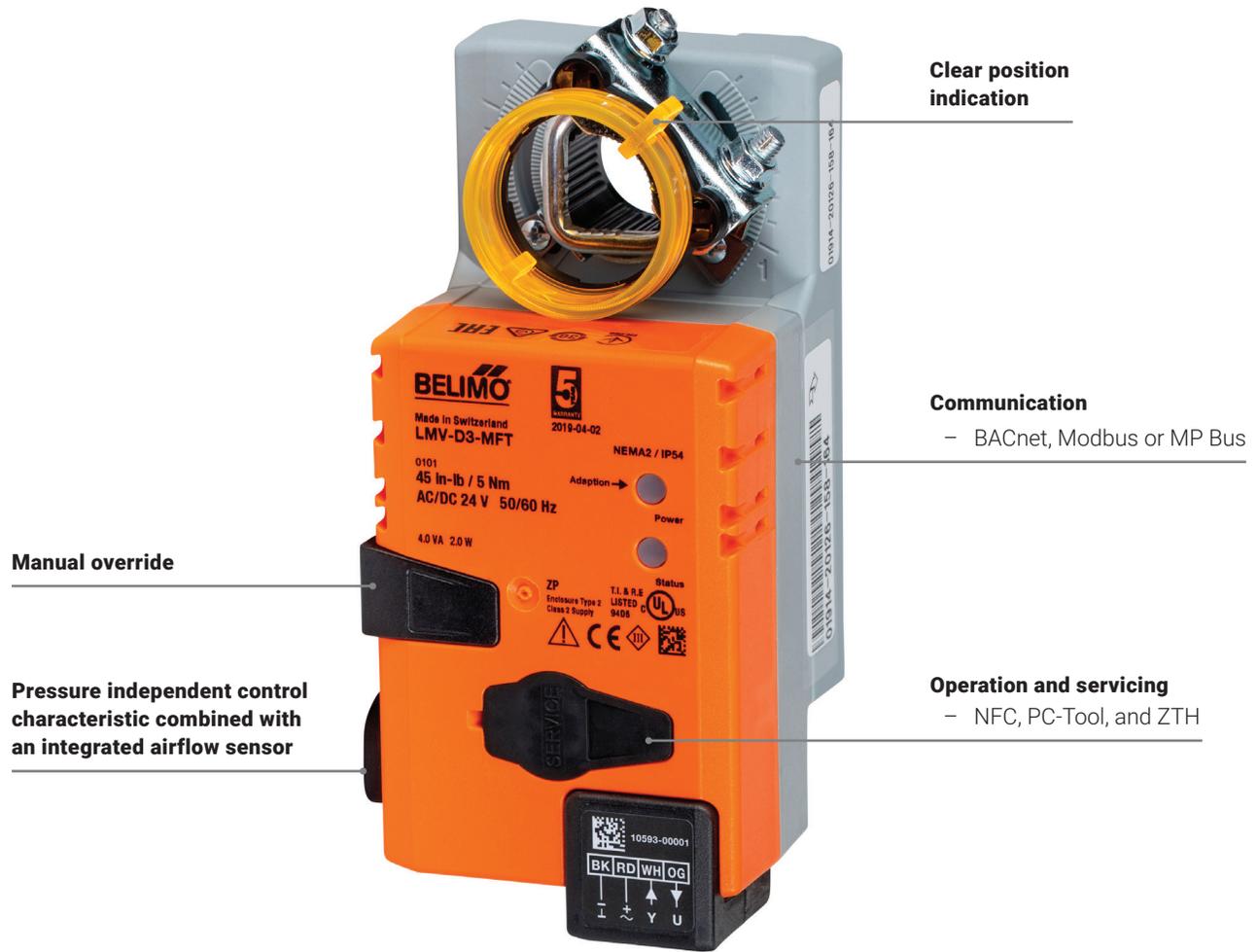


### FEATURES

- Integrated pressure sensor for standalone airflow control for rotary, linear, and in-duct applications
- Linear models with integrated airflow sensor D3 flow sensors for challenging push-pull applications
- Fast commissioning and adjustment on select devices via NFC
- Maintains pressure independent operation eliminating the need for manual balancing, reducing installation and commissioning
- Available control types are compatible with industry standards such as analog, BACnet MS/TP and Modbus RTU

For more information on Belimo's Airflow Measurement and Control Damper Actuators, click or scan below.





| NM                   | V                          | -D3                                   | -MOD                             |
|----------------------|----------------------------|---------------------------------------|----------------------------------|
| <b>Torque Rating</b> | <b>Pressure Dependency</b> | <b>Pressure Sensor</b>                | <b>Control</b>                   |
| Non Fail-Safe Rotary | V = Pressure Independent   | -D3 = D3 Differential Pressure Sensor | -MOD = BACnet MS/TP, Modbus RTU  |
| NM = 90 in-lb        |                            | -M1 = Membrane Differential Pressure  | -MP = Multi Point                |
| LM = 45 in-lb        |                            |                                       | -MFT = Multi-Function Technology |
| Non Fail-Safe Linear |                            |                                       |                                  |
| LH = 34 lbf          |                            |                                       |                                  |

| CMB                   | 24                         | -L                           | 100                          | D                  |                                  |
|-----------------------|----------------------------|------------------------------|------------------------------|--------------------|----------------------------------|
| <b>Torque Rating</b>  | <b>Pressure Dependency</b> | <b>Power Required</b>        | <b>Direction of Rotation</b> | <b>Damper Size</b> | <b>Control</b>                   |
| Non Fail-Safe in Duct | Blank = Pressure Dependent | Blank = AC/DC 24 V, 50/60 Hz | Blank = Selectable           | 100 = 4"           | D = On/Off, Floating Point       |
| CMB = 18 in-lb        | V = Pressure Independent   | 24 = AC/DC 24 V, 50/60 Hz    | -L = Left                    | 125 = 5"           | -MFT = Multi-Function Technology |
|                       |                            |                              |                              | 150 = 6"           |                                  |

## Fail-Safe Damper Actuators

Belimo fail-safe damper actuators provide a comprehensive torque offering from 22 to 1400 in-lb torque with direct-coupled, rotary or linear travel that can handle many HVAC applications. Fail-safe actuators use brushless DC motor technology controlled by an Application Specific Integrated Circuit (ASIC) to provide stall protection, lower power consumption, and higher efficiency, with smaller transformer sizing. A variety of accessories are available to increase application flexibility with more options in mounting and commissioning.



### FEATURES

- Rotary, linear, and quick running product offerings are available for challenging applications
- Patented motor technology with Application Specific Integrated Circuit (ASIC) reduces energy consumption and ensures longevity
- Multi-Function Technology models offer many proportional control functions and DC voltage feedback signals that come programmed from the factory or adjusted in the field
- Electronic fail-safe series offer fail position options (0...100%) that delay unnecessary actuator movements during short brownout conditions avoiding changes in the HVAC and BAS
- Electronically protected against overload increases actuator longevity and reduces maintenance cost
- Available control types are compatible with industry standards such as analog, BACnet MS/TP and Modbus RTU

For more information on Belimo's Fail-Safe Damper Actuators, click or scan below





**MECHANICAL FAIL-SAFE**

| EF             |                      | X              | 24                   | -MFT                                    | -S                             | N4                          |
|----------------|----------------------|----------------|----------------------|---|--------------------------------|-----------------------------|
| Torque Rating  | Speed <sup>†</sup>   | Options        | Power Supply         | Control                                 | Options                        |                             |
| EF = 270 in-lb | C = Fast Running     | B = Basic      | 24 = AC/DC 24 V      | Blank = On/Off                          | -S = Built-in Auxiliary Switch | US                          |
| AF = 180 in-lb | L = Low Noise        | X = Customized | 120 = AC 120 V*      | -3 = Floating Point                     |                                | EF...Series                 |
| NF = 90 in-lb  | Blank = Normal Speed | Blank = None   | 230 = AC 230 V       | -SR = 2...10 V                          |                                | N4 <sup>♦</sup> = NEMA 4/4X |
| LF = 35 in-lb  |                      |                | UP = AC 24...240 V** | -PC = Phasecut (0.5...20 V)             |                                | X...N4 Types                |
| TF = 22 in-lb  |                      |                |                      | -ECON-R03 = 3k Ω NTC Type 10 Thermistor |                                | H = Heater Option           |
|                |                      |                |                      | -MFT = Multi-Function Technology        |                                |                             |
|                |                      |                |                      | -MFT95 = 0...135 Ω                      |                                |                             |
|                |                      |                |                      | -MFT-20 = 6...9 V, 20 V Power Supply    |                                |                             |
|                |                      |                |                      | -IP = BACnet/IP, Modbus TCP             |                                |                             |
|                |                      |                |                      | -MOD = BACnet MS/TP, Modbus RTU         |                                |                             |

♦ NEMA 4 option on select models.  
 † Only available on certain LF and TF models.  
 \*EF and TF series have AC 100...240 V nominal power supply.  
 \*\*DC 24...125 V.

**ELECTRONIC FAIL-SAFE**

| NK              | Q                    | X              | 24                   | -MFT                             |                             |
|-----------------|----------------------|----------------|----------------------|----------------------------------|-----------------------------|
| Torque Rating   | Speed                | Version        | Power Supply         | Control                          |                             |
| PK = 1400 in-lb | Q = Quick Running    | B = Basic      | 24 = AC/DC 24 V*,    | -1 = On/Off                      | -T = Terminal Block         |
| GK = 360 in-lb  | Blank = Normal Speed | X = Customized | UP = AC 24...240 V** | -3 = On/Off, Floating Point      | N4 <sup>♦</sup> = NEMA 4/4X |
| NK = 54 in-lb   |                      |                |                      | -SR = 2...10 V                   | X...N4 Types                |
| AHK = 100 lbf   |                      |                |                      | -MFT = Multi-Function Technology | Y = Heater Option           |
|                 |                      |                |                      | -IP = BACnet/IP, Modbus TCP      |                             |
|                 |                      |                |                      | -MOD = BACnet MS/TP, Modbus RTU  |                             |

♦ NEMA 4 option on select models.  
 \*GK...24-3 is AC 24 V only.  
 \*\*DC 24...125 V

## Fire and Smoke Damper Actuators

Belimo fire and smoke damper actuators are designed for operation in fire, smoke and combination fire and smoke dampers in ventilation and air-conditioning systems with a torque range from 18 in-lb to 180 in-lb @ 350°F. For maximum safety in all situations, the fire and smoke actuators meet all codes for commercial buildings in the U.S., passes UL 555 & UL 555S at 350°F and tested for 30,000 open-closed cycles with approved dampers. Belimo fire and smoke damper actuators exceed UL's requirement of 20,000 cycles at damper static load.



### FEATURES

- Belimo's microcontrollers allow motors to deliver high torque at low current draw while running cooler for longer service life
- ISO 9001 certified quality control and a 5-year warranty ensure reliable operation with exceptional customer support
- Controlled from a central location and integrated into safety systems allowing for a relatively smoke-free environment for occupants to efficiently exit and firefighters to enter
- Compliant with Life Safety Codes and Standards

For more information on Belimo's Fire and Smoke Damper Actuator Solutions, click or scan below.



**Linkage kits available**  
(supporting indirect mounting or pneumatic retrofit projects)

**Life cycle testing**

**Modulating models available**

**Long service life**

**Auxiliary switches**



5-year warranty



| FS             | N             | F                | 24              |                           |                 | -S                               | US |
|----------------|---------------|------------------|-----------------|---------------------------|-----------------|----------------------------------|----|
| Fire and Smoke | Torque Rating | Actuator Type    | Power Supply    | Generation                | Control         | Options                          |    |
|                | A = 180 in-lb | F = Fail-Safe    | 24 = AC/DC 24 V | Blank = Original          | Blank = On/Off  | -S = Built-in Auxiliary Switches |    |
|                | N = 70 in-lb  | FB = Fail-Safe,  | 120 = AC 120 V* | A = New Generation On/Off | -SR = 2...10 V* |                                  |    |
|                | L = 30 in-lb  | Modulating       | 230 = AC 230 V  |                           |                 |                                  |    |
|                | T = 18 in-lb  | (180 in-lb only) |                 |                           |                 |                                  |    |

\* Available with FSAFB24-SR & FSAFB24-SR-S only.

# Exceptional service

For over 40 years, Belimo has successfully focused on the heating, ventilation, and air conditioning markets providing quality solutions that will increase energy efficiency and reduce installation costs with the fastest delivery times in the industry. Our innovative products have always been designed to help achieve objectives better, faster, and more economically. Investing in new technology is key to our success, and Belimo will continue to offer products to help businesses succeed.



5-year warranty



Global support



Tested quality



On-time delivery



Extensive service



Complete product range