

# LHX24-MFT-300 Technical Data Sheet

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



## Technical Data

|                                    |   |
|------------------------------------|---|
| Power Supply                       | 24 VAC, ±20%, 50/60 Hz, 24 VDC, ±20%  |
| Power consumption in operation     | 2.5 W   |
| Power consumption in rest position | 1.2 W   |
| Transformer sizing                 | 5 VA (class 2 power source)   |
| Electrical Connection              | 18 GA plenum cable with 1/2" conduit connector, degree of protection NEMA 2 / IP54, 3 ft [1 m] 10 ft [3 m] and 16ft [5 m] |
| Overload Protection                | electronic throughout full stroke   |
| Operating Range                    | 2...10 V (default), 4...20 mA w/ ZG-R01 (500 Ω, 1/4 W resistor), variable (VDC, on/off, floating point)                   |
| Operating range Y variable         | Start point 0.5...30 V<br>End point 2.5...32 V  |
| Input Impedance                    | 100 kΩ for 2...10 V (0.1 mA), 500 Ω for 4...20 mA, 1500 Ω for PWM, On/Off and Floating point                              |
| Position Feedback                  | 2...10 V, Max. 0.5 mA, VDC variable   |
| Stroke                             | 12" [300 mm]  |
| Actuating force motor              | 35 lbf [150 N]  |
| Direction of motion motor          | reversible with switch  |
| Manual override                    | external push button  |
| Running Time (Motor)               | 150 s 100 mm  |
| Ambient humidity                   | max. 95% r.H., non-condensing   |
| Ambient temperature                | -22...122°F [-30...50°C]  |
| Storage temperature                | -40...176°F [-40...80°C]  |
| Degree of Protection               | IP54, NEMA 2, UL Enclosure Type 2   |
| Housing material                   | UL94-5VA  |
| Agency Listing                     | cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014/35/EU                                 |
| Noise level, motor                 | 35 dB(A)  |
| Servicing                          | maintenance-free  |
| Quality Standard                   | ISO 9001  |
| Weight                             | 1.4 lb [0.63 kg]  |

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

**Linear force min. 34 lbf 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 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

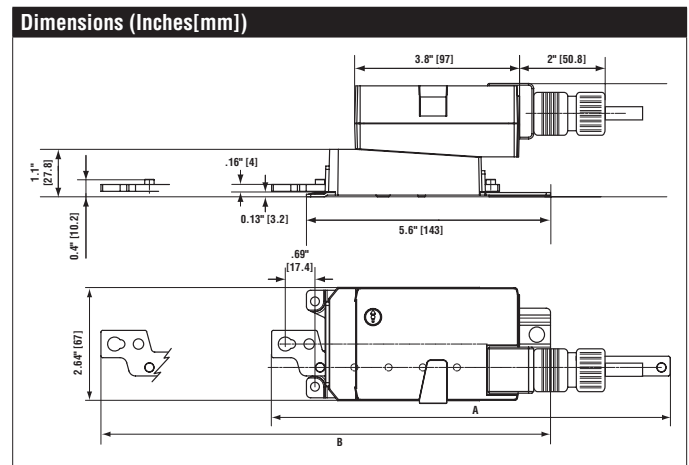
The actuator is not provided with and does not require and limit switches, but is electronically protected against overload. The anti-rotation strap supplied with the actuator will prevent lateral movement.

The LHX series provides 4, 8, or 12 in of linear force. The stroke of the gear rack can be adjusted on both sides in increments of 0.8 in [20 mm] by means of the mechanical end stops.

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 LHX24-MFT... 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.



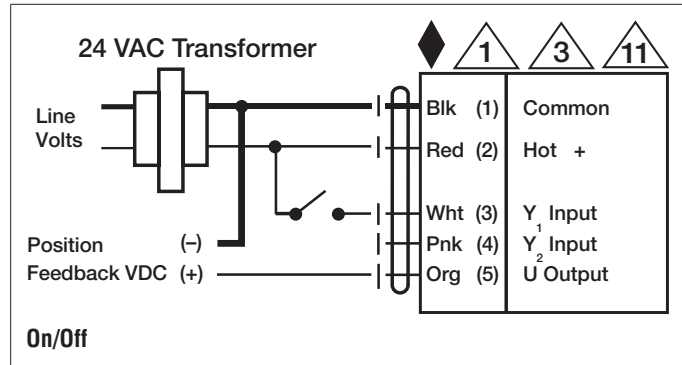
| Accessories |   |
|-------------|---|
| KG10A       | Ball joint  |
| KG8         | Ball joint  |
| SH8         | Push rod for KG6 & KG8 ball joints (36" L, 5/16" diameter).   |
| Z-DS1       | Rotary support  |
| Z-KSC       | 3/8"-16 shaft clevis for AHK/AH.  |
| ZG-119      | Bracket for AHK/AH/LH linear actuators.   |
| IRM-100     | Input rescaling module for modulating actuators.  |
| MFT-P       | Belimo PC-Tool  |
| PS-100      | Low voltage and control signal simulator.   |
| PTA-250     | Pulse width modulation interface for modulating actuators.  |
| SGA24       | Positioners suitable for use with the modulating damper actuators LM..A-SR, NM..A-SR, SM..A-SR and GM..A-SR |
| SGF24       | Positioners suitable for use with the modulating damper actuators LM..A-SR, NM..A-SR, SM..A-SR and GM..A-SR |
| TF-CC US    | Cable conduit connector, 1/2".  |
| UK24BAC     | Gateway MP to BACnet MS/TP  |
| UK24LON     | Gateway MP to LonWorks  |
| UK24MOD     | Gateway MP to Modbus RTU  |
| ZG-R01      | 4 to 20 mA adaptor, 500Ω, 1/4 W resistor w 6" pigtail wires.  |
| ZG-R02      | 50% voltage divider kit (resistors with wires).   |
| ZG-SGF      | Mounting plate for SGF.   |
| ZG-X40      | 120 to 24 VAC, 40 VA transformer.   |
| ZK1-GEN     | Connection cable  |
| ZK2-GEN     | Connection cable  |
| ZTH US      | Handheld programming tool w/ ZK1-GEN, ZK2-GEN, ZK6-GEN.   |
| NSV24 US    | Battery back-up module for non-spring return actuators.   |
| NSV-BAT     | 12V 1.2AH battery (two required for NSV24 US).  |

### Typical Specification

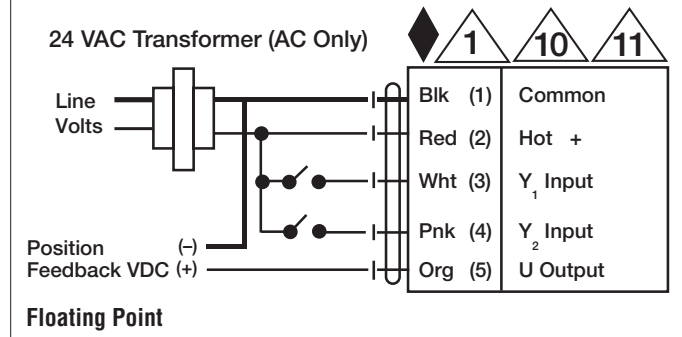
Proportional control damper actuators shall be electronic type, which require no crank arm and linkage. Actuators must provide proportional damper control in response to a 2 to 10 VDC or, with the addition of a 500 Ω resistor, a 4 to 20 mA control input from an electronic controller or positioner. Actuators 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 cUL Approved, have a 5-year warranty, and be manufactured under ISO 9001 International Quality Control Standards. Actuators shall be as manufactured by Belimo.

### Wiring Diagrams

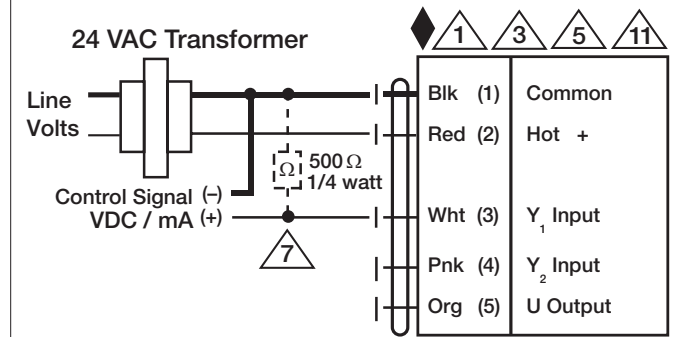
- A Actuators with appliance cables are numbered.
- 1 Provide overload protection and disconnect as required.
- 3 Actuators may also be powered by 24 VDC.
- 5 Only connect common to negative (-) leg of control circuits.
- 7 A 500 Ω resistor (ZG-R01) converts the 4 to 20 mA control signal to 2 to 10 VDC.
- 8 Control signal may be pulsed from either the Hot (Source) or Common (Sink) 24 VAC line.
- 10 For triac sink the Common connection from the actuator must be connected to the Hot connection of the controller. Position feedback cannot be used with a triac sink controller; the actuator internal common reference is not compatible.
- 11 Actuators may be connected in parallel if not mechanically linked. Power consumption and input impedance must be observed.
- 12 IN4004 or IN4007 diode. (IN4007 supplied, Belimo part number 40155).



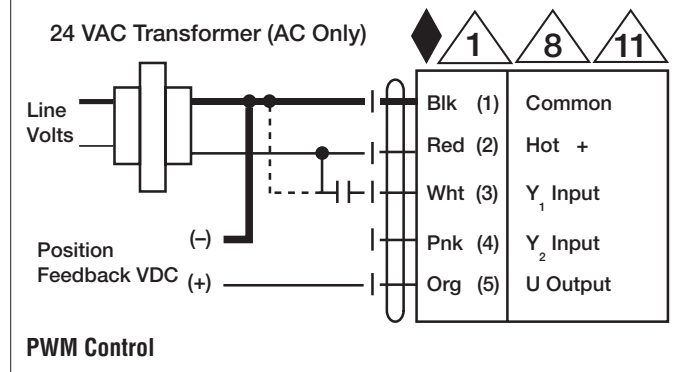
**On/Off**



**Floating Point**



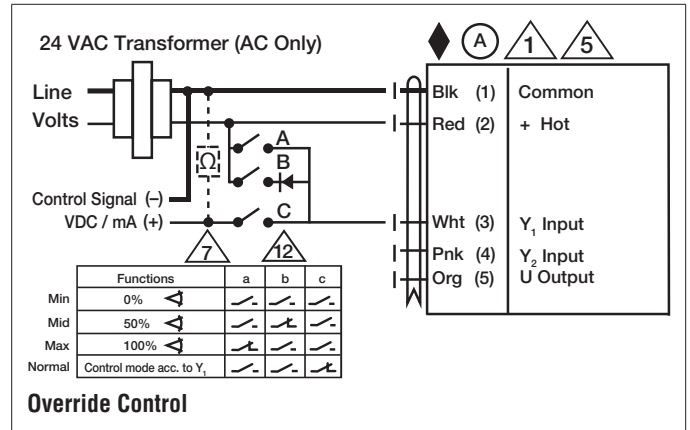
**VDC/mA Control**



**PWM Control**

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