LF24-MFT(-S)-20 US

Proportional, Spring Return, 24 V, for 6 to 9 VDC
Output Power Supply 20 VDC Provides Power to Controllers

MFT

- **Torque min. 35 in-lb**
- **Control 6 to 9 VDC (DEFAULT)**
- **Feedback 2 to 10 VDC (DEFAULT)**
- **20 VDC power output**

Application

For proportional modulation of dampers and control valves in HVAC systems. The LF24-MFT(-S)-20 US provides mechanical spring return operation for reliable fail-safe application.

Default/Configuration

Default parameters for 6 to 9 VDC applications of the LF24-MFT(-S)-20 US actuator are assigned during manufacturing. If required, custom versions of the actuator can be ordered. The parameters noted in the Technical Data table are variable.

These parameters can be changed by three means:

- Pre-set configurations from Belimo
- Custom configurations from Belimo
- Configurations set by the customer using the MFT PC tool software application.

Operation

The LF24-MFT(-S)-20 US actuator provides 95° of rotation and is provided with a graduated position indicator showing 0° to 95°. The actuator will synchronize the 0° mechanical stop or the damper or valves mechanical stop and use this point for its zero position during normal control operations.

The actuator uses a brushless DC motor which is controlled by an Application Specific Integrated Circuit (ASIC) and a microprocessor. The microprocessor provides the intelligence to the ASIC to provide a constant rotation rate and to know the actuator's exact position. The ASIC monitors and controls the brushless DC motor's rotation and provides a Digital Rotation Sensing (DRS) function to prevent damage to the actuator in a stall condition. The position feedback signal is generated with out the need for mechanical feedback potentiometers using DRS. The actuator may be stalled anywhere in its normal rotation without the need of mechanical end switches.

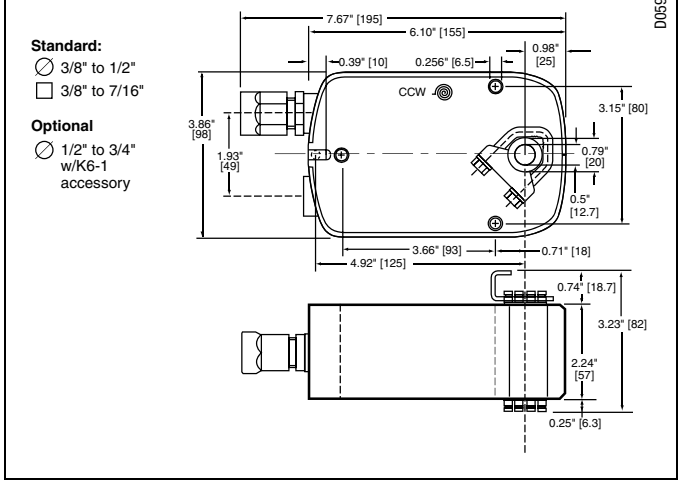
The LF24-MFT(-S)-20 US is mounted directly to control shafts up to 3/4" diameter by means of its universal clamp and anti-rotation bracket. A crank arm and several mounting brackets are available for damper applications where the actuator cannot be direct coupled to the damper shaft. The spring return system provides minimum specified torque to the application during a power interruption. The LF24-MFT(-S)-20 US actuator is shipped in the zero position, compression against seats or gaskets for tight shut-off is accomplished manually.

Technical Data		LF24-MFT(-S) -20 US
Power supply		24 VAC, ± 20%, 50/60 Hz 24 VDC, ±10%
Power consumption	running	3 W
	holding	1.5 W
Transformer sizing		6 VA (Class 2 power source)
Electrical connection (-S models have 2 cables)		3 ft, 18 GA, appliance cable 1/2" conduit connector
Overload protection		electronic throughout 0 to 95° rotation
Operating range Y*		6 to 9 VDC (Default), P-10005
Input impedance		100 kΩ for 2 to 10 VDC (0.1 mA) 500 Ω for 4 to 20 mA 1500 Ω for PWM, floating point and on/off control
Feedback output U*		2 to 10 VDC, 0.5 mA max
Torque		35 in-lb (4 Nm)
Direction of rotation*	spring	reversible with cw/ccw mounting
	motor	reversible with built-in switch
Angle of rotation*		max 95°, adjustable with mechanical stop
Mechanical angle of rotation*		limited to 95°
Running time	motor*	150 sec constant
	spring	<25 sec @-4°F to 122°F [-20°C to 50°C] <60 sec @-22°F [-30°C]
Angle of rotation adaptation*		off (default)
Override control*		Min. (Min Position) = 0% - ZS (Mid. Position) = 50% - Max. (Max. Position) = 100%
Position indication		visual indicator, 0° to 95° (0° is spring return position)
Humidity		5 to 95% RH, non-condensing
Ambient temperature		-22 to 122° F (-30 to 50° C)
Storage temperature		-40 to 176° F (-40 to 80° C)
Housing		NEMA 2, IP54
Housing material		zinc coated metal
Noise level	running	< 30 db (A)
	spring return	62 dB (A)
Agency listings		cULus acc. to UL 873 and CAN/CSA C22.2 No. 24-93
Quality standard		ISO 9001
Servicing		maintenance free
Weight	LF24-MFT-20 US	3.1 lbs (1.40 kg)
	LF24-MFT-S-20 US	3.2 lbs (1.45 kg)

* Variable when configured with MFT options

LF24-MFT-S-20 US	
Auxiliary switches	1 x SPDT 3A (0.5A) @ 250 VAC, UL approved adjustable 0° to 95° (double insulated)

Dimensions (Inches [mm])



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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.

2 Actuators may be connected in parallel if not mechanically mounted to the same shaft. Power consumption and input impedance must be observed.

3 Actuator may also be powered by 24 VDC.

6 For end position indication, interlock control, fan startup, etc., LF24-MFT(-S)-20 US incorporates one built-in auxiliary switch: 1 x SPDT, 3A (0.5A) @250 VAC, UL Approved, adjustable 0° to 95°.

A 24 VAC: Black/Blue
120 VAC: White
240 VAC: White/Black
Belimo modulating actuators are 24 VAC/DC, if 120 or 240 is available an external transformer is required.

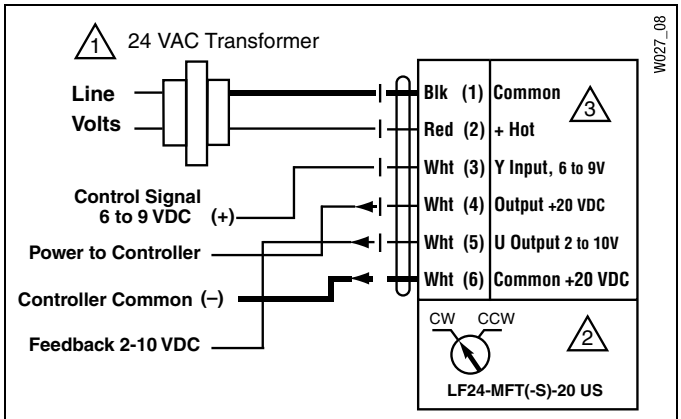
B Maximum of 2

C MP-52XX-500 models include internal SPDT auxiliary switch.

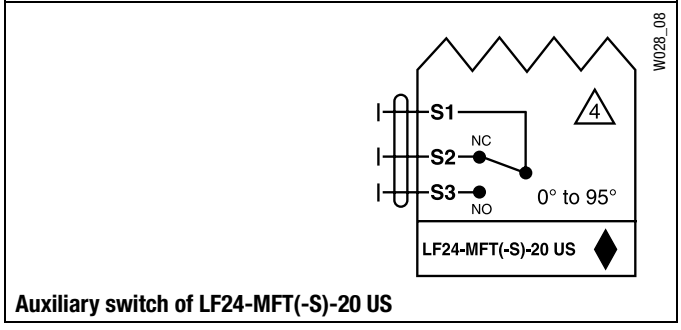
APPLICATION NOTES

◆ Meets cULus requirements without the need of an electrical ground connection.

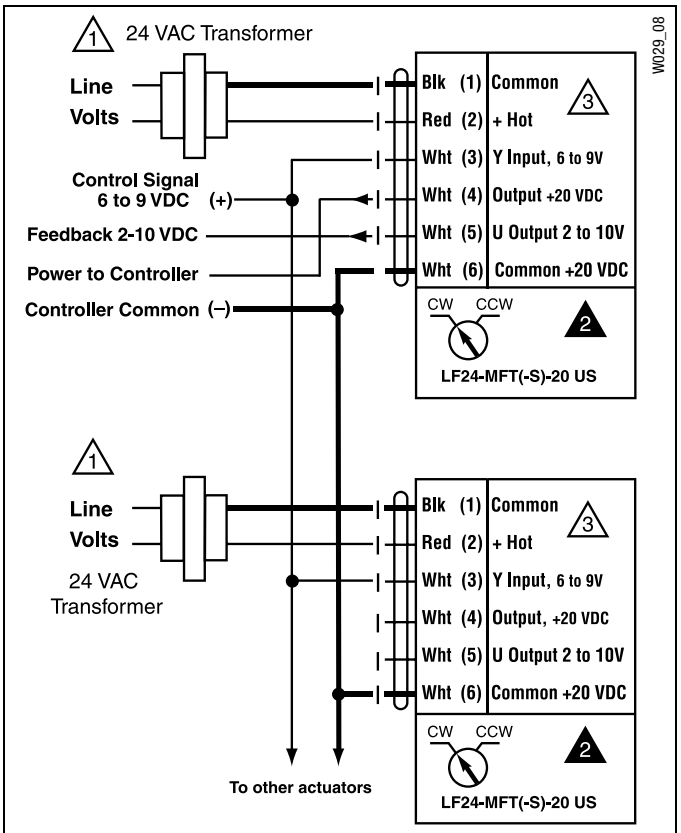
***WARNING** Live Electrical Components!*
During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components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



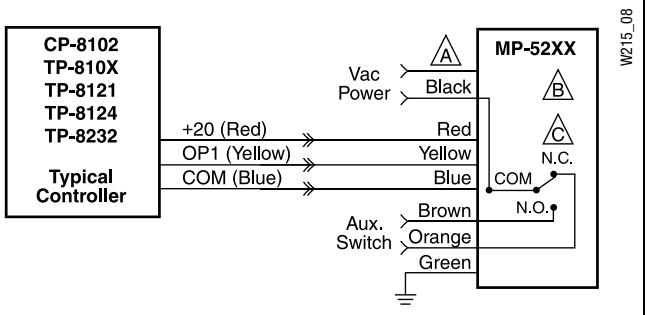
6 to 9 VDC control of LF24-MFT(-S)-20 US



Auxiliary switch of LF24-MFT(-S)-20 US



Multiple LF24-MFT(-S)-20 US actuators from one controller



Wire cross reference

MP-52XX	Belimo (SR or MFT)	
Black/Blue, Power	2, Hot	
Black, Power	1, Com	
Red, +20	4, +20 VDC	
Yellow, OP1	3, Signal	
Blue, COM	6, Com VDC	
Brown, N. O.	S3, N.O.	"-S"type
Orange, N.C.	S2, N.C.	"-S"type
Green, ground	Not used	

Typical Control Wiring for MP-52XX Series Actuators to Controllers Requiring External 20 VDC Power Supply.

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