

AF24-MFT (-S) US

Proportional Damper Actuator, Spring Return Fail-Safe, Multi-Function Technology®



MFT



Technical Data	AF24... US
Power supply	24 VAC, ± 20%, 50/60 Hz 24 VDC, ±10%
Power consumption	running 6 W holding 2.5 W
Transformer sizing	10 VA (Class 2 power source)
Electrical connection	3 ft, 18 GA appliance cable 1/2" conduit connector
Overload protection	electronic throughout 0 to 95° rotation
Operating range Y*	2 to 10 VDC 4 to 20 mA (w/500 Ω, 1/4 Ω resistor) ZG-R01
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	min 133 in-lb (15 Nm)
Direction of rotation*	spring reversible with cw/ccw mounting motor reversible with built-in switch
Mechanical angle of rotation*	95°, adjustable 35° to 95° w/ZDB-AF2 US
Running time	motor* 150 seconds constant spring <20 sec spring return fail safe position
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)
Auxiliary switches (AF24-MFT-S US)	2 x SPDT 7A (2.5A) @ 250 VAC, UL Approved one set at +5°, one adjustable 25° to 85°
Manual override	3 mm hex crank (supplied)
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	less than 45 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	6.0 lbs. (2.7 kg)

* Variable when configured with MFT options

- Torque min. 133 in-lb
- Control 2 to 10 VDC (DEFAULT)
- Feedback 2 to 10 VDC (DEFAULT)

Application

For proportional modulation of dampers and control valves in HVAC systems. The AF24-MFT US provides mechanical spring return operation for reliable fail-safe application.

Default/Configuration

Default parameters for 2 to 10 VDC applications of the AF24-MFT 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

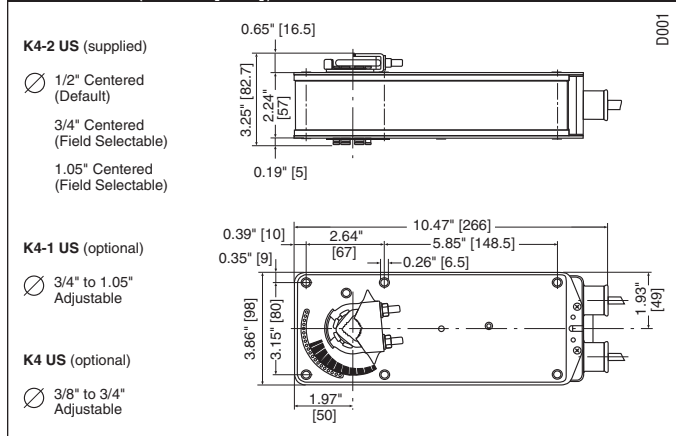
The AF24-MFT US actuator provides 95° of rotation and is provided with a graduated position indicator showing 0° to 95°. The actuator will synchronize the 0° mechanical stop or the physical damper or valve mechanical stop and use this point for its zero position during normal control operations. A unique manual override allows the setting of any actuator position within its 95° of rotation with no power applied. This mechanism can be released physically by the use of a crank supplied with the actuator. When power is applied the manual override is released and the actuator drives toward the fail-safe position.

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 without 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 AF24-MFT US is mounted directly to control shafts up to 1.05" diameter by means of its universal clamp and anti-rotation bracket. A crankarm 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 AF24-MFT US actuator is shipped at +5° (5° from full fail-safe) to provide automatic compression against damper gaskets for tight shut-off.

NOTE: Please See Documentation on Multi-Function Technology, page 287.

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 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.
- 5 For end position indication, interlock control, fan startup, etc., AF24-MFT-S US incorporates two built-in auxiliary switches: 2 x SPDT, 7A (2.5A) @250 VAC, UL Approved, one switch is fixed at +5, one is adjustable 25 to 85.

📄 APPLICATION NOTES

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

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