

# AFB24-MFT95, AFX24-MFT95

Proportional, Spring Return, 24 V, for Use with Honeywell® Electronic Series 90 or a 0 to 135 Ω Input



- Torque min. 180 in-lb
- Control fixed, 0 to 135 Ω input, or Honeywell series 90 (fixed)
- Feedback 2 to 10 VDC (DEFAULT)

## Application

For proportional modulation of dampers and control valves in HVAC systems. The AFB24-MFT95, AFX24-MFT95 provides mechanical spring return operation for reliable fail-safe application.

## Default/Configuration

Default parameters for 0 to 135 Ω Input applications of the AFB24-MFT95 and AFX24-MFT95 actuator are assigned during manufacturing. If required, custom versions of the actuator can be ordered. However the control input cannot be modified via MFT PC tool software. 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 (version 3.4 or higher) software application.

## Operation

The AFB24-MFT95, AFX24-MFT95 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.

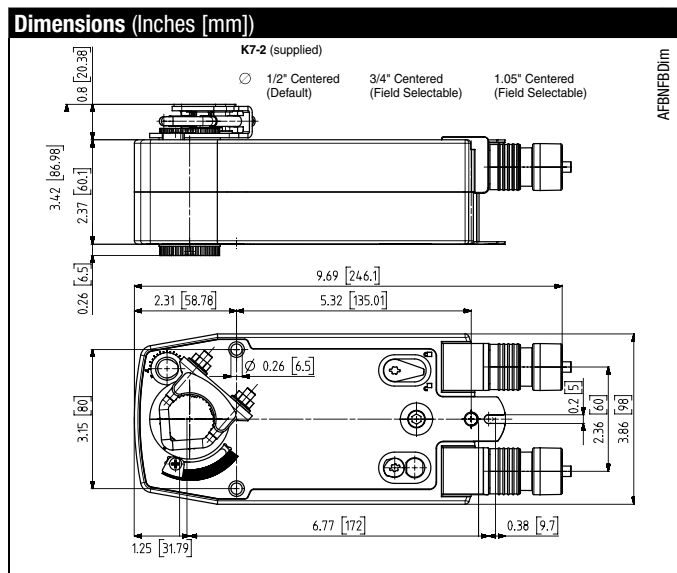
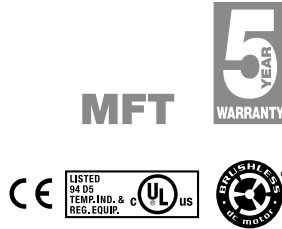
The AFB24-MFT95, AFX24-MFT95 is mounted directly to control shafts up to 1.05" diameter by means of its universal clamp and anti-rotation bracket. A crank arm and several mounting brackets are available for damper applications where the actuator cannot be direct coupled to the damper shaft. The spring return system provides minimum specified torque to the application during a power interruption. The AFB24-MFT95, AFX24-MFT95 actuator is shipped at +5° (5° from full fail-safe) to provide automatic compression against damper gaskets for tight shut-off.

Technical Data		AFB24-MFT95, AFX24-MFT95
Power supply		24 VAC, +/- 20%, 50/60 Hz 24 VDC, +20% / -10%
Power consumption♦	running holding	7.5 W 3 W
Transformer sizing♠		10 VA (Class 2 power source)
Electrical connection		
	AFB24-MFT95	3 ft, 18 GA plenum cable, with 1/2" conduit connector
	AFX24-MFT95	3 ft [1m], 18 GA plenum cable, with or without 1/2" conduit connector
Overload protection		electronic throughout 0 to 95° rotation
Operating range Y		0 to 135 Ω Honeywell Electronic Series 90, 0 to 135 Ω input
Feedback output U*		2 to 10 VDC, 0.5 mA max
Torque		minimum 180 in-lb (20 Nm)
Direction of rotation*	spring motor	reversible with cw/ccw mounting reversible with built-in switch
Mechanical angle of rotation*		95° (adjustable with mechanical end stop, 35° to 95°)
Running time	spring motor*	<20 seconds @ -4°F to 122°F [-20° C to 50° C]; <60 seconds @ -22°F [-30° C] 150 seconds (default), variable (70 to 220 seconds)
Angle of Rotation adaptation		off (default)
Position indication		visual indicator, 0° to 95° (0° is spring return position)
Manual override		5 mm hex crank (3/16" Allen), supplied
Humidity		max. 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, Enclosure Type 2
Housing material		zinc coated metal and plastic casing
Noise level		≤40dB(A) motor @ 150 seconds, run time dependent ≤62dB(A) spring return
Agency listings †		cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2004/108/EC & 2006/95/EC
Quality standard		ISO 9001
Servicing		maintenance free
Weight		4.6 lbs. (1.9 kg)

\* Variable when configured with MFT options

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

♠ Programmed for 70 seconds motor run time. At 150 sec motor run time, transformer sizing is 8.5 VA and power consumption is 6 W running / 3 W holding.



M40024 - 05/10 - Subject to change. © Belimo Aircontrols (USA), Inc.

### Proportional Potentiometric Control - Wiring Diagrams

#### INSTALLATION NOTES

- 5 Actuators with plenum rated cable do not have numbers on wires; use color codes instead. Actuators with appliance cables are numbered.
- 21 Provide overload protection and disconnect as required.
- 22 Actuators and controller must have separate transformers.
- 23 Consult controller instruction data for more detailed information.
- 24 Resistor value depends on the type of controller and the number of actuators.
- 24 No resistor is used for one actuator. Honeywell® resistor kits may also be used.
- 25 To reverse control rotation, use the reversing switch.

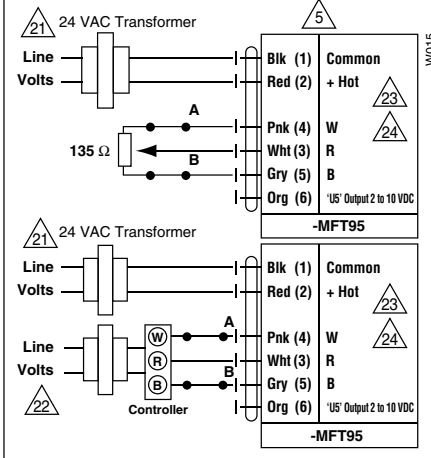
#### Wire Colors

1 = Black	3 = White	5 = Gray
2 = Red	4 = Pink	6 = Orange

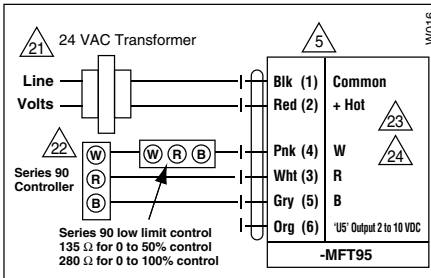
#### Override

Switch A	Switch B	Damper Position
		Damper Open
		Damper Closed

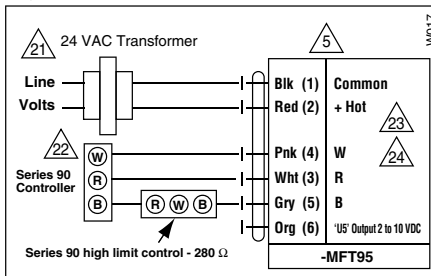
The direction of rotation switch is set so that the fail safe position and the position of the damper is closed with no signal at wire R.



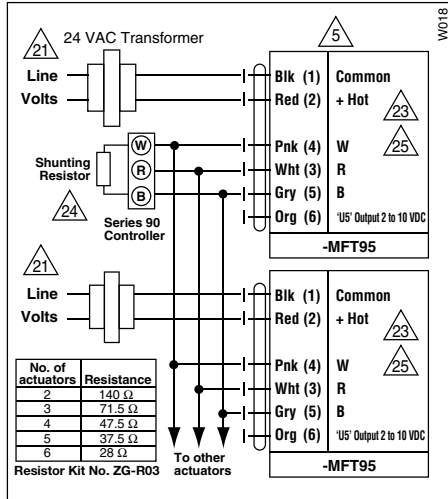
#### Low Limit Control



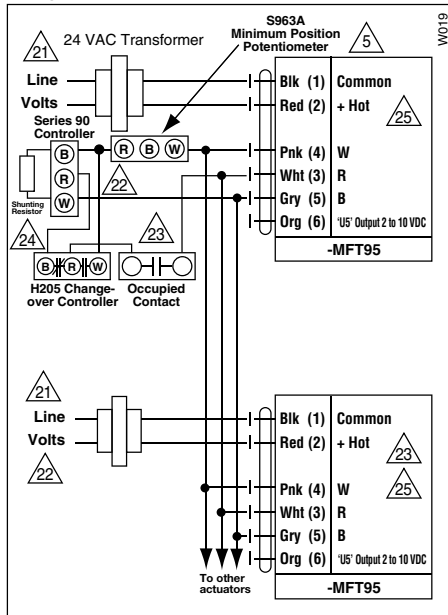
#### High Limit Control



#### Wiring Multiple Actuators to a Series 90 Controller



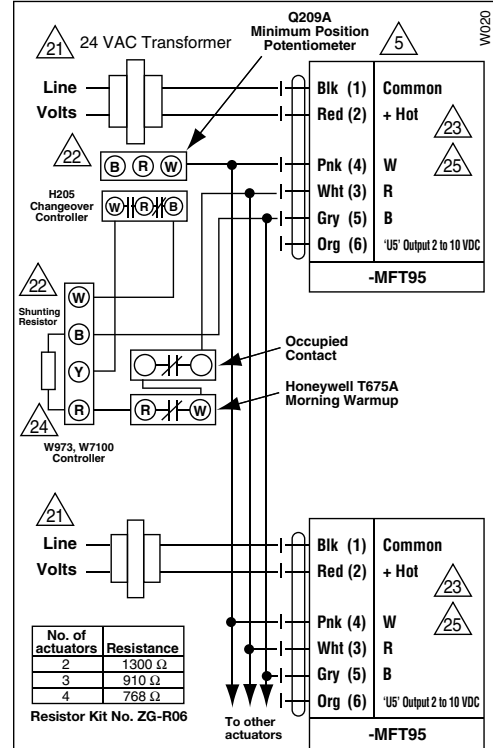
#### Wiring Multiple Actuators to a Series 90 Controller using a Minimum Position Potentiometer



#### 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.

#### Typical wiring diagrams for multiple actuators used with the W973, W7100 and T775 controllers



#### Used with the W973 and W7100 controllers

