

AFB24-MFT95 - Damper Actuator

Modulating, Spring Return, 24 V, 0 to 135 Ω Input



| Technical Data | |
|-----------------------------------|---|
| Power Supply | 24 VAC±20%, 50/60Hz, 24 VDC+20%/-10% |
| Power Consumption Running | 7.5 W |
| Power Consumption Holding | 3 W |
| Transformer Sizing | 10 VA (class 2 power source) |
| Shaft Diameter | 1/2" to 1.05" round, centers on 1/2" and 3/4" with insert, 1.05" without insert |
| Electrical Connection | 3 ft., 18 GA plenum cable with 1/2" conduit connector |
| Overload Protection | electronic throughout 0° to 95° rotation |
| Electrical Protection | actuators are double insulated |
| 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, VDC variable |
| Angle of Rotation | 95° (adjustable with mechanical end stop, 35° to 95°) |
| Torque | 180 in-lbs [20 Nm] minimum |
| Direction of Rotation (Motor) | reversible with built-in switch |
| Direction of Rotation (Fail-Safe) | reversible with CW/CCW mounting |
| Position Indication | visual indicator, 0° to 95° (0° is full spring return position) |
| Manual Override | 5 mm hex crank (3/16" Allen), supplied |
| Running Time (Motor) | 150 seconds (default), variable (70 to 220 seconds) |
| Running Time (Fail-Safe) | < 20 seconds @ -4°F to +122°F [-20°C to +50°C], < 60 sec @ -22°F [-30°C] |
| Angle of Rotation Adaption | Off (default) |
| Override Control | min. position = 0% , mid. Position = 50% , max. position = 100% (Default) |
| Humidity | max. 95% RH non-condensing |
| Ambient Temperature Range | -22°F to +122°F [-30°C to +50°C] |
| Storage Temperature Range | -40°F to +176°F [-40°C to +80°C] |
| Housing | NEMA 2, IP54, UL enclosure type 2 |
| Housing Material | zinc coated metal and plastic casing |
| Agency Listings† | cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2004/108/EC |
| Noise Level (Motor) | ≤40 dB (A) @ 150 seconds, run time dependent |
| Noise Level (Fail-Safe) | <62 dB (A) |
| Servicing | maintenance free |
| Quality Standard | ISO 9001 |
| Weight | 4.6 lbs [2.1 kg] |

*Variable when configured with MFT options.

†Rated Impulse Voltage 800V, Type of action 1.AA, Control Pollution Degree 3

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 fail-safe, modulating control of dampers in HVAC systems. Actuator sizing should be done in accordance with the damper manufacturer's specifications. A feedback signal is provided for position indication or master-slave applications.

Default/Configuration

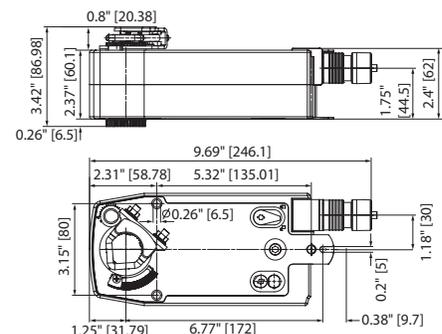
Default parameters for 0 to 135Ω Input applications of the AF.-MFT95 actuator are assigned during manufacturing. If required, custom versions of the actuator can be ordered, however the control input cannot be modified via MFT PC tool software. The parameters noted in the Technical Data table are variable. These parameters can be changed by three means:

- Pre-set or custom configurations from Belimo.
- Configurations set by the customer using the most current MFT PC tool software application.
- Handheld ZTH US.

Operation

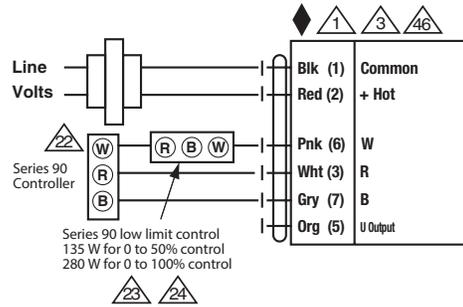
The AF.24-MFT95 actuator provides 95° of rotation and is provided with a graduated position indicator showing 0° to 95°. The actuator will synchronize the 0° mechanical stop or the physical damper or valve mechanical stop and use this point for its zero position during normal control operations. A unique 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 AF.24-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 AF.24-MFT95 actuator is shipped at +5° (5° from full fail-safe) to provide automatic compression against damper gaskets for tight shut-off.

Dimensions (Inches[mm])

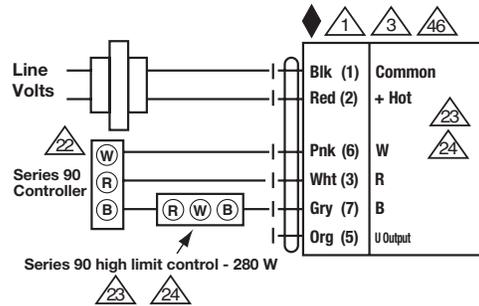


| Accessories | |
|-------------|--|
| AF-P | Anti-rotation bracket AFB(X)/NFB(X). |
| AV8-25 | 9.8" shaft extension for 5/16" to 1" diameter shafts. |
| IND-AFB | AFB(X)/NFB(X) position indicator. |
| K7-2 | Standard AFB(X)/NFB(X) clamp (1/2" to 1.05"). |
| KG10A | Ball joint for 3/8" diameter rod, zinc plated. |
| KG8 | Ball joint for 5/16" diameter rod, 90°, galvanized steel. |
| KH10 | Univ. crankarm, slot 21/64" w, for 9/16" to 1" dia. shafts. |
| KH12 | Univ. crankarm, slot 21/64" w, for 3/4" to 1" dia. shafts. |
| KH8 | Univ. crankarm, slot 21/64" w, for 3/8" to 11/16" dia. shafts. |
| KH-AFB | AFB(X)/NFB(X) crankarm (with 3/4" dia. shaft pass through). |
| SH10 | Push rod for KG10A ball joint (36" L, 3/8" diameter). |
| SH8 | Push rod for KG6 & KG8 ball joints (36" L, 5/16" diameter). |
| TOOL-06 | 8 mm and 10 mm wrench. |
| Z-AF | Classic AF/NF to AFB(X)/NFB(X) retrofit mounting bracket. |
| ZG-100 | Univ. right angle bracket (17" H x 11-1/8" W x 6" base). |
| ZG-101 | Univ. right angle bracket (13" H x 11" W x 7-7/16" base). |
| ZG-102 | Dual actuator mounting bracket. |
| ZG-109 | Right angle bracket for ZS-260. |
| ZG-110 | Stand-off bracket for ZS-260. |
| ZG-118 | AFB(X)/NFB(X) U bracket (5-7/8" H x 5-1/2" W x 2-19/32" D). |
| ZG-120 | Jackshaft mounting bracket. |
| ZG-AFB | AFB(X)/NFB(X) crankarm adaptor kit. |
| ZG-AFB118 | AFB(X)/NFB(X) crankarm adaptor kit. |
| ZG-DC1 | Damper clip for damper blade, 3.5" width. |
| ZG-DC2 | Damper clip for damper blade, 6" width. |
| ZG-JSA-1 | 1" diameter jackshaft adaptor (11" L). |
| ZG-JSA-2 | 1-5/16" diameter jackshaft adaptor (12" L). |
| ZG-JSA-3 | 1.05" diameter jackshaft adaptor (12" L). |
| ZG-JSL | Jackshaft linkage for 1/2" to 1.05" shafts |
| ZS-100 | Weather shield - galvanneal (13" L x 8" W x 6" D). |
| ZS-101 | Base plate for ZS-100. |
| ZS-150 | Weather shield - PC w/ foam seal (16" L x 8-3/8" W x 4" D). |
| ZS-260 | Explosion proof housing. |
| ZS-300 | NEMA 4X, 304 stainless steel enclosure. |
| ZS-300-5 | NEMA 4X, 316L stainless steel enclosure. |
| ZS-300-C1 | 1/2" shaft adaptor, standard with ZS-300(-5). |
| ZS-300-C2 | 3/4" shaft adaptor for ZS-300(-5). |
| ZS-300-C3 | 1" shaft adaptor for ZS-300(-5). |
| Z-SF | 20 piece Z-AF kit. |
| MFT-P | Belimo MFT configuration software (hardware not included). |
| PS-100 | Actuator power supply and control simulator. |
| TF-CC US | Cable conduit connector, 1/2". |
| ZG-R03 | MFT95 resistor kit for 0 to 135Ω control applications. |
| ZG-X40 | 120 to 24 VAC, 40 VA transformer. |
| ZK2-GEN | Cable for ZTH US to actuators w/o diagnostic/program socket. |
| ZTH US | Hand held programming tool w/ ZK1-GEN, ZK2-GEN & ZK6-GEN. |

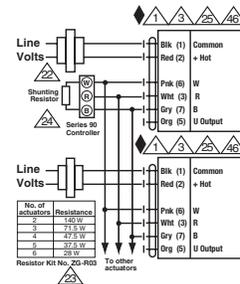
Typical and Override Control



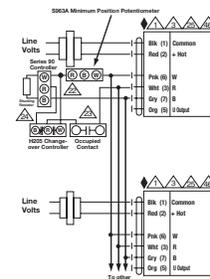
Low Limit Control 24 VAC Transformer



High Limit Control 24 VAC Transformer



Multiple Actuators 24 VAC Transformer



Multiple Actuators with Minimum Position Potentiometer 24 VAC Transformer

AFB24-MFT95 - Damper Actuator

Modulating, Spring Return, 24 V, 0 to 135 Ω Input

Typical Specification

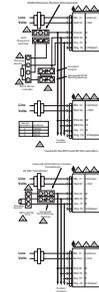
Spring return control damper actuators shall be direct coupled type which require no crank arm and linkage and be capable of direct mounting to a jackshaft up to a 1.05" diameter. The actuator must provide modulating damper control in response to a 2 to 10 VDC or, with the addition of a 500Ω resistor, a 4 to 20 mA control input from an electronic controller or positioner. The actuators must be designed so that they may be used for either clockwise or counter clockwise fail-safe operation. Actuators shall use a brushless DC motor controlled by a microprocessor and be protected from overload at all angles of rotation. Run time shall be constant, and independent of torque. A 2 to 10 VDC feedback signal shall be provided for position feedback or master slave applications. Actuators with auxiliary switches must be constructed to meet the requirements for Double Insulation so an electrical ground is not required to meet agency listings. Actuators shall be cULus listed and have a 5 year warranty, and be manufactured under ISO 9001 International Quality Control Standards. Actuators shall be as manufactured by Belimo.

Wiring Diagrams

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.

- Meets cULus requirements without the need of an electrical ground connection.
- Provide overload protection and disconnect as required.
- Actuators may also be powered by 24 VDC.
- Actuators and controller must have separate transformers.
- Consult controller instruction data for more detailed information.
- Resistor value depends on the type of controller and the number of actuators. No resistor is used for one actuator. Honeywell® resistor kits may also be used.
- To reverse control rotation, use the reversing switch.
- Actuators may be controlled in parallel. Current draw and input impedance must be observed.



Multiple Actuators Used with W973, W7100 and T775 24 VAC Transformer