

NFB24-S - Damper Actuator

On/Off, Spring Return, 24 VAC/DC



| Technical Data | |
|-----------------------------------|---|
| Power Supply | 24 VAC±20%, 50/60Hz, 24 VDC+20%/-10% |
| Power Consumption Running | 6 W |
| Power Consumption Holding | 2.5 W |
| Transformer Sizing | 8.5 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 | (2) 3 ft [1 m], 18 GA appliance cables with 1/2" conduit connectors |
| Overload Protection | electronic throughout 0° to 95° rotation |
| Electrical Protection | actuators are double insulated |
| Angle of Rotation | 95° (adjustable with mechanical end stop, 35° to 95°) |
| Torque | 90 in-lbs [10 Nm] minimum |
| Direction of Rotation (Motor) | reversible with CW/CCW mounting |
| 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) | <75 sec |
| Running Time (Fail-Safe) | 20 sec @ -4°F to +122°F [-20°C to +50°C], < 60 sec @ -22°F [-30°C] |
| 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 and 2006/95/EC |
| Noise Level (Motor) | ≤50 dB (A) |
| Noise Level (Fail-Safe) | <62 dB (A) |
| Servicing | maintenance free |
| Quality Standard | ISO 9001 |
| Weight | 4.4 lb [2 kg] |
| Auxiliary Switch | 2 x SPDT, 3A resistive (0.5A inductive) @ 250 VAC, one set at +10°, one adjustable 10° to 90° |

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

Torque min. 90 in-lb, for control of air dampers.

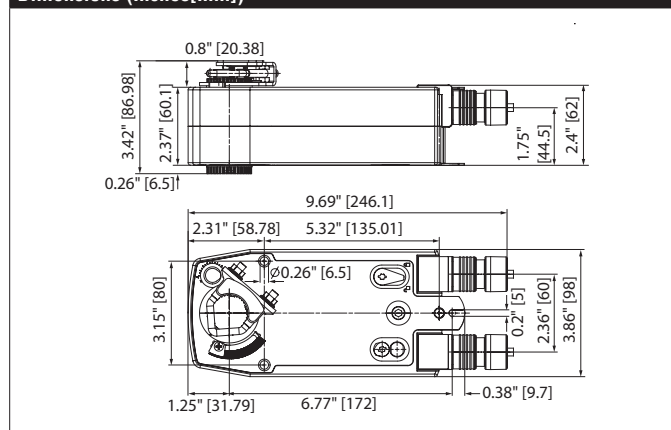
Application

For On/Off, fail-safe control of dampers in HVAC systems. Actuator sizing should be done in accordance with the damper manufacturer's specifications. Control is On/Off from an auxiliary contact or a manual switch. The actuator is mounted directly to a damper shaft up to 1.05" in diameter by means of its universal clamp. A crank arm and several mounting brackets are available for applications where the actuator cannot be direct coupled to the damper shaft.

Operation

The NF.24-S series actuators provide true spring return operation for reliable failsafe application and positive close off on air tight dampers. The spring return system provides constant torque to the damper with, and without, power applied to the actuator. The NF.24-S series provides 95° of rotation and is provided with a graduated position indicator showing 0° to 95°. The actuator may be stalled anywhere in its normal rotation without the need of mechanical end switches. The NF.24-S versions are provided with two built-in auxiliary switches. These SPDT switches are provided for safety interfacing or signaling, for example, for fan start-up. The switching function at the fail-safe position is fixed at +10°, the other switch function is adjustable between +10° to +90°. The NF.24-S actuator is shipped at +5° (5° from full fail-safe) to provide automatic compression against damper gaskets for tight shut-off.

Dimensions (Inches[mm])

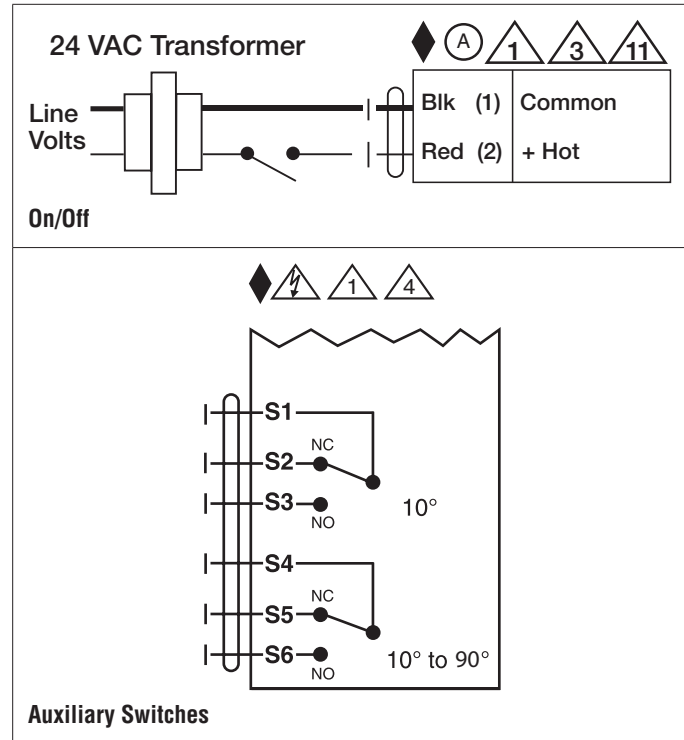


Accessories

| | |
|-----------|--|
| AF-P | Anti-rotation bracket AF/NF. |
| 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-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). |
| 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. |
| PS-100 | Actuator power supply and control simulator. |
| TF-CC US | Cable conduit connector, 1/2". |
| ZG-X40 | 120 to 24 VAC, 40 VA transformer. |

Typical Specification

On/Off spring return 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 actuators must be designed so that they may be used for either clockwise or counter clockwise fail-safe operation. Actuators shall be protected from overload at all angles of rotation. If required, two SPDT auxiliary switch shall be provided having the capability of one being adjustable. 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.



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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.



Apply only AC line voltage or only UL-Class 2 voltage to the terminals of auxiliary switches. Mixed or combined operation of line voltage/safety extra low voltage is not allowed.



Actuators with appliance cables are numbered.



Provide overload protection and disconnect as required.



Actuators may also be powered by 24 VDC.



Two built-in auxiliary switches (2x SPDT), for end position indication, interlock control, fan startup, etc.



Actuators may be connected in parallel if not mechanically linked. Power consumption and input impedance must be observed.