

# NFB24, NFB24-S, NFX24, NFX24-S

On/Off, Spring Return, 24 V



| Technical Data   |          | NFB24, NFB24-S, NFX24, NFX24-S  |
|--|----------|---|
| Power supply   |          | 24 VAC ± 20% 50/60 Hz<br>24 VDC +20% / -10%   |
| Power consumption  | running  | 6 W   |
|  | holding  | 2.5 W   |
| Transformer sizing   |          | 8.5 VA (class 2 power source)   |
| Electrical connection  | NFB24... | 3 ft, 18 GA appliance cable, 1/2" conduit connector<br><b>-S models:</b> two 3 ft, 18 gauge appliance cables with 1/2" conduit connectors   |
|  | NFX24... | 3 ft [1m], 10 ft [3m] or 16 ft [5m] 18 GA appliance or plenum cables, with or without 1/2" conduit connector<br><b>-S models:</b> two 3 ft [1m], 10 ft [3m] or 16 ft [5m] appliance cables, with or without 1/2" conduit connectors |
| Overload protection  |          | electronic throughout 0 to 95° rotation   |
| Control  |          | on/off  |
| Torque   |          | 90 in-lb [10 Nm] minimum  |
| Direction of rotation  | spring   | reversible with CW/CCW mounting   |
| Mechanical angle of rotation   |          | 95° (adjustable with mechanical end stop, 35° to 95°)   |
| Running time   | motor    | < 75 seconds  |
|  | spring   | 20 seconds @ -4°F to 122°F [-20°C to 50°C];<br>< 60 seconds @ -22°F [-30°C]   |
| Position indication  |          | visual indicator, 0° to 95° (0° is full spring return position)   |
| Manual override  |          | 5 mm hex crank (3/16" Allen), supplied  |
| Humidity   |          | max. 95% RH non-condensing  |
| Ambient temperature  |          | -22°F to 122°F [-30°C to 50°C]  |
| Storage temperature  |          | -40°F to 176°F [-40°C to 80°C]  |
| Housing  |          | Nema 2, IP54, Enclosure Type2   |
| 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 & 2006/95/EC  |
| Noise level  |          | <50dB(A) motor @ 75 seconds<br><62dB(A) spring return   |
| Servicing  |          | maintenance free  |
| Quality standard   |          | ISO 9001  |
| Weight   |          | 4.15 lbs (1.9 kg); 4.4 lbs (2.0 kg) with switches   |
| † Rated Impulse Voltage 800V, Type of action 1.AA (1.AA.B for -S version), Control Pollution Degree 3. |          |   |
| <b>NFB24-S, NFX24-S</b>  |          |   |
| Auxiliary switches   |          | 2 x SPDT 3A (0.5A) @ 250 VAC, UL approved one set at +10°, one adjustable 10° to 90°  |

- 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

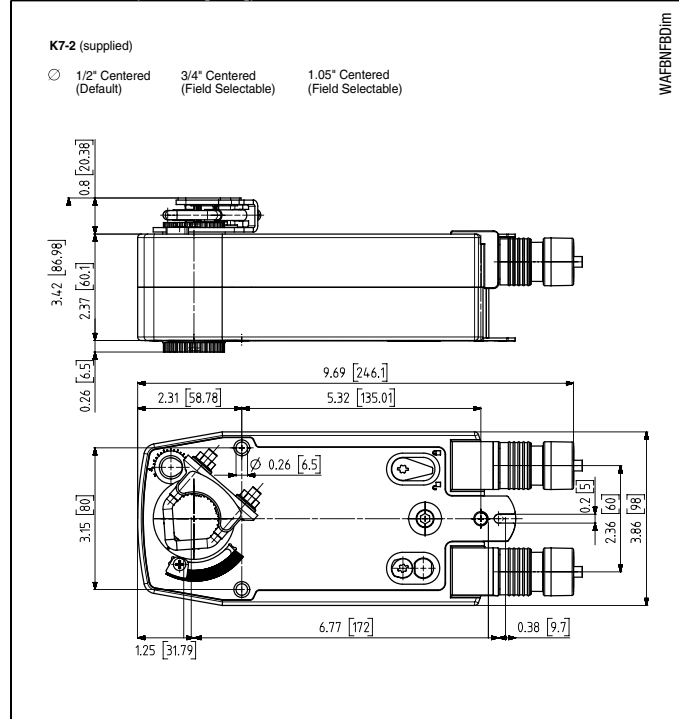
The NFB and NFX series actuators provide true spring return operation for reliable fail-safe application and positive close off on air tight dampers. The spring return system provides constant torque to the damper with, and without, power applied to the actuator.

The NFB and NFX 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 NFB24-S and NFX24-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°, for the other switch function is adjustable between +10° to +90°. The NFB24, NFB24-S, NFX24 and NFX24-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])



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

**Accessories**

|           |   |
|-----------|---|
| AV 8-25   | Shaft extension   |
| IND-AFB   | Damper position indicator   |
| KH-AFB    | Crank arm   |
| K7-2      | Universal clamp for up to 1.05" dia jackshafts  |
| TF-CC US  | Conduit fitting   |
| Tool-06   | 8mm and 10 mm wrench  |
| ZG-100    | Universal mounting bracket  |
| ZG-101    | Universal mounting bracket  |
| ZG-118    | Mounting bracket for Barber Colman® MA 3../4.., Honeywell® Mod III or IV or Johnson® Series 100 replacement or new crank arm type installations |
| ZG-AFB    | Crank arm adaptor kit   |
| ZG-AFB118 | Crank arm adaptor kit   |
| ZS-100    | Weather shield (metal)  |
| ZS-150    | Weather shield (polycarbonate)  |
| ZS-260    | Explosion-proof housing   |
| ZS-300    | NEMA 4X housing   |

Note: When using NFB24, NFB24-S, NFX24, NFX24-S actuators, only use accessories listed on this page.

For actuator wiring information and diagrams, refer to Belimo Wiring Guide.

**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 counterclockwise 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 Approved 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**
**INSTALLATION NOTES**

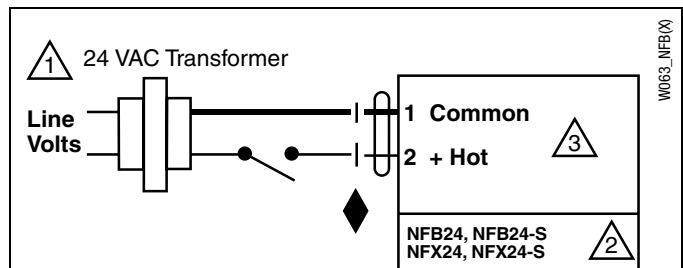
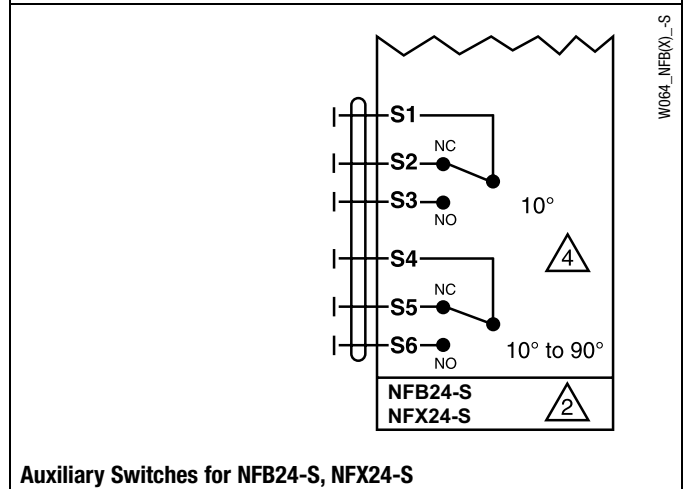
- 1 Provide overload protection and disconnect as required.
- 2 **CAUTION Equipment Damage!**  
Actuators may be connected in parallel.  
Power consumption and input impedance must be observed.
- 3 Actuators may also be powered by 24 VDC.
- 4 For end position indication, interlock control, fan startup, etc., NFB24-S and NFX24-S incorporates two built-in auxiliary switches: 2 x SPDT, 3A (0.5A) @250 VAC, UL Approved, one switch is fixed at +10°, one is adjustable 10° to 90°.

**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.


**On/Off wiring for NFB24, NFX24**

**Auxiliary Switches for NFB24-S, NFX24-S**