

On-Off Control, 24 VAC/DC Power

- NF24 us**
- NF24-S us** (NF24 us with built-in auxiliary switch)

On-Off Control, 120 VAC Power

- NF120 us**
- NF120-S us** (NF120 us with built-in auxiliary switch)

Proportional Control, 24 VAC/DC Power

- NF24-SR us**
- Control signal: 2 to 10 VDC
4 to 20 mA (with 500Ω resistor)
- Input impedance: 100 kΩ (500Ω)
- Feedback output: 2 to 10 VDC

Common Data

- Power consumption: 3 to 6 W running,
1 to 3.5 W holding (models vary)
- Transformer sizing: 6 VA (NF24-SR us), 7 VA (NF120 us)
8 VA (NF24 us), class 2 power
- Electrical connection: 3 ft, 18 GA appliance cable,
1/2" conduit fitting
- Electrical protection: 120V actuators/aux. switches
double insulated
- Overload protection: electronic throughout rotation
- Angle of rotation: 95° (adjustable with ZDB-AF2)
- Direction of rotation: selected by switch:
CW=CW with decrease signal
CCW=CCW with decrease signal
- Spring return direction: CW/CCW mounting
- Position indication: visual indicator
- Auxiliary switch: 1 x SPDT. 5° to 85° (-S)
- Running time: <75 sec. (on-off)
150 sec. independent of load (proportional)
< 60 sec. (spring)
- Ambient temperature: -22° F to 122° F [-30° C to 50° C]
- Housing: NEMA 2 / IP54
- Agency listings: UL 873, CSA 4813 02, CE
- Noise level: max. 45 dB(A)
- Weight: 6.0 lbs to 7.3 lbs (models vary)

Application/Operation

For fail-safe control of dampers in HVAC systems. Actuator sizing should be done in accordance with the damper manufacturer's specifications.

NF series actuator is mounted directly to a damper shaft up to 3/4" in diameter by means of its universal clamp, or up to a 1.05" jackshaft with the optional K4-1 clamp. A crankarm and several mounting brackets are available for applications where the actuator cannot be direct coupled to the damper shaft.



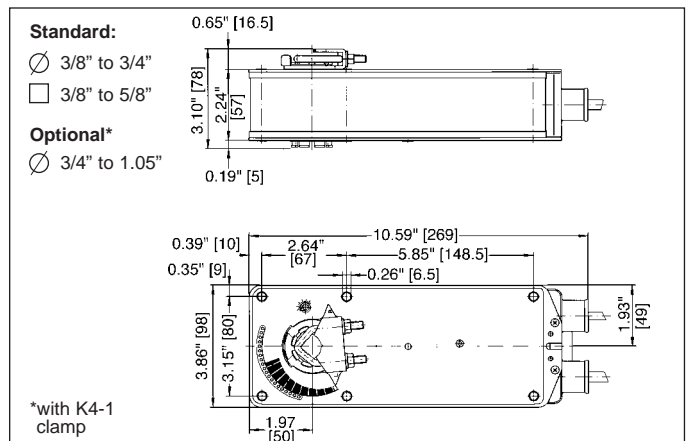
NF24(-S) us and **NF120(-S) us** control is on-off from an auxiliary contact of a fan motor contactor or a manual switch. The **NF24-SR us** operates in response to a 2 to 10 VDC, or with the addition of a 500Ω resistor, a 4 to 20 mA control input from an electronic controller or positioner. A 2 to 10 VDC feedback signal is provided for position indication or master slave applications. A microprocessor provides intelligence to the ASIC to provide a constant rotation rate and to know the actuator's exact zero position. The NF24-SR us uses a brushless DC motor which is controlled by an Application Specific Integrated Circuit (ASIC) and a microprocessor which monitors and controls the motor's rotation, and provides a digital rotation sensing function to prevent damage to the actuator in a stall condition. The 120 VAC models and all actuators with auxiliary switches are constructed to meet the requirements for Double Insulated devices. These units do not require a good connection to meet electrical code requirements.

True spring return operation is provided for reliable fail-safe application and positive close-off on air-tight dampers. Consistent torque is provided to the damper with, and without, power applied to the actuator.

The NF series provides 95° of rotation 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.

* Based on 4 in-lb/ft² damper torque loading. Parallel blade. No edge seals.

Dimensions (All numbers in brackets are metric.)



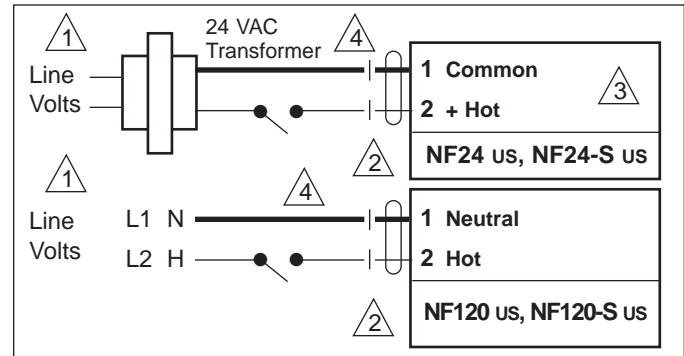
Typical Specification:

Spring return damper actuators shall be direct coupled type which require no crankarm 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, 1 SPDT auxiliary switch shall be provided for on-off actuators, with the capability of being adjustable. High voltage 120 VAC actuators and actuators with auxiliary switches must be constructed to meet the requirements for Double Insulation so an electrical ground connection is not required to meet agency codes. Actuators shall be UL listed and CSA certified, have a 2 year warranty, and be manufactured under ISO 9001 International Quality Control Standards. Actuators shall be as manufactured by Belimo.

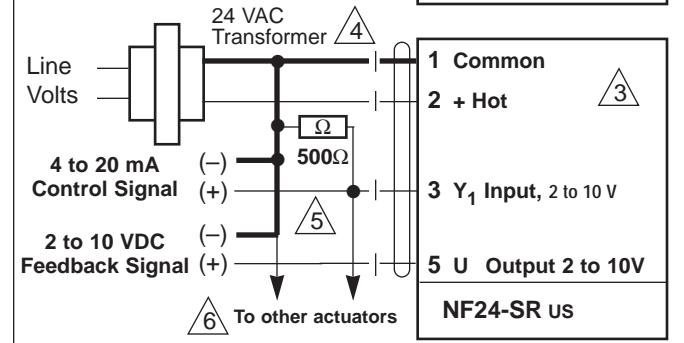
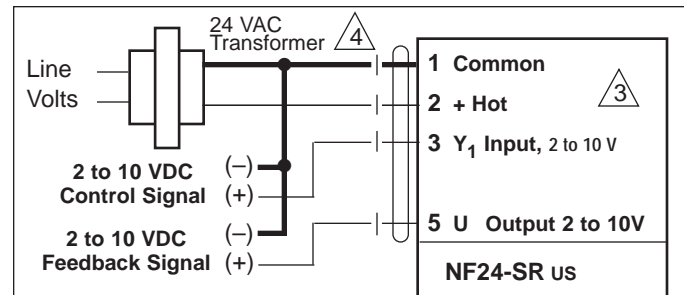
NF24-SR US

The actuator must provide proportional damper control in response to a 2 to 10 VDC, with the addition of a 500Ω resistor, a 4 to 20 mA control input from an electronic controller or positioner. 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 independent of load. A 2 to 10 VDC feedback signal shall be provided for position feedback or master-slave applications.

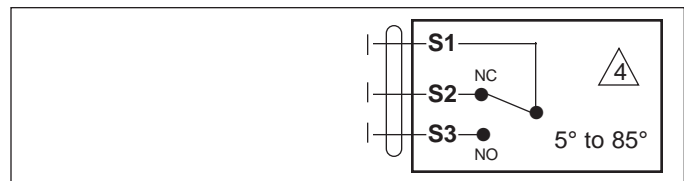
Wiring diagrams



On-off wiring



Proportional wiring (2 to 10 VDC, 4 to 20 mA control signals)



Auxiliary switch models - All NF-series with '-S' suffix

- Wiring Notes**
- ① Provide overload protection and disconnect as required.
 - ② Actuators may be connected in parallel. Power consumption must be observed.
 - ③ NF24 (-S) us, NF24-SR us actuators may also be powered by 24 VDC.
 - ④ High voltage 120 VAC models and models with auxiliary switches meet UL and CSA requirements without the need of an electrical ground connection.
 - ⑤ The ZG-R01 500Ω resistor converts the 4 to 20 mA control signal to 2 to 10 VDC.
 - ⑥ Up to 4 actuators may be connected in parallel. With 4 actuators wired to one 500Ω resistor, a +2% shift of control signal may be required. Power consumption must be observed.