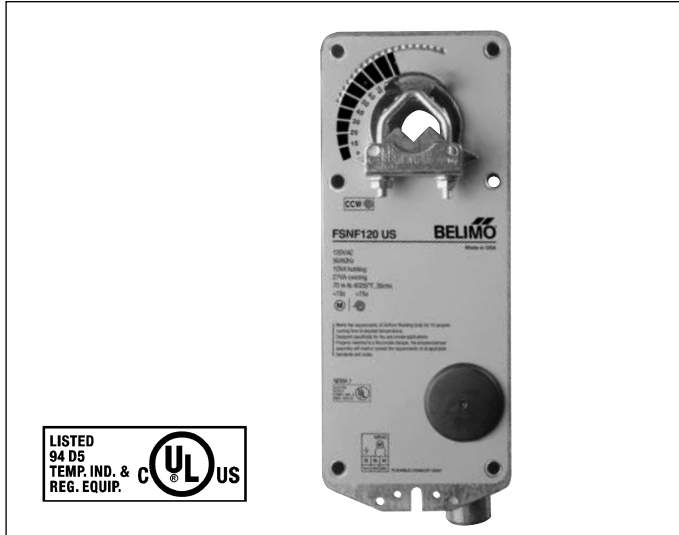


# Fire and smoke spring return actuators FSNF120 (-S) US, FSNF24 (-S) US

Fire and smoke actuator, 70 in-lb, spring return, 350°F for limited time, 15 sec. cycle time



Technical Data	FSNF120(-S)	FSNF24(-S)
Power supply	120 VAC ± 10% 50/60 Hz	24 VAC ± 20% 50/60 Hz
Power consumption 120 VAC	Running: 27 VA, Holding: 10 VA, .09A	.23A
Transformer sizing 24 VAC	27 VA Class 2 power supply	
Electrical connection	3 ft, 18 ga, 3 color coded leads (120V) 3 ft, 18 ga, 2 color coded leads (24V) 3 ft, 18 ga, appliance cable (-S models)	
Overload protection	Electronic throughout 0 to 95° rotation Grounded enclosure, 120V	
Electrical protection	Double insulated aux switches	
Control	Microprocessor	
Angle of rotation	95°	
Torque	70 in-lb [7.9 Nm] minimum from 32°F to 350°F	
Direction of rotation	Spring return can be selected by CCW/CW mounting	
Position indication	Visual indicator, 0° to 95°	
Running time	Between 32°F and 350°F motor: < 15 sec at rated voltage and torque spring: < 15 sec	
Auxiliary switches (FSNF24-S/120-S)	2 x SPDT 7A (2.5A inductive)@ 125/250VAC, UL listed, 5° and 85°	
Humidity	5 to 95% RH noncondensing	
Ambient temperature	32°F to +122°F [0°C to +50°C]	
Storage temperature	-40°F to +176°F [-40°C to +80°C]	
Housing	NEMA type 1, zinc coated steel	
Gears	Steel, permanently lubricated	
Agency listings	cULus listed to UL873 and CAN/CSA C22.2 No. 24	
Servicing	Maintenance free	
Quality standard	ISO 9001	
Weight 24,120, (-S) [kg]	6 lbs [2.75], 6.7 lbs [3.0], (+.5 lbs [+.23])	

## Application:

The type FSNF spring-return actuator is intended for the operation of smoke and combination fire and smoke dampers in ventilation and air-conditioning systems. The actuator will meet requirements of UL555 and UL555S when tested as an assembly with the damper and will meet requirements of UBC for 15 second opening and closing at 350°F. Square footage of damper operated will depend on make and model and the temperature required.

## Operation

Mounting of the actuator to the damper axle shaft or jackshaft (3/8" to 1.05") is via a cold-weld clamp. Teeth in the clamp and V-bolt dig into the metal of both solid and hollow shafts maintaining a perfect connection. The specially designed clamp will not crush hollow shafts. The bottom end of the actuator is held by an anti-rotation strap or by a stud provided by the damper manufacturer.

The actuator is mounted in its fail safe position with the damper blade(s) closed. Upon applying power, the actuator drives the damper to the open position. The internal spring is tensioned at the same time. If the power supply is interrupted, the spring moves the damper back to its fail-safe position.

## Safety note:

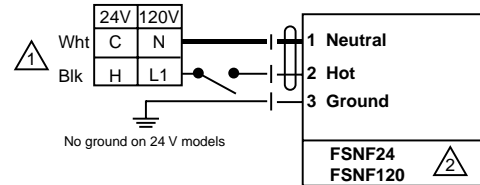
The actuator contains no components which the user can replace or repair.



## Accessories

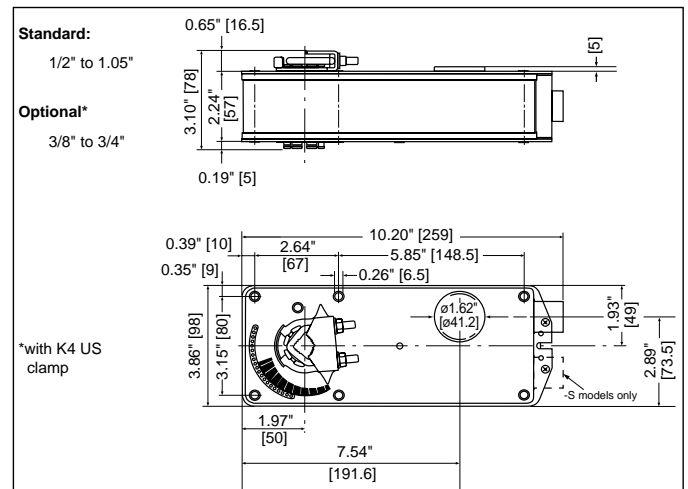
All AF/NF linkages and parts may be employed.

## Wiring



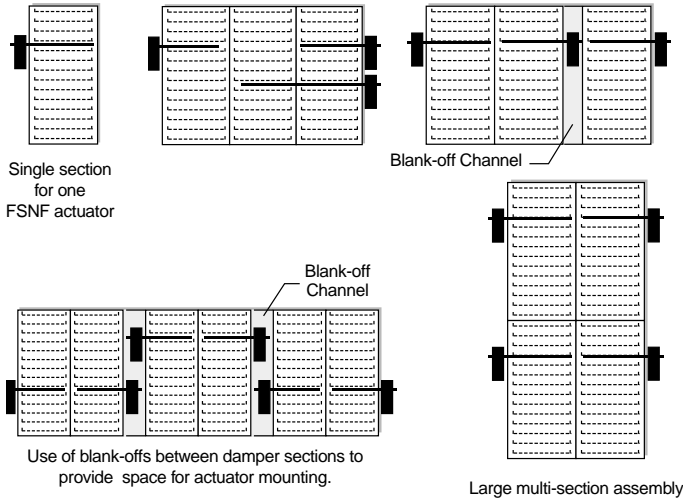
- 1 Provide overload protection and disconnect as required.
- 2 Actuators may be connected in parallel. Power consumption must be observed.

## Dimensions (All ratings in brackets are millimeters.)



## Multi-section damper assemblies – typical applications

The typical fire and smoke damper requires from 5-15 in-lb of torque per square foot at 250°F - 350°F under dynamic load (2400 fpm velocity). The FSNF will operate multi-section



dampers using multiple actuators for multiple sections. Some of the methods used are shown left.

This is a direct coupled actuator. If linkages are needed use the FSNF series. Square shaft adaptors are available: 22153-00002, 22153-00003, 22513-00004 for the 8mm, 10mm, and 12mm, form fit respectively.

### Safety note:

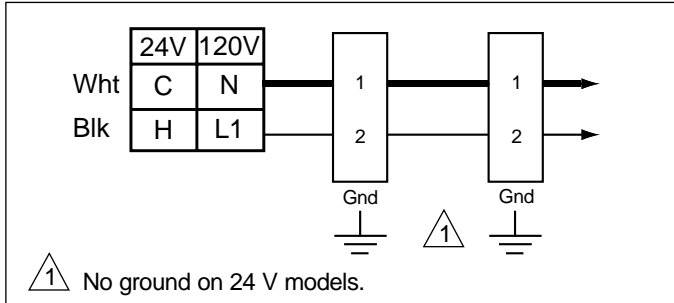
#### 1/2" Threaded Connector

Screw a conduit fitting into the actuator's metal bushing. Jacket the actuator's input wiring with suitable flexible conduit. Properly terminate the conduit in a suitable junction box.

#### 3/8" Flexible Connector Models (-FC Screw Connector)

Mount the flexible conduit into the actuator's metal bushing by means of the provided screw with a torque of 1.2 Nm. Jacket the actuator's input wiring with suitable flexible conduit. Properly terminate the conduit in a suitable junction box.

## Parallel actuator wiring



## Typical specification

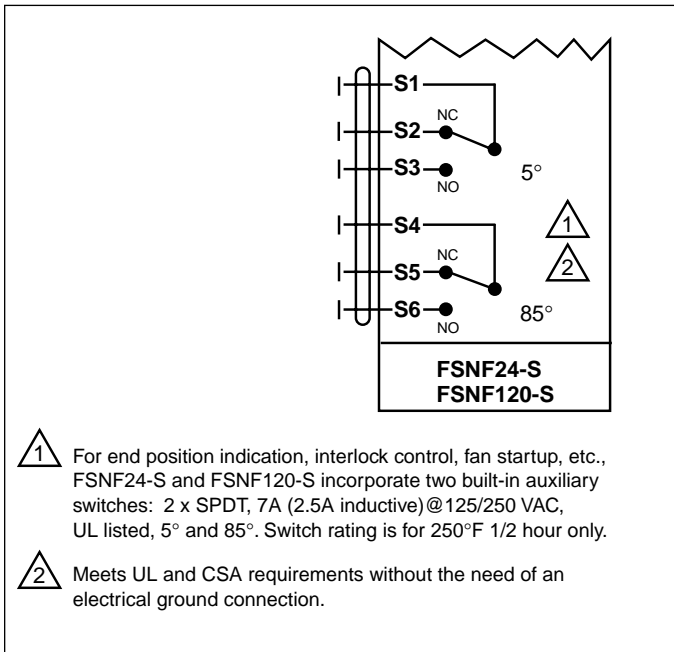
### Smoke Control and Combination Fire and Smoke Control Damper Actuators

All smoke and combination fire and smoke dampers shall be provided with Belimo FSLF, FSNF, or FSAF actuators. No substitutions allowed.

Damper and actuator shall have UL555S Listing for 250°F (350°F) and shall comply with UBC if required by local codes.

Where proof of closure switches are required, blade switches, actuator auxiliary switches, or proximity switches are allowed.

## Auxiliary switch wiring for FSNF24-S US, FSNF120-S US



## Replacement applications

The number one "equal or better" requirement for use as a replacement for obsolete defective motors is the UL555S listing of the Belimo actuator with the damper for the application. The local authority having jurisdiction sets the requirements. In some cases a permit and inspection may be required.

Contact Belimo for a list of damper manufacturers with UL555S listing with Belimo FSAF, FSLF, & FSNF actuators.

Caution must be used when replacing failed motors with new Belimo actuators. Many old motors did not have internal springs and depended on external springs on the side of the damper or wrapped around the damper shaft to close the damper.

In some cases, the damper must be replaced because the damper would have to undergo major modifications to replace an actuator.

In many cases, replacing the actuator voids the UL555S listing of the damper.