

3. FSNF-1 AP

Product-Information
Fire/Smoke damper actuators

FSNF



Selection Table

		FSNF24 US	FSNF120 US	FSNF230 US
Torque	7 Nm			
Nominal Voltage	AC 24 V AC 120 V AC 230 V	•	•	•
Running time	Motor 15 s Spring 15 s	• •	• •	• •
Angle of rotation	95°	•	•	•
Direction of Rotation	Reversible by CCW/CW mounting	•	•	•
Control	Open/Close	•	•	•
Steel gear and housing		•	•	•
Steel cold-weld clamp		•	•	•
UL listed and ISO9001 quality		•	•	•

Content

Spring return actuators

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



7.9 Nm (70 in-lb) spring return, 177°C (350°F) for limited time, nominal 15 sec. operation



Application:

The 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 the requirements of UL555 and UL555S when tested as an assembly with a suitable damper, it will also meet the requirements of the Universal Building Code (UBC) for 15 second opening and closing.

The size of damper that the FSNF can operate will depend on the make, the model and the temperature requirement.

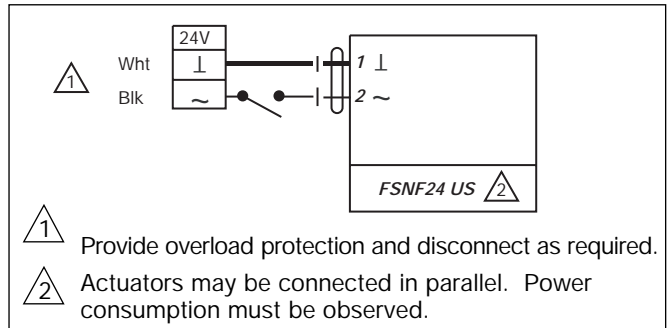
Operation

Mounting of the actuator to the damper shaft or jackshaft is via dual square shaft fittings or 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 special design of the 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.

Accessories: All AF/NF linkages may be applied. Order part 22965-00001 for square shafts (□12mm).

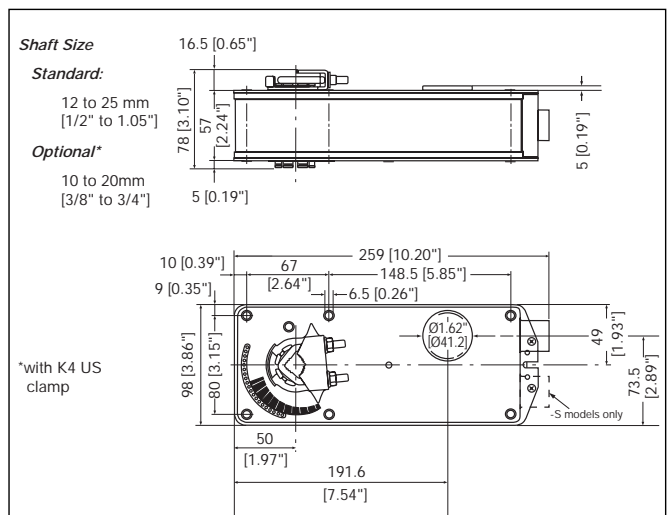
Technical Data	FSNF24(-S) US
Power supply	24 VAC ± 20% 50/60 Hz
Power consumption	running: 18 W holding: 6 W
Electrical connection	3 ft (1m), 18 ga, 2 color coded leads Aux Switch: 3 ft (1m), 18 ga, appliance cable
Transformer Sizing	27 VA Class 2 Power supply
Overload protection	Electronic throughout 0 to 95° rotation Auto-restart after temporary overload
Electrical protection	Double insulated aux switches
Angle of rotation	95°
Torque	7.9 Nm [70 in-lb] minimum from 0°C to 177°C (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 0°C to 177°C (32°F to 350°F) motor: apx. 15 sec at rated voltage and torque spring: apx. 15 sec
Auxiliary switches (FSNF24-S US)	2 x SPDT 7A (2.5A inductive)@ 125/250VAC, UL listed, 5° and 85°
Humidity	5 to 95% RH noncondensing
Ambient temperature	0°C to +50°C [32°F to +122°F]
Storage temperature	-40°C to +80°C [-40°F to +176°F]
Housing	NEMA1
Housing material	zinc coated steel
Agency listings	UL listed to UL873 and CAN/CSA C22.2 No. 24 NY BEC & CSFM (24V)
Servicing	maintenance free
Quality standard	ISO 9001
Weight	2.75 kg. (6 lbs)

Wiring



Dimensions

(All ratings in brackets are imperial.)





Application:

The 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 the requirements of UL555 and UL555S when tested as an assembly with a suitable damper, it will also meet the requirements of the Universal Building Code (UBC) for 15 second opening and closing.

The size of damper that the FSNF can operate will depend on the make, the model and the temperature requirement.

Operation

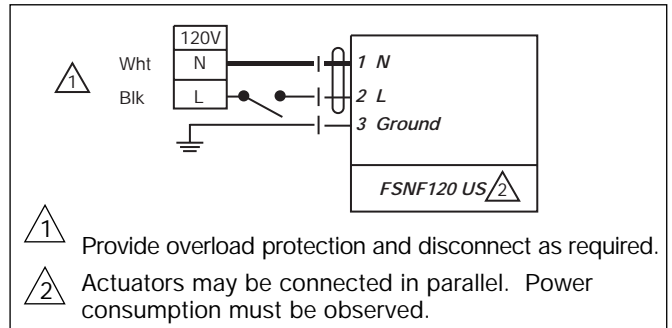
Mounting of the actuator to the damper shaft or jackshaft is via dual square shaft fittings or cold-weld clamp. Teeth in the clamp and V-bolt dig into the metal of both solid and hollow shafts maintaining a perfect connection. The special design of the clamp will not crush hollow shafts. The bottom end of the actuator is held by an anti-rotation strap or by a stud provided by the damper manufacturer.

Accessories: All AF/NF linkages may be applied.

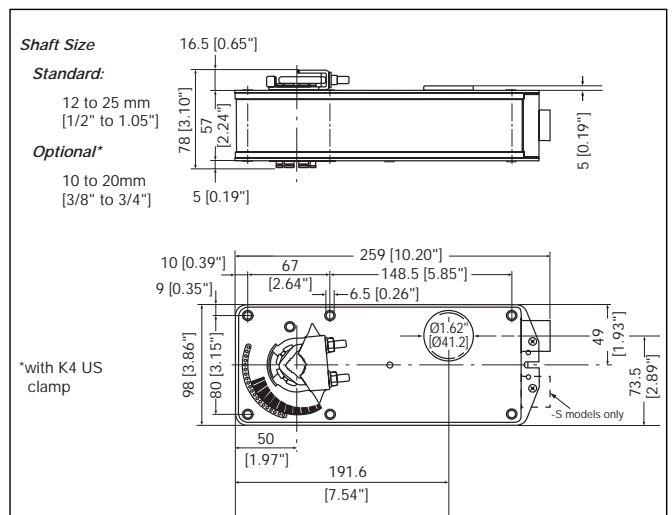
Order part 22965-00001 for square shafts (□12mm).

Technical Data	FSNF120(-S) US
Power supply	120 VAC ± 10% 50/60 Hz
Power consumption	running: 18 W holding: 6 W
Electrical connection	3 ft (1m), 18 ga, 3 color coded leads Aux Switch: 3 ft (1m), 18 ga, appliance cable
Overload protection	Electronic throughout 0 to 95° rotation Auto-restart after temporary overload
Electrical protection	Grounded enclosure Double insulated aux switches
Angle of rotation	95°
Torque	7.9 Nm [70 in-lb] minimum from 0°C to 177°C (32°F and 350°F)
Direction of rotation	spring return can be selected by CCW/CW mounting
Position indication	visual indicator, 0° to 95°
Running time	between 0°C to 177°C (32°F and 350°F) motor: apx. 15 sec at rated voltage and torque spring: apx. 15 sec
Auxiliary switches	2 x SPDT 7A (2.5A inductive)@ (FSNF120-S US) 125/250VAC, UL listed, 5° and 85°
Humidity	5 to 95% RH noncondensing
Ambient temperature	0°C to +50°C [32°F to +122°F]
Storage temperature	-40°C to +80°C [-40°F to +176°F]
Housing	NEMA1
Housing material	zinc coated steel
Agency listings	UL listed to UL873 and CAN/CSA C22.2 No. 24 NY BEC & CSFM (24V)
Servicing	maintenance free
Quality standard	ISO 9001
Weight	2.75 kg. (6 lbs)

Wiring



Dimensions (All ratings in brackets are imperial.)



Fire and smoke spring return actuators FSNF230(-S) US



7.9 Nm (70 in-lb) spring return, 177°C (350°F) for limited time, nominal 15 sec. operation



Application:

The 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 the requirements of UL555 and UL555S when tested as an assembly with a suitable damper, it will also meet the requirements of the Universal Building Code (UBC) for 15 second opening and closing.

The size of damper that the FSNF can operate will depend on the make, the model and the temperature requirement.

Operation

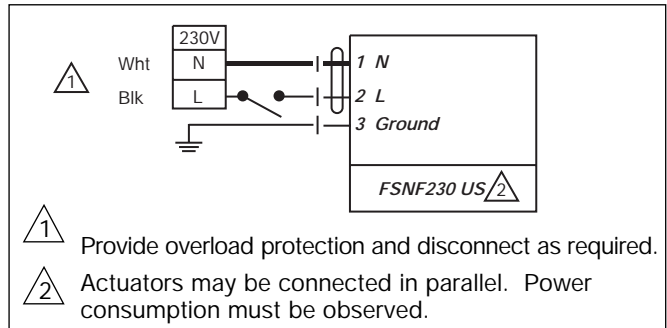
Mounting of the actuator to the damper shaft or jackshaft is via dual square shaft fittings or cold-weld clamp. Teeth in the clamp and V-bolt dig into the metal of both solid and hollow shafts maintaining a perfect connection. The special design of the clamp will not crush hollow shafts. The bottom end of the actuator is held by an anti-rotation strap or by a stud provided by the damper manufacturer.

Accessories: All AF/NF linkages may be applied.

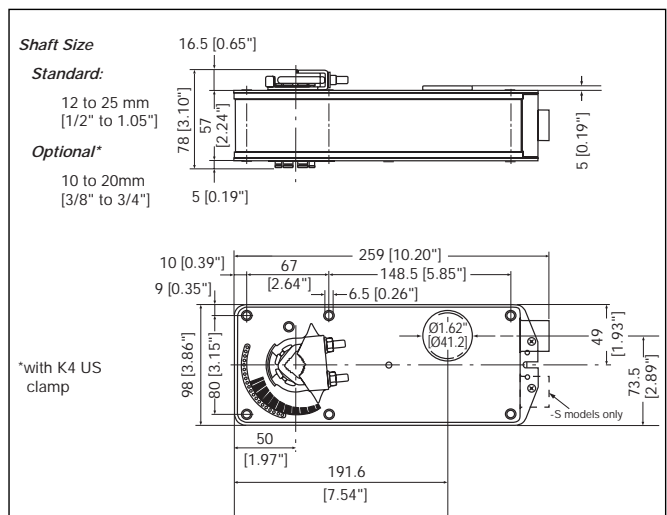
Order part 22965-00001 for square shafts (□12mm).

Technical Data	FSNF230(-S) US
Power supply	230 VAC ± 10% 50/60 Hz
Power consumption	running: 18 W holding: 6 W
Electrical connection	3 ft (1m), 18 ga, 3 color coded leads Aux Switch: 3 ft (1m), 18 ga, appliance cable
Overload protection	Electronic throughout 0 to 95° rotation Auto-restart after temporary overload
Electrical protection	Grounded enclosure Double insulated aux switches
Angle of rotation	95°
Torque	7.9Nm [70 in-lb] minimum from 0°C to 177°C (32°F and 350°F)
Direction of rotation	spring return can be selected by CCW/CW mounting
Position indication	visual indicator, 0° to 95°
Running time	between 0°C to 177°C (32°F and 350°F) motor: apx. 15 sec at rated voltage and torque spring: apx. 15 sec
Auxiliary switches (FSNF230-S)	2 x SPDT 7A (2.5A inductive)@ 125/250VAC, UL listed, 5° and 85°
Humidity	5 to 95% RH noncondensing
Ambient temperature	0°C to +50°C [32°F to +122°F]
Storage temperature	-40°C to +80°C [-40°F to +176°F]
Housing	NEMA1
Housing material	zinc coated steel
Agency listings	UL listed to UL873 and CAN/CSA C22.2 No. 24 NY BEC & CSFM (24V)
Servicing	maintenance free
Quality standard	ISO 9001
Weight	2.75 kg. (6 lbs)

Wiring



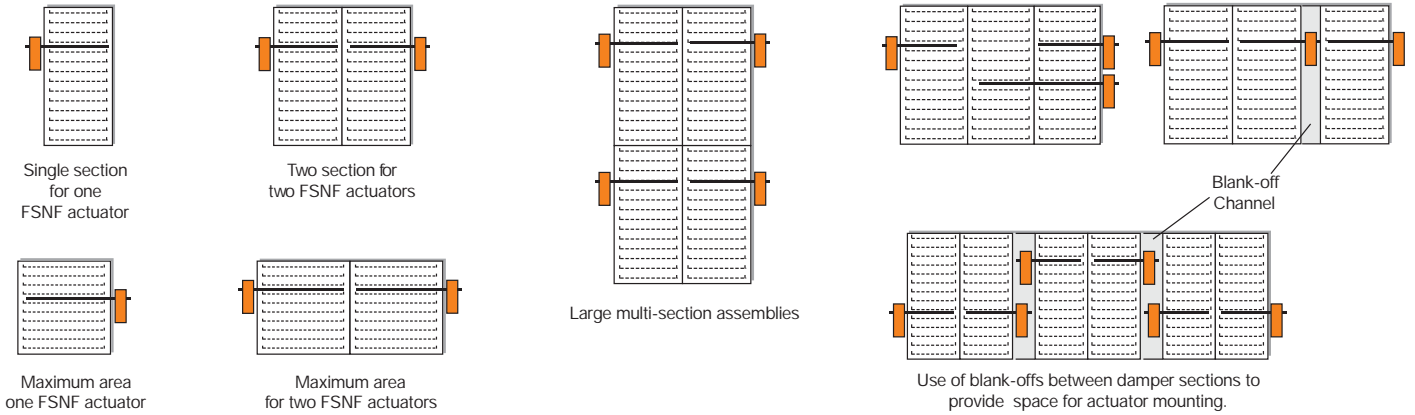
Dimensions (All ratings in brackets are imperial.)



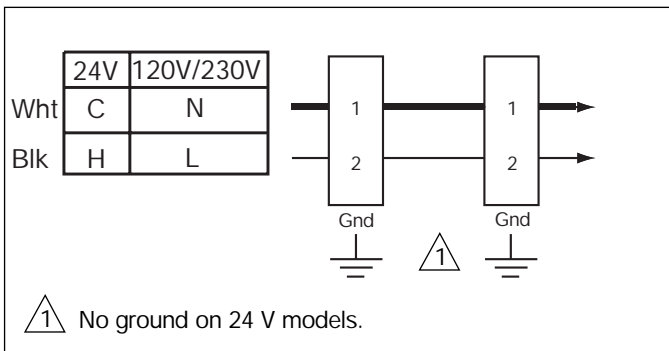
Multi-section damper assemblies - typical applications

The typical fire and smoke damper requires from 6-17Nm torque per sq. meter (5-15 in-lb/ ft²) at 177°C (350°F) under dynamic load (12m/s [2400 fpm] velocity). The FSNF will operate

multi-section dampers using multiple actuators for multiple sections. Some of the methods used are shown below.



Parallel actuator wiring



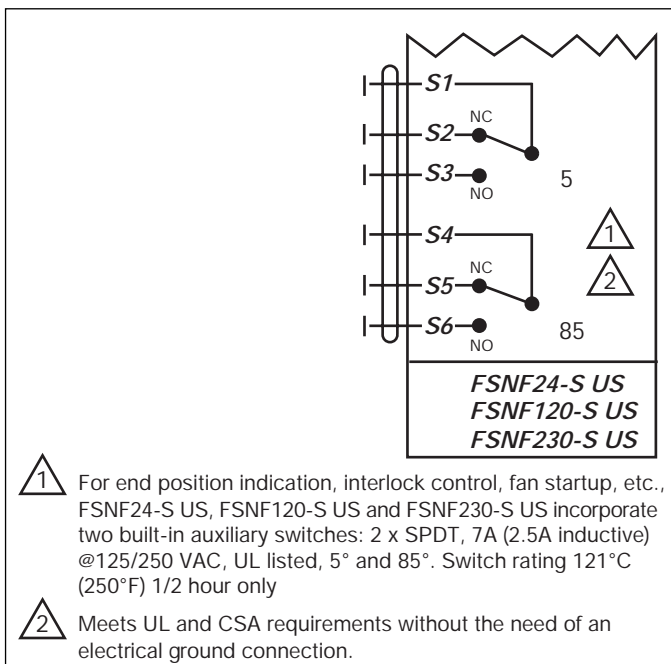
How to specify the FSNF

Smoke Control and Combination Fire and Smoke Control Actuator FSNF

All smoke and combination fire and smoke dampers shall be provided with Belimo FSNF US actuators. No substitutions allowed.

Damper and actuator shall have UL555S Listing for 177°C (350°F), 121°C (250°F) and shall drive open in 15 seconds and spring closed in 15 seconds at elevated temperature.

Auxiliary switch wiring for FSNF24-S US, FSNF120-S US, FSNF230-S US



Replacement applications

When actuators fail on existing dampers, the local authority having jurisdiction sets the code requirements for replacement actuators. The local inspector or fire marshal should be consulted. In some jurisdictions, a product meeting current codes may be required.

The FSNF will meet or exceed requirements.

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 all cases, replacing the actuator voids the UL555 listing of the damper and actuator.

Air applications

Water applications



Standard actuators and spring-return actuators for air control dampers in HVAC systems



Safety actuators for motorizing fire and smoke extraction dampers



VAV systems for individual room air control



Mixing actuators and motorized ball valves for HVAC water circuits



Globe valves and intelligent linear actuators

Innovation, Quality and Consultancy: A partnership for motorizing HVAC actuators

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