

# FSLF24(-S) US, FSLF120(-S) US

On/Off, Spring Return, 350°F [177°C] for Half Hour, 15 Seconds Operation



Technical Data		FSLF24(-S) US, FSLF120(-S) US
Power supply		
	FSLF24(-S) US	24 VAC, 50/60 Hz nominal voltage range 21.6-26.4 VAC
	FSLF120(-S) US	120 VAC, 50/60 Hz nominal voltage range 108-132 VAC
Power consumption		
	24 VAC	running 50/60 Hz, 5.0 VA holding 50/60 Hz, 3.5 VA
	120 VAC	running 50 Hz, 20 VA / 60 Hz, 18 VA holding 50 Hz, 12 VA / 60 Hz, 6.5 VA
Transformer sizing		
	24 VAC	Safety Note, connect via safety isolating transformer, class 2 supply
Electrical connection		
	FSLF24(-S) US	3 ft [1m], 18 ga, 2 color coded leads
	FSLF120(-S) US	3 ft [1m], 18 ga, 3 color coded leads
	FSLF...-S US	3 ft [1m], 18 ga, appliance cable
Overload protection		electronic throughout 0 to 95° rotation auto-restart after temporary overload
Electrical protection		grounded enclosure, 120V
Control		microprocessor
Angle of rotation		95°
Torque		30 in-lb [3.5 Nm] minimum from 32°F to 350°F [0°C to 177°C]
Direction of rotation	spring	can be selected by CCW/CW mounting
Position indication		visual indicator, 0° to 95°
Running time	motor	< 15 seconds at rated voltage and torque 32°F and 122°F [0°C to 50°C]
	spring	< 15 seconds at ambient temperature
Humidity		5 to 95% RH non-condensing
Ambient temperature		
	normal duty	32°F to 122°F [0°C to 50°C]
	safety duty	3 on/off cycles after 30 minutes at ambient temperature of 350°F [177°C]
Storage temperature		-40°F to 176°F [-40°C to 80°C]
Housing		NEMA type 1, zinc coated steel
Type of action		Type 1.B Software class A
Shaft		3/8"-1/2" rnd (7/16" sq) 1/2"-3/4" rnd w/K6-1
Gears		permanently lubricated
Agency listings		cULus listed to UL 60730-1 and CAN/CSA 22.2 No 4
Servicing		maintenance free
Quality standard		ISO 9001
Weight		
	FSNF24(-S) US	3.4 lbs (1.7 kg)
	FSNF230(-S) US	4.0 lbs (1.8 kg)
	FSNF...-S US	+0.3 lbs (+.14 kg)

FSLF24-S US, FSLF120-S US	
Auxiliary Switch	2 x SPST 0.5 A inductive @ 120/250 V, 1 mA @ 5 VDC, 3 A resistive @ 120/250 V, UL Approved, 10° and 85°, double insulated

## Application:

The type FSLF 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.

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 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.

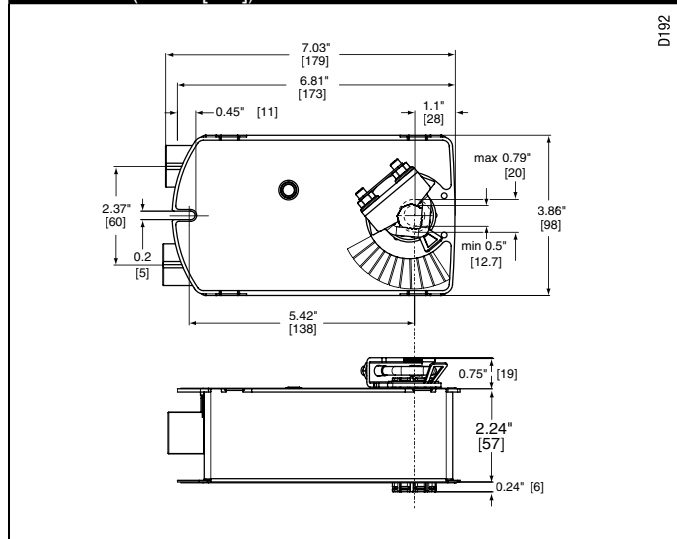
## SAFETY NOTES

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

**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.

## Dimensions (Inches [mm])



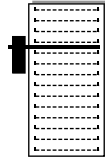
M40024 - 05/10 - Subject to change. © Belimo Aircontrols (USA), Inc.

## Typical Applications

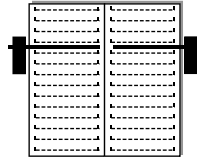
### Multi-section Damper Assemblies

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 (2000 fpm velocity). The FSLF is a single section damper actuator. For the multi section dampers, use the FSNF series. This is a direct coupled actuator. If linkages are needed use the FSNF series.

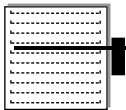
Square shaft adaptors are available: 22153-00002, 22153-00003, 22513-00004 for the 8mm, 10mm, and 12mm, form fit respectively.



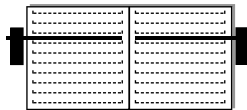
Single section for one FSLF actuator



Two section for two FSLF actuators



Maximum area one actuator



Maximum area for two actuators

## 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.

## 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.

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

### CAUTION

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.

Most codes require that "equal or better" actuators be used to replace defectives.

## Wiring Diagrams

### INSTALLATION NOTES

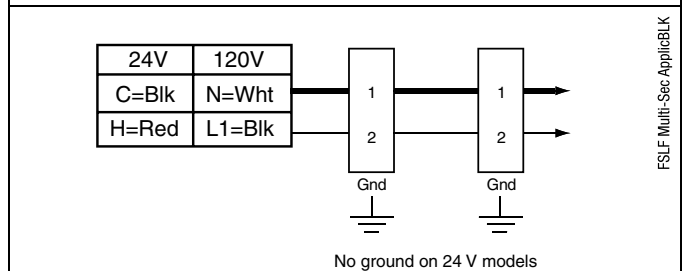
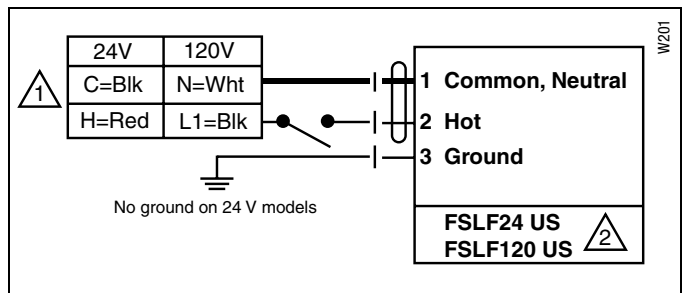
- 1 Provide overload protection and disconnect as required.
- 2 **CAUTION Equipment Damage!**  
Actuators may be connected in parallel. Power consumption and input impedance must be observed.
- 3 No ground connection required. Double insulated.
- 4 For end position indication, interlock control, fan startup, etc., FSNF24-S and FSNF230-S incorporate two built-in auxiliary switches: 2 x SPDT, 7A (2.5A inductive)@125/250 VAC, UL Approved, 5 and 85. Switch rating 250°F [121°C] 1/2 hour only.

### APPLICATION NOTES

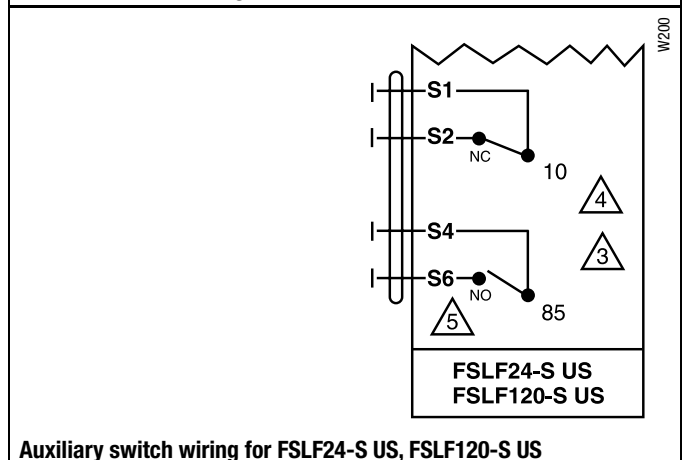
- ◆ Meets cULus or UL and CSA Standard requirements without the need of an electrical ground connection.

### 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.



### Parallel Actuator Wiring



### Auxiliary switch wiring for FSLF24-S US, FSLF120-S US