

LF24-3 (-S) US

On-off, spring return safety, reversible, floating point, 24V



Torque min. 35 in-lb, for control of air dampers

Application

For modulation or on-off control of dampers in HVAC systems. Actuator sizing should be done in accordance with the damper manufacturer's specifications.

The actuator is mounted directly to a damper shaft from 3/8" up to 1/2" in diameter by means of its universal clamp, 1/2" shaft centered at delivery. For shafts up to 3/4" use K6-1 accessory. A crank arm and several mounting brackets are available for applications where the actuator cannot be direct coupled to the damper shaft.

Control is 3 wire, floating point from a triac or relay, or on-off from an auxiliary contact from a fan motor contactor, controller, or manual switch.

Operation

The LF 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 consistent torque to the damper with, and without, power applied to the actuator.

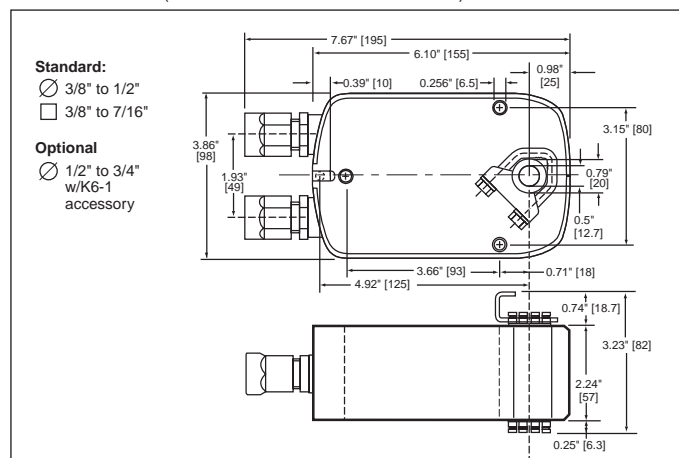
The LF series provides 95° of rotation and is provided with a graduated position indicator showing 0 to 90°.

The LF24-3 (-S) US uses a brushless DC motor which is controlled by an Application Specific Integrated Circuit (ASIC) and a microprocessor. The microprocessor provides the intelligence to the ASIC to provide a constant rotation rate. The ASIC monitors and controls the brushless DC motor's rotation and provides a digital rotation sensing function to prevent damage to the actuator in a stall condition. The actuator may be stalled anywhere in its normal rotation without the need of mechanical end switches. Power consumption is reduced in holding mode.

The LF24-3-S US version is provided with 1 built-in auxiliary switch. This SPDT switch is provided for safety interfacing or signaling, for example, for fan start-up. The switching function is adjustable between 0° and 95°. The auxiliary switch in the LF24-3-S US is double insulated so an electrical ground is not necessary.

Technical Data	LF24-3 (-S) US
Power supply	24 VAC ± 20% 50/60 Hz 24 VDC ± 10%
Power consumption	running: 2.5 W ; holding: 1 W
Transformer sizing	5 VA (class 2 power source)
Electrical connection	LF24-3 US 3 ft, plenum rated cable LF24-3-S US 3 ft, 18 GA appliance cables (2) 1/2" conduit connector
Overload protection	electronic throughout 0 to 95° rotation
Input impedance	1000 Ω (0.6w) control inputs
Angle of rotation	max. 95°, adjust. with mechanical stop
Torque	35 in-lb [4 Nm]
Direction of rotation	spring: reversible with cw/ccw mounting motor: reversible with built-in switch
Position indication	visual indicator, 0° to 90° (0° is spring return position)
Auxiliary switch (LF24-3-S US)	1 x SPDT 6A (1.5A) @ 250 VAC, UL listed adjustable 0° to 95° (double insulated)
Running time	motor: 150 sec constant, independent of load spring: < 25 sec @ -4°F to +122°F [-20°C to +50°C] < 60 sec @ -22°F [-30°C]
Humidity	5 to 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 type 2 /IP54
Housing material	zinc coated metal
Agency listings	UL 873 listed; CSA C22.2 No. 24 certified, CE
Noise level	max: running < 30 db (A) spring return 62 db (A)
Servicing	maintenance free
Quality standard	ISO 9001
Weight	LF24-3 3.1 lbs (1.40 kg.) LF24-3-S 3.6 lbs (1.45 kg.)

Dimensions (All numbers in brackets are metric.)

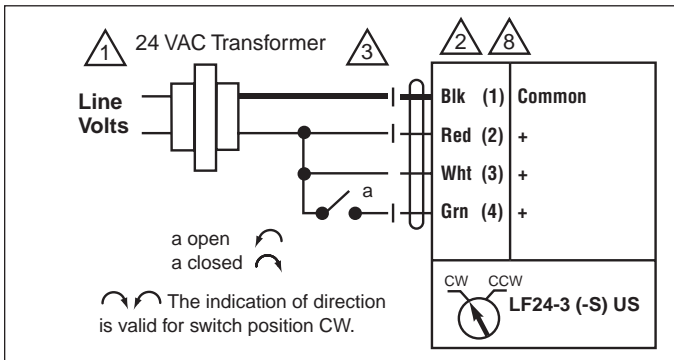


Accessories

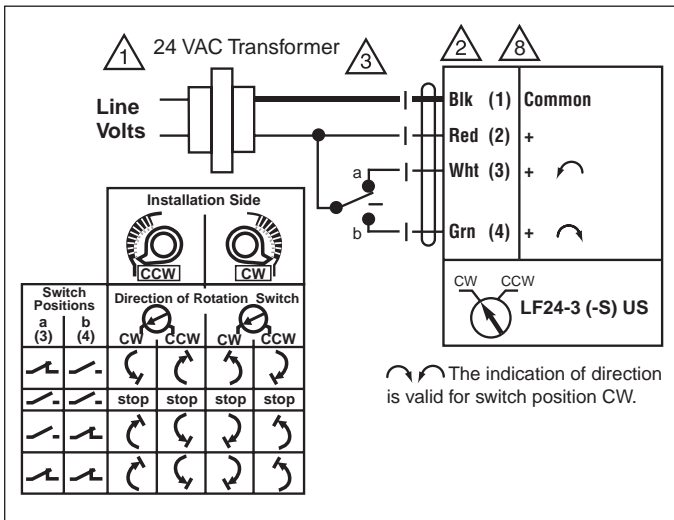
- AV 10-18 Shaft extension (K6-1 is required)
- IND-LF Damper position indicator
- K6-1 Universal clamp for up to 3/4" diameter shafts
- KH-LF Crankarm for up to 1/2" round shaft
- Tool-01 10 mm wrench
- ZG-LF2 Crankarm adaptor kit for LF
- ZG-112 Mounting bracket for Honeywell Mod IV, M6415 type actuators, and new installations
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- ZS-100 Weather shield (metal)
- ZS-150 Weather shield (polycarbonate)
- ZS-260 Explosion-proof housing

Note: When using LF24-3 (-S) US actuators, only use accessories listed on this page.

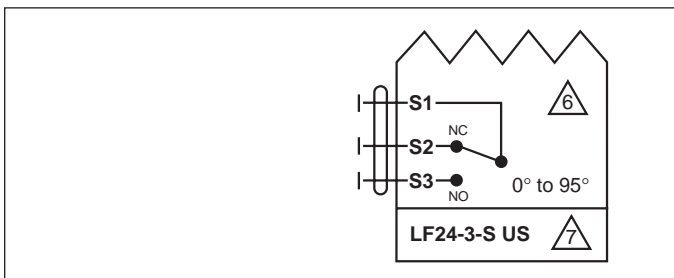
Wiring Diagrams



On-Off control of LF24-3 (-S) US



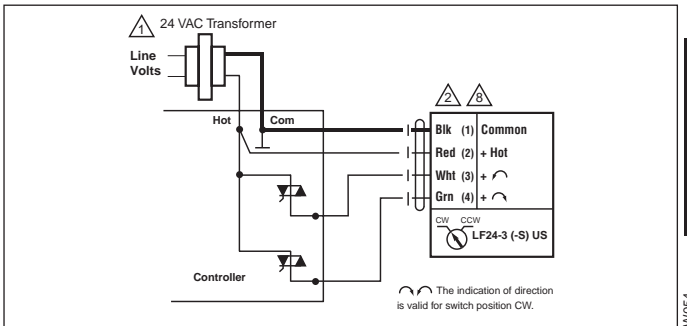
Floating point control of LF24-3 (-S) US



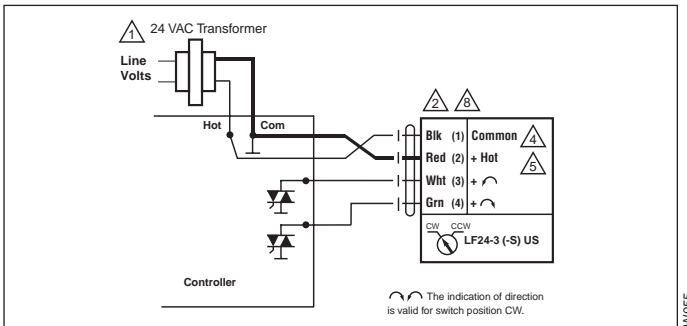
Auxiliary switch of LF24-3 (-S) US

LF24-3 (-S) US Typical Specification

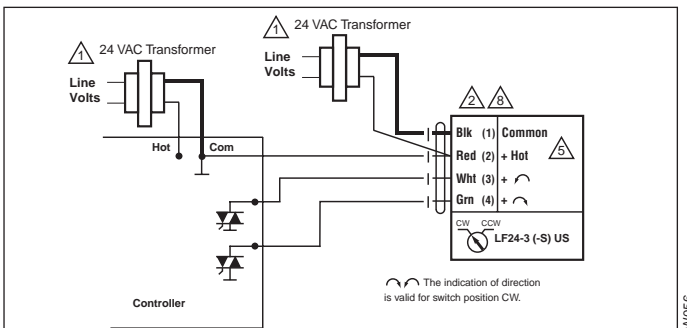
Floating point, on-off spring return damper actuators shall be direct coupled type which require no crankarm and linkage and be capable of direct mounting to a shaft up to a 3/4" diameter and center a 1/2" shaft. The actuators must be designed so that they may be used for either clockwise or counterclockwise fail-safe operation. Actuators shall have an external direction of rotation switch to reverse control logic. Actuators shall use a brushless DC motor and be protected from overload at all angles of rotation. If required, 1 SPDT auxiliary switch shall be provided having the capability of being adjustable. Actuators with auxiliary switch must be constructed to meet the requirements for Double Insulation so an electrical ground is not required to meet agency listings. Run time shall be constant and independent of torque. 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.



Triac source



Triac sink



Triac sink with separate transformers

Notes:

- 1 Provide overload protection and disconnect as required.
- 2 Actuators may be connected in parallel. Power consumption must be observed.
- 3 May also be powered by 24 VDC.
- 4 The Common connection from the actuator must be connected to the Hot connection of the controller.
- 5 The actuator Hot must be connected to the control board Common.
- 6 For end position indication, interlock control, fan startup, etc., LF24-3-S US LF120-S US and LF230-S US incorporate one built-in auxiliary switch: 1 x SPDT, 6A (1.5A) @250 VAC, UL listed, adjustable 0° to 95°.
- 7 Meets UL and CSA requirements without the need of an electrical ground connection.
- 8 Actuators with plenum rated cable do not have numbers on wires; use color coded instead. Actuators with appliance rated cable use numbers.