Modulating, Spring Return, AC 24 V/DC, for DC 2...10 V or 4...20 mA Control Signal





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Technical data		
Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage frequency	50/60 Hz
	Power consumption in operation	2.5 W
	Power consumption in rest position	1 W
	Transformer sizing	5 VA (class 2 power source)
	Electrical Connection	18 GA plenum cable, 3 ft [1 m], with 1/2" conduit connector
	Overload Protection	electronic throughout 095° rotation
	Electrical Protection	actuators are double insulated
Functional data	Torque motor	35 in-lb [4 Nm]
	Operating range Y	210 V
	Operating range Y note	420 mA w/ ZG-R01 (500 Ω, 1/4 W resistor)
	Input Impedance	100 k Ω for 210 V (0.1 mA), 500 Ω for 420 mA
	Position feedback U	210 V
	Position feedback U note	Max. 0.7 mA
	Direction of motion motor	selectable with switch 0/1
	Direction of motion fail-safe	reversible with cw/ccw mounting
	Angle of rotation	Max. 95°
	Running Time (Motor)	150 s / 90°
	Running time motor note	constant, independent of load
	Running time fail-safe	<25 s @ -4122°F [-2050°C], <60 s @ -22°F [-30°C]
	Noise level, motor	30 dB(A)
	Noise level, fail-safe	62 dB(A)
	Shaft Diameter	3/81/2" round, centers on 1/2"
	Position indication	Mechanical
Safety data	Degree of protection IEC/EN	IP54
	Degree of protection NEMA/UL	NEMA 2
	Enclosure	UL Enclosure Type 2
	Agency Listing	cULus acc. To UL 873 and CAN/CSA C22.2 No. 24-93; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC
	Quality Standard	ISO 9001

Materials

-22...122°F [-30...50°C]

-40...176°F [-40...80°C]

maintenance-free

Max. 95% RH, non-condensing

Ambient temperature

Storage temperature

Ambient humidity

Servicing



Footnotes †Rated Impulse Voltage 800V, Type of action 1.AA, Control Pollution Degree 3

Product features

Application

For fail-safe, modulating 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. The actuator operates in response to a 2...10 V, or with the addition of a 500Ω resistor, a 4...20 mA control input from an electronic controller or positioner. A 2...10 V feedback signal is provided for position indication.

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 95°. The LF24-SR 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 and to know the actuator's exact fail-safe position. 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.

Typical specification

Spring return control damper actuators shall be direct coupled type which require no crank arm and linkage and be capable of direct mounting to a shaft up to a 3/4" diameter and center on a 1/2" shaft (default). Actuator shall deliver a minimum output torque of 35 in-lbs. The actuator must provide modulating damper control 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. 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 constant, and independent of torque. A 2 to 10 feedback signal shall be provided for position feedback. The actuator must be designed so that they may be used for either clockwise or counter clockwise failsafe operation. Actuators shall be cULus listed, have a 5 year warranty, and be manufactured under ISO 9001 International Quality Control Standards. Actuators shall be as manufactured by Belimo.

Accessories

Electrical accessories	Description	Туре
	DC Voltage Input Rescaling Module	IRM-100
	Auxiliary switch, mercury-free	P475
	Auxiliary switch, mercury-free	P475-1
	Signal simulator, Power supply AC 120 V	PS-100
	Convert Pulse Width Modulated Signal to a 210 V Signal for Belimo	PTA-250
	Proportional Actuators	
	Positioner for wall mounting	SGA24
	Positioner for front-panel mounting	SGF24
	Resistor, 500 Ω , 1/4" wire resistor with 6" pigtail wires	ZG-R01
	Resistor kit, 50% voltage divider	ZG-R02
	Transformer, AC 120 V to AC 24 V, 40 VA	ZG-X40



Technical data sheet LF24-SR U

Mechanical accessories

Description	Туре
Shaft extension 170 mm Ø10 mm for damper shaft Ø 616 mm	AV6-20
End stop indicator	IND-LF
Shaft clamp	K6 US
for LF	
Shaft clamp reversible, clamping range Ø1620 mm	K6-1
Ball joint suitable for damper crank arm KH8 / KH10, Multipack 10 pcs.	KG10A
Ball joint suitable for damper crank arm KH8, Multipack 10 pcs.	KG6
Ball joint suitable for damper crank arm KH8, Multipack 10 pcs.	KG8
Damper crank arm Slot width 8.2 mm, for Ø1.05"	KH12
Damper crank arm Slot width 6.2 mm, clamping range Ø1018 mm	KH6
Damper crank arm Slot width 8.2 mm, clamping range Ø1018 mm	KH8
Actuator arm, clamping range Ø816 mm, Slot width 8.2 mm	KH-LF
V-bolt Kit for KH-LF.	KH-LFV
Anti-rotation bracket LF.	LF-P
Push rod for KG10A ball joint 36" L, 3/8" diameter	SH10
Push rod for KG6 & KG8 ball joints (36" L, 5/16" diameter).	SH8
Wrench 0.32 in and 0.39 in [8 mm and 10 mm]	TOOL-06
Angle of rotation limiter, with end stop	ZDB-LF
Form fit adapter 8x8 mm	ZF8-LF
Mounting Bracket: ZS-260 Right Angle	ZG-109
Linkage kit	ZG-110
Mounting bracket	ZG-112
for LF	
Damper clip for damper blade, 3.5" width.	ZG-DC1
Damper clip for damper blade, 6" width.	ZG-DC2
LF crankarm adaptor kit (includes ZG-112).	ZG-LF112
LF crankarm adaptor kit (T bracket included).	ZG-LF2
Shaft extension for 3/8" diameter shafts (4" L).	ZG-LMSA-1
Shaft extension for 1/2" diameter shafts (5" L).	ZG-LMSA-1/2-5
Weather shield 330x203x152 mm [13x8x6"] (LxBxH)	ZS-100
Base plate, for ZS-100	ZS-101
Weather shield 406x213x102 mm [16x8-3/8x4"] (LxWxH)	ZS-150
Explosion proof housing 406x254x164 mm [16x10x6.435"] (LxBxH), UL	ZS-260
and CSA, Class I, Zone 1&2, Groups B, C, D, (NEMA 7), Class III, Hazardous	
(classified) Locations	
Weather shield 438x222x140 mm [17-1/4x8-3/4x5-1/2"] (LxBxH), NEMA	ZS-300
4X, with mounting brackets	
Weather shield 438x222x140 mm [17-1/4x8-3/4x5-1/2"] (LxBxH), NEMA	ZS-300-5
4X, with mounting brackets	
Shaft extension 1/2"	ZS-300-C1
Shaft extension 3/4"	ZS-300-C2
Shaft extension 1"	ZS-300-C3

Electrical installation



Marning! 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.

Meets cULus requirements without the need of an electrical ground connection.

A Provide overload protection and disconnect as required.

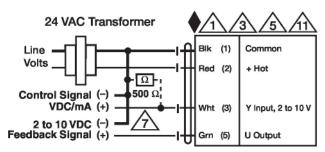
Actuators may also be powered by DC 24 V.

Only connect common to negative (-) leg of control circuits.

 Λ A 500 Ω resistor (ZG-R01) converts the 4...20 mA control signal to 2...10 V.

Actuators may be connected in parallel if not mechanically linked. Power consumption and input impedance must be observed.





2...10 V / 4...20 mA Control

Dimensions

