

Fail-Safe actuator used in typical Fire and Smoke damper applications

- Torque motor 70 in-lb [8 Nm]
- Nominal voltage AC/DC 24 V
- Control On/Off
- @ 350°F [177°C] for 30 min
- 15 s, 15 s Motor/Fail-safe
- 2x SPDT



5-year warranty


**Technical data**

<b>Electrical data</b>	Nominal voltage	AC/DC 24 V	
	Nominal voltage frequency	50/60 Hz	
	Power consumption in operation	27 VA	
	Power consumption in rest position	3 W, 6.5 VA, End stop 55 VA, 2.5 A slow blow fuse *	
	Transformer sizing	40 VA	
	Auxiliary switch	2x SPDT, 7 A resistive (2.5 A inductive) @ AC 250 V, one set at 10°, one set at 85°	
	Switching capacity auxiliary switch	7 A resistive (2.5 A inductive) @ AC 250 V	
	Connection supply	2 leads 32" [0.9 m], 18 AWG with 3/8" NPT flex connector	
	Connection auxiliary switch	cable 32" [0.9 m], 18 AWG appliance cable with 3/8" NPT flex connector	
	Overload Protection	electronic throughout 0...95° rotation	
	Electrical Protection	actuators are double insulated	
	<b>Functional data</b>	Torque motor	70 in-lb [8 Nm] @ 350°F [177°C] for 30 min
		Direction of motion motor	selectable by ccw/cw mounting
Direction of motion fail-safe		reversible with cw/ccw mounting	
Angle of rotation		95°	
Running Time (Motor)		15 s / 90°	
Running time motor note		between 32...350°F [0...177°C], <15 s at rated voltage & torque	
Running time fail-safe		15 s	
Noise level, motor		45 dB(A)	
Noise level, fail-safe		62 dB(A)	
Position indication		Mechanical	
<b>Safety data</b>	Power source UL	Class 2 Supply	
	Degree of protection IEC/EN	IP40	
	Degree of protection NEMA/UL	NEMA 1	
	Enclosure	UL Enclosure Type 1	
	Agency Listing	cULus listed to UL873 and CAN/CSA C22.2 No.24 NYC Department of Buildings MEA 197-07-M California State Fire Marshal Listing 3210-1593:101	
	Quality Standard	ISO 9001	

Technical data

<b>Safety data</b>	UL 2043 Compliant	Suitable for use in air plenums per Section 300.22(C) of the NEC and Section 602 of the IMC
	Ambient humidity	Max. 95% RH, non-condensing
	Ambient temperature	32...122°F [0...50°C ]
	Storage temperature	-40...176°F [-40...80°C]
	Servicing	maintenance-free
<b>Weight</b>	Weight	5.9 lb [2.7 kg]
<b>Materials</b>	Housing material	galvanized steel
	Gears	steel, permanently lubricated
<b>Footnotes</b>	† UL File XAPX.E108966	

Safety notes



- \* Neither UL nor Belimo require local over-current protection. The FSNF actuators draw higher peak current when driving against any type of stop. If used, this requires the value of a local fuse or breaker to be increased to avoid nuisance opening or tripping. A 2.5 A slow blow should be used for AC 24 V. A 0.5 A slow blow should be used for AC 120 V. A 0.25 A slow blow should be used for 230 V and a 0.3 A slow blow for AC 208 V. Transformers: Note that while a 24 V 100 VA transformer would handle 2 actuators, a 4 A breaker or plug fuse is insufficient. A 5 A slow blow would be required.
- Belimo Fire & Smoke actuators have passed the AMCA 520 and UL 555S Long Term Holding test. No special cycling is required during prolonged periods when actuator is driven open and held there. Periodic testing of dampers and actuators per local codes and NFPA 80 and NFPA 105 are required.
- The actuator contains no components which the user can replace or repair. A 1/2" threaded connector is standard. FSNFxx-FC models have a 3/8" Flex Connector. Other than the connector, these actuators are identical to the conduit connector version.

Product features

<b>Application</b>	The FS series of spring-return actuators are designed for the operation of UL555 and UL555S listed fire/smoke dampers in ventilation and air-conditioning systems.
<b>Operation</b>	The actuator is mounted in its fail safe position with the damper blade(s) typically 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.
<b>Typical specification</b>	All smoke and combination fire and smoke dampers shall be provided with Belimo FSTF, FSLF, FSNF, or FSAF series actuators. All substitutions must be approved before submission of bid. Damper and actuator shall have UL555S Listing for 250°F and/or 350°F. Actuator shall have been tested to UL2043 per requirements of IMC 602.2 and NEC 300.22 (c). Where position indication is required -S models with auxiliary switches shall be provided.

Accessories

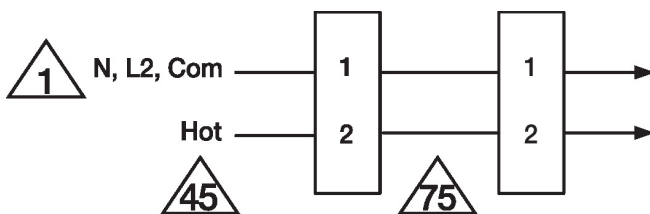
Electrical accessories	Description	Type
	Thermoelectric tripping device, Duct inside temperature 165°F	BAE165 US
	Auxiliary switch 2x SPDT	S2A-F US
Mechanical accessories	Description	Type
	Anti-rotation bracket, for AF / NF	AF-P
	End stop indicator for AF / NF	IND-AF2

**Accessories**

Description	Type
Shaft clamp for AF..	K4-1 US
Actuator arm, clamping range $\varnothing$ 10...20 mm	KH-AF KH-AF-1 US SH8
Angle of rotation limiter for Classic AF/NF.	ZDB-AF2 US
Mounting bracket for AF..	ZG-100
Mounting bracket for AF / NF	ZG-101
Crank arm adapter kit Incl. mounting hardware	ZG-AF US
	ZG-AF108
Damper clip for damper blade, 3.5" width.	ZG-DC1 ZG-DC2
Weather shield 13x8x6" [330x203x152 mm] (LxWxH)	ZS-100
Weather shield 406x213x102 mm [16x8-3/8x4"] (LxWxH)	ZS-150
Explosion proof housing 16x10x6.435" [406x254x164 mm] (LxWxH), UL and CSA, Class I, Zone 1&2, Groups B, C, D, (NEMA 7), Class III, Hazardous (classified) Locations	ZS-260
Weather shield 17-1/4x8-3/4x5-1/2" [438x222x140 mm] (LxWxH), NEMA 4X, with mounting brackets	ZS-300

**Electrical installation**
**INSTALLATION NOTES**

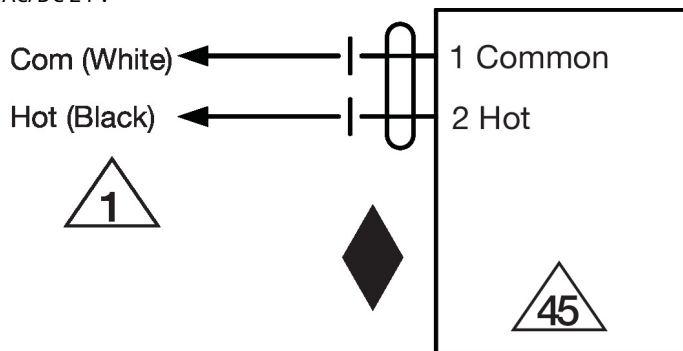
- Provide overload protection and disconnect as required.
- Actuators may be powered in parallel. Power consumption must be observed.
- S4 makes to S6 when actuator is powered open.
- Auxiliary switches are for end position indication or interlock control.
- Double insulated.
- Ground present on some models.
- Meets cULus requirements without the need of an electrical ground connection.



Parallel Actuator Wiring

**Wiring diagrams**

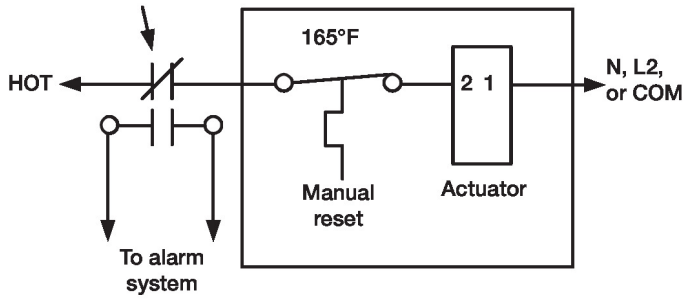
AC/DC 24 V



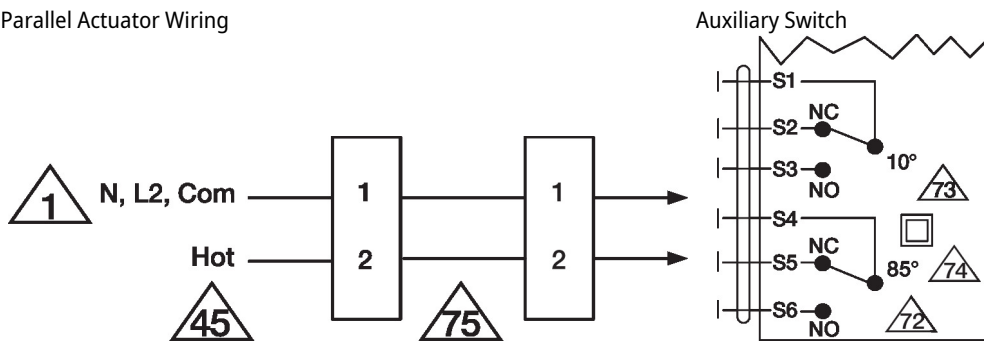
**Electrical installation**

**Wiring diagrams**

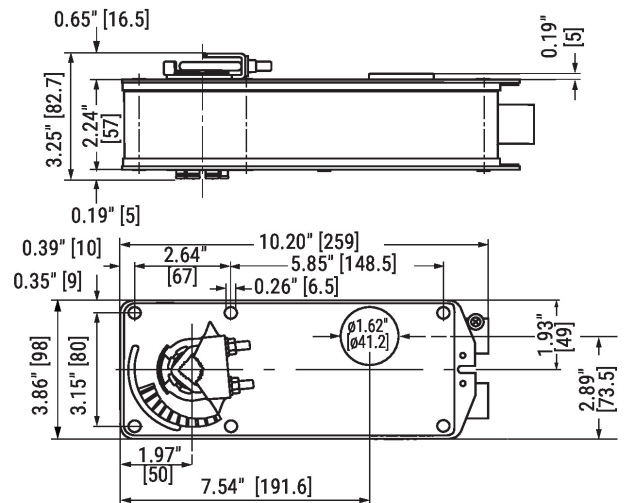
Typical containment damper control wiring  
 Detector or relay F&S Damper



Parallel Actuator Wiring



**Dimensions**



Standard:  
1/2" to 1.05"

Optional\*  
3/8" to 3/4"  
\*with K4 US clamp