

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

- Torque motor 18 in-lb [2 Nm]
- Nominal voltage AC/DC 24 V
- Control On/Off
- @ 250°F [121°C] for 30 min
- 75 s, <25 s Motor/Fail-safe



5-year warranty



Technical data

|                        |                                    |  |                  |
|------------------------|------------------------------------|--|------------------|
| <b>Electrical data</b> | Nominal voltage                    | AC/DC 24 V   |                  |
|                        | Nominal voltage frequency          | 50/60 Hz   |                  |
|                        | Nominal voltage range              | AC 19.2...28.8 V / DC 21.6...28.8 V  |                  |
|                        | Power consumption in operation     | 2 W/2 W, 3 VA  |                  |
|                        | Power consumption in rest position | 1.5 W, 2 VA  |                  |
|                        | Transformer sizing                 | 5 VA   |                  |
|                        | Electrical Connection              | 18 GA appliance cable, 1 m, with 1/2" conduit connector  |                  |
|                        | Overload Protection                | electronic throughout 0...95° rotation   |                  |
|                        | Electrical Protection              | actuators are double insulated   |                  |
| <b>Functional data</b> | Torque motor                       | 18 in-lb [2 Nm] @ 250°F [121°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)               | 75 s / 90°   |                  |
|                        | Running time motor note            | @ 250°F [121°C]  |                  |
|                        | Running time fail-safe             | <25 s @ 32...122°F [0...50°C]  |                  |
|                        | 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        | IP42   |                  |
|                        | Degree of protection NEMA/UL       | NEMA 2   |                  |
|                        | Enclosure                          | UL Enclosure Type 2  |                  |
|                        | Agency Listing                     | cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02<br>California State Fire Marshal Listing 3210-1593:104 |                  |
|                        | Quality Standard                   | ISO 9001   |                  |
|                        | 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   | 1.6 lb [0.60 kg] |
|                        | <b>Materials</b>                   | Housing material   | UL94-5VA         |

**Footnotes** Part no. Clamp side spring-return  
 FSTF120 US CW  
 FSTF120.1 US CW (bulk pack)  
 FSTF120.1 CCW CCW (bulk pack)  
 FSTF120-S US CW CW  
 FSTF120-S.1 US CW (bulk pack)  
 FSTF120-S.1 CCW CCW (bulk pack)  
 FSTF24-S.1 US CW (bulk pack)  
 † UL File XAPX.E108966

**Safety notes**


- Screw a conduit fitting into the actuator’s bushing. Jacket the actuator’s input and output wiring with suitable flexible conduit. Properly terminate the conduit in a suitable junction box.
- Retrofit Safety Note
- Use of the FSTF for replacement of other makes of actuators is limited in damper area. The FSLF is preferred for direct coupled applications. The FSTF may be applied for linkage applications on dampers 1.5 sq.ft. and smaller at velocities under 2000 fpm.

**Product features**

- Application** 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.
- Operation** 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.
- Typical specification** 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.

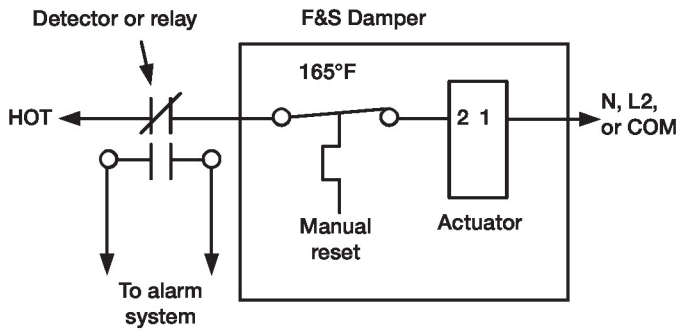
**Accessories**

| Electrical accessories | Description   | Type       |
|------------------------|---|------------|
|                        | Thermoelectric tripping device, Duct inside temperature 165°F   | BAE165 US  |
| Mechanical accessories | Description   | Type       |
|                        | Position indicator for TFB(X)                                   | IND-TF     |
|                        | Ball joint suitable for damper crank arm KH8, Multipack 10 pcs. | KG8        |
|                        | TFB(X) crankarm with 5/16" slot.                                | KH-TF US   |
|                        | TFB(X) crankarm with 1/4" slot.                                 | KH-TF-1 US |
|                        | Anti-rotation bracket TF/NKQ/AM/NM/LM.                          | TF-P       |
|                        | Wrench 0.32 in and 0.39 in [8 mm and 10 mm]                     | TOOL-06    |
|                        | Angle of rotation limiter, with end stop                        | ZDB-TF     |
|                        | TFB(X) crankarm adaptor kit (T bracket included).               | ZG-TF2     |
|                        | Mounting kit for TFB(X)   | ZG-TF3     |
|                        | TFB(X) crankarm adaptor kit (includes ZG-113).                  | ZG-TF112   |
|                        | Weather shield 13x8x6" [330x203x152 mm] (LxWxH)                 | ZS-100     |
|                        | Weather shield 406x213x102 mm [16x8-3/8x4"] (LxWxH)             | ZS-150     |

**Electrical installation**

- Provide overload protection and disconnect as required.
- Actuators may also be powered by DC 24 V.

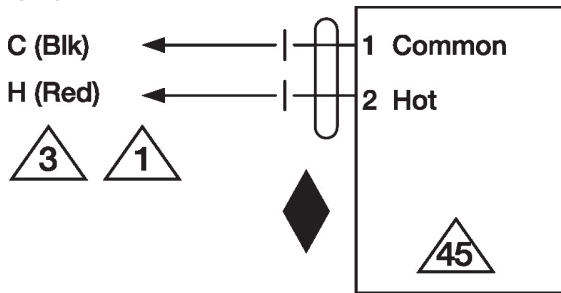
- ▲<sub>45</sub> Actuators may be powered in parallel. Power consumption must be observed.
- ▲<sub>75</sub> Ground present on some models.
- ◆ Meets cULus requirements without the need of an electrical ground connection.



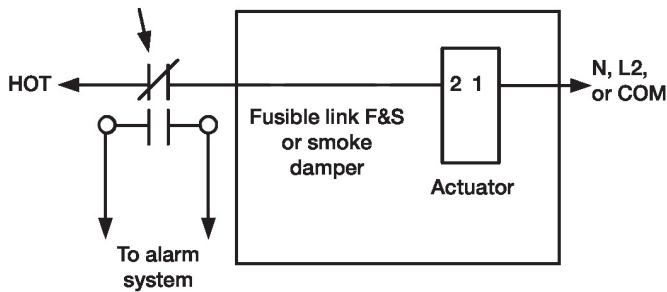
Typical containment damper control wiring

**Wiring diagrams**

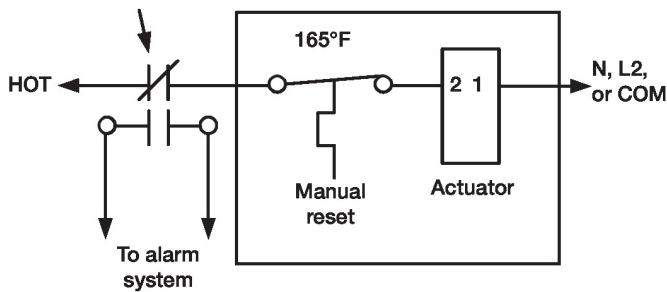
AC/DC 24 V



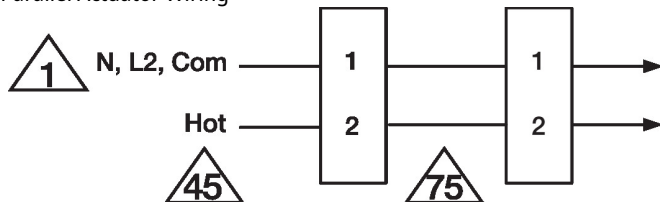
Typical smoke or fusible link damper wiring



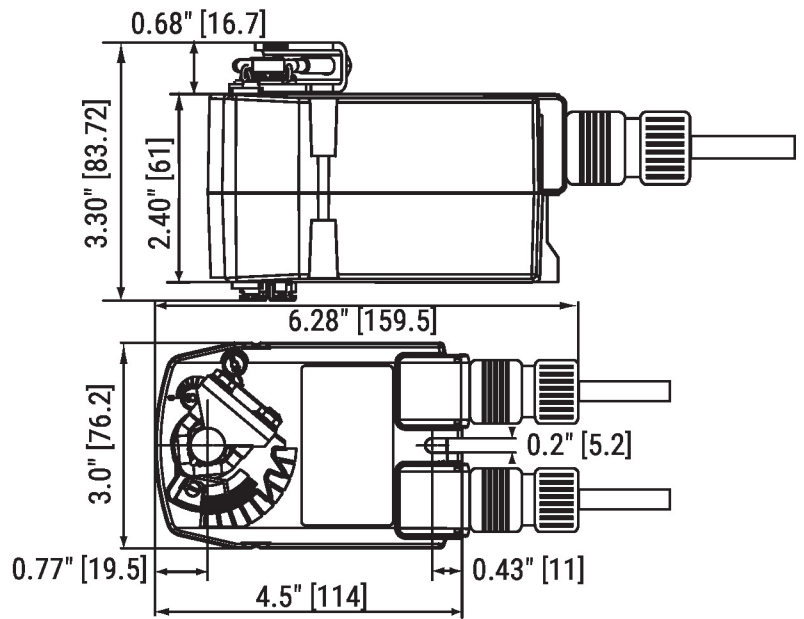
Typical containment damper control wiring



**Parallel Actuator Wiring**



Dimensions



Standard:

∅ 1/4" to 1/2"

□ 1/4" to 5/16"