FSAFB24-SR

Fire & Smoke, Fail-Safe, Spring Return, Modulating 2-10 VDC Actuators

Torque min. 180 in-lb, Control 2 to 10 VDC, Feedback 2 to 10 VDC

Application
For proportional control of fire and smoke combination and smoke dampers in UL555S applications. In new installations, UL 555S requires that actuators be mounted by the damper manufacturer.

Operation
The FSAFB24-SR & FSAFB24-SR-S actuators provide 95° of rotation and are provided with a graduated position indicator showing 0° to 95°. A unique manual override allows the setting of any actuator position within its 95° of rotation with no power applied. This mechanism can be released physically by the use of a crank supplied with the actuator. When power is applied the manual override is released and the actuator drives toward the fail-safe position to synchronize before going to the position commanded by the signal.

The actuator uses a brushless DC motor which is controlled by an Application Specific Integrated Circuit (ASIC). The ASIC monitors and controls the brushless DC motor's rotation and provides a Digital Rotation Sensing (DRS) function to prevent damage to the actuator in a stall condition. The position feedback signal is generated by a feedback potentiometer. The actuator may be stalled anywhere in its normal rotation without the need of mechanical end switches. The actuator cannot burn out from being stalled before full rotation is achieved.

The FSAFB24-SR, FSAFB24-SR-S, is mounted directly to control shafts up to 1.05" diameter by means of its universal clamp and anti-rotation bracket. A crank arm and several mounting brackets are available for damper applications where the actuator cannot be direct coupled to the damper shaft. The spring return system provides the specified torque to the application during a power interruption. The FSAFB24-SR, FSAFB24-SR-S, actuator is shipped at +5° (5° from full fail-safe) to provide automatic compression against damper gaskets for tight shut-off.

Dimensions (Inches [mm])

K7-2 (supplied)

- 1/2" Centered
- 3/4" Centered
- 1.05" Centered

Noise Level (Motor)
Inaudible holding, running <40 dB (A) spring <62 dB (A)

Servicing
maintenance free

Quality Standard
ISO 9001

Weight
4.6 lb (2.1 kg)

† UL File XAPX.E108966
## Accessories

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AF-P</td>
<td>Anti-rotation bracket AF/NF.</td>
</tr>
<tr>
<td>IND-AFB</td>
<td>AFB(X)/NFB(X) position indicator.</td>
</tr>
<tr>
<td>K7-2</td>
<td>Standard AFB(X)/NFB(X) clamp (1/2&quot; to 1.05”).</td>
</tr>
<tr>
<td>KG8</td>
<td>Ball joint for 5/16&quot; diameter rod, 90°, galvanized steel.</td>
</tr>
<tr>
<td>KH-AFB</td>
<td>AFB(X)/NFB(X) crankarm (with 3/4&quot; dia. shaft pass through).</td>
</tr>
<tr>
<td>SH6</td>
<td>Push rod for KG6 &amp; KG8 ball joints (36&quot; L, 5/16&quot; diameter).</td>
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<tr>
<td>TOOL-06</td>
<td>8 mm and 10 mm wrench.</td>
</tr>
<tr>
<td>ZG-100</td>
<td>Univ. right angle bracket (17&quot; H x 11-1/8&quot; W x 6&quot; base).</td>
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<tr>
<td>ZG-101</td>
<td>Univ. right angle bracket (13&quot; H x 11&quot; W x 7/7-16&quot; base).</td>
</tr>
<tr>
<td>ZG-116</td>
<td>AFB(X)/NFB(X) U bracket (5-7/8&quot; H x 5-1/2&quot; W x 2-19/32&quot; D).</td>
</tr>
<tr>
<td>ZG-AFB</td>
<td>AFB(X)/NFB(X) crankarm adaptor kit.</td>
</tr>
<tr>
<td>ZG-AFB118</td>
<td>AFB(X)/NFB(X) crankarm adaptor kit.</td>
</tr>
<tr>
<td>ZG-DC1</td>
<td>Damper clip for damper blade, 3.5” width.</td>
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<tr>
<td>ZG-DC2</td>
<td>Damper clip for damper blade, 6” width.</td>
</tr>
<tr>
<td>ZS-100</td>
<td>Weather shield - galvaneal (13” L x 8” W x 6” D).</td>
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<tr>
<td>ZS-150</td>
<td>Weather shield - PC w/ foam seal (16” L x 8-3/8” W x 4” D).</td>
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<tr>
<td>ZS-260</td>
<td>Explosion proof housing.</td>
</tr>
<tr>
<td>ZS-300</td>
<td>NEMA 4X, 304 stainless steel enclosure.</td>
</tr>
<tr>
<td>BAE165 US</td>
<td>165°F electric thermal sensor, SPST, normally closed.</td>
</tr>
<tr>
<td>SGA24</td>
<td>Positioner control for modulating actuators (surface mount).</td>
</tr>
<tr>
<td>S2A-F US</td>
<td>Auxiliary switch, 2x SPDT, 3A (0.5A inductive) @250 VAC max.</td>
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</tbody>
</table>

## Wiring Diagrams

### Application Notes

- Meets cULus requirements without the need of an electrical ground connection.
- Provide overload protection and disconnect as required.
- Actuators may also be powered by 24 VDC.
- Actuators may be powered in parallel. Power consumption must be observed.
- 500 ohm load resistor for 4-20 mA. Only one resistor for multiple actuators.
- Master-slave control/wiring of mechanically paralleled (“piggyback”) Fire and Smoke actuators will not function.
- Actuators may be electrically paralleled on different damper sections that are not mechanically connected to one another.
- Smoke relay and primary heat responsive sensor may be located in hot wire.
- Only one smoke signal and/or thermal sensor may be employed for all paralleled actuators.
- Any wire 5 feedback could be used to indicate position or to drive actuators that are not mechanically paralleled. That is, they are on other dampers.

### Parallel Wiring

- **Smoke Relay**
  - 24 VAC/DC
  - Manual Reset: 165°F
  - **2 – 10 V Signal**
  - Signal Common -
  - **Parallel Wiring**
    - Relay 1, Override open
      - Changeover will drive damper full open
    - Relay 2, Override closed
      - Opening contact will spring damper closed
    - Minimum Position Potentiometer
      - FSAFB 24-SR used as a balancing actuator, FSA24-BAL
      - SGA 24
        - 2-10 VDC
      - FSAFB24-SR
      - 1 Com
      - 2 Hot
      - 3 Signal
      - 5 Fbk

## Diagrams

- **24 VAC/DC**
- **Manual Reset**
- **Smoke Relay**
- **FSAFB24-SR**, **FSA24-BAL**

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