WARNING!

Before replacing actuator, damper must be inspected and determined to be fully functional. See damper checklist in NFPA 80 & NFPA 105 sections.

Replacement of MultiProducts motors to Belimo FSxx Series

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800 543-9038

WARNING!

Installer must be trained and experienced with repair of fire and smoke dampers and actuators.

www.belimo.us/firesmoke
In the “Marking & Application Guide, Dampers for Fire Barrier and Smoke Applications & Ceiling Dampers” April 2013 by Underwriters Laboratories Inc.®, page 6 they state:

**DAMPER ACTUATORS**

“… field mounting or substitution of actuators is not covered within the scope of the UL certification of the product. However, this does not necessarily preclude replacement of actuators in the field. Like any appliance, field servicing of these products is not covered under the scope of the UL certification and factory follow-up service program. As with any part of the damper, it is expected that replacement of actuators in the field be done in accordance with the damper manufacturer’s normal field servicing program.”

**Code and Standard Issues**

In general, the administrative section of codes state that all mechanical and electrical systems must be kept in working order and an individual section may state that all life safety devices and systems must be operable. NFPA 80 (Fire) & NFPA 105 (Smoke) require periodic testing and repair of dampers as soon as possible after any deficiency is uncovered.

<table>
<thead>
<tr>
<th>Chapter 7 IBC &amp; IFC “Containment” Dampers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commissioning</td>
</tr>
<tr>
<td>End of first year</td>
</tr>
<tr>
<td>Every 4 years except in hospitals every 6 years</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chapter 9 IFC “Smoke Control System” Dampers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dedicated</td>
</tr>
<tr>
<td>Commissioning</td>
</tr>
<tr>
<td>Semi-annually</td>
</tr>
<tr>
<td>Non-dedicated</td>
</tr>
<tr>
<td>Commissioning</td>
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<tr>
<td>Annually</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Chapter 9 IBC &amp; IFC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire detection &amp; Smoke control systems</td>
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<tr>
<td>Dedicated</td>
</tr>
<tr>
<td>Weekly self-test</td>
</tr>
<tr>
<td>Non-dedicated</td>
</tr>
<tr>
<td>Not required</td>
</tr>
</tbody>
</table>

Fire & smoke dampers are appliances and field replacement of components is required when failure of any component occurs.

The Authority Having Jurisdiction (local Fire Marshal and/or Building Official) must be consulted if any blade or auxiliary switches are employed and are connected to the fire alarm system or to a Fire Fighters Smoke Control System (FSCS) panel. Retesting is required. A permit and inspection may be required since connections to an alarm system have been touched.
NFPA 80 (Fire) & NFPA 105 (Smoke)

NFPA requires damper inspection and repair of dampers. See www.nfpa.org for Standards.

See NFPA 80 & NFPA 105 for details. The damper cleaning and examination check list here is based on them.

Damper installation shall meet code requirements. Fire stopping and drywall integrity shall be confirmed. Damper blades shall be in plane of wall. Duct shall be fall away with no fasteners connected to damper sleeve.

a. Dampers and ducts shall be cleaned of all foreign debris and dust build-up.
b. All exposed moving parts of the damper shall be dry lubricated as required by the manufacturer. Do not use oil as it draws dirt.
c. Damper shall be examined without defective old motor or new actuator to determine:
   i. The damper shall fully close from the open position.
   ii. Damper shall fully open from the closed position.
   iii. There are no obstructions to the operation of the damper. The damper shall not be blocked from closure in any way due to rusted, bent, misaligned, or damaged frame or blades. The damper shall not have defective hinges, side &/or blade seals, or other moving parts. The damper frame shall not be penetrated by any foreign objects that would affect operation.
d. If the damper is equipped with a fusible link, the link shall be removed for testing to ensure full closure and lock-in-place if so equipped. If the link is damaged or painted, it shall be replaced with a link of the same size, temperature, and load rating.
e. The fusible link shall be reinstalled after testing is complete.

After installation and wiring of new actuator it shall be tested.

a. The checklist may be customized using material here and in NFPA Standards. Multiple geometric configurations of springs, fusible link, thermal sensor(s), and actuation are possible. Confirm with AHJ if any additional requirements exist.
b. Electric thermal sensors, if present, must be tested and replaced if defective.
c. The test shall be conducted with normal HVAC airflow.
d. When equipped with smoke detection activation, the smoke detector shall be activated and damper operation observed.

test voltage input to actuators and repair as necessary if voltage is not correct. Old breakers often deliver below 115V and failed actuators may be due to power supply problems.

A record of all repairs must be kept and made available to AHJ.

For the Air Movement and Control Association damper maintenance manual go to: http://www.amca.org/publications/damper_maintenance.aspx
Local Code Approval

While it is not detailed in codes, the following rules should be followed for selecting Belimo actuators for replacement:

Check the technical specifications to ensure an “equal or better” actuator is used.

- **Temperature** – the replacement actuator shall have been UL555S tested at the same or better temperature as the original actuator. 250°F or 350°F are standard.
- **Time** – the replacement actuator shall drive open and spring closed at a speed equal or faster than presently required by codes. (The AHJ may grant an exception and “grandfather” slower actuators where the original actuator was slower.)
- **Torque** – replacement actuator shall have equal or greater torque than the failed actuator.
- **Voltage** – replacement actuator shall have the same voltage rating as the original.
- **Amperage** – the replacement actuator(s) shall not draw more amperage than the original(s) and cause the total connected amp draw on a circuit breaker to be greater than allowed by electrical code.
- **Final Testing** – actuated damper and associated devices shall be tested for proper operation. See Acceptance testing details below.

(Mnemonic device: TTT-VAT)

**WARNING!**

In all cases, installation must comply with any and all local electrical and life safety codes. Operation of the system after installation must be performed to verify proper damper cycling. Final checkout requires verifying correct function.

**WARNING!**

Note that where any fire alarm wiring is touched, the fire department must be informed.
**Cross Reference**

For greater detail see belimo.us/firesmoke RETROFIT or download from https://www.belimo.us/mam/americas/technical_documents/pdf-web/fire_and_smoke_doc/fire_smoke_competitive_replacement_data_reference.pdf

One is not replacing the Multiproducts motor per se, but rather installing a new actuator on the damper shaft. In most cases the new installation is the same as the modern UL555S listed method. There were many models of Multiproducts used and no complete cross reference exists. Some are listed below. Most were 120V, but verifying voltage is necessary.

A general rule of thumb is that the FSLF replaces motors on dampers 4 sq.ft. and smaller and the FSNF replaces motors on dampers greater than 4 sq.ft. The Belimo FSLF has passed UL555S testing at larger sizes; however, with age and corrosion, it is best to be conservative. Call if questions exist.

The Multiproducts motors varied in torque, CW or CCW rotation, length of shaft, shaft shape, electrical mounting, and voltage. All of these except voltage may be ignored with focus on the damper itself.

It is technically superior to remove the old motor and replace using the methods shown below. This also produces an installation that is closest to the present UL mounting methods.

There are a large number of different MultiProducts motors and approaches to spring return. Call Belimo for any not covered here.

For damper manufacturer specific instructions see Retrofit section at:

https://www.belimo.us/firesmoke.com Go to RETROFIT section.
Prefco 5800 EMB

In all cases disconnect external motor spring without compromising fusible link and internal spring ability to close the blades. These are quite old and changes may have been made over the years. Investigate operation. Confirm voltage. Check fusible links or McCabe © Link. Verify damper functions after replacement by testing damper open and spring closed.

FSTF if less than 1.5 sq.ft.
FSLF from 1.5 to 4 sq.ft.
FSNF up to 10 sq.ft.

Use -S models if auxiliary switches are required.

Use of FSLF is recommended for dampers less than 4 sq.ft. For linkage applications all FSTF & FSNF parts can be used.

<table>
<thead>
<tr>
<th>Model</th>
<th>Voltage</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>5800EMB2XPO</td>
<td>FSLF120</td>
<td></td>
</tr>
<tr>
<td>5800EMB2XPC</td>
<td>FSLF120</td>
<td></td>
</tr>
<tr>
<td>5800EMB1</td>
<td>FSLF120</td>
<td>5800EMB1 - Outside the duct, top mount, power open</td>
</tr>
<tr>
<td>5800EMB7</td>
<td>FSLF120</td>
<td>5800EMB7 - Inside the duct, bottom mount, power closed</td>
</tr>
<tr>
<td>5800EMB10</td>
<td>FSLF120</td>
<td>5800EMB10 - Outside the duct, bottom mount, power closed</td>
</tr>
<tr>
<td>5800EMB5</td>
<td>FSLF120</td>
<td>5800EMB5 - Inside the duct, top mount, power open</td>
</tr>
<tr>
<td>5800EMB8</td>
<td>FSLF24</td>
<td></td>
</tr>
<tr>
<td>5800EMB9</td>
<td>FSLF120</td>
<td></td>
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</tbody>
</table>

While direct coupling is preferable, some applications require linkages. See Linkages below for an example of a FSTF linked to a Prefco internally.

All 120V, FSLF120

<table>
<thead>
<tr>
<th>Model</th>
<th>Voltage</th>
<th>Notes</th>
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<tbody>
<tr>
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<tr>
<td>5953</td>
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<td>5949</td>
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<td>M12, MZRHM</td>
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<tr>
<td>5186</td>
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</tbody>
</table>
1 Square shaft inserted into damper sleeve with special crankarm. If a smoke damper, replacement may be possible and requires a new shaft and other linkage parts. If a combination fire and smoke damper, Belimo may not be capable of being used. See Air Balance with MP2553.

2 Typically these were linkaged using a crank arm on the square motor shaft and the spring was on the round shaft. Remove all linkage parts and direct couple to damper shaft.

3 Safe-Air / Imperial. Typically linkaged. There was an internal spring and fusible link for the fire function.

4 Except in rare occasions where space constraints exist, simply remove all linkage parts and direct couple on damper shaft. Use old motor as a mounting platform for anti-rotation strap

5 Usually on a Negator Spring damper. For pneumatic, the FSLF120 will usually work. For electric, the Ruskin kit FSLF120/MP must be ordered from a Ruskin rep.

6 10 in-lb. "A" model = CW rotation; plain = CCW. Check voltage. FSLF replaces both in most cases. Use FSTF when linkages necessary

7 10 in-lb. "A" model = CW rotation; plain = CCW. Check voltage. FSLF replaces both in most cases. Use FSTF when linkages necessary.

8 Inside clamp mounting or a shaft extension required.

9 See Greenheck Installation Instructions. Typically these were linkaged using a crank arm on the square shaft and the spring was on the round shaft. Remove all linkage parts and direct couple to damper shaft.

10 See Greenheck Installation Instructions. Typically these were linkaged using a crank arm on the square shaft and the spring was on the round shaft. Remove all linkage parts and direct couple to damper shaft

11 Some were direct coupled to the damper shaft with an external spring. Some were linkaged using a crank arm on the square motor shaft and the spring was on the round shaft. Remove all linkage parts and direct couple.

12 Some were direct coupled to the damper shaft with an external spring. Some were linkaged using a crank arm on the square motor shaft and the spring was on the round shaft. Remove all linkage parts and direct couple.


14 Nailor. Remove linkage parts and mount to damper shaft. FSLF for dampers < 4 sq.ft. and FSNF for damers > 4 sq.ft.

15 Nailor. Remove linkage parts and mount to damper shaft. FSLF for dampers < 4 sq.ft. and FSNF for damers > 4 sq.ft.

16 Typically these were linkaged using a crank arm on the square motor shaft and the spring was on the round shaft. Remove spring and all linkage parts and direct couple to damper shaft.
Typical Multiproducts Replacement Concepts

The non-spring motor is assisted by linkage and spring assembly.

After removing the extraneous parts, the damper shaft is available for direct coupling.

Note that the old motor has been left in this case as it provides a good base for the Belimo anti-rotation strap.

The Belimo is mounted on the shaft with no linkages or external spring.

Test by cycling and tripping thermal sensor. Reset and completed.

For full instruction on this application, see: AB_MP_Jackshaft_to_Belimo_Replacement_Instructions at www.belimo.us/firesmoke RETROFITS.
Black arrow points to the spring. White arrow points to the damper shaft.

The two pictures above show views of an external “screen door” spring return application. The spring is missing on the left application. As with the other examples above, remove the old motor, linkage and spring. Mount the Belimo over the shaft.
Other examples are shown above. The arrow points at the spring in the right photograph. It is removed along with the motor.

Crankarm is connected to the damper shaft. The Belimo may be direct coupled over the shaft. For short shaft mounting, place clamp of actuator between actuator and damper. See p9.

If a linkage is needed due to space constraints, use FSNF with ZG-AF or other linkage kit with rod. See Mounting Methods Guide and Mechanical Accessories Booklets at www.belimo.us.

In above examples, the extraneous parts are removed and the Belimo dropped onto the damper shaft.
Repair of drywall penetrated during linkage installation

Unless the Building Official or Fire Marshal specifically approves motor replacement, the damper should be replaced. The cut drywall violates the code as it impairs the fire protection.

EMB2X Multiproducts type motor. A number of variations were made.

A number of ways to repair the cuts into the drywall exist. Here we see sheetmetal and firestopping used to seal the holes.

Top. An EMB2X motor with linkage is shown. A detail of the drywall and linkage is shown in middle, left.

The two pictures on p11 and one on p12 show details of how the repairs were made.

This should be approved by the fire marshal or building official before applying.
Shaft Springs and Fusible Links

In the examples below there is a spring wrapped around the damper shaft with a fusible link holding it (arrows). The link prevents the spring from slamming the damper blades closed. When it melts at 165°F the spring is released.

This is the fire damper function.

The shaft spring and fusible link (arrow) are NOT to be removed or modified.

If the fusible link melts due to temperatures over 165°F the shaft spring slams the damper closed.

This is the fire function.
Example of mounting the Belimo directly to the jackshaft and ignoring old mounting.

Depending on exact geometry, old bracket may be used to hold anti-rotation strap.

Remove all linkage parts to expose damper shaft.

Once shaft is exposed, direct couple Belimo actuator.

Disassemble spring and remove it and motor.

Old motor and crankarm can be ignored as far as function is concerned. Old motor should be removed to maintain a mechanically conventional appearance.

Belimo is simply direct coupled to the damper shaft.

Linkaged motor here is typical of many applications.
Negator Spring Applications – Ruskin and Air Balance

TYPICAL FUSIBLE ROD AND NEGATOR SPRING

The springs are attached to the damper blades and instead of a fusible link, there is a fusible rod that connects the blades to the motor via a crankarm. Replacement springs and rods are NOT available.

If the springs and rod are intact then an actuator kit is available from Ruskin. See below.

If the springs or rod are not intact, then the rod can be replaced with ball joints and a 5/16” rod. A Ruskin or Air Balance heat responsive device or a Belimo BAE 165 US sensor can be installed. This upgrades the damper to modern standards. See Ruskin_Negator_Spring_Pneumatic_to_Belimo_FSxx_2014 or Ruskin_MP2781_MP_to_Belimo_FSxx_2014 at https://www.belimo.us/solutions/actuators/product-documentation/damper-actuators-fire-and-smoke#tab2

Ruskin makes a kit with a shaft adaptor, hold down, and Belimo FSLF120 actuator.

Fusible rods are no longer available from Ruskin.

Where springs are defective, ball joints, rod, and a BAE 165 or Ruskin EFL are necessary.

Rewiring is necessary.
Top. A full Belimo instruction for the McCabe link dampers can be found at https://www.belimo.us/mam/americas/technical_documents/pdf-web/fire_and_smoke_doc/prefco_mccabe_emb2_mp_to_belimo_fs.pdf

As with most of this type of application, remove the motor, spring, cable, and linkage. Mount Belimo over the damper shaft.

Other applications

Most Multiproducts motors along with their linkages and springs can be removed and a Belimo direct coupled to the damper shaft.
Some examples of dampers that should be replaced

Multiproducts with pulley and cable

Guillotine damper

Rope connected damper

Accordion damper

Cable connected curtain damper

Belimo cannot support actuator replacement on the types of dampers above.
Completed Installations

FSLF (left) or FSNF (right) mounted on the damper shaft.

Two sheet metal screws hold the anti-rotation strap. Two nuts secure cold-weld clamp onto shaft.

As long as it is mechanically solid, the anti-rotation strap may be bent to fit height.

FSTF is small and fits tight spaces well. Maximum recommended damper is 1.5 sq.ft.

Replacement of Multiproducts motors with Belimo FSxx Series    March 2018
Distance at top must be the same as at bottom

Actuator must be perpendicular to the damper shaft.

Actuator should be parallel to the plane of the damper frame and sleeve.

Allow any non-concentric shaft motion to be taken up by mounting stud in middle of U-slot

When completed the Belimo should be perpendicular to the damper shaft to avoid stressing the internal or external bearings.

The actuator should float on the stud of the anti-rotation strap to avoid binding.

Note how the pin of the anti-rotation strap is mounted in middle of actuator U-slot.

This is acceptable as long as mechanically solid.
Short shaft mounting

For short shaft mounting, the ZG-LMSA-1/2-5 can be used. Alternately, the clamp can be installed between the actuator and sheet metal.

Depending on the geometry, any number of mounting arrangements are correct. The most common are shown here. Alternately, the anti-rotation strap can be attached to any Belimo linkage, an electrical J-box cover plate, or to a piece of U-channel.

It is important to remember that the ducts are fall-away. The actuator mounting cannot interfere with the ability of the duct to fall from the damper. The damper must continue to protect the wall.

Linkage mounting

**WARNING!**

Read Data Sheet provided in box with each actuator for specific wiring details.
**Miscellaneous parts**

Should they be needed, Belimo carries a range of parts. Ball joints and 5/16" rods are available from most distributors.

Where the crank arm on the jackshaft is broken or not of the type needed, the KH12 fits over the shaft without removing it. Zinc plated steel. Slot is for the KG10A ball joint. V-bolt fits ¼” to 1” (20 to 25mm) shafts.

KH-6. Zinc plated steel. For shafts 3/8” to 11/16”
Uses KG6 ball joint. Slot width 1/4”

KH-8. Zinc plated steel. For shafts 3/8” to 11/16”
Uses KG8 (90 degree) or KG10A ball joint. Slot width 21/64”

**SH8** (not shown – see picture page 9). Push-rod for KG6 & KG8 ball joints. 5/16” 36” long
Use SH10 3/8” rods for GMB and dual FSAF or FSNF linkages. 5/16” can bend under heavy loads.

**ZG-DC1** Damper blade clip and ball joints for blades typically 3.5” in width. Typically the actuator or rod to shaft is in front of blade.

**ZG-DC2** Damper blade clip and ball joints – typically used for 6” wide blade control dampers. Typically the actuator or rod to shaft is above or below the damper.

**Prefco Internally Mounted Actuator**

Some internally mounted motors on small dampers may require linkage mounted actuators. Call for information.

ZG-TF112 Crank Arm Adaptor Kit

ZG-TF2 Crank Arm Adaptor Kit

includes:

It is assumed that the bracket here will be installed on an existing sleeve or the Prefco mounting plate shown in the full damper pictures below. Belimo brackets and parts are shown in our Mounting Accessories Guide:

Instructions

An FSLF120 has sufficient torque to handle almost any damper that had a Multiproducts motor. Only if a leg kit is required should an FSNF120 be used. In some cases where the Multiproducts had insufficient torque initially, the FSNF is preferred.

1. Disconnect power to damper.
2. Disconnect wiring from motor to thermal sensor wiring box if present.
3. Remove spring, linkage parts, and motor from damper.
4. Test damper to ensure it moves easily from open to closed and back again. Clean, lubricate (food grade silicone spray or equal – NOT WD40).
5. The Belimo is slightly wider than the old MultiProducts. If the Belimo does not fit in the space available, then any thermal sensor sheet metal enclosure can be removed and a 4” x 2” electrical box with open back installed. The box covers the thermal sensors. This is typically necessary on small dampers.
6. Most applications had shaft springs and fusible links. Some had modern electrical thermal sensors. See drawings. Negator spring, internal pulley, or other irregular arrangements do exist. Some are field modifications. Take photographs and send to Belimo for analysis.

NOTE:

If the damper shaft bearing does not hold the shaft firmly, then a Belimo FSNF should be used with a leg kit, ZG-AF. The actuator then serves to hold the jackshaft steady. On small dampers, it may be necessary to extend a flat plate out in the air in order to mount leg kit.

7. Check direction of rotation of damper and jackshaft. Place clamp of Belimo FSLF120 on CW or CCW side as necessary.
8. Place Belimo FSLF120 onto the shaft.
9. At this point, any jackshaft drive blade bracket connecting bar closer to blade axle will need to be adjusted.

10. 90 to 95 degrees of jackshaft rotation must be 90 degrees of blade rotation.
11. Actuator rotates 95 degrees and this must achieve full closed and near open. Typically 93 degrees of actuator rotation gives 90 degrees of damper rotation after adjusting.
12. Mount anti-rotation bracket of Belimo to sleeve.
13. Tighten clamp nuts.
14. Wire actuator per drawings below.
15. Cycle 3 times to insure proper cycling. If not perfect, readjust linkage, flip actuator over, or troubleshoot to identify problem.
16. Thermal sensor must be checked with heat gun to ensure it opens upon detection of heat. See Fire Marshal form for steps with single and dual sensors. If sensor is defective, replacements must be obtained from local damper manufacturer rep.
17. Press manual reset and cycle again to ensure operation.
18. Fill out Fire Marshal form on last page of instructions.

Note that actuator floats freely. Clamp cold welds when teeth dig into the damper shaft and the anti-rotation strap stud allows the actuator to move if shaft is not perfectly concentric. Rigid mounting by jamming the stud into the U-slot of actuator is NOT usually best.

### WARNING!

**USE CAUTION!**

Spring is under high torsion and may cause serious injury! If any external springs are present, exercise caution – wear face and hand protection.

### Thermal sensor replacements – BAE165 US

Original equipment is recommended although not strictly required by code. UL does not regulate replacement or repair. See NFPA 80 or NFPA 105.

Belimo BAE165 US

Where existing sensor is defective or one must be added, the 165°F primary sensor may be used.
**Auxiliary Switches**

**Damper blade switch assembly**

Where the original switches for signaling position to a Fire Fighters’ Smoke Control Panel or to local indicator lights must be replaced or are inoperative, the Belimo –S model actuators may be used or a S2A-F may be installed.

**Belimo S2A-F**

FSLF (mid 2014ff), FSNF, and FSAF actuators can use the add on switch package.

-S models

Some models are SPDT. Check data sheets.

Internal switches

- Contact closed if damper closed
- Contact closes if damper open

Closed  Hot  Open
There are three wiring schemes that describe all applications. While the geometry of the wire runs may vary, the connections are straightforward.

Regardless of the wiring routes used, this drawing shows the wiring necessary for a UL555S damper and actuator. Use it as a basis for any of the other wiring schematics. Note that the alarm connections are not touched when replacing an actuator. This is a major concern for Fire Marshals.

Fusible link DAMPER ACTUATOR WIRING

SMOKE DAMPER ACTUATOR WIRING

WARNING!

Actuator anti-rotation strap may not be screwed to the duct. It must attach to either the sleeve or to the mounting bracket. The duct must be able to fall away from the damper in case of ceiling collapse in a fire.

WARNING!

Disconnect and lock out power before starting to disconnect old motor.
TYPICAL COMBINATION FIRE-SMOKE DAMPER WIRING

Electric thermal disc
Smoke Detector or Relay from area smoke detection system

TYPICAL SENSOR TEMPERATURE
165°F

BELIMO FSxx ACTUATOR

BELIMO Mechanical
165°F Thermodisc
Anti-rotation strap
FSLF FSNF
½" threaded connector
Chase nipple
2x4 box and blank cover
Existing flex connector and incoming power wires

If more wiring space is required, a j-box can be attached to the actuator with a chase nipple and locknut.

TYPICAL REOPENABLE DAMPER with FSCS

FIRE FIGHTERS CONTROL PANEL
Smoke detector or relay contacts

TYPICAL SENSOR TEMPERATURES
165°F
350°F

BELIMO FSLF or FSNF ACTUATOR

FSAF actuators are 250°F only.
Building Official / Fire Marshal Notification Form

Retain this portion of checklist at premises for Fire Marshal inspection. See local AHJ or Fire Marshal for other information and requirements regarding conformance with NFPA 80 & NFPA 105.

☐ Test Checklist (Smoke dampers do not have sensors. Only steps a & b apply.)

1. Single Sensor Combination Damper
   a. ☐ Open smoke detector or relay wire or contact to cut power. Damper springs closed.
   b. ☐ Reconnect power. Damper drives open.

Repeat 3 times to ensure operation. This imitates UL555S test.

2. Reopenable Two Sensor Fire-Smoke Combination Damper
   (Since this system involves the Firefighters’ Smoke Control System, inform fire department.)

With FSCS switch in Auto position:
   a. ☐ Disconnect power from smoke detector or relay contacts. Actuator springs damper closed.
   b. ☐ Reconnect power. Actuator drives damper open.
   c. ☐ Trip thermal sensor. Actuator springs damper fully closed.

Test FSCS switch functions:
   a. ☐ Move FSCS switch to Off position. Actuator springs damper fully closed.
   c. ☐ Trip secondary (higher temperature) thermal sensor. Actuator springs damper fully closed.

Move FSCS switch back to Auto position:
   a. ☐ Actuator springs damper closed if Primary sensor is still open.
   b. ☐ Actuator stays open if Primary sensor has re-closed.

☐ When completed, ensure sensors are reset and smoke detector is in normal state and FSCS switch is in Auto. Damper is normally Open; check sequence of operation.

Damper Numbers or Location Identifying Numbers……………………………………………………………………

Date……………………………………

Contractor…………………………………………………………………………………………………………………

Service Technician (Print)………………………………………………………………………………………………

Service Technician (Signed)………………………………………………………………………………………………

Phone Number (……)……………………………………………………………………………………………………

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Replacement of Multiproducts motors with Belimo FSxx Series  March 2018  27