

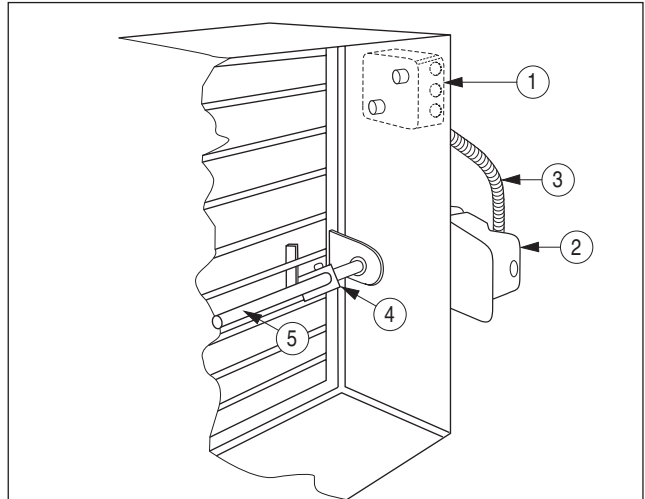
The DTO Dual Temperature Override Sensor (formerly MLS-400) is a factory installed option on Nailor combination fire/smoke dampers, incorporating two electric heat sensors. A primary heat sensor (manual reset) automatically closes the damper upon sensing an elevated temperature of 165°F (74°C) at the damper. The sensor interrupts power to the actuator, and the actuator's spring return mechanism causes the damper to close. The damper may be closed at anytime by placing a control switch (by others) in the closed position.

The primary heat sensor and the smoke detector (if used) can be bypassed by an external electrical signal from a remote control station, allowing the damper to reopen as may be required in the operation of a smoke control system. The Fire Fighter's Smoke-Control Station must include a three position (double throw, center off) master switch for correct operation.

The damper remains operational until the the temperature at the damper reaches that of the high limit secondary heat sensor. This is the UL listed elevated/degradation temperature rating (operational limit) of the damper/actuator assembly. The standard high limit temperature is 250°F (121°C). A 350°F (177°C) elevated temperature classification is available as an option. When the temperature of the high limit heat sensor is exceeded, the damper closes and locks and remains closed thereafter, in conformance with UL 555 and NFPA 90A. The primary and secondary sensor can be manually reset at the damper using external reset buttons, after temperatures have cooled down.

The DTO can be ordered with electric (120, 24 or 230 VAC) or pneumatic actuators. Pneumatic actuators are supplied with a factory mounted EP (electric/pneumatic) switch.

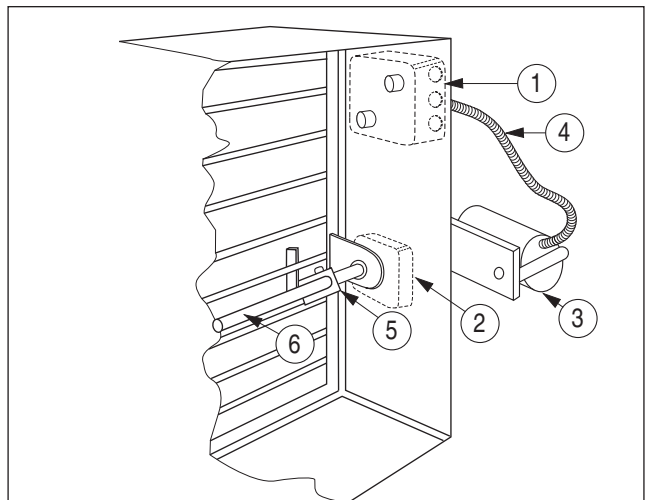
The DTO Fire Sensor also incorporates a position indicator package. Two auxiliary switches indicate the open and closed damper position at a remote control station.



With UL Listed Electric Actuator

Description:

1. Electrical Junction Box with 165°F (74°C) primary heat sensor and High limit secondary heat sensor 250° or 350°F (121° or 177°C)
2. Electric Actuator with auxiliary position indicator switches
3. Flexible Conduit
4. Over-Center Knee Lock
5. Jackshaft



With UL Listed Pneumatic Actuator

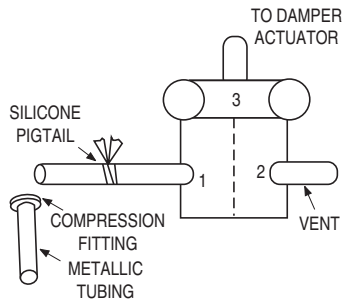
Description:

1. Electrical Junction Box with 165°F (74°C) primary heat sensor and EP switch and High limit secondary heat sensor 250° or 350°F (121° or 177°C)
2. Position Indicator Package
3. Pneumatic Actuator
4. Silicone Tubing
5. Over-Center Knee Lock
6. Jackshaft

INSTALLATION:

Pneumatic Connection:

Connect the #1 air inlet port of the electric pneumatic (EP) switch mounted on the electric junction box to the pneumatic main air supply (1/8" [3] NPT barbed fitting). Metallic tubing requires a silicone tubing pigtail and compression fitting (by others). Rated operating main air pressure is 25 psi.



Electrical Connections for Pneumatic or Electrical Actuators

1. Remove cover of junction box. There are seven coded color wires. Consult applicable wiring diagram, see Figures 1, 2 and 3. Color coding of position indicator microswitches (Aux. switches) varies dependent upon actuator.

MS1 is damper open signal.

MS2 is damper closed signal.

Important: Installer must double check continuity of **MS1** and **MS2** before wiring to confirm which switch signals the damper's open or closed position.

2. Connect external wiring from the remote control panel and electrical power supply (120, 24 or 230 VAC) in accordance with N.E.C. and any applicable local codes.
3. It is essential that the remote controls include a 3-position master control switch (single pole double throw, center off) and that it is connected to operate as shown.
4. Replace junction box cover and check operation.

OPERATION:

Circuit Test

Combination fire/smoke dampers with the DTO Dual Temperature Override Sensor option are supplied with factory mounted spring return actuators that have a power open/fail closed (normally closed) damper connection.

1. Place master control switch (MCS) in center closed position.
2. Apply power. The damper will remain closed and the closed (red) indicator light will go on.
3. Place MCS in reopen (override) position. The damper will open. The closed (red) indicator light will go off and the open (green) indicator light will go on. Note: When the MCS is in the reopen (override) position, the smoke detector (if used) and primary heat sensor are bypassed. The damper will remain open even if the primary heat sensor has been activated. Do not leave MCS in reopen position.
4. Place MCS in the normal (auto) position. The damper will remain open and the open (green) indicator light will remain on.

Emergency Operation (Smoke Control Management)

1. MCS Normal Position

- (a) **Fire Control:** The damper is open and will remain so until the primary heat sensor activates when temperatures at the damper reach 165°F (74°C), when the damper will close. The primary heat sensor is a manual reset device and the damper will remain closed until the override signal for smoke management from a remote command station is present and the duct temperature has not exceeded the high limit. If temperatures reach the elevated temperature rating of the damper/actuator assembly (250°F or 350°F [121° or 177°C]), the high limit secondary heat sensor will either prevent the damper from reopening or will close and lock the damper, rendering it inoperable from a remote location. A manual reset button is provided on the DTO that may be used to reopen damper upon cessation of fire conditions.
- (b) **Smoke Control (Optional):** If a smoke detector (wired with normally closed contacts) is included in the design, when activated, power to the actuator is interrupted and the damper will close.

2. MCS Closed Position

The damper will close regardless of whether the primary heat sensor or smoke detector has activated or not.

3. MCS Reopen Position

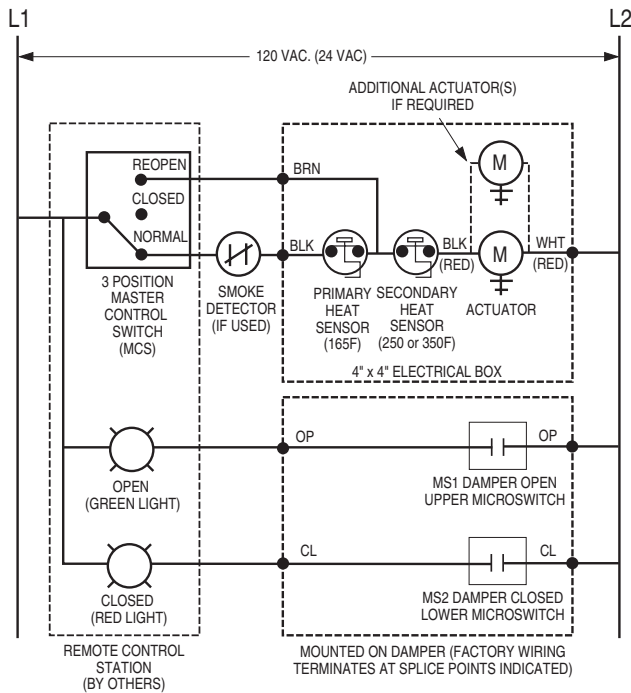
If the damper has not been exposed to an elevated temperature higher than its rating (250°F or 350°F [121°C or 177°C]), the damper will open, bypassing the primary heat sensor and smoke detector regardless of whether they have been activated or not. This provides control of the smoke management system and is to be done only by an authorized party per NFPA 92, Smoke Control Systems. If the damper has been exposed to an elevated temperature higher than its temperature degradation rating (250°F or 350°F [121°C or 177°C]), the damper will close and remain closed under all conditions (regardless of any MCS position) in accordance with NFPA 90A.

Testing

Damper system testing may be done by:

1. Remotely using the master control switch (MCS) to cycle the damper.
2. Activating the smoke detector.
3. Periodic Inspection, Testing and Maintenance.

Refer to IOM-FSDIMP Operation and Maintenance procedure.

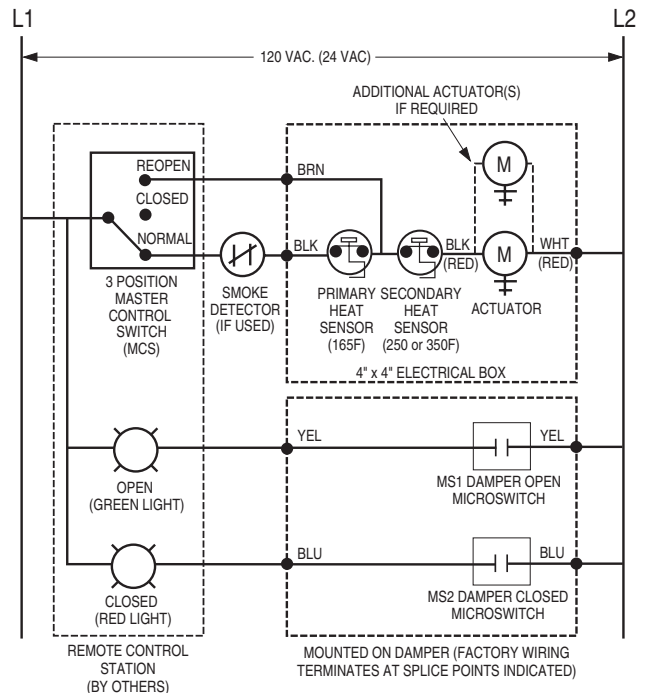


POSITION INDICATOR MICROSWITCH RATINGS: SINGLE POLE DOUBLE THROW (2), AT OR BELOW 240 VAC; RESISTIVE LOAD: 8A, INDUCTIVE LOAD: 2A, AT 125 VDC; 0.5A, PILOT DUTY: 4A, 125 VAC.

Fig. 1. DTO with Belimo Electric Actuators with built-in Auxiliary Switches.

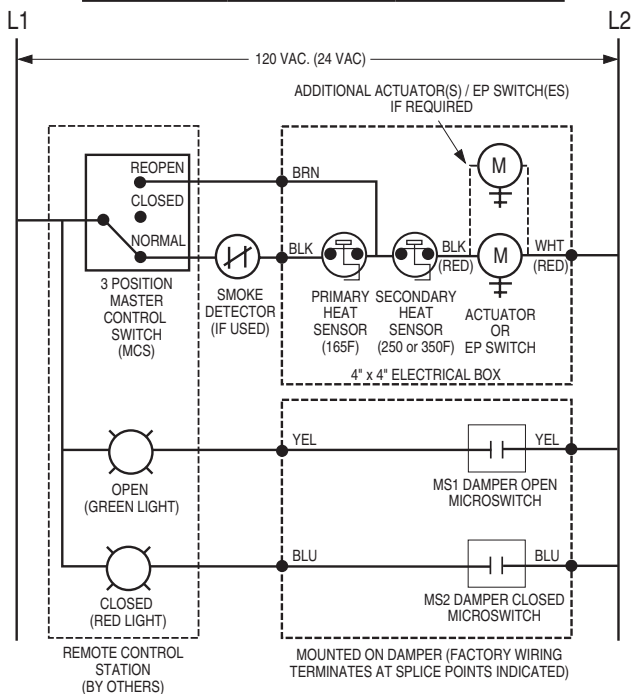
Belimo Actuator Auxiliary Switch Wiring Connections

Model Series	Open (OP)	Closed (CL)
FSTF	Orange / Gray	Violet / Red
FSLF / FSAF	Gray / Gray	Violet / Violet
FSNF / FSAFB	White S4 / S6	White S1 / S2



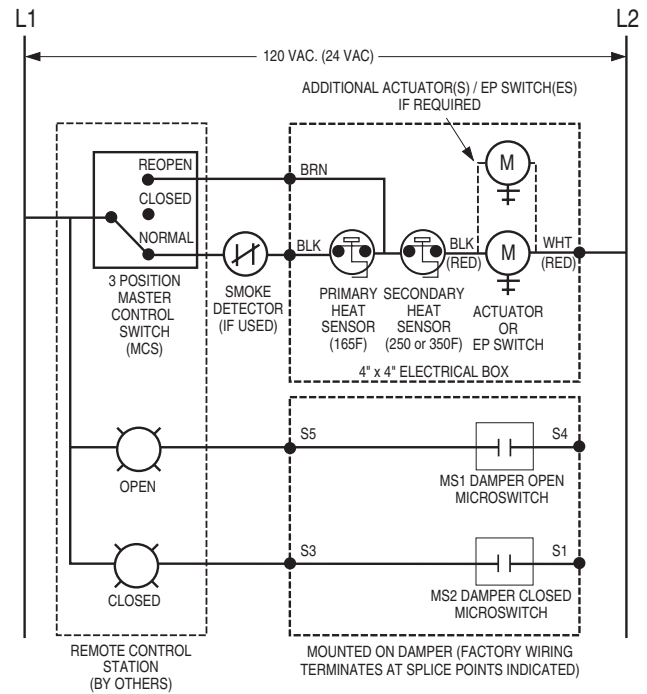
POSITION INDICATOR MICROSWITCH RATINGS: SINGLE POLE SINGLE THROW (2), MAX. LOAD: 250VAC, 5A RESISTIVE, 4A INDUCTIVE.

Fig. 2. DTO with Honeywell Electric Actuators with built-in Auxiliary Switches.



POSITION INDICATOR MICROSWITCH RATINGS: SINGLE POLE DOUBLE THROW (2), 15A, 125, 250 VAC OR 24 VDC, 0.5A, 125 Vdc, 0.25A, 250Vdc.

Fig. 3. DTO with Electric (Belimo, Honeywell, Siemens) or 331-2961/3060 (pneumatic) actuators and Nailor position indicator package.



POSITION INDICATOR MICROSWITCH RATINGS: SINGLE POLE DOUBLE THROW (2), 15A, 125, 250 VAC OR 24 VDC, 0.5A, 125 Vdc, 0.25A, 250Vdc.

Fig. 4. DTO with Siemens GJD Series Electric actuators with built-in Auxiliary Switches.



Houston, Texas
Tel: 281-590-1172
Fax: 281-590-3086

Las Vegas, Nevada
Tel: 702-648-5400
Fax: 702-638-0400

Toronto, Canada
Tel: 416-744-3300
Fax: 416-744-3360

Calgary, Canada
Tel: 403-279-8619
Fax: 403-279-5035