

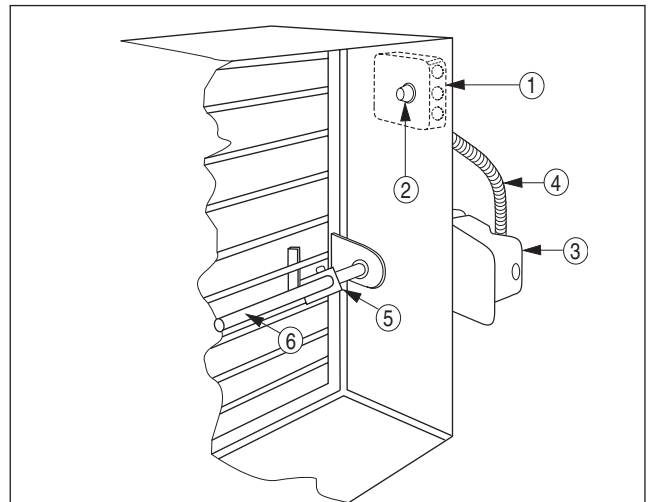
The MLS-400 Fire Sensor is a factory installed option on Nailor combination fire / smoke dampers, incorporating two electric heat sensors. A primary heat sensor (manual reset) automatically closes the damper upon sensing an elevated temperature of 165°F (74°C) at the damper. The sensor interrupts power 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 secondary sensor is of the manual reset type and can be reset at the damper after temperatures have cooled down.

The MLS-400 can be ordered with electric (120 or 24 Vac) or pneumatic actuators. Pneumatic actuators are supplied with a factory mounted EP (electric / pneumatic) switch.

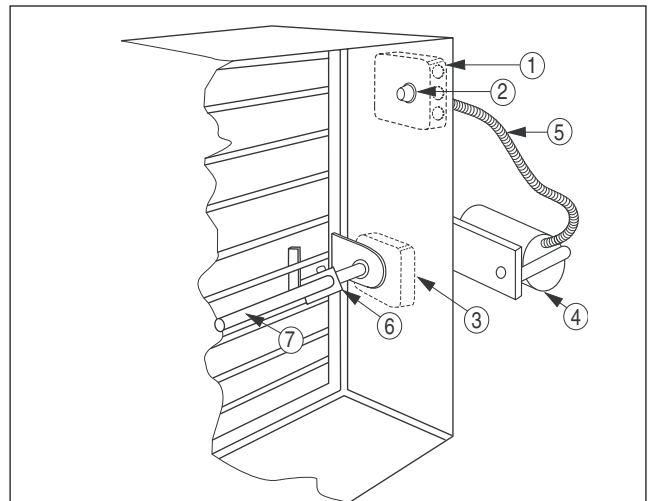
The MLS-400 Fire Sensor also incorporates a position indicator package. Two auxiliary switches indicate the open and closed damper position at a remote control station.



**With UL Listed Electric Actuator**

**Description:**

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



**With UL Listed Pneumatic Actuator**

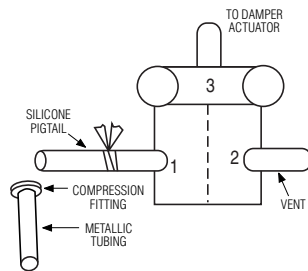
**Description:**

1. Electrical Junction Box with external 165°F (74°C) primary heat sensor and EP switch
2. High limit secondary heat sensor 250° or 350°F(121° or 177°C)
3. Position indicator package
4. Pneumatic Actuator
5. Silicone tubing
6. Over-Center Knee Lock
7. 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 or 24 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 MLS-400 Re-openable Fire 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 MLS-400 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.

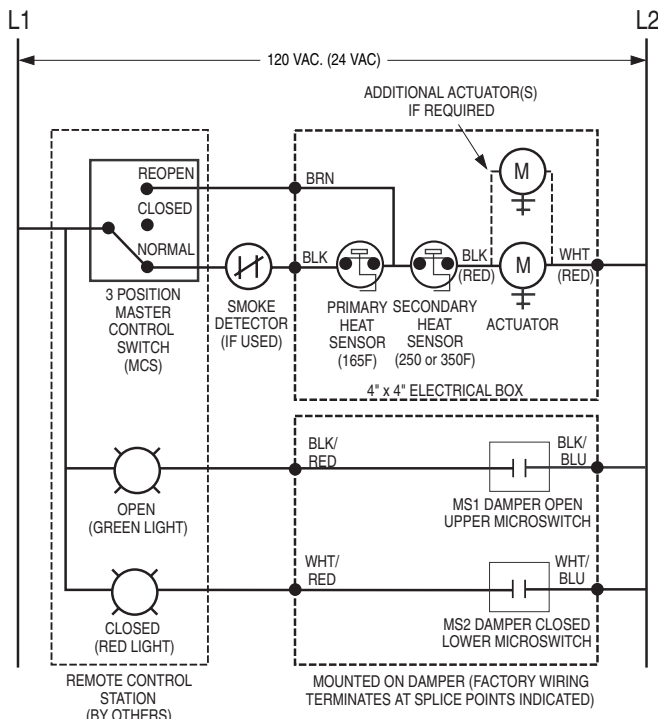
### 3. MCS Reopen Position

If the damper has not been exposed to an elevated temperature higher than its rating (250 or 350°F [121 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 92A, Smoke Control Systems. If the damper has been exposed to an elevated temperature higher than its temperature degradation rating (250 or 350°F [121 or 177°C]), the damper will close and remain closed under all conditions (regardless of any MCS position) in accordance with NFPA 90A.

### Testing

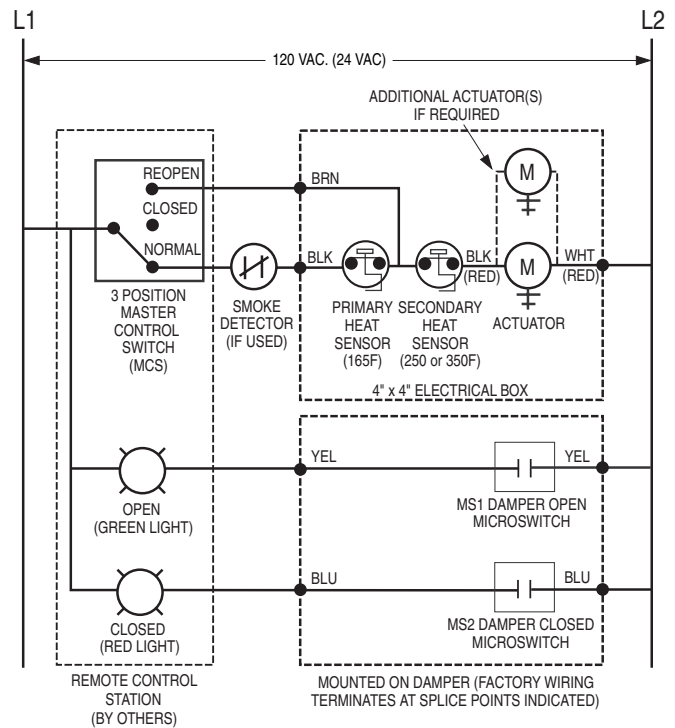
Damper system testing may be done by:

1. Remotely using the master control switch (MCS) to cycle the damper.
2. Activating the smoke detector.
3. Locally at the damper by heating the primary heat sensor by holding a match or lighter by its face. The primary heat sensor has a manual button for reset after it has cooled.



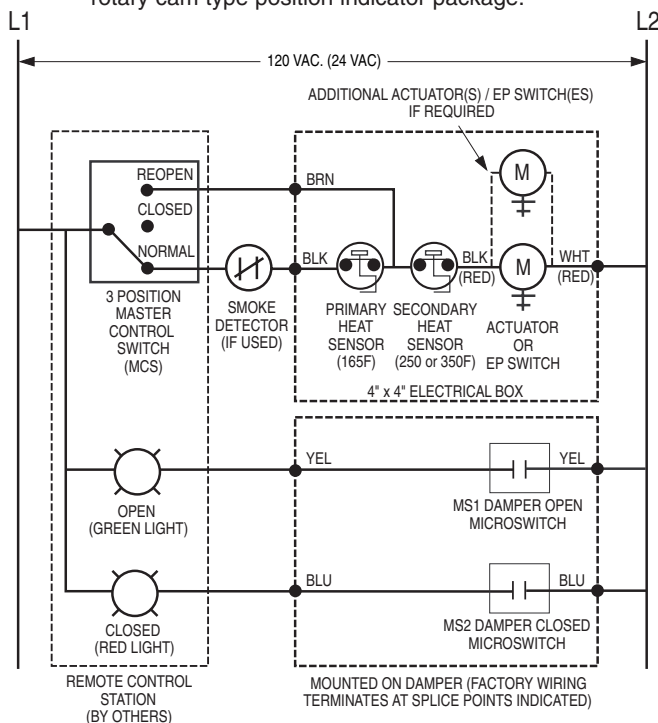
POSITION INDICATOR MICROSWITCH RATINGS: SINGLE POLE DOUBLE THROW (2). AT OR BELOW 240 VAC: RESISTIVE LOAD: 6A. INDUCTIVE LOAD: 2A. AT 125 VDC: 0.5A. PILOT DUTY: 4A, 125 VAC.

Fig. 1. MLS-400 with ML4X02/8X02 ML4115/8115 or MS4X09F/8X09F Electric Actuators and Honeywell rotary cam type position indicator package.



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

Fig. 2. MLS-400 with MS4120F/8120F Electric Actuators with built in Aux. 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. MLS-400 with GGD221/121, MS4120F/8120F (electric) or 331-2961/3060 (pneumatic) actuators and Nailor position indicator package.



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