

# MILLIVOLT FIREPLACE DAMPER

Model: FSM and FSM Low Profile Series



The Flue Sentinel® Millivolt Fireplace Damper is designed to operate with millivolt, standing pilot gas log fireplaces, and certain battery-powered spark ignition controls that operate on 3.3V battery supply. The FSM consists of a stainless steel pipe/blade assembly with mounting ring, a solid-state battery-powered controller in a weather-proof enclosure, and a jacketed cable wiring harness. The FSM is installed outdoors on top of the chimney of a gas-fired fireplace and is electrically interlocked with the appliance's safety control. The damper automatically opens the flue outlet when the fireplace is turned on and automatically closes off the flue outlet when the fireplace is turned off. By closing off the flue outlet when the fireplace is not in use, the damper prevents drafts and conserves energy by preventing heat in the building from escaping through an open flue.

The Flue Sentinel® is design certified by the Canadian Standards Association (CSA) to ANSI Z21.66 Automatic Damper Devices For Use with Gas-Fired Appliances and is covered by U.S. Patent No. 6,915,799.

**⚠ WARNING:** Do NOT install this damper on a chimney burning solid fuel such as wood. Do NOT install this damper on a chimney used for venting central heating or water heating appliances.

## READ THESE INSTRUCTIONS CAREFULLY AND COMPLETELY BEFORE PROCEEDING WITH THE INSTALLATION.

This device **MUST** be installed by a qualified agency in accordance with the manufacturer's installation instructions. The definition of a qualified agency is: any individual, firm, corporation or company which either in person or through a representative is engaged in, and is responsible for, the installation and operation of fireplace appliances, who is experienced in such work, familiar with all the precautions required, and has complied with all the requirements of the authority having jurisdiction.

Please retain these instructions after installation.

Installed By: \_\_\_\_\_ Phone: \_\_\_\_\_ Installation Date: \_\_\_\_\_



MFG BY:



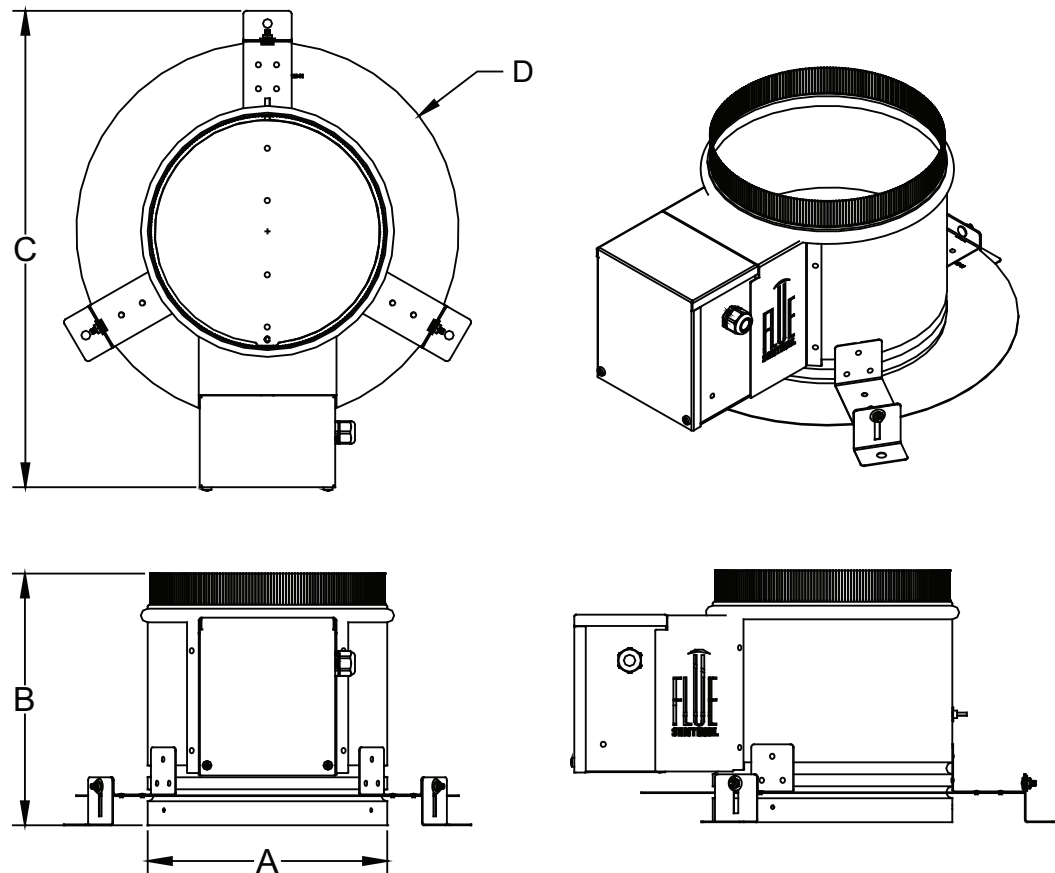
**FIELD CONTROLS**  
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P/N 0247-00 Rev G 10/18

SPECIFICATIONS

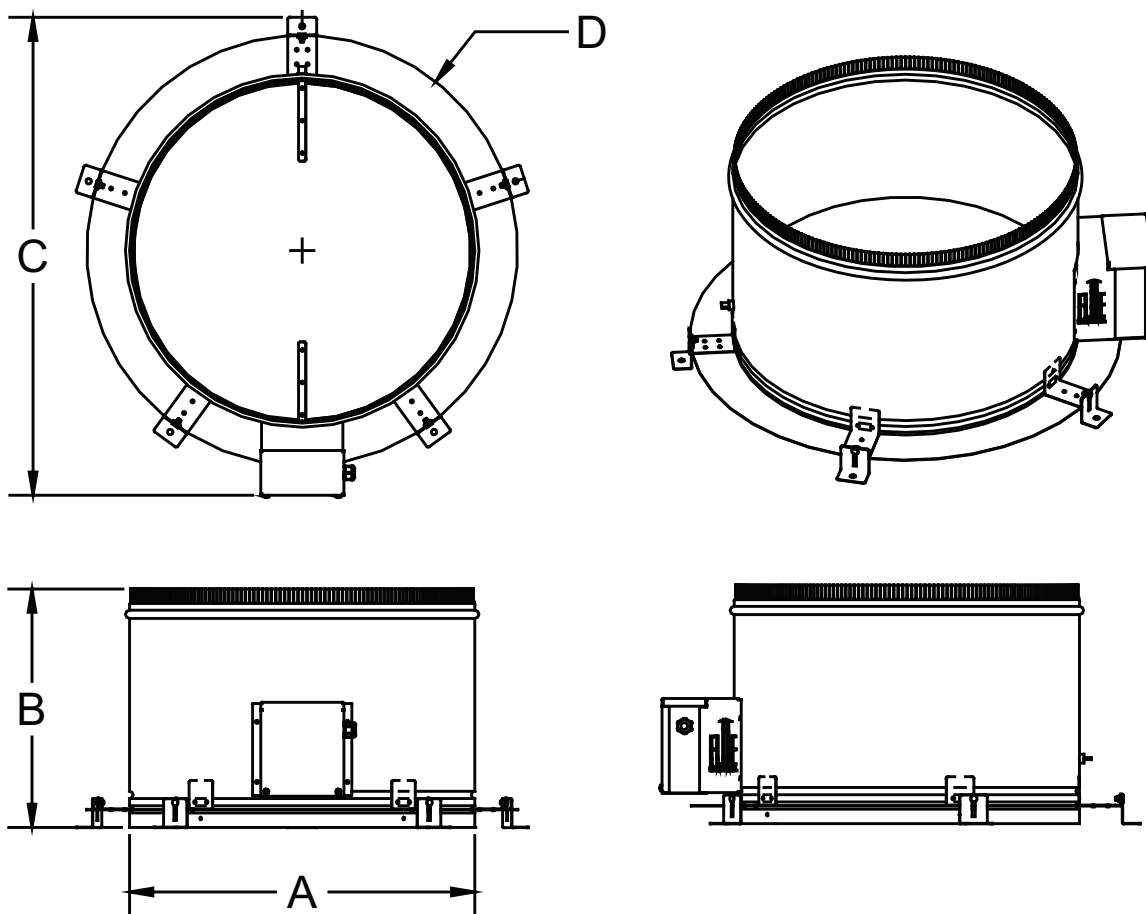
| OPERATING SPECIFICATIONS    |                                                     |
|-----------------------------|-----------------------------------------------------|
| Controller Voltage          | 3.6 VDC                                             |
| Switching Voltage           | 100-750 mVDC/compatible with 3.3V systems           |
| Battery Life                | 10 yrs*                                             |
| Operating Temperature Range | Controller: (-40) - 140°F<br>Pipe: (-40) - 650°F    |
| Timing                      | 7 seconds to open<br>30-40 seconds to close @ 450mV |

\*Based on normal usage as presented by HPBA Market Survey findings



| Flue Sentinel® Dimensions and Weight: FSM-8 through FSM-16 |       |       |       |       |          |
|------------------------------------------------------------|-------|-------|-------|-------|----------|
| MODEL                                                      | DIM A | DIM B | DIM C | DIM D | WT. (LB) |
| FSM-8                                                      | 7.9   | 10.5  | 17.8  | 13.8  | 7.8      |
| FSM-10                                                     | 9.9   | 10.5  | 19.8  | 15.8  | 8.9      |
| FSM-11                                                     | 10.9  | 10.5  | 20.8  | 16.8  | 9.4      |
| FSM-12                                                     | 11.9  | 10.5  | 21.8  | 17.8  | 10.0     |
| FSM-13                                                     | 12.9  | 12.5  | 22.8  | 18.8  | 11.3     |
| FSM-14                                                     | 13.9  | 12.5  | 23.8  | 19.8  | 12.0     |
| FSM-16                                                     | 15.9  | 12.5  | 25.8  | 21.8  | 13.3     |

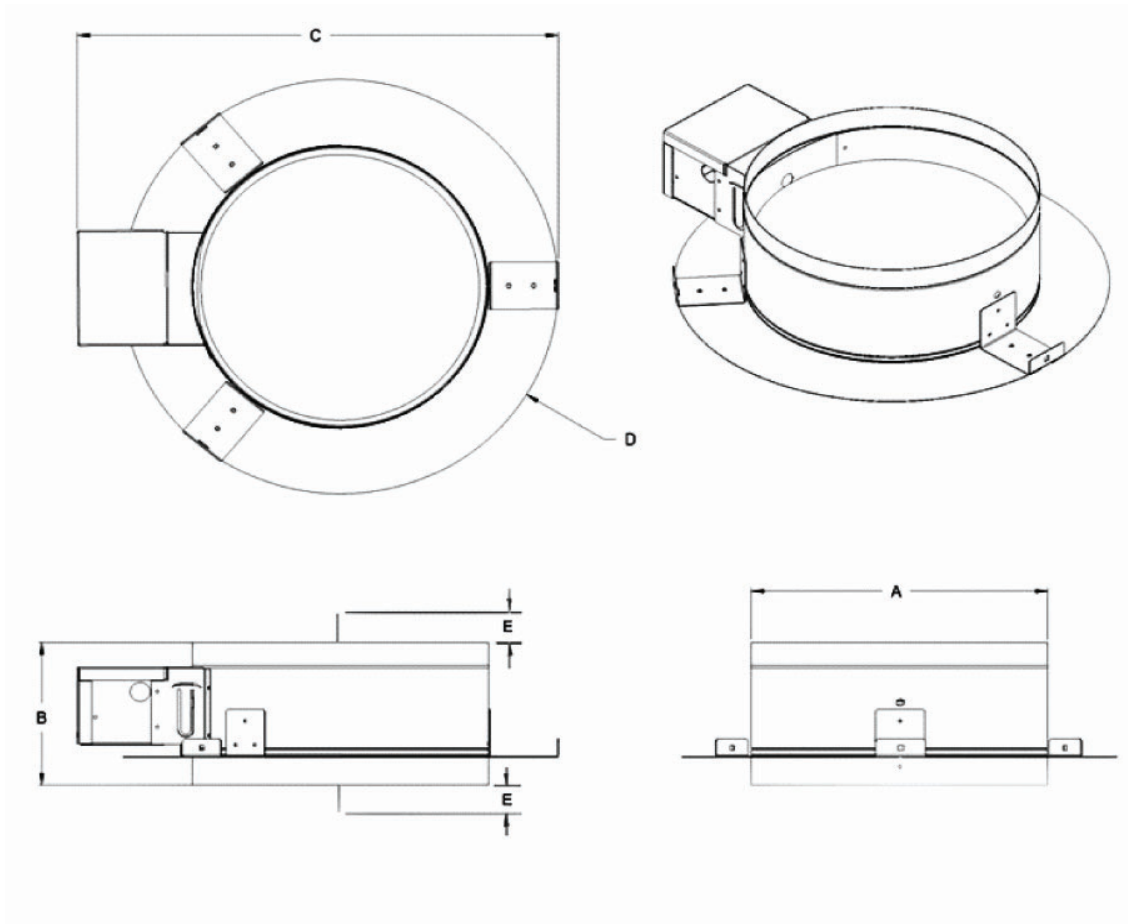
NOTE: All dims are in inches



**Flue Sentinel® Dimensions and Weight: FSM-18 through FSM-24**

| MODEL  | DIM A | DIM B | DIM C | DIM D | WT. (LB) |
|--------|-------|-------|-------|-------|----------|
| FSM-18 | 17.9  | 13.5  | 27.8  | 23.8  | 15.6     |
| FSM-20 | 19.9  | 14.5  | 29.8  | 25.8  | 17.8     |
| FSM-22 | 21.9  | 15.5  | 31.8  | 27.8  | 20.1     |
| FSM-24 | 23.9  | 16.5  | 33.8  | 29.8  | 22.9     |

**NOTE: All dims are in inches**



**Flue Sentinel® Dimensions, Weights and Clearances for Low Profile Units**

| MODEL   | DIM A | DIM B | DIM C | DIM D | WT. (LB) | Damper Blade Clearance Required ('E') |
|---------|-------|-------|-------|-------|----------|---------------------------------------|
| FSM-L6  | 5.9   | 6.0   | 14.5  | 11.8  | 4.02     | .25                                   |
| FSM-L8  | 7.9   | 6.0   | 16.5  | 13.8  | 4.25     | 1.25                                  |
| FSM-L10 | 9.9   | 6.0   | 18.5  | 15.8  | 5.25     | 2.25                                  |
| FSM-L11 | 10.9  | 6.0   | 19.5  | 16.8  | 5.81     | 2.75                                  |
| FSM-L12 | 11.9  | 6.0   | 21.5  | 17.8  | 6.36     | 3.25                                  |
| FSM-L13 | 12.9  | 6.0   | 22.5  | 18.8  | 6.55     | 3.75                                  |
| FSM-L14 | 13.9  | 6.0   | 23.5  | 19.8  | 7.07     | 4.25                                  |
| FSM-L16 | 15.9  | 6.0   | 25.5  | 21.8  | 8.25     | 5.25                                  |
| FSM-L18 | 17.9  | 6.0   | 27.5  | 23.8  | 9.80     | 6.25                                  |
| FSM-L20 | 19.9  | 6.0   | 29.5  | 25.8  | 11.25    | 7.25                                  |
| FSM-L22 | 21.9  | 6.0   | 31.5  | 27.8  | 12.35    | 8.25                                  |
| FSM-L24 | 23.9  | 6.0   | 33.5  | 29.8  | 13.75    | 9.25                                  |

**NOTE: All dims are in inches**

**⚠ NOTE:** Before installing a cap other than one offered by Flue Sentinel®, insure that the clearance inside the cap meets the clearance noted in Dimensions and Clearance table on page 4 for the size of the unit that is being installed. Failure to do so will damage the unit and will void the warranty.

## INSTALLATION

The Flue Sentinel® has been designed to fit a variety of chimney types including masonry and manufactured chimneys. It features a mounting collar that seals the chimney, adjustable legs for means of attachment, and a crimped outlet for mounting the chimney top. Figure 1 is an example of a typical installation.

The Flue Sentinel® FSM models are designed to allow remote battery location in the fireplace vicinity, as of August 2016. The battery may also be installed within the FSM damper if desired.

Installation of the Flue Sentinel® must comply with the following requirements:

- The Flue Sentinel® must be installed only on a factory built chimney or vent complying with a recognized standard, or a masonry or concrete chimney acceptable to the authority having jurisdiction.
- The Flue Sentinel® must be located on a chimney so that it serves only the single fireplace appliance for which it is installed.
- The Flue Sentinel® shall be installed in accordance with local codes, or in the absence of local codes, in accordance with the National Fuel Gas Code, ANSI Z223.1.
- If the Flue Sentinel® is to be installed on an air-cooled chimney, it must be installed with the appropriate Flue Sentinel® Mounting Kit per the kit instructions.

Installation Steps:

1. Set the damper in the opening of the chimney flue to check the fit. The damper's mounting collar should rest evenly on the top edge of the flue. Also check the orientation of the damper control housing and mounting legs to ensure the proper attachment and routing of the wiring harness.
2. Remove the damper and apply a bead of high temperature sealant on the top edge of the flue.
3. Center the damper in the opening of the chimney flue.
4. Adjust the mounting legs to rest on top of the chimney and secure with screws. Tighten the mounting leg bolts at the collar brackets.
5. Install the chimney top and secure per the manufacturer's instructions.
6. Install 4-wire Damper wire Harness and \*Optional Remote Battery Wiring Harness (See Remote Battery Installation Instructions Section).
7. Install the warning tag on the damper wiring harness near gas valve. To identify the requirement that the Flue Sentinel device be removed before converting to wood burning.

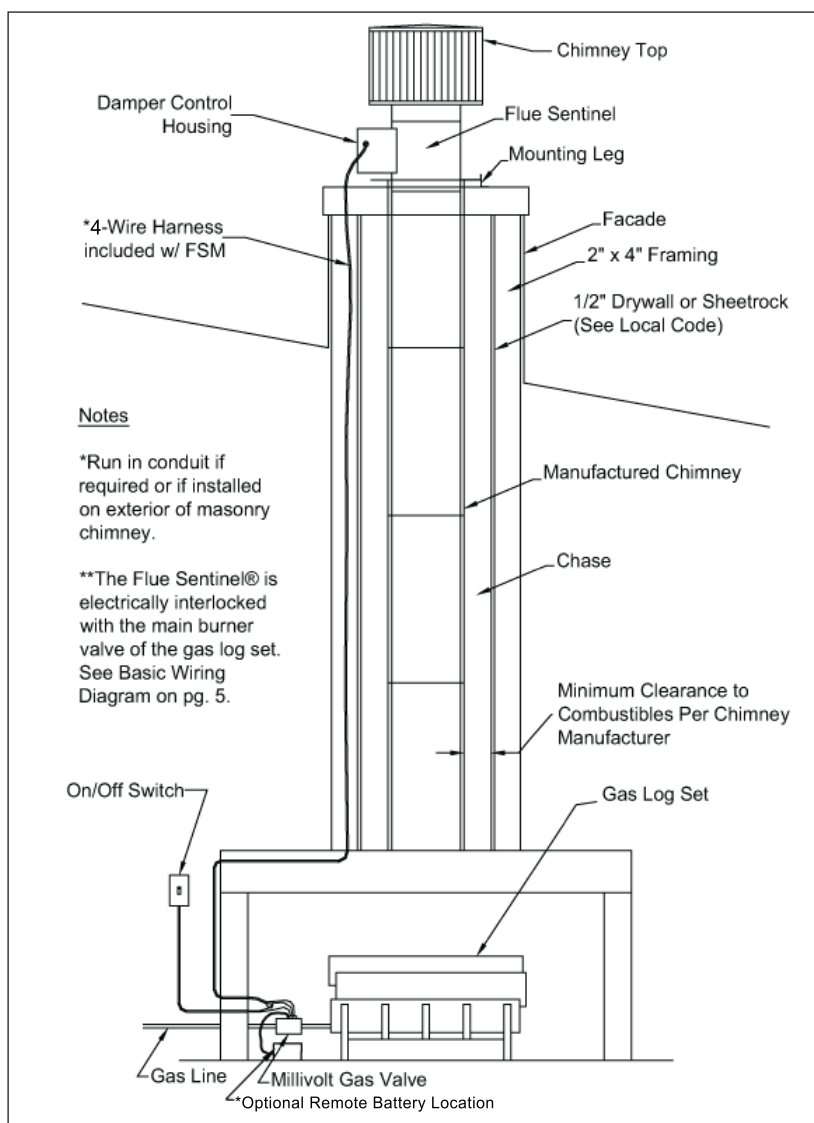


Figure 1: Example of typical installation

## WIRING

**⚠ WARNING:** This damper device **MUST** be interlocked with all automatic gas valves on the fireplace appliance. **DO NOT** negate the action of any existing safety of operational control.

The following requirements must be met to ensure safe and proper operation:

- Do **NOT** use this damper with a 24V or greater system as it will damage the controls. This damper has been designed to operate with millivolt (.75V or less) or 3.3V systems only.
- The Flue Sentinel® Electronic Fireplace Damper must be electrically connected to the fireplace appliance using the chimney upon which the damper is installed.
- The damper must be installed using the 50 foot wiring harness and wire terminals supplied with it. The harness should be cut to remove any excess length.
- Figure 2 is the Basic Wiring Diagram for a FSM with a millivolt gas valve typically used with gas log sets and must be wired as shown in Figure 2. The battery is to be located within the FSM Damper.
- Figure 3 is the Wiring Diagram for the Remote Battery Location Installation. The battery is to be located in the fireplace area; refer to Remote Battery Location Installation Section.

### FSM Harness

Orange - On/Off Switch

Yellow - TH

Black - TP

\*Brown - Red wire, Remote Battery Harness

### Thermopile Leads

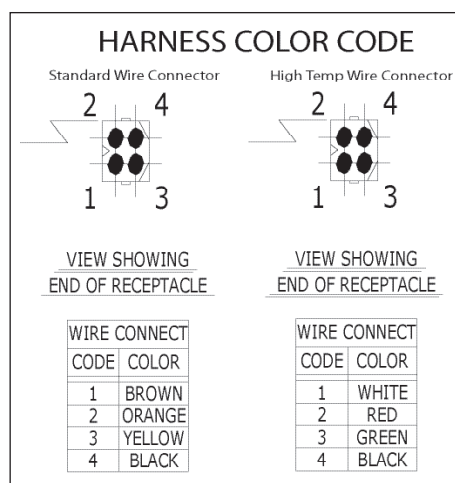
Red (Positive) – TH/TP

White (Negative) - TP

### \*Remote Battery Harness (OPTIONAL)

Red - Brown, FSM Harness

Black - TP



**Note:** If you have a gas valve or thermopile with connection callouts different from those pictured above, contact Field Controls Technical Support at 1-800-742-8368 for assistance.

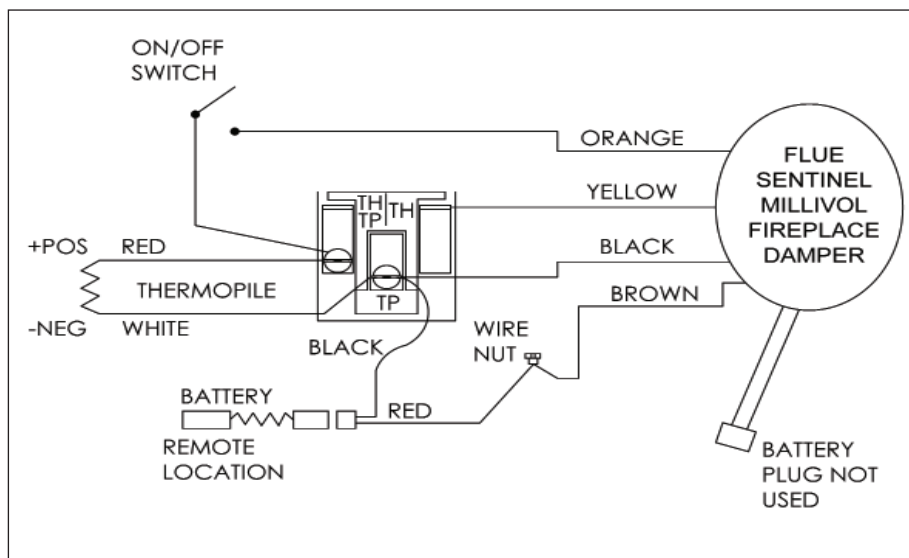


Figure 2: Original (FSM) Battery Location Installation





## SEQUENCE OF OPERATION (3.3V)

When the fireplace is turned on, a 3.3 Vdc signal is sent by the fireplace control to the damper controller. The damper controller motor then rotates the damper blade, which is indexed to a cam, to the open position to allow products of combustion to pass through the flue outlet. The cam proves the damper is in the open position and sends the 3.3 Vdc signal to the main gas valve, which fires the main burner.

When the fireplace is turned off, the fireplace control removes the 3.3 Vdc signal to the damper controller, shutting off the main burner. The damper controller then waits 30 seconds then rotates the damper blade to the closed position and resets itself for the next time the fireplace is turned on.



**CAUTION:** Use appropriate personal protective equipment for eye, face, and hand safety before proceeding with the installation!

## INSTALLATION PROCEDURE FOR REMOTE BATTERY LOCATION

**Note:** The controller's circuit board includes battery connector on 4-pin control, as well as provides a battery plug for original installation method, See Figure 5. Unless it is desired to have the battery installed within the FSM atop the chimney, leave the battery connector unused. If the battery is to be installed in the fireplace area, the battery will not be connected to the circuit board inside the FSM. If the battery is to be installed in the FSM, follow the steps given in the procedure for FSM Battery Location Installation.

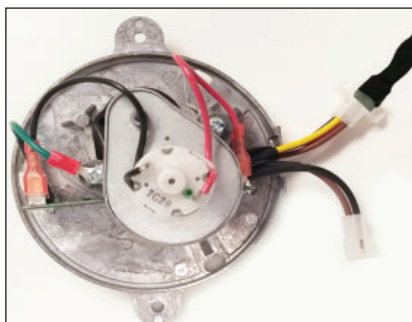


Figure 5

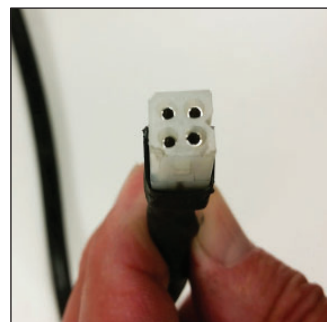


Figure 6

1. At the fireplace, determine a good location for the remote battery that is protected from moisture, potential physical damage, and significant heat sources such as direct exposure to open flame or metal parts that may become hot during fireplace operation. The remote battery housing may be buried within pumice rock, glass beads or other insulating material if the location becomes no warmer than 160 degrees F during prolonged operation.



**WARNING:** Ensure that the battery is protected from physical damage, excessive heat, and potential moisture exposure! Locate the battery such that potential fire or explosion from battery failure or mistreatment will not cause damage or injury. The battery is designed with safety features intended to prevent these occurrences but may not give protection in all circumstances. DO NOT install the battery within a flammable enclosure or area, and protect from moisture in all cases.



**WARNING:** ENSURE THAT THE BATTERY IS NOT CONNECTED TO THE BATTERY WIRING HARNESS BEFORE PROCEEDING WITH THE INSTALLATION!

2. Connect the supplied Battery Wiring Harness to the gas valve and FSM control cable, as shown in the wiring diagram. See typical installation as shown in Figure 7. Use the various wiring connectors/terminations as included with the kit as appropriate for the gas valve terminals, or other approved wiring connectors.

Male and female spade (tab) connectors are provided, attach the male terminal to the red battery harness wire, and the female to the brown or white damper control cable. See Figure 7.

Attach the black battery harness wire, and the black damper cable wire (standard and hi-temp cable) to the gas valve TP terminal using appropriate wiring connectors.

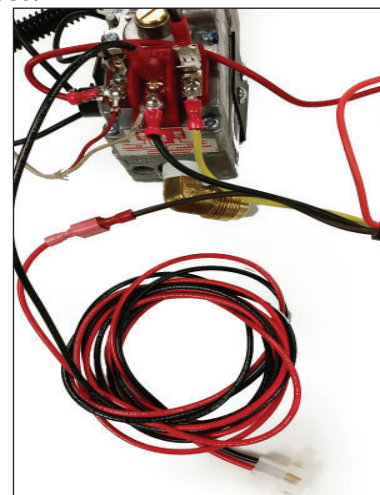


Figure 6





Figure 8

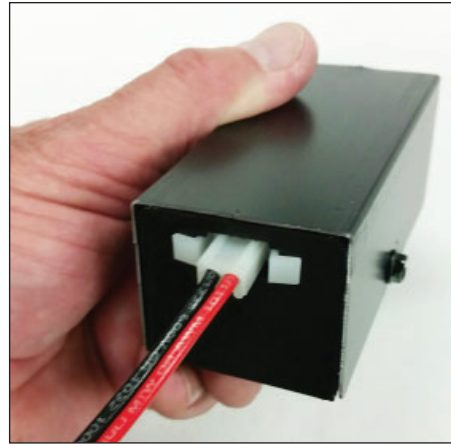


Figure 9

3. Ensure that the wiring is correct and no direct short of the battery wiring harness exists. Probe the battery harness wire terminals with a voltmeter set to Ohms (electrical resistance), touching the red battery wire terminal with the red probe, and the black battery wire terminal with the black probe at the same time; see Figure 8. No less than 1000 (1K) Ohms should be observed on the voltmeter.
4. Snap the Wiring Harness modular wiring connector into place in the matching hole in the end of the battery housing; see Figure 9. The connector may be attached with the red and black wires in either orientation; gently fold back the "ears" on the connector while pushing it into the hole.
5. Loosen the battery box cover screws and remove the battery housing cover.
6. Snap the battery's modular wiring connector into the matching connector on the Wiring Harness, making sure the polarized connectors are correctly aligned. See Figure 10. Do not force the connection; if the connectors do not snap together easily, inspect for proper orientation of the two connectors, and for proper mating pin alignment. DO NOT short the battery connector terminals!
7. Observe the FSM damper for operation. If not already in the closed position, the FSM damper motor should begin running to reach a closed position within 10-50 seconds. The damper motor should stop running upon reaching a closed position. If this does not occur, or if the damper runs continuously, immediately unplug the battery connector and inspect all wiring for proper connections according to the wiring diagram.
8. Place the battery into the battery housing, see Figure 10. Replace the battery housing cover and tighten the cover screws, using care to avoid stripping the screws. DO NOT use alternate screws that are pointed and/or longer than the screws supplied; battery damage and a fire hazard may result!
9. Place the battery and housing in the location chosen in Step 1, making sure to route the wiring to avoid contact with heat sources and potential physical damage.
10. Open the manual gas valve and light the pilot flame, or otherwise prepare the fireplace for operation. Ensure that any insulating or protective covers or shielding of components have been replaced into proper position for safe operation.



Figure 10



Figure 11

11. Turn on the fireplace switch and observe the FSM damper and fireplace for proper operation. The FSM damper motor should begin running immediately and run to a fully open position and stop, before allowing the fireplace to light. If the FSM requires more than about 9-10 seconds to reach the open position, consider replacing the battery.

**⚠ WARNING: If the fireplace lights or continues to burn at any time when the FSM damper is not halted in a fully open position, turn off the fireplace and manual gas valve immediately, and inspect all wiring and equipment before attempting to place the fireplace into operation!**

12. Cycle the fireplace on and off at least 3 times to check for proper operation.
13. Perform all fireplace system checkout and safety inspection procedures before leaving the job site.

## INSTALLATION PROCEDURE FOR FSM BATTERY LOCATION

1. Close the manual gas valve supplying gas to the fireplace, to prevent gas flow to the fireplace.
2. Install the FSM damper and damper cable as directed in the installation steps. Remove the FSM controller housing and note that the FSM electronic circuit board battery connector is available for installing battery.
3. Position battery within the FSM battery clip.
4. Reconnect the controller circuit board battery connector to the battery connector. See Figure 12. Note that the 4th wire in the cable assembly should not be connected or used. Observe the FSM damper for operation. If not already in the closed position, the FSM damper motor should begin running to reach a closed position within 10-50 seconds. The damper motor should stop running upon reaching a closed position. If this does not occur, or if the damper runs continuously, immediately unplug the battery connector and inspect all wiring for proper connections according to the wiring diagram.
5. Perform Step 7 as described above in the Remote Battery Installation section.
6. Replace the FSM controller housing.
7. Open the manual gas valve and light the pilot flame, or otherwise prepare the fireplace for operation. Ensure that any insulating or protective covers or shielding of components have been replaced into proper position for safe operation.
8. Verify that all fireplace system checkout and safety inspections are performed before leaving the job site.



Figure 12: For FSM (Original)  
Battery Location Only

## FINAL INSPECTION

**⚠ CAUTION: Do NOT turn damper by hand. Manually rotating the Flue Sentinel® damper will damage the motor and void the warranty.**

Turn on the gas to the appliance and light the pilot. Check the operation of the Flue Sentinel® by cycling the appliance at least three times as follows:

1. Switch the fireplace control to turn on the fireplace.
2. The damper will open and fire the main burner. **The damper must be in the open position when appliance main burner is operating.**
3. Switch the fireplace control to turn off the fireplace. The main burner will immediately shut off and, depending on the system voltage, the damper will rotate to the closed position after approximately 10-50 seconds.

If the Flue Sentinel® Electronic Fireplace Damper and/or fireplace appliance does not operate as described above, consult the Troubleshooting Chart below for the proper course of action to resolve the problem.

## MAINTENANCE

**⚠ CAUTION:** Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation.

The Flue Sentinel® has been designed to provide years of maintenance free service. However, for continued safe operation, the Flue Sentinel®, chimney and fireplace appliance should be examined once a year by a qualified service agency. It is also recommended that the homeowner examine these components at least every six (6) months, with particular attention given to deterioration from corrosion or other source.

| TROUBLESHOOTING CHART                                   |                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PROBLEM                                                 | POSSIBLE CAUSES                                    | ACTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Damper won't open                                       | Signal voltage at Orange wire less than 100 mV*    | Check connections, adjust pilot, and/or replace thermopile                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                                         | Obstruction in damper                              | Remove obstruction                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                         | Insufficient power at damper                       | Check damper battery & replace if less than 2.8V. Check battery voltage at FSM Cable plug, pin positions 1(+) and 4(-) (Remote Battery Only). Check voltage on battery harness wires: red (+) and black (-), and battery connector.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                                                         | Defective damper controller                        | Replace controller                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                         | No Power                                           | Battery test: With a good AA battery attach to the Orange (Red on high temp harness) and Black wire from the harness of the FSM. If the damper opens check to see if there is 1.5 volts DC between the Yellow (Green on high temp harness) and the black with the battery is still attached to the Orange (Red on high temp harness) and Black wires. If there is 1.5 volts DC the FSM is operating properly and the thermopile on the gas valve of the log set would need to be checked. If there is no voltage check to make sure the FSM opened. If the damper open, but no power replace controller. If damper did not open check battery to FSM to see if there is 3.6 volts DC on the battery. If battery is below 2.8 volts DC replace battery. If battery has good voltage replace controller. |
| Damper opens but appliance main burner(s) does not fire | Signal voltage at Yellow wire less than 100 mV*    | Check connections, adjust pilot, and/or replace thermopile                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                                         | Signal voltage at Yellow wire greater than 100 mV* | Make sure valve knob is On, if so replace valve operator                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Damper rotates continuously                             | Defective damper controller                        | Replace controller                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                         | Reversed Battery Polarity                          | Check red wire terminal (+), black wire terminal (-) for proper connections.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Damper won't close, main burner off                     | Signal voltage at Orange wire                      | Check on/off switch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                                                         | Thermopile polarity reversed*                      | Re-connect thermopile leads per Figure 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                                         | Obstruction in damper                              | Remove obstruction                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                         | No power or insufficient power at damper           | Check damper battery & replace if less than 2.8V. Check at battery connector & cable plug.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                                         | Defective damper controller                        | Replace controller                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

\*Applicable to millivolt systems only.

| REPLACEMENT PARTS |                                          |
|-------------------|------------------------------------------|
| FSP-RC-MV         | SVC Part - Controller, FSM               |
| FSP-RCL-MV        | SVC Part - Controller, FSM (Low Profile) |
| 0241-00           | Battery, FSM                             |
| 5101000400        | FSM Remote Battery Wire Harness          |

### MANUALS AND LITERATURE

This manual may be downloaded and printed from the Field Controls website at [www.fieldcontrols.com](http://www.fieldcontrols.com)

### WARRANTY

For warranty about this or any Field Controls product, visit:  
[www.fieldcontrols.com/warranty](http://www.fieldcontrols.com/warranty)

### TECHINICAL SUPPORT

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