FSE SERIES
Low Profile
ELECTRONIC
FIREPLACE DAMPER

**WARNING:** Installation and service must be performed by a qualified installer, service agency or the gas supplier. Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life. Read these instructions carefully and completely before proceeding with the installation.

**Warning:** Do not install this damper on a chimney burning solid fuel such as wood.

**Warning:** Do not install this damper on a chimney used for venting central heating or water heating appliances.
1.0 DESCRIPTION

The Flue Sentinel Electronic Fireplace Damper is designed to increase the comfort and energy efficiency of residential homes with gas-fired fireplaces. Consisting of a stainless steel pipe/blade assembly and solid-state controller housed in a weather-proof enclosure, the damper is installed outdoors on the top of the chimney of a gas-fired fireplace. 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 the fireplace is not in use, the damper prevents drafts and conserves energy by preventing heat in the home from escaping through an open flue.

The Flue Sentinel is design certified by the Canadian Standards Association (CSA) to CSA Requirement NO. 2.03-US for Automatic Vent Dampers Devices for Use Outdoors on Fireplaces Chimneys and covered by U.S. Patent No. 6,915,799.

1.2 SPECIFICATIONS

Table 1. Operating Specifications

<table>
<thead>
<tr>
<th>Voltage (range)</th>
<th>24 VAC (Max. 27.6, Min. 20.4 VAC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>50/60 Hz</td>
</tr>
<tr>
<td>Current (running)</td>
<td>80 mA</td>
</tr>
<tr>
<td>Maximum current rating for output circuit</td>
<td>5 A</td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>Controller: (-40) - 140°F Pipe: (-40) - 650°F</td>
</tr>
<tr>
<td>Timing</td>
<td>7 seconds to open 30-40 seconds to close (incl. time delay)</td>
</tr>
</tbody>
</table>
Table 2. Dimensions and Clearance Needed

<table>
<thead>
<tr>
<th>PART NO.</th>
<th>DIM. A</th>
<th>DIM. B</th>
<th>DIM. C</th>
<th>DIM. D</th>
<th>WT. (lb)</th>
<th>Damper Blade Clearance Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSE-L6</td>
<td>5.9</td>
<td>6.0</td>
<td>14.5</td>
<td>11.8</td>
<td>4.02</td>
<td>.25</td>
</tr>
<tr>
<td>FSE-L8</td>
<td>7.9</td>
<td>6.0</td>
<td>16.5</td>
<td>13.8</td>
<td>4.25</td>
<td>1.25</td>
</tr>
<tr>
<td>FSE-L10</td>
<td>9.9</td>
<td>6.0</td>
<td>18.5</td>
<td>15.8</td>
<td>5.25</td>
<td>2.25</td>
</tr>
<tr>
<td>FSE-L11</td>
<td>10.9</td>
<td>6.0</td>
<td>19.5</td>
<td>16.8</td>
<td>5.81</td>
<td>2.75</td>
</tr>
<tr>
<td>FSE-L12</td>
<td>11.9</td>
<td>6.0</td>
<td>21.5</td>
<td>17.8</td>
<td>6.36</td>
<td>3.25</td>
</tr>
<tr>
<td>FSE-L13</td>
<td>12.9</td>
<td>6.0</td>
<td>22.5</td>
<td>18.8</td>
<td>6.55</td>
<td>3.75</td>
</tr>
<tr>
<td>FSE-L14</td>
<td>13.9</td>
<td>6.0</td>
<td>23.5</td>
<td>19.8</td>
<td>7.07</td>
<td>4.25</td>
</tr>
<tr>
<td>FSE-L16</td>
<td>15.9</td>
<td>6.0</td>
<td>25.5</td>
<td>21.8</td>
<td>8.25</td>
<td>5.25</td>
</tr>
<tr>
<td>FSE-L18</td>
<td>17.9</td>
<td>6.0</td>
<td>27.5</td>
<td>23.8</td>
<td>9.80</td>
<td>6.25</td>
</tr>
<tr>
<td>FSE-L20</td>
<td>19.9</td>
<td>6.0</td>
<td>29.5</td>
<td>25.8</td>
<td>11.25</td>
<td>7.25</td>
</tr>
<tr>
<td>FSE-L22</td>
<td>21.9</td>
<td>6.0</td>
<td>31.5</td>
<td>27.8</td>
<td>12.35</td>
<td>8.25</td>
</tr>
<tr>
<td>FSE-L24</td>
<td>23.9</td>
<td>6.0</td>
<td>33.5</td>
<td>29.8</td>
<td>13.75</td>
<td>9.25</td>
</tr>
</tbody>
</table>

*All dimensions are in inches.
2.0 INSTALLATION

**Warning:** Do not install this damper on a chimney burning solid fuel such as wood.

**Warning:** Do not install this damper on a chimney used for venting central heating or water heating appliances.

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 cramped outlet for mounting the chimney top. Figure 1 is an example of a typical installation.

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.

If you have any questions regarding the proper installation of the Flue Sentinel, contact Technical Service at 586-739-4373 (8:30am-5:00pm EST).

**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 mounting legs to rest flush with the exterior of the chimney before attaching to flue with worm gear clamps or screws no longer than ¼ inch. Tighten the mounting leg bolts at the collar brackets.

**Warning:** Before installing a cap other than one offered by Flue Sentinel, insure that the clearance inside the cap meets the clearance noted in Table 2 for the size of the unit that is being installed. Failure to do so will damage the unit and will void the warranty.

5. Install the warning tag on the damper wiring harness near gas valve. To identify the requirement that the Flue Sentinel device before converting to wood burning.
Notes

* Typically 18/4. Run in conduit if required or if installed on exterior of masonry chimney.

** The Flue Sentinel is electrically interlocked with the main burner valve/controls of the gas log set. See Basic Wiring Diagram on pg. 8.
2.1 WIRING

**Warning:** This damper device **must** be interlocked with all automatic gas valves on the fireplace appliance.

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

- 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 in accordance with the NEC NFPA 70 (most recent edition) and/or local codes.

- The damper must be installed using the wiring harness supplied with it. This harness has a mated connector which plugs into the damper controller.

- The damper's wiring harness must terminate at the gas valve.

**Warning:** Do not negate the action of any existing safety or operational control.

- The wiring connecting the damper controller to the gas valve must be a minimum of 18 AWG and must be run in conduit if installed on the exterior of the chimney or required by code.

- Figure 2 is a wiring connection diagram for a typical installation with an intermittent ignition system.

- The damper control wiring **must always** be connected as follows:

  - Brown - 24 VAC Hot
  - Orange - Signal In
  - Yellow - Signal Out
  - Black - 24 VAC Common

If you have any questions regarding the proper wiring of the Flue Sentinel, contact Technical Service at 586-739-4373 (8:30am-5:00pm EST).
3.0 Sequence of Operation

When the fireplace is turned on, a 24V 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 switches 24V from the motor to the main gas valve or ignition system, which fires the main burner.

When the fireplace is turned off, the fireplace control removes the 24V signal to the damper controller, shutting off the main burner. After a 30-40 second delay, the damper controller motor then rotates the damper blade to the closed position and resets itself for the next time the fireplace is turned on.

4.0 Final Inspection

**Warning:** If a damper was installed prior to installing the Flue Sentinel, this damper **must** be blocked completely open or removed.

**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 and electrical supplies to the appliance. 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, after approximately 30-40 seconds, the damper will rotate to the closed position.

If the Flue Sentinel Electronic Fireplace Damper and/or fireplace appliance does not operate as described above, consult the Troubleshooting Chart on Page 10 for the proper course of action to resolve the problem.
<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible Causes</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Damper won’t open</td>
<td>No power or insufficient power at damper</td>
<td>Check for opens in the power supply circuit and correct.</td>
</tr>
<tr>
<td></td>
<td>No signal into damper</td>
<td>Check for opens in fireplace control/circuit and correct.</td>
</tr>
<tr>
<td></td>
<td>Obstruction preventing damper blade from rotating</td>
<td>Check for protruding screws or binding in pipe/blade assembly and correct.</td>
</tr>
<tr>
<td></td>
<td>Defective damper controller</td>
<td>Replace controller.</td>
</tr>
<tr>
<td>Damper opens but appliance main burner(s) does not fire</td>
<td>Defective gas valve or ignition control on appliance</td>
<td>Check for power at gas valve and/or ignition control. If present, replace defective part.</td>
</tr>
<tr>
<td></td>
<td>Defective damper controller</td>
<td>If not present, check for power at controller, yellow wire should be energized. If not, replace controller.</td>
</tr>
<tr>
<td>Damper rotates continuously</td>
<td>Defective damper controller</td>
<td>Replace controller.</td>
</tr>
<tr>
<td>Damper won’t close, main burner off</td>
<td>No power or insufficient power at damper</td>
<td>Check for power at controller, only black and brown wires should be energized. If not, check wiring diagram.</td>
</tr>
<tr>
<td></td>
<td>Obstruction preventing damper blade from rotating</td>
<td>Check for protruding screws or binding in pipe/blade assembly and correct.</td>
</tr>
<tr>
<td></td>
<td>Defective damper controller</td>
<td>Replace controller.</td>
</tr>
<tr>
<td>Damper won’t close, main burner on</td>
<td>Fireplace control still sending signal to damper to open</td>
<td>Check for shorts in fireplace control/circuit and correct.</td>
</tr>
</tbody>
</table>
5.0 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 (6) months, with particular attention given to deterioration from corrosion or other source.
WARNING: Installation and service must be performed by a qualified installer, service agency or the gas supplier. Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life. Read these instructions carefully and completely before proceeding with the installation.

Warning: Do not install this damper on a chimney burning solid fuel such as wood.

Warning: Do not install this damper on a chimney used for venting central heating or water heating appliances.
1.2 SPECIFICATIONS (Cont.)

![Diagram](image)

<table>
<thead>
<tr>
<th>PART NO.</th>
<th>DIM. A</th>
<th>DIM. B</th>
<th>DIM. C</th>
<th>DIM. D</th>
<th>WT. (lb)</th>
<th>Damper Blade Clearance Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSM-L6</td>
<td>5.9</td>
<td>6.0</td>
<td>14.5</td>
<td>11.8</td>
<td>4.02</td>
<td>.25</td>
</tr>
<tr>
<td>FSM-L8</td>
<td>7.9</td>
<td>6.0</td>
<td>16.5</td>
<td>13.8</td>
<td>4.25</td>
<td>1.25</td>
</tr>
<tr>
<td>FSM-L10</td>
<td>9.9</td>
<td>6.0</td>
<td>18.5</td>
<td>15.8</td>
<td>5.25</td>
<td>2.25</td>
</tr>
<tr>
<td>FSM-L11</td>
<td>10.9</td>
<td>6.0</td>
<td>19.5</td>
<td>16.8</td>
<td>5.81</td>
<td>2.75</td>
</tr>
<tr>
<td>FSM-L12</td>
<td>11.9</td>
<td>6.0</td>
<td>21.5</td>
<td>17.8</td>
<td>6.36</td>
<td>3.25</td>
</tr>
<tr>
<td>FSM-L13</td>
<td>12.9</td>
<td>6.0</td>
<td>22.5</td>
<td>18.8</td>
<td>6.55</td>
<td>3.75</td>
</tr>
<tr>
<td>FSM-L14</td>
<td>13.9</td>
<td>6.0</td>
<td>23.5</td>
<td>19.8</td>
<td>7.07</td>
<td>4.25</td>
</tr>
<tr>
<td>FSM-L16</td>
<td>15.9</td>
<td>6.0</td>
<td>25.5</td>
<td>21.8</td>
<td>8.25</td>
<td>5.25</td>
</tr>
<tr>
<td>FSM-L18</td>
<td>17.9</td>
<td>6.0</td>
<td>27.5</td>
<td>23.8</td>
<td>9.80</td>
<td>6.25</td>
</tr>
<tr>
<td>FSM-L20</td>
<td>19.9</td>
<td>6.0</td>
<td>29.5</td>
<td>25.8</td>
<td>11.25</td>
<td>7.25</td>
</tr>
<tr>
<td>FSM-L22</td>
<td>21.9</td>
<td>6.0</td>
<td>31.5</td>
<td>27.8</td>
<td>12.35</td>
<td>8.25</td>
</tr>
<tr>
<td>FSM-L24</td>
<td>23.9</td>
<td>6.0</td>
<td>33.5</td>
<td>29.8</td>
<td>13.75</td>
<td>9.25</td>
</tr>
</tbody>
</table>

*All dimensions are in inches.
1.0 DESCRIPTION
The Flue Sentinel Millivolt (FSM) Fireplace Damper is designed to operate with millivolt, standing pilot gas log fireplaces. 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 CSA Requirement NO. 2.03-US for Automatic Vent Dampers Devices for Use Outdoors on Fireplace Chimneys and covered by U.S. Patent NO. 6,915,799.

1.2 SPECIFICATIONS

Table 1. Operating Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controller Voltage</td>
<td>3.6 VDC</td>
</tr>
<tr>
<td>Switching Voltage</td>
<td>100 – 750 mVDC</td>
</tr>
<tr>
<td>Battery Life</td>
<td>10 yrs.*</td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>Controller: (-40) - 140°F</td>
</tr>
<tr>
<td></td>
<td>Pipe: (-40) - 650°F</td>
</tr>
<tr>
<td>Timing</td>
<td>7 seconds to open</td>
</tr>
<tr>
<td></td>
<td>30 seconds to close @ 450mV</td>
</tr>
</tbody>
</table>

*Based on normal usage as presented by HPBA Market Survey findings.
2.0 INSTALLATION

**Warning:** Do not install this damper on a chimney burning solid fuel such as wood.

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 2.1 is an example of a typical installation

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 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.

If you have any questions regarding the proper installation of the Flue Sentinel, contact Technical Service at 586-739-4373 (8:30 am-5:00pm EST).

**Warning:** Do not install this damper on a chimney used for venting central heating or water heating appliances.

**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. Center the damper in the opening of the chimney flue.

3. Adjust mounting legs to rest flush with the exterior of the chimney before attaching to flue with worm gear clamps or screws no longer than ¼ inch. Tighten the mounting leg bolts at the collar brackets.

**Warning:** Before installing a cap other than one offered by Flue Sentinel, insure that the clearance inside the cap meets the clearance noted in Table 2 for the size of the unit that is being installed. Failure to do so will damage the unit and will void the warranty.

4. 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.
Notes

*Run in conduit if required or if installed on exterior of masonry chimney.

**The Flue Sentinel is electrically interlocked with the main burner valve of the gas log set. See Basic Wiring Diagram on pg. 7.
2.1 WIRING

**Warning:** This damper device **must** be interlocked with the automatic gas valve on the fireplace appliance.

**Warning:** Do not negate the action of any existing safety or 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) 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 2.2 is the Basic Wiring Diagram for a FSM with a millivolt gas valve typically used with gas log sets and **must** be wired as follows:

  ** FSM Harness**
  Orange - On/Off Switch
  Yellow - TH
  Black - TP

  **Thermopile Leads**
  Red (Positive) – TH/TP
  White (Negative) - TP

Note: If you have a gas valve or thermopile with connection callouts different from those pictured here, contact Flue Sentinel for assistance.

![Figure 2.2](image-url)
3.0 Sequence of Operation

When the fireplace is turned on, a millivolt 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 millivolt signal to the main gas valve, which fires the main burner.

When the fireplace is turned off, the fireplace control removes the millivolt 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.

*Average time delay at 450mV. Time delay ranges from 10 to 50 seconds and will be longer at a higher voltage, shorter at a lower voltage.

4.0 Final Inspection

**Warning:** If a damper was installed prior to installing the Flue Sentinel, this damper **must** be blocked completely open or removed.

**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 on Page 9 for the proper course of action to resolve the problem. If you have any questions regarding the proper operation of the Flue Sentinel, contact Technical Service at 586-739-4373 (8:30am-5:00pm EST).
5.0 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 (6) months, with particular attention given to deterioration from corrosion or other sources.

**Troubleshooting Chart**

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible Causes</th>
<th>Action</th>
</tr>
</thead>
</table>
| Damper won't open. | Signal voltage at Orange wire **less** than 100 mV.  
Obstruction in damper.  
No power or insufficient power at damper.  
Defective damper controller. | Check connections, adjust pilot, and/or replace thermopile.  
Remove obstruction.  
Check damper battery & replace if less than 2.8V.  
Replace controller. |
| Damper opens but appliance main burner(s) does not fire. | Signal voltage at Yellow wire **less** than 100 mV.  
Signal voltage at Yellow wire **greater** than 100 mV. | Check connections, adjust pilot, and/or replace thermopile.  
Make sure valve knob is On, if so replace valve operator. |
| Damper rotates continuously. | Defective damper controller. | Replace controller. |
| Damper won't close, main burner off. | Signal voltage at Orange wire.  
Thermopile polarity reversed.  
Obstruction in damper.  
No power or insufficient power at damper.  
Defective damper controller. | Check on/off switch.  
Re-connect thermopile leads per Figure 2.2  
Remove obstruction.  
Check damper battery & replace if less than 2.8V.  
Replace controller. |
| Damper won't close, main burner on. | Fireplace control still sending signal to damper to open. | Check for shorts in fireplace control/circuit and correct. |

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