Dampered Fury Residential Gas Troubleshooting Codes

Control Settings

SETTING	VALUE
Set point Range	90°F (32°C) to 156°F (71°C)
"HOT" Set point	120°F (49°C)
Differential	17°F (9°C)
ECO Limit	199°F (93°C)
Flame Prove Igniter Off	0.5 µA
Flame Prove RUN	0.7 µA
Flame Lost	< 0.5 µA
Strong Flame	≥ 1.5 µA
Igniter	18kV
Damper	24 VAC; 0.5 Amp draw

Timings

IGNITION STATE	TIMING
Soft Lockout	2 minutes; then unit attempts to relight
Trial For Ignition	90 seconds
Flame Stabilization Period	3 seconds

Error Code Flash Display

Gas Valve "Status" Flash Code	Control Status
Short flash once every four seconds	IDLE (no call for heat, no fault conditions)
"Heartbeat", alternates bright/dim	Call For Heat (no fault conditions)
One Flash, three second pause	Low flame signal (control continues to operate)
Two Flash, three second pause	Damper blade failed open
Three Flash, three second pause	Damper blade failed closed
Four Flash, three second pause	Thermal Cut Off limit lockout
Five Flash, three second pause	Flame out of sequence
Six-One Flash, three second pause	Failed trial for ignition
Six-Two Flash, three second pause	Recycle limit – damper switch opened
Six-Three Flash, three second pause	Recycle limit - flame lost
Six-Four Flash, three second pause	Flame out of sequence sensed
Six-Five Flash, three second pause	Failed ignition attempts
Seven Flash, three second pause	Flammable Vapor Sensor
Eight-One Flash, three second pause	Flammable Vapor Sensor fault (mis-wired) detected
Eight-Two Flash, three second pause	Temperature sensor fault detected
Eight-Three Flash, three second pause	Electronics fault detected
Eight-Four Flash, three second pause	Valve fault detected

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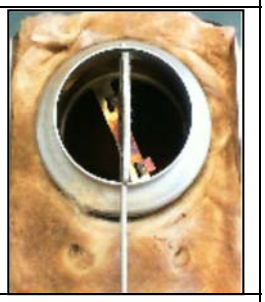
No Power or No Damper Motor

Indications	**Display**
Nothing happens at all. No damper motor; no sounds.	There is not a flash display code for this problem.
Troubleshooting	
1. Check wall plug power with a table lamp. Must be polarity correct and grounded wall plug. Reverse polarity or no ground will cause this problem. 2. Check that the unit is plugged in. 3. Verify power to the damper at the red and blue wire on the transformer Molex. Replace transformer if there is no power. 4. Verify power to the gas control thru the black wire on the gas valve Molex. 5. Verify gas control slide switch is ON.	

Error 1

Indications	**Display**
Low flame signal (control continues to operate)	One Flash, three second pause
Troubleshooting	**Solution**
1. Low gas supply pressure 2. Carbon buildup on electrode 3. Pilot tube restriction	1. Verify gas pressure with rating plate on water heater. 2. Clean spark electrode and pilot hood with steel wool. 3. Inspect pilot tube for obstructions

Error 2

Indications	**Display**
Damper blade failed open at start of Call for Heat - The control waits 2 minutes for the end switch to open (after 30 seconds it begins to flash error code. Control powers the damper for 30 seconds. The damper is unpowered after 30 seconds and the control returns to waiting for the End Switch to open. Any time the End Switch opens the control proceeds forward to waiting for the End Switch to close.	Two Flash, three second pause 
Troubleshooting	**Solution**
1. Damper switch faulty 2. Damper blade or arm pinched	1. Inspect damper switch assy. 2. Replace flue damper assembly.

Service Switch Mode

1. Allow service mode entrance only when the device is in Damper Blade Failed Open fault condition.
2. Move knob to VERY HOT (stay there for 10 seconds), then to LOW (10 seconds), and then back to the desired set-point.
3. If knob is already on VERY HOT, first decrease the set-point to the dot right below the VERY HOT (for 10 seconds) and then start the sequence.
4. Full sequence of operation must be competed in less than 40 seconds.
5. Cycle power to the valve to cancel service mode.

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Error 3

Indications	**Display**
Damper blade failed closed – At the beginning of the heating cycle the control attempts to open the damper. Contacts will make telling the control it is OK to light burner. If the damper does not open in 30 seconds, the control flashes error code. The control powers the damper and waits 30 seconds. If the damper does not open in 30 seconds, the damper is unpowered and the control flashes error code. The control waits in this mode for 2 minutes before powering the damper again and trying for another 30 seconds to see the damper blade opens.. This cycle repeats as long as the Call for Heat is present.	Three Flash, three second pause 
Troubleshooting	**Solution**
1. Damper switch faulty 2. Damper blade or arm pinched	1. Inspect damper switch assy. 2. Replace flue damper assembly.

Troubleshooting damper assembly

1. Is there a call for heat? Yes - 12VAC on red wire to damper Molex. This rules out bad gas valve.
2. Did the damper open? No
   a. Visual check of damper blade
   b. Does not have 12 VAC on blue wire at damper Molex (should be NO)
3. Do you feel the damper motor vibrate? Yes or No
   a. Measure 24 VAC at the blue and yellow spade clip terminals of the damper board. If you have 24VAC, then board is good.
   b. Touch the damper motor and feel for vibration. If the motor has vibration, then replace the damper assy. There is something wrong with the switching and motor drives to rotate the blade.
   c. If the damper motor does not have vibrations, then replace the damper assy. The board is not passing 24VAC to the damper motor to run.

Error 4

Indications	**Display**
ECO limit lockout - Water temperature sensed in excess of ECO limit (199º) - the control immediately turns off pilot and main valves and enters ECO Limit Lockout. During ECO Limit Lockout, the damper remains open.	Four Flash, three second pause
Troubleshooting	**Solution**
1. Thermal well fault 2. Gas control fault	1. The sensed water temperature must be below 120Fº 2. Power must be cycled to remove the control from ECO limit hard lockout.

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Error 5

Indications	Display
Flame Sensed Out Of Sequence - the control only looks for pilot flame when pilot valve is open. If flame is present when the pilot valve is not open, the control proceeds to Wait Flame Lost and flashes the Flame out Of Sequence error code. Damper remains open.	Five Flash, three second pause
Troubleshooting	**Solution**
1. Pilot or main burner valve has failed open	1. Recycle heater to verify error code 2. Replace gas control valve

Error 6-1

Indications	Display
Soft Lockout. Failed trial for ignition; Maximum ignition attempts. If flame is not sensed during the Trial period, the igniter turns off; the pilot valve closes, and enters Soft Lockout and flashes the Soft Lockout error code. The control remains in Soft Lockout for 2 minutes before responding to the demand for heat again. If the control has entered Soft Lockout three times, the control will enter Flash code 6-5.	Six-One Flash, three second pause
Troubleshooting	**Solution**
1. Low gas supply pressure 2. Carbon buildup on electrode 3. Igniter Wire damage 4. Combustion air blockage 5. Pilot tube restriction	1. Verify gas pressure with rating plate on water heater. 2. Clean spark electrode and pilot hood with steel wool. 3. Verify igniter spark at electrode 4. Verify air inlet holes on side of water heater are clean and clear 5. Inspect pilot tube for obstructions 6. This lockout can only be cleared by manually cycling the control power.

Error 6-2

Indications	Display
Recycle limit – damper switch opened – Maximum number of retries has occurred. Unit is in hard lock-out.	Six-Two Flash, three second pause
Troubleshooting	**Solution**
1. Damper switch damaged 2. Damper blade or arm pinched	1. Inspect damper switch assembly. 2. Replace flue damper assembly. 3. The hard lockout will require a manual power cycle of the control to clear the hard lockout.

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Error 6-3

Indications	Display
Flame lost during RUN: During the heating cycle, the ***pilot flame*** is lost. The control turns off the pilot and main valves, runs Inter-purge, increments the Recycle Count and, if the Recycle count limit has not been reached, begins another Trial for Ignition. If the Recycle Count Limit has been reached, the control enters soft lockout. The control remains in soft lockout for 15 minutes before responding to the Demand for Heat. This clears the Recycle Count to allow for another set of "Recycle Count Limit" recycles. A total of three such sets of ignition trials including the first ignition trial set to be attempted. If the control has entered soft lockout for the total number of ignition trials as specified above the control will enter hard lockout. This lockout can be cleared by manually cycling the control power.	Six-Three Flash, three second pause
Troubleshooting	**Solution**
1. Check pilot flame to insure flame is not lifting away from flame sense hood – when main burner ignites. 2. Check static and dynamic gas supply to insure pressure is maintained when main burner lights. 3. Check for leaking pilot supply tube. 4. Check for carbon/soot buildup on pilot grounding strap.	1. Verify gas pressure with rating plate. 2. Clean pilot supply hood to enhance flame rectification readings. 3. Reposition pilot igniter into proper position. 4. Replace pilot igniter.

Error 6-5

Indications	Display
The control is in hard lockout because of maximum ignition attempts. The unit did not rectify flame after three successive attempts at main burner.	Six-Five Flash, three second pause
Troubleshooting	**Solution**
1. Low gas supply pressure 2. Carbon buildup on electrode 3. Igniter Wire damaged or not connected to valve 4. Pilot tube restriction	1. This lockout can only be cleared by manually cycling the control power.

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Error 7

Indications	**Display**
Flammable vapor sensor lockout - FVS > 100 and < 300KΩ - the control immediately turns off all outputs (valves closed, ignition off). Control enters hard lockout and registers Flammable Vapor Present error code.	Seven Flash, three second pause 
Troubleshooting	**Solution**
1. Gasoline or other flammable gas was detected by the flammable vapor sensor.	1. Check for flammable vapors around water heater 2. Verify FVS sensor resistance ~ 9KΩ -45 KΩ 3. Replace FVS sensor if >45 KΩ 4. Hard lockout to be cleared when the power is manually cycled, the control dial is rotated through the HOT setting 7 times within 30 seconds and the resistance of the sensor is within the normal operation range.

Error 8-1

Indications	**Display**
FVS fault detected - FVS < 7 or > 300 KΩ - the control immediately turns off all outputs (valves closed, inducer off, ignition off) and enters Hardware Error Lockout and registers Flammable Vapor Device Interface/Miswiring error code.	Eight-One Flash, three second pause 
Troubleshooting	**Solution**
1. Flammable vapor sensor resistance is out of range (well below or well above parameters) 2. Wiring to FV sensor is faulty (open) 3. Gas control is faulty	1. Verify FVS sensor resistance ~ 9KΩ -45 KΩ 2. Replace sensor and wiring harness. 3. Replace control if new sensor does not work.

Reset Gas Control

This will clear the current fault and force the unit to recycle for ignition.

1. Turn temperature control knob all the way clockwise
2. Recycle power to the heater
3. Rotate the temp knob all the way to the left and then back to the right. You must cross the midline seven (7) times to reset the gas valve.
4. Unit should return to normal operations if all faults have been cleared and repaired. You will hear the fan motor come on.
5. Set water temperature to a safe setting of 120º or less.

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Error 8-2

Indications	**Display**
Thermal well fault - Temperature Sensors not reading the same temperature within ± 5.5 °F (measure when water temperature is changing less than 1 °F/minute) - the control immediately turns off all outputs (valves closed, inducer off, ignition off) and enters Hardware Fault Lockout. Hardware Fault Lockout self clears if the fault clears for at least 15 seconds.	 Eight-Two Flash, three second pause
Troubleshooting	**Solution**
1. Thermal well fault	1. Recycle power to verify error 2. Replace thermal well

Error 8-3

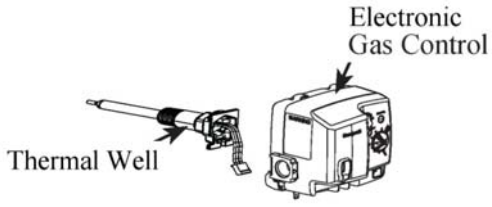
Indications	**Display**
Electronics fault detected - Gas control valve needs to be reset or has been damaged.	Eight-Three Flash, three second pause
Troubleshooting	**Solution**
1. Gas control fault	1. Recycle heater to verify error code 2. Replace gas control valve

Error 8-4

Indications	**Display**
Valve fault detected	Eight-Four Flash, three second pause
Troubleshooting	**Solution**
1. Gas control valve needs to be reset or has been damaged.	1. Recycle power to verify error 2. Replace gas control

Replacing the Gas Control Valve.

The electronic component for the gas valve is replaceable without draining the water from the tank. To replace just the electronic control portion:



1. Turn off the gas valve. Unplug the water heater.
2. Remove wiring harnesses from the gas valve.
3. Remove main burner supply tube and pilot supply tube.
4. Remove / disconnect gas supply line.
5. Grab the bottom of the gas valve (at the main burner supply tube area) and lift up and out at the same time. There are two small plastic locking tabs that will release.
6. The electronic component will slide up and off the thermal well still installed in the tank.
7. Replace the control in reverse order.
8. Reconnect fuel supply lines and tubes.
9. Reconnect wiring harnesses.
10. Recycle power to the water heater.
11. Set the water temperature not to exceed 120º F.
12. Check for safe water heater operations