http://waterheatertimer.org/How-to-troubleshoot-gas-water-heater.html#honeywell

TROUBLESHOOTING GUIDELINES

These guidelines should be utilized by a qualified service agent.

PROBLEM	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
BURNER FLAME TOO HIGH	1. Air inlets blocked 2. Insufficient secondary air 3. Orifice too large	1. Unblock inlet air openings 2. Provide ventilation to water heater 3. Replace with correct orifice
FLAME BURNS AT ORIFICE	1. Low gas pressure 2. Defective gas control valve/thermostat	1. Check with gas utility company 2. Replace gas control valve/thermostat
INSUFFICIENT HOT WATER	1. Low gas pressure 2. Orifice too small 3. Thermostat set too low 4. Gas control error codes 5. Sediment or lime in tank 6. Water heater too small 7. Wrong piping connections 8. Leaking faucets 9. Wasted hot water 10. Long runs of exposed piping 11. Hot-water piping in outside wall	1. Check with gas utility company 2. Replace with correct orifice (see rating plate) 3. Turn temperature knob to higher setting 4. Refer to gas control error codes 5. Drain/flush-provide water treatment if needed 6. Install adequate heater 7. Correct piping: dip tube must be in cold inlet 8. Repair faucets 9. Advise customer 10. Insulate piping 11. Insulate piping
WATER IS TOO HOT	1. Thermostat is too high 2. Defective gas control valve/thermostat	1. Turn temperature knob to lower setting 2. Replace the gas control valve/ thermostat
SLOW HOT WATER RECOVERY	1. Insufficient air/ flue blockage 2. Low gas pressure 3. Orifice too small 4. Thermostat set too low 5. Heater too small 6. Wrong piping connection 7. Wasted hot water 8. Flue clogged 9. Air inlets blocked	1. Provide ventilation to water heater. Check flue way, flue baffle and burner 2. Check with gas utility company 3. Replace with correct orifice (see rating plate) 4. Turn temperature knob to higher setting 5. Install adequate heater 6. Correct piping-dip tube must be in cold inlet 7. Advise customer 8. Clean flue, locate source and correct 9. Unblock inlet air openings
DRIP FROM RELIEF VALVE	1. Pressure build-up 2. Heater stacking 3. Closed water system 4. Improperly seated valve	1. Use a pressure-reducing valve and relief valve 2. Lower the thermostat setting 3. See thermal expansion section 4. Check Relief valve for proper operation (Do Not plug T&P valve)
GAS CONTROL VALVE/ THERMOSTAT FAILS TO SHUT OFF	1. Defective gas control valve/thermostat	1. Replace gas control valve/thermostat
SMELLY WATER	1. Sulfides in water supply 2. Bacteria in water supply 3. Incompatible anode	1. Chlorination procedure 2. Chlorination procedure 3. Replace with anode appropriate for water conditions

PROBLEM	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
CONDENSATION	1. Filling the new water heater for the first time 2. Moisture from the products of combustion 3. Water dripping from blower assembly 4. Undersized water heater	1. Normal operation: the condensation should disappear after heater warms up 2. Normal operation: the condensation should disappear in time 3. Install condensate hose to drain port on the rubber coupling 4. Install adequate heater
COMBUSTION ODORS	1. Air inlets blocked 2. Insufficient air 3. Flue clogged 4. Heater installed in a confined area 5. House too tight	1. Unblock inlet air openings 2. Provide fresh air ventilation to the water heater 3. Clean, locate source and correct 4. Provide fresh air ventilation to the water heater 5. Provide fresh air ventilation to the water heater
SMOKING AND CARBON FORMATION	1. Air inlets blocked 2. Insufficient air 3. Low gas pressure 4. Orifice too large 5. Flue clogged 6. Defective gas control valve/thermostat 7. Heater installed in a confined area	1. Unblock inlet air openings 2. Provide ventilation to water heater. Check flue way, flue baffle and burner 3. Check with gas utility company 4. Replace with correct orifice (see rating plate) 5. Clean, locate source and correct 6. Replace gas control valve/thermostat 7. Provide fresh air ventilation
UNABLE TO LIGHT THE BURNER	1. Air in gas line 2. Pressure switch 3. Blocked exhaust 4. Wire connection 5. Defective gas control valve/thermostat	1. Purge the air from gas line 2. Check the pressure switch, make sure the pressure switch hose is not kinked 3. Check vent pipe for blockage 4. Check wire connections 5. Replace the gas control valve/ thermostat
SIZZLING, RUMBLING NOISE	1. Scale and sediment 2. Condensation dripping on burner	1. Drain/flush-provide water treatment if needed 2. Refer to “Condensate” section
WATER LEAKAGE	1. Condensation 2. Dripping Temperature & Pressure Relief Valve 3. Drain valve dripping/leaking 4. Tank Leak	1. Refer to “Condensate” section 2. Refer to “Temperature & Pressure Relief Valve” section 3. Back flush to clean- out sediment, replace if necessary. 4. Check “Leakage Checkpoints”
BLOWER WILL NOT START	1. No power to unit 2. Thermostat set too low 3. Defective air pressure switch 4. Defective blower 5. Disconnected or loose wire 6. Control locked out	1. Plug in power cord, check fuses and/or supply voltage 2. Turn temperature knob to higher setting 3. Replace air pressure switch 4. Replace blower 5. Repair and reconnect wires 6. Refer to “Resetting The Heater Control” – determine cause of lockout

PROBLEM	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
BLOWER RUNS CONTINUOUSLY	1. Air pressure switch not closing due to insufficient draft – check for: a. Vent piping blocked b. Piping length too long c. Clogged/dirty blower 2. Disconnected, torn or blocked pressure switch hose from air pressure switch to blower housing 3. Defective pressure switch 4. High limit switch open due to excessive vent temperature or defective switch	1. Determine cause of insufficient draft. Check draft with manometer at pressure switch a. Remove blockage b. Reduce vent length/increase vent size c. Clean blower wheel 2. Reconnect or replace pressure switch hose 3. Replace defective pressure switch 4. Determine cause of overheating check for: overfiring, insufficient air supply, high ambient air temperature
HOT SURFACE IGNITER NOT GLOWING FOLLOWING WARM-UP PERIOD	1. 120VAC polarity reversed at 120VAC outlet receptacle 2. Defective hot surface igniter 3. Defective gas control valve/thermostat	1. Reverse polarity at 120VAC outlet receptacle 2. Replace igniter 3. Replace gas control valve/thermostat
VENT PIPE TOO HOT	1. Blower high limit switch fails to open - switch defective 2. Not enough dilution air to mix with flue gases 3. Air in room too hot for mixing with flue gases 4. Wrong burner orifice	1. Replace blower high limit switch Replace blower high limit switch 2. Proper air circulation must be provided for combustion and dilution of flue temp 3. Increase ventilation to lower room temperature 4. Install correct orifice.

RESETTING THE HEATER CONTROL

- Soft lockouts as diagnosed by the system error codes require the gas control to be reset.
- To reset the control, slide the “ON/OFF” switch to the “OFF” position. Wait for 10 seconds and move the switch back to the “ON” position.
- If the problem that caused the control to lock out has not been corrected, the control will remain or again go back into lockout.

LOCKOUTS

Soft Lockout

- occurs when a system safety device trips to break the sequence of operation. The control will retry the system in a timed basis but will not reinstate operation until the failure is corrected.

Hard Lockout

- occurs when the main controller fails and must be replaced.

The gas control valve\thermostat includes a temperature limiting ECO (Energy Cut Off) system that will shut off the water heater if the water temperature is too high.
Should the water temperature get too high, the diagnostic status light will indicate a code (4 flashes), indicating an over-temperature condition and the main burner will be shut off. If a high temperature condition occurs, turn the main gas supply OFF and have the water heater repaired by a qualified service technician. Contact your local dealer for service information.

Note: Should an over-temperature condition occur, restart the water heater and verify the LED flash sequence. If the 4 flash sequence is observed, slide the “ON/OFF” switch to the “OFF” position. Turn Main Gas Supply “OFF”. Replace the gas control valve\thermostat. See “Removing and Replacing the Gas Control Valve/Thermostat.”

IGNITION STATE AND TIMING

IGNITION STATE	TIMING
Pre-purge	5 seconds (NG models)
	15 seconds (LP models)
Hot Surface Igniter (HSI) Warmup	10 seconds
Ignition Activation Period (IAP)	3.5 seconds maximum
Flame Recognition Period (FRP)	0.5 second
Trial For Ignition	IAP + FRP
Flame Stabilization Period	Not Applicable
Inter-purge	30 seconds
Flame Failure Response Time	2 seconds max (@ 1uA flame current)
Post-purge	30 seconds
Pressure Switch (PS) Prove Period	2 minutes
Pressure Switch (PS) Fault Delay (failed open/closed)	2 minutes
Soft Lockout	20 minutes
Energy Cut Off (ECO) Limit Lockout	Indefinite
Flammable Vapor (FV) Sensor Lockout	Indefinite (see “Resetting The Heater Control”)

SYSTEM STATUS AND ERROR CODES

The micro-controller inside the gas control monitors the flammable vapor safety features, the ignition sequence, temperature settings and overall operation of the heater. If any of these parameters does not operate properly the controller will shut down the water heater, diagnose the failure and flash an error code. The table below lists the System Status Codes for the Honeywell control. Refer to it and to the “Trouble Shooting Guidelines” to diagnose the problem before attempting corrective action. See also “Flammable Vapor Sensor”.

LED Flash Sequence	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	Pressure Switch Failed Closed
Three Flash, three second pause	Pressure Switch Failed Open
Four Flash, three second pause	ECO (Energy Cut Off) Limit Lockout thermostat temperature limit was exceeded.
Five Flash, three second pause	Flame Out Of Sequence
Six-One Flash, three second pause	Soft Lockout - Retry Limit - Failed Trial For Ignition
Six-Two Flash, three second pause	Soft Lockout - Recycle Limit - Pressure Switch/ High Limit opened
Six-Three Flash, three second pause	Soft Lockout - Recycle Limit - Flame Lost
Six-Four Flash, three second pause	Soft Lockout - Flame out of Sequence Sensed
Seven Flash, three second pause	Flammable Vapor Sensor (FVS) Lockout
Eight-One Flash, three second pause	Flammable Vapor Sensor FVS Fault 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
Hardware Fault Lockout	Indefinite