



**75 & 98 Gallon ULN Sequence of Operations
 Commercial and Residential**

SEQUENCE OF OPERATIONS

All voltage inputs are 120V. All electrical connectors are Molex and fit one way. The word ‘control’ in this sequence will normally refer to the electronic control module on the gas valve. The control constantly monitors the water temperature via the thermistor so that the water temperature is within the user-selected temperature range. Control monitors the inputs for any fault conditions and presence of flammable vapors.

This is a sealed combustion water heater. It uses a hot surface igniter for main burner and uses one pressure switch in the blower as a proof of fan switch. The pressure switch has nothing to do with venting.

This water heater is a Category I Vented Appliance in accordance with the National Fuel Gas Code.

Tank is full of water.

 Gas supply is connected.

 Unit is plugged into a 3-prong plug.

Fill tank.
 Connect gas.

 Socket must be wired polarity correct with an earth ground. Black wire to brass screw; white wire to silver screw; green wire to ground.



Turn rocker switch on the blower to ON position.

 120V is passed to the control on the yellow wire at the at the gas valve Molex.

Rocker switch controls all power inputs to blower motor and control module.

 At power ON and a demand for heat, the control performs a self-test diagnostic routine. If the self-check fails, the control locks out with light indications on the control.





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“Wake Up” the control by pressing the red and blue arrow keys. Set the water temperature not to exceed 120°F.

Temperature is sensed electronically by the *Thermistor* in the sensing bulb.



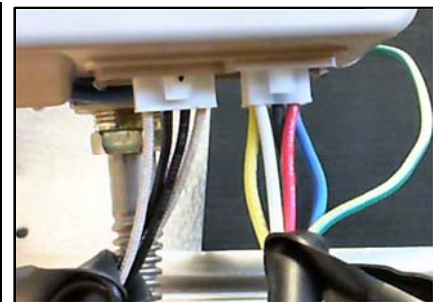
Call for Heat –
 Control checks for an OPEN pressure switch.
 You will have 120V at the blue wire going to the pressure switch.

In normal operation, the pressure switch is OPEN at the start of call for heat.
 Once the control verifies the pressure switch is OPEN, it will continue with starting the blower.



120V power is passed from the control – to the black wire – and to the blower motor.

This black wire is the only source of AC power for the blower motor.
 You will hear the blower running.





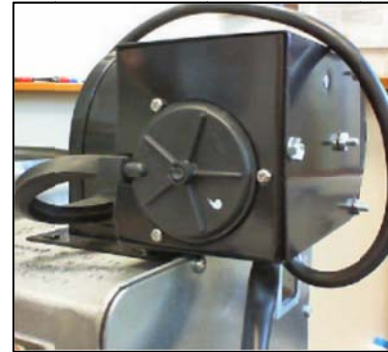
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With the blower running, the pressure switch will close.

The control logic prevents jumping this pressure switch for main burner.

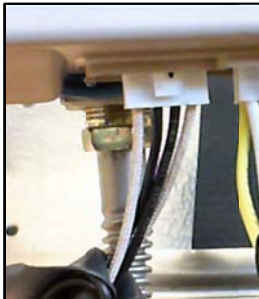
You will have 120V at the red wire from the pressure switch to the gas valve.

Pressure switch:
Breaks on pressure fall;
-.28 ± .03 in w.c.



Ignition attempt.

You will have @ 120V at hot surface igniter wiring harness.



Visually verify the hot surface is glowing inside the combustion chamber by looking thru the sight glass window.

After 20 seconds warm up time, the gas valve opens.



With the blower running, make up air is forced in the plenum chamber.

It mixes with the fuel and is blown down the burner tubes for ignition.

Gas valve solenoids open allowing fuel to flow down the main burner supply tube and in to the plenum box.

Visually verify main burner flame is present.





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Flame is rectified.

 There is always a flame rectification circuit check while the main burner is operating.

After flame has been recognized (rectified), the hot surface igniter will turn off.

 IF the main burner fails during heating, the unit will recycle and attempt ignition.



Water heats to thermostat setting.

 Flammable Vapor (FV) sensor is monitoring.

ECO is monitoring water temperature. Trips at 195°F.

 FV Sensor is monitoring local environment for presence of flammable vapors.



Water is heated.

 Control module shuts off all power to the gas valve.

 Unit is in stand-by mode.

In stand-by mode, the control module constantly monitors the water temperature via the thermistor to ensure the water inside the tank is within the user-selected range.

 Unit monitors control health, other fault conditions and the local environment for flammable vapors.



Don't forget to clean the inlet air screen on the blower. If it becomes clogged, you will get a pressure switch error code.