



**Hybrid Heat Pump Water Heater (Generation 2.4)
 Sequence of Operations**

SEQUENCE OF OPERATIONS

Primary voltage input is 240V from the circuit breaker to the control board. All electrical connectors are Molex and fit one way. The word ‘control’ in this sequence will refer to the electronic control module. 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 ambient air, suction, discharge and evaporator temperatures via thermistors on the heat pump components. This sequence assumes a properly installed Hybrid water heater.

Energy Save Mode (factory set) and High Demand Mode

<p>Tank thermistors send temperature readings to the control.</p>	<p>The upper and lower tank thermistors are used to get a good reading on the internal stored water temperature.</p>	
<p>Control demands heat.</p>		
<p>Delay timer on heat pump begins.</p>	<p>300 second (5 minute) anti short cycle delay timer to prevent cycling compressor.</p>	
<p>Compressor turns on.</p>	<p>Listen for sounds like a refrigerator in your kitchen.</p>	
<p>Fan speed is set to LOW.</p>	<p>Control decides if fan speed is set to high based on suction temp <47°F.</p>	
<p>Heat pump heats water in tank until bottom thermistor senses low water temperature.</p>	<p>Control, thru its software, is analyzing hot water demand rate by sampling tank thermistors. If lower tank thermistor drops low enough (@70°F), control brings on additional water heating effort by energizing elements.</p>	



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Control brings on Lower Element and / or Upper Element until demand stops and tank is recovered.

Thru control software, control decides to use the lower of upper heating elements to maximize 'shower' performance time.



When using the High Demand Mode, the electric heating elements are energized sooner in the process.

This results in less energy efficiency, but much more available hot water during use.

Heat Pump Only Mode

The heat pump only mode uses the same sequence of operations as Energy Save above with one exception.

The heating elements are never used. This results in a better energy factor, but takes a little longer to heat the contents of the 50 gallon tank.



Electric Heat Only Mode

In electric heat only, the water heater works as a double element, non-simultaneous residential electric water heater.

This is the default cycle in the event of any compressor fault. IF this cycle is selected by the user, it will make an attempt to return to Energy Saver Mode after 14 days.



Vacation Mode

This user selectable mode keeps the water warm between 72°F and 85°F.

User may select between 2 and 28 days; or a HOLD setting for indefinite.





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