High Efficiency Integrated Heat Pump Water Heater

*With Hydrastone Lining*

**FEATURES**

**Heavy Duty Construction**
- Heat Pump transfers heat from surrounding air into the hot water tank
- Industry leading efficiency
- Insulated with 3” thick CFC free polyurethane foam insulation to minimize stand-by heat loss

**Long Life**
- Hydrastone cement lining ensures long tank life
- Proven heat pump technology
- Incoloy sheathed back-up electric elements resist corrosion and mineral build up

**Simple Operation**
- Fully integrated water heater easily replaces a standard electric water heater
- User friendly electronic controller simplifies operation, maintenance, and troubleshooting
- Low maintenance design
- Designed for simple installation and service by a professional plumber

**High Performance and High Efficiency**

The American made Vaughn Heat Pump Water Heater combines the proven longevity of Hydrastone lining and steel construction with the latest in heat pump technology. The result is the most reliable and energy efficient water heater on the market. With three inches of high quality, CFC-free foam insulation, the Vaughn Heat Pump Water Heater has the lowest standby heat-loss rating in the industry. A streamlined user interface on the controller ensures ease of use and is highly versatile, including a customizable temperature differential, temporary mode overrides and child lock protection. A high level of efficiency ensures a fast payback period, and the long life of the Vaughn stone lined tank ensures additional long term savings. Suitable for even the coldest of climates, the Vaughn Heat Pump Water Heater offers a low-maintenance, affordable way to bring green technologies to your home.

**Built With You In Mind**

High Efficiency • Superior Performance • Long Service Life
How The Vaughn Heat Pump Works

The Vaughn Heat Pump Water Heater uses a small amount of electricity to transfer heat to the water from the surrounding air. In comparison, traditional electric water heaters use resistive heating elements to directly heat the water. The Vaughn Heat Pump Water Heater is significantly more energy efficient when compared to a conventional electric water heater because the heat pump utilizes considerably less electricity than a standard electric unit. In essence, a heat pump works like a refrigerator in reverse. A refrigerator moves heat from inside the refrigerator (making things cold) and transfers that heat energy to the surrounding room, whereas a heat pump water heater captures free and essentially unlimited heat from the ambient air and transfers that heat to the water stored in the tank. The Vaughn Heat Pump Water Heater can capture heat from air as cool as 40°F. If the unit cannot provide enough heating capacity to meet demand, the back-up resistive heating elements will activate to ensure the unit provides sufficient hot water. The process of removing heat from the air and transferring it to the water results in the exhaust of cooler dryer air. This added benefit of dehumidifying the surrounding air can provide as much as 0.4 gallons per hour of “free” dehumidification provided by the heat pump when the unit is heating water.

Heat Pump Functions

1. The built in fan draws air from the room into the water heater heat pump compartment, across an evaporator coil, and exhausts cooler and slightly dryer (dehumidified) air.

2. The evaporator coil captures heat energy in the air and transfers that energy to a specially formulated, CFC free refrigerant contained within the evaporator.

3. The refrigerant changes from a liquid to a gas as it gets warmer.

4. The refrigerant, now as a warm gas, exits the evaporator and passes into a compressor.

5. The warm gas is compressed, causing it to become a superheated hot gas and then flows to the heat pump’s exchanger.

6. The heat exchanger transfers heat energy from the superheated hot gas to the cold water from the tank.

7. The pump circulates cold water from the tank through the heat exchanger in the upper unit, resulting in a continuous transfer of heat energy from the superheated gas to the water.

8. Hot water exits the heat exchanger and is stored in the tank.

9. The superheated gas condenses back to a liquid and awaits to repeat the process.

Heat Pump Operational Diagram
Energy Consumption Chart

### Ambient Temperature and Energy Factor (EF) Chart

<table>
<thead>
<tr>
<th>Ambient Air Temp</th>
<th>Energy Factor (EF)</th>
<th>Coefficient of Performance (COP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50°F</td>
<td>1.5</td>
<td>1.6</td>
</tr>
<tr>
<td>70°F</td>
<td>2.5</td>
<td>2.6</td>
</tr>
<tr>
<td>90°F</td>
<td>3.3</td>
<td>3.4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Energy</th>
<th>Operating Cost $</th>
<th>Operating Cost $</th>
<th>Operating Cost $</th>
<th>Operating Cost $</th>
</tr>
</thead>
<tbody>
<tr>
<td>kW-Hrs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Economy</td>
<td>2950</td>
<td>$314</td>
<td>2950</td>
<td>$314</td>
</tr>
<tr>
<td>Hybrid</td>
<td>1759</td>
<td>$187</td>
<td>1759</td>
<td>$187</td>
</tr>
<tr>
<td>Electric</td>
<td>1350</td>
<td>$144</td>
<td>1350</td>
<td>$144</td>
</tr>
</tbody>
</table>

**Note:** Energy Factor and Average Annual Operating Costs based on 2007 D.O.E. (Department of Energy) test procedures. D.O.E. national average fuel rate electricity 10.65c/KWH. Energy Factor (EF) based upon heater operating in Hybrid mode.

### Dimensional Data

<table>
<thead>
<tr>
<th>Storage Capacity (Gallons)</th>
<th>Base Model Number</th>
<th>Dimensions (Inches)</th>
<th>Shipping Weight (lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>S40WHPT3838I</td>
<td>Overall Diameter: 28</td>
<td>Overall Height: 49</td>
</tr>
<tr>
<td>50</td>
<td>S50WHPT3838I</td>
<td>25</td>
<td>66</td>
</tr>
<tr>
<td>65</td>
<td>S60WHPT3838I</td>
<td>28</td>
<td>63</td>
</tr>
<tr>
<td>80</td>
<td>S80WHPT3838I</td>
<td>28</td>
<td>73.5</td>
</tr>
<tr>
<td>119</td>
<td>S120WHPT3838I</td>
<td>30</td>
<td>84</td>
</tr>
</tbody>
</table>

These units are designed to meet or exceed ANSI (American National Standards Institute) requirements and have been tested according to D.O.E. test procedures and meet or exceed the energy efficiency requirements of NAECA, ASHRAE standard 90, ICC Code and all state energy efficiency performance criteria for energy consuming appliances.

### Outline Dimensions

**TOP VIEW**
- Condensate Connection
- Hot Water Outlet
- Cold Water Inlet and Drain
- T&P Relief Valve

**FRONT VIEW**
- Condensate Connection
- Hot Water Outlet
- Hi-Limit Thermostat
- T&P Relief Valve
- Electrical Controller
- Electrical Junction Box
- Tank Cross Section
- Hydrastone
- Cement Lining
- Steel Pressure Vessel

**Clearance Notes**
- 6° Clearance
- 18° Clearance
- 2° Clearance
- Air Flow

**Legend**
- Front
- Rear
- Condensate Connection
- T&P Relief Valve
- Electronic Controller
- Electrical Junction Box
- Thermistor Sensor
- Upper Heating Element
- Lower Heating Element
- Steel Pressure Vessel
- Cement Lining
About Vaughn

Headquartered in Massachusetts since 1961, Vaughn Thermal Corporation is the leading manufacturer of cement lined water heaters. The company produces electric, hybrid, indirect and solar water heaters for residential and commercial applications. Vaughn also designs and manufactures digital energy controllers and electronic devices used by electric utilities for load controlling water heaters.

Vaughn Product Line

- Residential Electric Water Heaters
- Residential Hybrid Heat Pump Water Heaters
- Commercial Electric Water Heaters
- Indirect Water Heaters
- Solar Water Heaters
- Range Boilers
- Storage Tanks / Aqua Boosters
- Off Peak Timers
- Digital Energy Controllers
- Electronic Controls

Committed to continuous improvement...
Continuing research results in product improvement; therefore specifications are subject to change without notice. For the most updated information, consult factory directly.

For more information, please visit us on the web at: www.vaughncorp.com

Selectable Operating Modes

- **Economy**
  This mode controls the heater such that the heat pump provides essentially all of the heating capacity. This is typically the mode with the lowest operating cost mode.

- **Hybrid**
  This mode controls the heater in a way that optimizes both efficiency and user experience, it is the default setting. This mode operates the water heater such that the heat pump provides the vast majority of heating capacity and automatically switches to electric resistance heater mode only when necessary to meet high demand or to optimize efficiency.

- **Electric**
  This mode controls the heater such that it only operates using the electric resistance elements and operates as a traditional electric water heater. The heat pump is not used in this mode.

- **Super**
  This mode allows both the heat pump and the electric resistance elements to operate simultaneously. Due to this simultaneous operation, Super mode provides the fastest recovery option possible.

- **Vacation**
  This mode prevents the heater from heating (regardless of what mode it is in) as a way to improve efficiency during long periods of no usage (i.e. vacation). In this mode the only time the heater will operate is if the unit is in danger of freezing. The user sets the number of days to be in vacation mode (adjustable from 2 to 99 days or Off), and the unit resumes its previous mode of operation at the end of this period.

Temporary Modes

- **Max Heat**
  By using the Max Heat button, you will maximize the heating capacity by temporarily putting the heater into Super mode.

- **Fan Off**
  By using the Fan Off button, you will temporarily lower the fan speed which reduces the airflow and minimizes operating noise. Pressing the button twice temporarily disables the fan for a programmable amount of time.

Installation Requirements

- Installed location must have minimum dimension of 10’ x 10’ x 7’ room (700 cubic feet of air space). If smaller, there must be louver installed to provide sufficient airflow.

- Room where unit is installed must not be cooler than 40°F.

- Installed locations with warmer ambient air temperature (i.e. furnace room) provides abundant “free” heat and are advantageous.

- The heat pump dehumidifies the air and as a result produces condensate which must be piped to a drain.

- The washable air filter requires periodic cleaning. Frequency of cleaning will depend upon environmental conditions.