**HEAT PUMP WATER HEATER AND RECOMMENDATIONS**

**[Current -50-gal-equiv-water-heaters.jpg](https://climate.smiller.org/REF/HPWaterHeaters/current-50gal-equiv-water-heaters.jpg)**

 Side-by side comparisons: purchase price, efficiencies, operating cost of electric tank; electric tankless; gas tank, gas tankless, and electric heat pump

[**Current -50-gal-equiv-water-heaters-GHG-emissions.jpg**](https://climate.smiller.org/REF/HPWaterHeaters/fitting.jpg)

 Side-by-side comparisons: tons of CO2 (equiv) emissions per year

[**Latest-hp-water-heaters.jpg**](https://climate.smiller.org/REF/HPWaterHeaters/latest-hp-water-heaters.jpg) (AO Smith Voltex AL; Rheem Proterra Plub-in; Rheem Proterra Plug IN w/hydroboost)

I HAVE RECENT EXPERIENCE WITH HEAT PUMP VERSIONS OF RHEEM 60 GALLON AND AOSMITH 50 GALLON.

ADVANTAGES OF AO Smith Voltext AL (current model HPS10-50H45DV200 ):

* duplicate side and top hot/cold water connections
* Side connections are typical electric water heaters
* Top connections are typical gas water heaters (easier to connect to existing house pipes)
* 45 dBA is VERY low sound emissions from the heat pump

Rheem Proterra Plug-In –

* requires a DEDICATED 15 amp circuit

Rheem Proterra Plug In w/”Hydroboost”-

* share a 15 amp (share an electrical circuit and outlets)
* This is a VERY new breed- good for older houses with lower amp panels and wiring difficult to upgrade. Competitors likely to quickly follow.
* Appears to store water at HIGHER stored internal temp: then mixes with cold water to lower hot water to 120 degrees.
Allows a smaller tank to have same immediate water capacity as a larger sized tank
* Check for reviews before buying

[**Required-size-of-room.pdf**](https://climate.smiller.org/REF/HPWaterHeaters/required-size-of-room.pdf)  Ventilation requirements of various sized rooms

* >700 cubic foot room: no ventilation required
* <700 cubic foot room: need louvered door

[**Rheem-performance-platinum.pdf**](https://climate.smiller.org/REF/HPWaterHeaters/rheem-performance-platinum.pdf) specifications and dimensions of available models

 1st page: highlights; 2nd page: specs- including dimensions of Rheem heat pump water heaters

 These comments based upon experience with 65 gallon model XE65T10H45UO $2163 (10/2022) from Home Depot (not in stock- ordered on-line)

NOTES: Include a drain pan installed under the hot water tank. (All tanks eventually leak; all my tank leaks have been slow drips) For insurance, run a pan drain line - add a small diameter drain hose to outdoors An optional version of Rheem and AO Smith heat pump water tanks have a built-in leak detector**-** it will send your cell phone an alert if it detects water in the pan.

The heat pump behaves like a dehumidifier, so a drain is required for heat pump water heater condensate . Condensate drains from ~5 feet high (bottom of the heat pump, which is mounted on top of the tank). Run a pipe to any convenient drain.

**REBATES**: $750 rebate from JCP&L. <https://residential.energysavenj.com/jersey-central/products/>; $1000 rebate from PSEG

**TAX CREDITS: (effective now)**

+ IRA 30% Tax credit heat pump water heater under section 25C

See <https://www.rewiringamerica.org/app/ira-calculator/information/heat-pump-water-heater>

+ IRA 30% TAX Credit for electrical panel update (credit capped at $600)

Your personal IRA calculator is at: <https://www.rewiringamerica.org/app/ira-calculator>

**IRA REBATES** (Available in late 2023 into 2024, whenever NJ distribution plans are approved by Feds. LMI families will receive HIGH rebates. Higher income families receive limited or NO rebates. Use above “IRA-Calculator” to determine your family rebates.

**ELECTRICAL PANEL/HOUSE PANEL RECOMMENDATIONS**: Plan the electrical panel capacity needed in the next 10 years, after full electrification of your house using IRA benefits. You will likely have a heat pump furnace (my A/C replacement furnace heat pump draws about 8 amps at 240 volts, but requires a 30 amp breaker). A heat pump clothes dryer uses maybe 1/3 the electric usage of an electric clothes dryer; an induction stove; one or two EVs. There are now many add-on solutions that allow sharing of circuits, for older houses that are difficult to upgrade the amperage from pole to the house.

**WHAT I DID**: My existing 200 amp panel was completely filled with 15 and 20 amp breakers. My electrician installed an overflow 125 amp (max) panel slaved from a new 100amp breaker inserted into my existing 200 amp panel. The new panel is mostly dedicated to 240 volt appliances (current heat pump water heater; current heat pump pool heater, current heat pump furnaces; heat pump clothes dryer, future induction stove, and future 240 volt plug-in EV chargers (Tesla 240 volt chargers have a 32 amp load (provided by 40 or 50 amp circuit)

**MY EXPERIENCE WITH RHEEM AND AO SMITH HEAT PUMP WATER HEATERS**

**RECENT EXPERIENCE** with Rheem 65 gallon and AOSmith 50 gallon heat pump water heaters installed professionally in two different houses. Both require a 30 amp 240 circuit. Designs are very similar. Both have a display panel, and have Wifi-connected App to cell phone for control and display of any errors.

**AO SMITH EXPERIENCE** AOSmith tank was DOA upon inst, Oct, 2023. Factory support said the symptoms indicated the tank (in its shipping box) was likely on its side for part of the shipment (contrary to written directions on outside of box). This caused the freon to “pool”. The tank had to be returned for factory repair. A 2nd identical tank was shipped and installed 2 days later. It worked well for a few days. However, the tank began reporting repeated failure of controller components every 4 or 5 days, (reset by turning off beaker), and also reported a thermistor error. The factory shipped replacements. I installed the parts- -design is modular (2 hours of my time), and the tank has since worked perfectly for last 2 months. The low noise level (45 dbA) is suitable for installation in a small furnace room off a hallway in a single story house. Existing louvered doors provide sufficient ventilation.

RHEEM EXPERIENCE: tank installed Nov, 2022 in my unheated basement (lowest temp is ~54 degrees). Initially installed without ducting, and it worked fine.  The little basement alcove was definitely colder (maybe 10 degrees) when the heat pump operated (but quickly warmed to basement temps when the heat pump was not working). Later, I decided to improve the efficiency a little by ducting the cold exhaust air into the open basement.  [Photo shows](https://climate.smiller.org/REF/HPWaterHeaters/20230206_085305.jpg) the 90 degree elbow, and the flexible ducting.  The steady-state temperature change, within a larger area of unfinished unheated basement,  is not noticeable (maybe  1 or 2 degrees ?) It has worked great with no problems .It has little or no cooling effect in a large area.  (The water heater is operating only a small portion of the day).  In the summer, the heat pump water heater is like a small air conditioner that intermittently cools and dehumidifies the air.

Instructions for locating heat pump water heater in a small area/laundry room: orient the water tank so the heater exhaust (the side vent) should be close to door louvers  (a couple of feet?) and preferably aimed directly at the louvers in the entrance door.  An adapter for Rheem tanks (~$130 from a supply house) and an adjustable 8 inch (diameter)  elbow (plus short length of flex duct) will direct the exhaust air in any direction. See photo of adapter, elbow, and flex duct.  My hot water tank is in a small alcove in my basement and condensation drains into a utility sink.

HVAC contractors, during webinars, have said customers have not noticed any larger area cooling effect from the heat pump in the laundry room. Addition of exhaust ducting to the outdoors (or into garage) is unlikely to make a noticeable difference in house temperature, but DOES create a net loss of conditioned air.  To replace that air volume (maybe a few cubic feet per second?), you would need an intake opening or duct for an equal air flow into the house; that incoming air then requires energy to be heated or cooled and dehumidified, (depending on season).

My biggest concern is noise level. Location of the Rheem heat pump water heater in a basement is unlikely to be a noise concern. Location in a laundry room depends upon location of the laundry room relative to livings/sleeping quarters.  My Rheem heat pump noise emission is both a steady-state low-frequency drone, plus a higher frequency “whine”. (I estimate the Rheem total sound intensity is somewhat less than a clothes washer on spin portion of the wash cycle).

If noise is an issue because the heat pump location is near living or bedroom areas, then I recommend the AO Smith Voltex AL (noise level is 45dBA , which is quite low- about the noise of the flames of a gas burning furnace and/or the associated room air blower.).  It is likely the same vent issues would apply equally to AO Smith and Rheem heat pump water heaters.

CREDITS: WATER HEATER PHOTOS are from 2023-1-18 “Tankless Gas Water Heaters The Infamous Methane Puff” by ElectrifyNow slides [**here**](https://clicks.eventbrite.com/f/a/NBWwV0AWDRM4Y0NTUvBYQA~~/AAQxAQA~/RgRlqpS4P0RUaHR0cHM6Ly9kcml2ZS5nb29nbGUuY29tL2RyaXZlL2ZvbGRlcnMvMU9nQkpVOWpNTncwOHkzbTA0dEtINUpxWlMzWnVQX0pMP3VzcD1zaGFyaW5nVwNzcGNCCmPJOGHJY1CacnhSF3N0ZXZlbWlsbGVyQGNvbWNhc3QubmV0WAQAAAAA); recording [**here**](https://clicks.eventbrite.com/f/a/5M34RFzXOpfD2xbByobLDg~~/AAQxAQA~/RgRlqpS4P0QcaHR0cHM6Ly95b3V0dS5iZS9tRkZNQ0NjMzN4b1cDc3BjQgpjyThhyWNQmnJ4UhdzdGV2ZW1pbGxlckBjb21jYXN0Lm5ldFgEAAAAAA~~)**.**