



BDC Presents: A.O. Smith's Voltex 120V Heat Pump Water Heater

April 25, 2024

Summary:

Join us for a conversation with America's largest water heating manufacturer, A. O. Smith, as they introduce their plug-in ready Voltex® 120V heat pump water heater. The retro-fit ready model can save homeowners up to 35% on energy bills compared to its gas counterparts and requires no electrical panel upgrades.

Resources:

- [Recording](#)
- [BDC newsletter sign up](#)

Events

- [California Policy Call](#): May 21st, 10am PT / 1pm ET
- [National Policy Call: Minnesota](#): May 14th, 10am PT / 12pm CT
- [BDC Presents: NODE Collective](#): May 30th, 10am PT/ 1pm ET

Summary

What is a Hybrid Heat Pump Water Heater

- A hybrid heat pump water heater is made up of a heat pump and standard backup heating elements.
 - Up to four times more efficient compared to any electric or gas heating technology leading to significantly less electricity usage and significant utility bill savings
- How does it work?
 - A hybrid heat pump water heater operates similarly to a refrigerator or air conditioner by using a refrigerant to transfer heat from one place to another. ([See slide 13](#))

Why Choose a Heat Pump Water Heater?

- Three main reasons to choose a Heat Pump Water Heater today
 - Save on utility bills
 - Customers see savings compared to standard electric (up to \$600 per year) and standard gas (\$100 or more per year and avoids on-site GHG emissions)
 - Currently a wide array of incentives
 - Ability to stack existing federal, state, and local incentives
 - Federal tax credit: 30% of total installed cost including labor up to \$2k
 - State/local incentives: \$300-\$3,000 and more depending on the program
 - Find rebates available to you on [A.O Smith Rebate Center](#) or the [Switch is On](#) in California
 - Are compliant with the evolving regulatory landscape
 - Federal requirements: by 2029 NAECA 4 to require heat pump efficiency

- State and regional requirements: all-electric or high-efficiency building codes, making heat pump water heaters the preferred choice
- Installation Considerations
 - A.O. Smith heat pumps will generally be taller than gas water heaters
 - The room size for proper heat pump operation or ventilation options ([see slide 30](#))
 - Heat pump water heaters will produce condensate and will require a drain and potentially a condensate pump

Voltex Family Overview

- The three most recent heat pump water heaters (Voltex AL (240V), Voltex MAX (240V), and Voltex 120V) have many distinct features (for all features [see slides 18-21](#))
 - All meet Energy Star standards, are quiet, and have a wide operating range (37°F to 120°F)
 - First of A.O. Smith products to include leak detection and anti-leak capabilities
 - Designed to replace water heaters by having the water connection straight out of the top
 - All connections were moved to either the front or top of the unit so no clearance on the sides or back is needed
 - Only requires 450 ft³ compared to 700 ft³ requirement from other manufacturers

Voltex 120V and its features

- When selecting, the primary difference between 240V and 120V is what kind of water heater was in the home previously
 - If electric, 240V could be used and if gas water heater, 120V addresses the issue of not having a dedicated circuit available
 - For 120V, upsizing the heat pump compared to the gas water heater is critical because they tend to take longer to heat water, and having a larger heat pump will offset the lag in heating with additional hot water storage
- Key benefits of 120V
 - Adaptable
 - 120V plugs into standard 120V outlet on a 15A or larger shared circuit
 - Can integrate local utility time of use rate plan information to prioritize heating when electricity is cheaper
 - An integrated digitally controlled smart valve that allows customers to select the desired temperature to offset the slower recovery for a 120V
 - Reliability
 - Includes backup elements if the heat pump cannot run such as in cold ambient temperatures
 - Automatic water shut-off valve, to limit how much water leaks out and for the customer to figure out the problem
 - Reduced carbon footprint
 - Uses R-513A, which has a 56% lower global warming potential than standard refrigerant used in other heat pump water heaters

Q & A

1. What is a condensate pump?

- It's a small water pump. Traditionally on a heat pump water heater, we're relying on gravity to drain the water out of the heat pump and into a drain, and a pump just lets you go vertically. However, if your water heater is in the basement to get it to the first floor, you need a pump to access a drain.

2. How does this water heat work in a smaller space (450 ft³ compared to 700 ft³)?

- I think there's probably some improvement here, but the real thing was doing more analysis and understanding how much space a heat pump water heater actually requires, how much heat they actually extract from an area, and proving out what the limit is. So NEEA (Northwest Energy Efficiency Alliance) has been a driving factor for heat pump water heaters over the years. They conducted a shrinking room study where they had a heat pump water heater in a room with walls that could be moved to shrink the space and tracked the performance of the heat pump compared to the space it was in. A.O. Smith looked at this study and recognized that the space needed was smaller than 700.

3. 45 decibel specification is great. **There's just a question about real-world applications, are you doing testing of installs to see how it's performing against the spec?**

- We have been testing it to see, but right now, the test procedure set by NEEA for a water heater has been fairly basic. We are considering outside of decibels, do we need to analyze tonal or what it sounds like? This is where individual preference also comes into play, and A.O. Smith has sound juries to better understand what people are looking for.

4. **Are you generally finding that the products are able to attain the 45 decibel limit on installation?**

- A lot of it comes down to how it's installed. It's very variable, but depending on how far you are from the walls you are will impact if the 45 decibels is achieved.

5. **What is the global warming potential (GWP) of the refrigerant R513A, and then could you talk about just the necessity of adequate disposal, and could we get to a point where that's, we could consider a global warming potential of zero, if it's discarded properly?**

- Based on the IPCC's fourth assessment the GWP of 513A is 630 vs 1430 for 134A (the refrigerant used in most heat pumps). This is an 800 GWP decrease and it stays within the non-flammable, non-toxic category of refrigerants which is beneficial for us and to anyone who might service it.
- There's not a lot of refrigerant in there, but, proper recovery of the refrigerant at the product's end of life is required. A.O Smith is working with the EPA's responsible appliance disposal (RAD) program to try to make sure that we've got programs in place around the country to help make that kind of end-of-life easier. But then beyond that, with the upcoming changes in HVAC and ultimately some point requirements on the heat pumps to move to lower -GWP refrigerants, I think we're going to see more contractors in the field comfortable with doing their own refrigerant recovery.

6. You mentioned there are situations where in small spaces you may need to vent the heat pump water heater. **In cases where you have really dirty air quality, whether that be pollution or dust, is there ever a need to filter the air going into the heat pump water heater?**

- I don't want to say never, but we do include an inlet filter (a mesh screen filter on the inlet side of our heat pumps), and beyond that, the water heater will generate an error code if it senses that the inlet is obstructed. I don't know of any sort of filtration required specifically for the water heater, but you may want that for your interior space regardless.
- 7. How would A.O. Smith advise customers on the use of heat pump water heaters and recirculating pumps?**
- This is a challenge that remains to be addressed fully. Our guidance today is to use on-demand style recirculation systems outlined within California Title 24. We are looking at other solutions and are working on finding a solution that would combine the comfort and convenience of hot water recirculation without impacting the efficiency of the heat pump water heater.
- 8. Can you talk a bit about the nationwide availability? Where are A.O. Smith products sold generally?**
- We go to business both through plumbing wholesale and retail markets. Our products are stocked at Lowes, but you should also be able to special order anything including the 120 volts. A lot of stocking use depends on how strong the incentives are locally because that ultimately generates most of the customer demand.
- 9. You mentioned a couple of times about the growing interest in heat pumps and heat pump water heaters being the talk of the town in the space. How quickly will we see adoption in your mind with what you're seeing with all the incentives and excitement? Are there regional hot spots that A.O. Smith is particularly focused on?**
- Maine is the preeminent one in terms of completely transforming their market by executing an incentive program so effectively. The Northwest (Oregon and Washington) long-term driver for heat pumps is another strong market. California is another place where in two years we've seen a lot of growth. With all of these examples, I think it's shown it can be done fairly easily and quickly. The only frontier where we need some development is the equity piece of it.