

Gas Heat Pump Water Heater Installation

Considerations for Installation



Table of Contents

Introduction	2
Product Benefits & Features	2
The Anatomy of a Gas Heat Pump Water Heater	3
Before You Begin	4
Considerations for Installation	4
Garages, Basements, and Utility Closets are Ideal Locations for GHPWHs	4
Ensure the Tank Size Can Meet the Needs of the Occupants	4
Position the Unit for Easy Access	4
Avoid Blowing Cool Exhaust Air in Frequently Occupied Rooms	5
Be Aware of Extra Noise from GHPWH	5
Properly Drain Away Condensate with PVC or Stainless-Steel Pipes and Vents	5
Use an Insulation Pad to Reduce Unnecessary Heat Loss	5
Install a Drain Pan To Minimize Potential Water Damage	5
No Stand Needed	5
Reuse Existing Vent Piping and Temperature/Pressure-Relief (TPR) Drainpipe	5
Insulate All Hot Water Pipes	6
Heated Water Circulation (Temperature Maintenance)	6
Test for Gas Line Leaks Using a Soapy Water Solution	6
Install a Carbon Monoxide Detector	6
Regularly Service the Water Heater After Installation	6
GHPWH Customer Benefits	6

Introduction

Quality service and installation of household appliances can generate word-of-mouth referrals, increase sales, and improve customer satisfaction. Conversely, a bad installation or poor customer experience can hurt contractors' business momentum. To make sure your customers get the most from their gas heat pump water heater (GHPWH) system, this guide details install considerations and homeowner education.

Installing a GHPWH is similar to installing a standard gas tank-type water heater, although there are some important considerations, including: condensate management, proper sizing, and selecting the best installation location to enhance performance and customer satisfaction. These topics are outlined in this guide.

This guide **does not** replace the manufacturer's specifications or installation guidelines. Always follow the manufacturer's installation instructions and building code requirements.



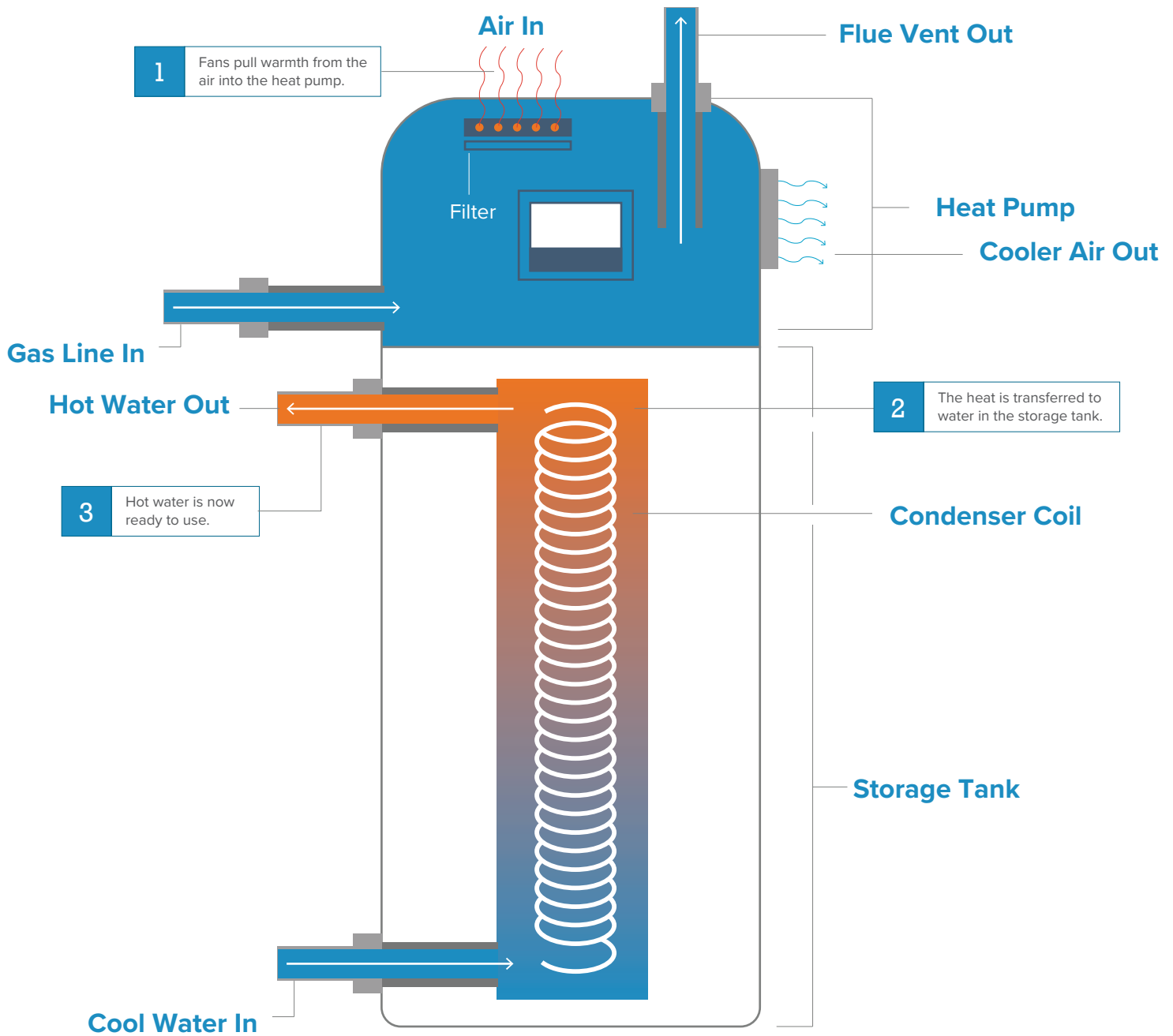
Product Benefits & Features

- **Energy and Cost Savings.** GHPWHs offer **up to 50% energy savings** over conventional gas storage water heating equipment, which yields an average energy savings up to **100 therms per unit annually**. By installing a GHPWH, customers can save up to 50% on their water heater energy costs.
- **Cold Climates.** Because cold ambient temperatures only minimally impact the performance of gas-fired heat pumps, a GHPWH is a highly efficient solution in cold climates.
- **Greenhouse Gas (GHG) Reductions.** GHGs trap heat in the atmosphere and typically include carbon dioxide (CO₂), methane and nitrous oxide. GHPWHs have an average CO₂ emissions reduction of about 50% over conventional gas storage water heating equipment.
- **Like-For-Like Replacement.** GHPWHs can be installed almost anywhere a gas storage water heater is currently installed.

The Anatomy of a Gas Heat Pump Water Heater

GHPWHs extract heat from the surrounding air and transfer it to the water inside the tank. By harnessing heat in the air GHPWHs can significantly reduce the amount of heat the unit must create to warm the water inside the tank. This process generally goes as follows:

1. Fans pull warmth out of the air in the room into the heat pump.
2. Heat from the air and a gas burner is transferred to the water storage tank.
3. Hot water is ready to use.



Before You Begin

- Review the existing water heater location and configuration with your customers. Consider the number of occupants, usage rates, install location, and climate when replacing an existing water heater in the home.
- Determine the proper size for the new GHPWH by understanding if it will serve the entire home or a specific area.
- Review any available utility rebates and tax credits. Consult the NAGHP Collaborative website for up-to-date information or consult your local utility's program offerings by visiting their website directly.
- Ensure there are proper gas lines available. The minimum line size is a ½" diameter gas pipe. Consult manufacturer installation instructions for specific unit requirements.
- Confirm there is a nearby 110V/15a outlet.

Considerations for Installation

Installing a GHPWH is similar to installing a standard gas storage water heater, so no additional trades or special skills are needed, and no refrigerant handling is required. For product-specific information and guidance, it is essential to reference manufacturer's product manual and other available resources. Additionally, consider the following best practices.



Garages, Basements, and Utility Closets are Ideal Locations for GHPWHs

Manufacturers normally require that water heaters have 700 cubic ft. of air volume in the space where they are installed, which is a roughly 9 x 9 x 9-ft room. Your system may have a different requirement, so be sure to consult manufacturer's installation guide for recommendations about your specific model. Access to existing water and gas piping, flue and exhaust venting, electrical connections, and adequate combustion air supply are considerations for where you can easily install a GHPWH. Garages are ideal locations to install a GHPWH, as there is ample space. For houses in colder climates, the garage may reach freezing temperatures, which can impact the system's performance. The impact of cold ambient temperatures is minimal, given GHPWHs use combustion to drive the heat pump cycle, but they will see some decreases in efficiency when temperatures drop below a certain threshold. If a garage is unavailable or not ideal for installing the GHPWH, other suitable locations include basements, utility rooms, and laundry rooms.



Ensure the Tank Size Can Meet the Needs of the Occupants

As always, follow your local plumbing code to determine the tank size for a home. To correctly size a GHPWH to meet hot water needs, you should consider the number of consecutive 10-minute showers that may take place in the household. Traditionally, a 50-gallon tank can provide enough hot water for up to two consecutive showers; a 65-gallon tank will supply hot water for three showers; an 80-gallon tank is adequate for four or more consecutive showers. Increasing the tank size can maximize the system's efficiency.



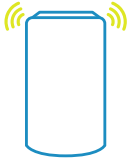
Position the Unit for Easy Access

The positioning of the GHPWH should allow for easy access to all controls, filters, and drains to ensure inspection and maintenance are easy to complete. It's important to follow local codes and manufacturer guidance for clearance and seismic strapping (if applicable in your area). Make sure the control panel is facing outward and that it and all other data connection ports are easily accessible for the owner. Ensure the air intake is not obstructed and has sufficiently free and open access.



Avoid Blowing Cool Exhaust Air in Frequently Occupied Rooms

GHPWHs exhaust air that is cooler than their surroundings. Therefore, they should not be located in rooms that are frequently occupied. When garage installations are not available, basements, utility rooms, and laundry rooms serve as excellent locations. Position exhaust air aiming away from the center of the room to avoid blowing cooled air on occupants. Confirm exhaust is not blowing directly toward a wall, as this causes a continual lowering of intake air temperature.



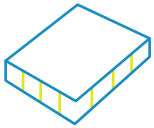
Be Aware of Extra Noise from GHPWH

GHPWHs have a fan and pump that emit noise, typically at levels less than 55 dBA. Standing on the other side of a wall or door, the sound level drops to 35–40 dBA, which is quieter than a refrigerator. Still, placing the water heater away from bedrooms and living rooms can help mitigate any potential sound issues. Check with manufacturers for best practices regarding isolation pads, foam, and mounting strategies.



Properly Drain Away Condensate with PVC or Stainless-Steel Pipes and Vents

GHPWHs, like other high-efficiency condensing water heaters, produce a condensate that must be drained away from the water heater. Water heaters usually produce only a few cups of condensate per day during late spring through early fall. Condensate is a byproduct of the combustion process, corroding steel vents and possibly damaging the sewer system unless neutralized. For that reason, PVC and stainless-steel pipes and vents are recommended and may be code required in your area. To ensure that the condensate is safe for sewer disposal, you can purchase and install a condensate neutralizer kit. It's also important to make sure the tank is level and the evaporator drain pan drains correctly.



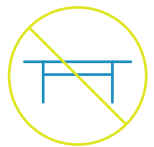
Use an Insulation Pad to Reduce Unnecessary Heat Loss

To avoid unnecessary heat loss through the GHPWHs bottom, place an R-10 (or greater) foam pad under it. R-10 foam pads are readily available at plumbing supply centers and should be used regardless of floor type.



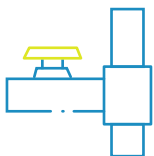
Install a Drain Pan To Minimize Potential Water Damage

If the floor under the GHPWH is susceptible to water damage, be sure to install a drain pan to prevent future problems caused by leaks. Connect the drain pan outlet to appropriate drainage that meets your local code requirements.



No Stand Needed

Storage water heaters with elements above 18", including GHPWHs, do not need to be raised off the floor with a stand. This requirement was a safety provision for older atmospheric gas storage water heaters located in garages. Most GHPWHs are taller than gas storage water heaters — they have the same nominal volume, but their connections are in different places. Ensure there is space above and around the heater to accommodate variations for the models you are considering.



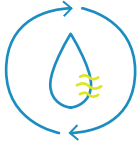
Reuse Existing Vent Piping and Temperature/Pressure-Relief (TPR) Drainpipe

If existing vent piping and TPR drainpipe are in good condition, they can typically be reused with the new GHPWH. If existing piping is damaged or defective, follow manufacturer's guidance and best practices for installing new piping.



Insulate All Hot Water Pipes

At a minimum, insulate hot water piping to meet your local code requirements. You can insulate all the hot water piping to improve the system's performance and customer experience, even if your local codes don't require it. Having continuous pipe insulation is more important and impactful than increasing the thickness or R-value of the pipe insulation.



Heated Water Circulation (Temperature Maintenance)

Do not use a continuously operated circulation pump (this is prohibited under some states' energy codes). If pipe runs to fixtures are too long, use a demand-, sensor-, or occupant-activated pump to circulate just enough hot water to prime the loop. Connect circulation pump return pipe to the cold inlet, guiding cooler return water to tank bottom and increasing hot water availability. Continuous circulation is particularly detrimental to heat pump water heaters and will result in a lack of hot water availability and significantly increase energy use. Consequently, never set the circulation system controls to continuous and advise the homeowner to do the same.



Test for Gas Line Leaks Using a Soapy Water Solution

You should test for gas leaks by spraying all gas connections with a leak detection solution, which can be homemade or store-bought. If you notice any "bubbling" where you sprayed the solution, it's an indication that gas is escaping from a loose or faulty connection. Try tightening the connection and check for bubbling again.



Install a Carbon Monoxide Detector

To prevent potential carbon monoxide poisoning, you or the customer should install a carbon monoxide detector near the GHPWH. Your local building codes may require this.



Regularly Service the Water Heater After Installation

As with all water heaters, GHPWHs will require regular servicing to maintain the system's performance. Follow manufacturer's recommended service requirements, including routine maintenance for draining the tank and servicing the anode rod. Air filters should be cleaned every 3 to 6 months, with a more frequent cleaning schedule if it is installed in an area with significant dust. Manufacturers design GHPWHs to be fully sealed systems with no need to add or remove refrigerants. On some rare occasions, the homeowner may have to clear the condensate drain port if it is blocked. Homeowners should be aware of the potentially caustic fluids and wear proper protection.

GHPWH Customer Benefits

By switching to a GHPWH, customers can have access to the same hot water for a lower cost, while reducing their home's emissions. Many homes have inefficient gas storage water heaters and could considerably improve the efficiency of their water heaters by upgrading to a GHPWH. Consumers can save over \$2,000 per unit over a 10-year period, resulting in a 6 to 8 year payback period when choosing GHPWH over a standard gas storage water heater. GHPWHs can also reduce greenhouse gas emissions by up to 50% and are compatible with natural refrigerants that have no global warming potential and no ozone depletion potential.