

SINGLE-STORY

- ✓ Less than 2,200 sq. ft.
- ✓ Primarily heated by either:
 - Electric resistance with baseboard heating or wall heaters
 - Infrared panels/ceilings

TWO-STORY

- ✓ Less than 2,600 sq. ft.
- ✓ Primarily heated by either:
 - Electric resistance with baseboard heating or wall heaters
 - Electric forced air furnace

MANUFACTURED OR MOBILE HOME

- ✓ Primarily heated by either:
 - Electric baseboard or wall heating
 - Electric forced air furnace



Four ideal homes for single-head ductless heat-pump installation

Primary and supplement heat source.

By Suzi Asmus

Ductless heat pumps, or ductless mini-splits, are gaining popularity in North America, both to displace existing inefficient or ineffective heating and cooling, as well as to replace entire heating and cooling systems.

The Northwest Ductless Heat Pump Project — focused on accelerating the adoption of ductless heating and cooling systems in the Northwest by providing resources, tools and support to increase ductless system sales and installations — promotes the displacement approach for the right homes, since it provides quality heating and cooling to the main living area of a home, while “displacing” 30-60% of the home’s heating/cooling needs, with efficient and effective heat pump technology at a price that appeals to a wide array of homeowners.

What makes these modern DHPs so attractive is the way customers with electric heating systems can benefit from a single-head DHP system without resorting to installing costly and complex central heating or multiple head systems.

Current DHPs utilize inverter compressors, high-efficiency indoor fan motors and control algorithms that maximize the

ability to provide a stable temperature in the main living area, typically the living room, of the home. Add to this the fact that many manufacturers also offer extra-capacity systems that allow the DHP to continue to move hot/cold air into the home in more extreme temperatures (down to -5° F in cold climates and above 110° F in hot/dry climates), making these systems a good choice in a large percent of the country.

These advancements help make a good case for the use of DHPs to displace existing heat for homeowners not satisfied with their current system, or who simply want to use a higher-efficiency system for much of the year. But not every home or configuration is ideal for this strategy. To help identify the best cases for DHPs to displace a sizeable amount of heating load and reduce electric-resistance heating bills by up to 40%, we will begin with a description of the general recommendations for ideal scenarios and then look at the best options for home size and configuration.

The way it works

For general recommendations, displacement will work best in zonally heated homes, preferably zonal systems not connected

SPLIT-LEVEL

- ✓ Less than 2,400 sq. ft.
- ✓ Primarily heated by either:
 - Electric forced air furnace (preferred)
 - Baseboard heating, infrared panel, wall heaters



to complicated central-ducted heating and cooling systems. This option allows for portions of the home heating and cooling load not directly supplied by the DHP to still control additional zone temperatures to suit the needs of the homeowners without impacting the DHP controller. For instance, in a home with electric baseboard heat, the DHP ideally will be installed in the main living area of the home where people spend most of their time (the living room, connected to the dining room, entry and kitchen).

Homeowners can then still control the heating needs in their bedrooms and auxiliary rooms of the house with their preexisting zonal system. While a displacement DHP system could work with a gas boiler, most utility programs will only allow incentives to be applied when displacing or upgrading a system of the same fuel type.

Regarding home sizes and configurations, simplicity and relatively open floor plans will work best. The best-case home will be the single-story ranch home that is 2,200 square feet or less, or the two-story box-on-a-box-shaped home that is 2,600 square feet or less. In both configurations, the DHP not only will effectively control the temperature in the

main living area, but the rest of the home also will gain residual heating and cooling benefit through heat transfer within the home.

This strategy also can work quite well in manufactured homes that are single or double-wide standard connections. More “architecturally interesting” or “L” shaped homes can be difficult to reap the benefits of conductive or residual heat transfer and may rely more heavily on the existing zonal heating system in the more distant rooms.

Finally, another decent home configuration is the split-level home. In this configuration, the main living area of the home will receive the DHP indoor unit and should still provide around 30% of the home’s heating needs, depending on the amount of time the second level of the home is used.

Help homeowners understand

Many contractors find that helping homeowners understand the value proposition of a single-head displacement DHP at an affordable price and potentially with local utility rebates outweighs the preconceived notion that an entire heating system must be replaced in a home.

In some cases, a second head may be added to control a master bedroom, front room over garage or basement where

homeowners spend a lot of their time. These types of considerations should be discussed with homeowners and they can weigh the cost/benefit scenarios. These strategies may provide additional comfort for the home, but will reduce the energy bill savings-per-dollar invested, as rebates typically are paid per install, regardless of size or capacity of the system.

Finally, it is critical for installers to educate homeowners on temperature expectations, system-control best practices and tips for maintenance. This is true of any heating system, but particularly so when a less familiar system is installed.

When sized, installed and controlled correctly, the Northwest Ductless Heat Pump Project has seen customer satisfaction rates with displacement DHPs of more than 90%. **RJ 2.0**



Suzi Asmus is the program manager for the NW Ductless Heat Pump Project. For more information, resources and guidance on sales and customer communication around

DHPs, visit www.goingductless.com or connect with your local utility.



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