Heat Pumps As Energy-Efficient HVAC Systems

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4/8/25

Heat Pump System Classification

Does it use refrigerant to move heat?

Heat Pump

5 and 6

What is the heat source/sink?

Air Source

Water Source

3 and 4

Does it use ductwork to distribute heating/cooling?

Ducted

Ductless

1 and 2

Is there a single piece of heating/cooling equipment, or is it split apart?

Packaged

Split

1) and 3) Packaged and Ducted

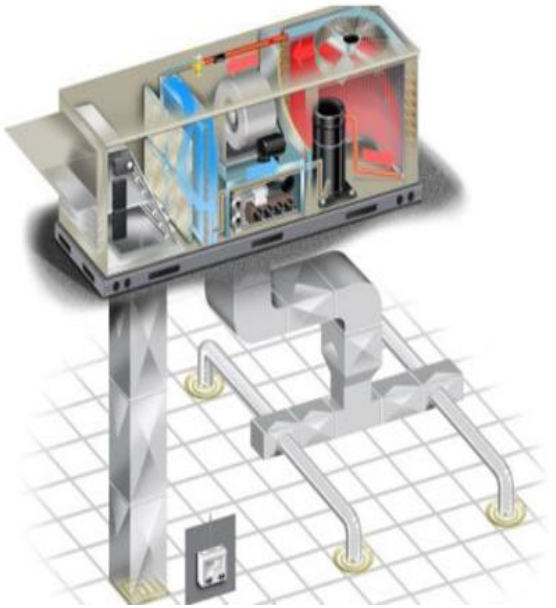
Packaged Heat Pump

Components

- ❑ Outdoor packaged unit
- ❑ Ductwork to distribute heating & cooling

Advantages

- Low initial cost
- Simple install
- Can often replace existing package units



1) And 3) Packaged Ducted contd.

Incentives for Dominion Energy customers – Specs.

Unitary Air Cooled Heat Pumps			
15	Unitary Air Cooled Heat Pumps All Split Units < 60kBtu/h (5ton)	12.0 EER or 13.8 IEER	$177
16	Unitary Air Cooled Heat Pumps All Single Package Units < 60kBtu/h (5ton)	11.4 EER or 13.0 IEER	$138
17	Unitary Air Cooled Heat Pumps All Single Package Units ≥ 60k and < 132k Btu/h (5-11 tons)	10.6 EER or 12.0 IEER	$19
18	Unitary Air Cooled Heat Pumps All Single Package Units ≥ 132k and < 240k Btu/h (11-20 tons)	11.1 EER or 13.5 IEER	$10
19	Unitary Air Cooled Heat Pumps All Single Package Units ≥ 240k and < 756k Btu/h (20-63 tons)	10.2 EER or 11.2 IEER	$23
20	Package Units > 60k and < 132k Btu/h (5-11 tons)	11.1 EER or 13.5 IEER	$45
21	Package Units ≥ 132k and < 240k Btu/h (11-20 tons)	10.7 EER or 12.2 IEER	$45
22	Package Units ≥ 240k and < 756k Btu/h (20-63 tons)	10.1 EER or 11.1 IEER	$45

** Yellow Highlighted are from Dominion Energy Incentive Sheets

1) and 4): Packaged and Ductless

Packaged Terminal Heat Pump

Components

❑ Self-contained through-wall unit

Key Features

- Low initial cost
- Room-by-room controls

NOTE: Always look for **PTHP, not PTAC**. PTACs (and even some PTHPs) may have inefficient electric resistance heat.

1) And 4) Packaged-Ductless Contd.

Incentives for Hotels/Motels-Dominion Energy

EN21	Guest Room Energy Management – PTAC for Motel	Electric Heat	per ton	$195
EN22	Guest Room Energy Management – PTHP for Motel	Electric Heat	per ton	$195
EN23	Guest Room Energy Management – PTAC for Hotel	Electric Heat	per ton	$195
EN24	Guest Room Energy Management – PTHP for Hotel	Electric Heat	per ton	$195

Packaged Terminal Heat Pumps			
5	< 7k Btu/h	13.0 EER or 4 COP	$63
6	< 9k btu/h	12.1 EER or 3.7 COP	$63
7	< 12k btu/h	11.7 EER or 3.6 COP	$63
8	≥ 15k Btu/h	10.6 EER or 3.3 COP	$63

2) and 3) Split Ducted

Split Heat Pumps

Ducted Split Heat Pump

Components

- ❑ Outdoor unit, indoor unit, and refrigerant lines
- ❑ Ductwork to distribute heating & cooling

Key Features

- Nearly identical install to common ducted AC
- Can use existing ductwork
- Indoor equipment is mostly hidden from view

2) And 3) Split, Ducted Contd.

Mini-Split Heat Pump

Components

- ❑ Outdoor unit
- ❑ 1-5 indoor units
- ❑ Refrigerant lines

Key Features

- Inverter-driven compressor
- Room-by-room controls
- Ducted or Ductless fan Coils

2) Split Heat Pump Contd.

2) And 3) Split Ducted Contd.

Incentives and Specs. for Dominion Energy Programs

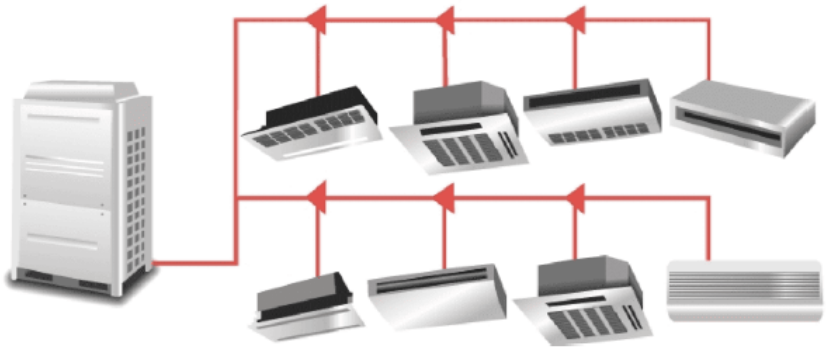
Mini Split Heat Pumps			
43	Mini Split Air Conditioners and Heat Pumps – Level 1 ≤ 60k Btu/h	11.8 – 13.7 EER or 14.0 – 18.0 SEER	$1,508 per unit
44	Mini Split Air Conditioners and Heat Pumps – Level 2 ≤ 60k Btu/h	13.8 – 15.9 EER or 18.1 – 21.9 SEER	$1,687 per unit
45	Mini Split Air Conditioners and Heat Pumps – Level 3 ≤ 60k Btu/h	16.0 EER or 22.0 SEER	$1,937 per unit

5) Air-Source VRF

Variable Refrigerant Flow (VRF)

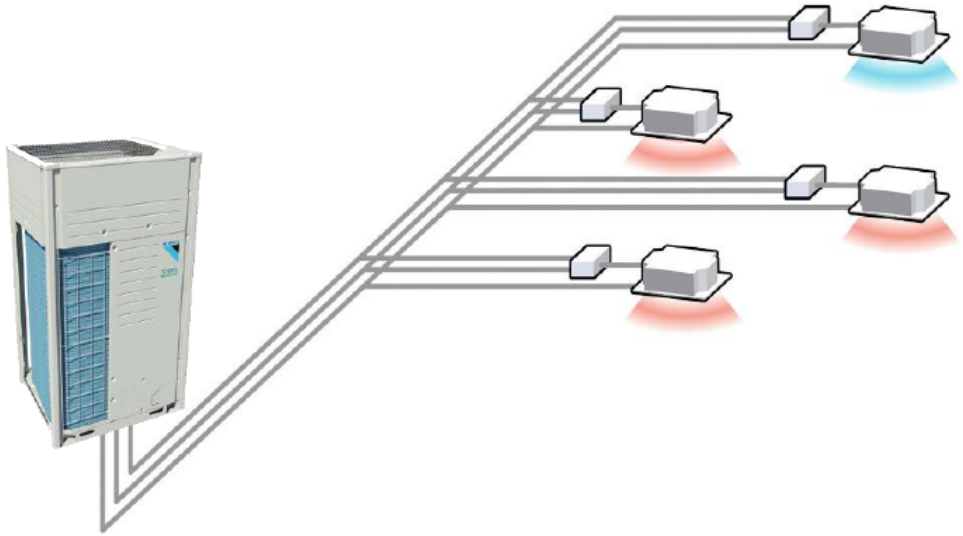
Components

- ❑ Outdoor unit
- ❑ Many (40+) indoor units
- ❑ Refrigerant Lines
- ❑ Control Boxes



Key Features

- Simultaneous Heating + Cooling
- Multiple Zones
- Challenging to sub-meter tenants



5. VRF Contd.

Incentives and Specs. for Dominion Energy Programs

Variable Refrigerant Flows			
46	≥ 60k and < 132k Btu/h	14.0 EER or 14.2 IEER	$2,145
47	≥ 132k and < 240k Btu/h	13.0 EER or 13.7 IEER	$2,145
48	≥ 240k Btu/h	12.4 EER or 13.0 IEER	$2,145

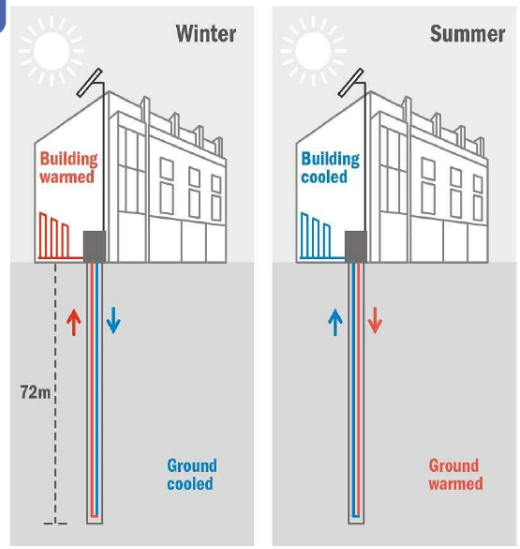
Ground Source Heat Pump

Components

- ❑ Heat exchanger/ground loop
- ❑ Heat pump unit
- ❑ Distribution - Fan Coils / Radiators / Chilled Beams

Key Features

- Super efficient
- Climates Independent
- Requires land large area



5) and 6) Air and Water Source

Hydronic/Radiant?

Components

- ❑ Monoblock heat pump water heater + tank
- ❑ Distribution piping
- ❑ Radiant coils or fan coils

Key Features

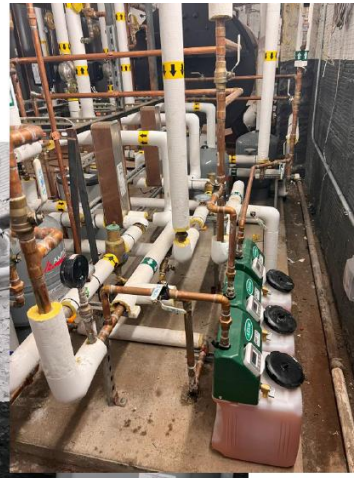
- Heating and Domestic Hot Water
- May need fan coil for cooling

5) and 6) Ground Source Contd.

Incentives and Specs. for Dominion Energy Programs

5) and 6) Ground Source Contd.

Geothermal Heat Pumps			
34	All Sizes	18.1 EER	$1,202



6) Water Source VRF

Incentives and Specs for Dominion Energy Programs

Water Source Heat Pumps			
49	≤ 132k Btu/h	14.0 EER	$188

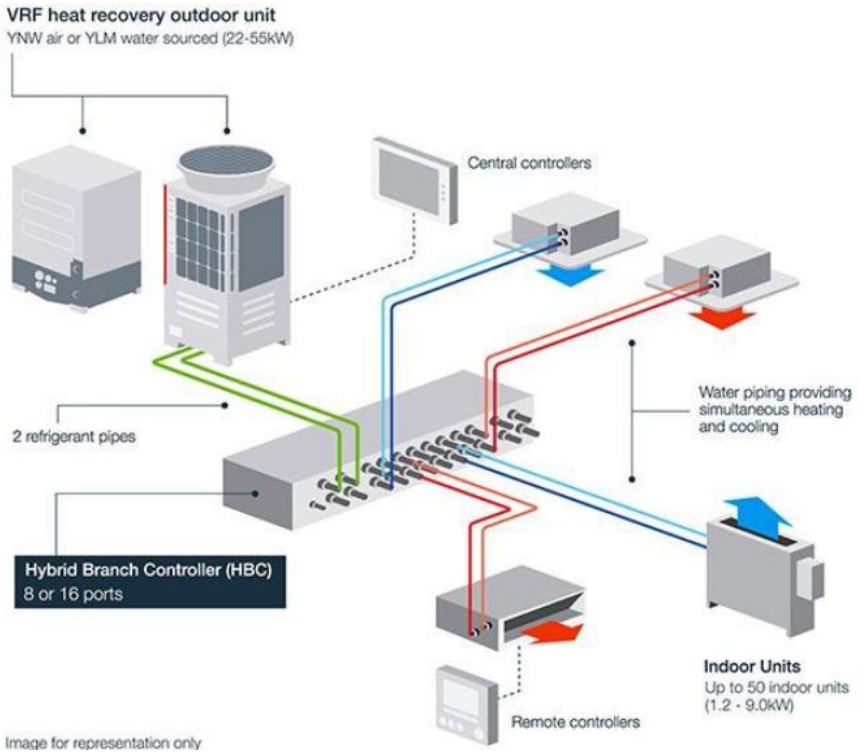
Hybrid VRF (Refrigerant + Water)

Components

- ❑ VRF outdoor unit
- ❑ 2 **refrigerant** pipes to hybrid branch controller
- ❑ 2 **water** pipes to each indoor coil

Key Features

- Reduced Refrigerant Volume
- Minimized Refrigerant Leak Detection
- 2 pipes to fan coils instead of 4



Dominion Energy Incentives For Custom Solutions

Custom incentives are calculated based on your project's projected calculated savings for the first 12 months after installation at $0.12/kWh.

Custom Airflow/HVAC Measure

Measure must be pre-approved by program staff

Measure savings must be demonstrated with information provided to the program. Based on the review of information, final measure eligible and incentivized savings will be determined by program staff. Interested customers should review specific documentation requirements with a program representative.

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