Cold Climate Packaged Terminal Heat Pump and Single Package Vertical Heat Pump Specification (Version 1)

As facilitated by Northeast Energy Efficiency Partnerships (NEEP)

The following specification defines a set of performance requirements and reporting requirements to meet the voluntary "Cold-Climate Packaged Terminal Heat Pump and Single Package Vertical Heat Pump Specification" (ccPTHP and SPVHP Specification). The specification was designed to identify air-source heat pumps that are best suited to heat efficiently in cold climates (IECC climate zone 4 and higher). The specification is intended as a model equipment specification to be used broadly by energy efficiency program administrators in cold climates as a minimum requirement for program qualification. It also is intended for engineers, contractors, and other practitioners who need assurance that the equipment they select will have the required heating capacity at design temperature without unnecessary oversizing, and will serve the load efficiently throughout the ambient temperature range.

Stakeholders should be aware that simply meeting the performance requirements does not necessarily mean a product is appropriate for all cold climate applications. Consumers, contractors, and designers should review building loads, equipment capacities at design temperatures, and other important factors before selecting equipment.

Scope

- *Packaged Terminal Heat Pumps* and *Single Package Vertical Heat Pumps* defined by federal regulation 10 CFR §431.92
- Units must be tested under AHRI 310/380[1] or AHRI 390[2]
- Compressor must be variable capacity (three or more distinct operating speeds, or continuously variable)

Performance Requirements

- COP @5°F ≥ 1.5 (at maximum capacity operation)
- Lab testing results OR engineering data for each system must be reported through the attached "Performance Information Tables". Incomplete tables will not be considered.

[1] https://www.ahrinet.org/App_Content/ahri/files/STANDARDS/AHRI/AHRI_Standard_310-380_2017_CSA_C744_17.pdf

[2] https://www.ahrinet.org/Portals/AHRI%20390%20I-P%20(2021)%20(1).pdf

Performance Information Tables

Manufacturers must complete the following "Performance Information Tables" for each qualifying system. This information will support the cold climate specification and aid in appropriate equipment selection for installations in cold climates.

Brand Owner	
Brand Name	
Model Name/Product Line (if applicable)	
Ducting Configuration	
AHRI Certified Reference Number	
AHRI Type	
Model Number	
EER	
Variable Capacity? (True/False)	
Refrigerant	
Sold In? (USA and/or Canada)	
Is there a low ambient temperature at which the compressor locks out and the unit switches to electric heat?	
What is the sequence of operation for electric heat?	
Is there an option to disable electric heat above a certain ambient temperature?	
How is condensate handled from dehumidification in cooling mode and defrost in heating mode?	

Provide laboratory testing data or engineering data for the conditions shown below. "Minimum" and "Maximum" refer to the steady-state heating (and cooling) capacities and input power at each condition that the rated outdoor equipment model can deliver continuously (without cycling or time-limited "boost" modes), during normal operation using the equipment's built-in controls (e.g. not using fixed speed test modes). Capacities in the "Rated" column should correspond to those listed on the AHRI certificate at 47°F for heating and 95°F ODB for cooling. (In some cases these may be equal to the "Maximum" capacity values, but shall still be reported.) Btu/h is total heat or cooling capacity, and kW is power input. Do not include the power required for defrost cycling or drain pan heater operation in the table.

Cooling Performance

			Capacity Level		
Outdoor Dry Bulb (°F)	Indoor Dry Bulb (°F)		Minimum	Rated	Maximum
95	80	Btu/h			
		kW input			
		COP			
82	80	Btu/h			
		kW input			
		COP			

Heating Performance

			Capacity Level		
Outdoor Dry Bulb (°F)	Indoor Dry Bulb (°F)		Minimum	Rated	Maximum
47	70	Btu/h			
		kW input			
		COP			
17	70	Btu/h			
		kW input			
		COP			
5	70	Btu/h			
		kW input			
		COP			
Lowest Cataloged ODB[3]	70	Btu/h			
		kW input			
		COP			

[3] Lowest Cataloged Outdoor Dry Bulb is defined as the lowest temperature at which the manufacturer offers published performance data in technical manuals or product documentation. If 5°F is the lowest cataloged ODB, please populate lowest cataloged ODB with 5°F performance.