7. Heat Pump Savings

Keeping the electric strip heat off is the key to maximizing energy savings from heat pumps.

Savings depend on:

- Correct sizing
- Controls that minimize use of strip heat
- A high-efficiency heat pump

8. Strip Heat

To minimize the use of strip heat:

- Size the compressor large enough to provide all the heat needed as long as the outdoor temperature is above 30°F.
- Set strip heat lockout at or below 35°F to prevent unnecessary strip heat use.
- Encourage homeowners to avoid setback temperatures more than 2°F.

9. Cooling Load

Do not forget cooling load calculations. Total Cooling Load = Sensible and Latent

- Sensible: Involves lowering the temperature.
- Latent: Involves removing water vapor from the air (dehumidification).
- Cooling will reduce both temperature and moisture.
- The selected unit must take care of both sensible and latent loads to maintain comfort.
- In the Northwest, assume low latent cooling loads and select a low indoor wet bulb design temperature in most cases.

10. Consider the Details

- Insulation levels (none, some, fair amount, a lot).
- House tightness: Usually between .35 and .8 ACH.
- Windows:
  - » U-value is critical! 0.3–0.4 for vinyl.
  - » If Solar Heat Gain Coefficient (SHGC) is unknown, use same value as U-value.
  - » Consider orientation/direction.
- Duct multiplier: Between 0% and 20%. If it's worse than that, fix it.
- House size.
- Capacity of heat pump at desired balance point.
- Pick the right weather station.

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PTCS
Heat Pump Sizing Reference Guide

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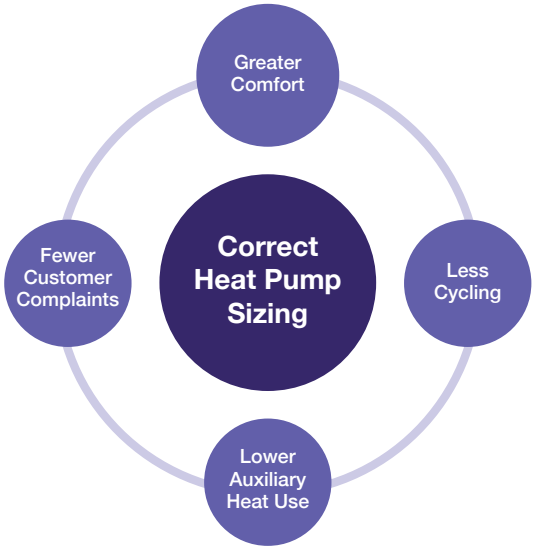
This brochure is intended to be a quick reference guide to sizing heat pumps in compliance with the PTCS program. The goal is greater comfort, less cycling, fewer customer complaints, and lower auxiliary heat use.

1. Importance of Heat Pump Sizing

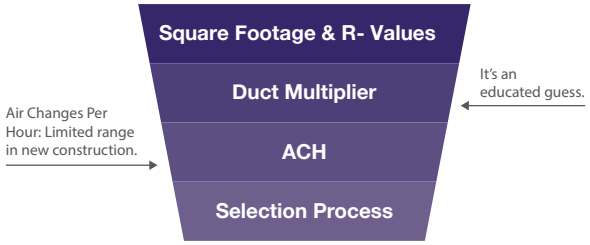


2. Heat Loss/Heat Gain Analysis

- **Manual J** calculates heat loss/heat gain.
- **Manual S** guides in the selection process.
- **Manual D** guides duct design.

3. Manual J Heating Load Inputs

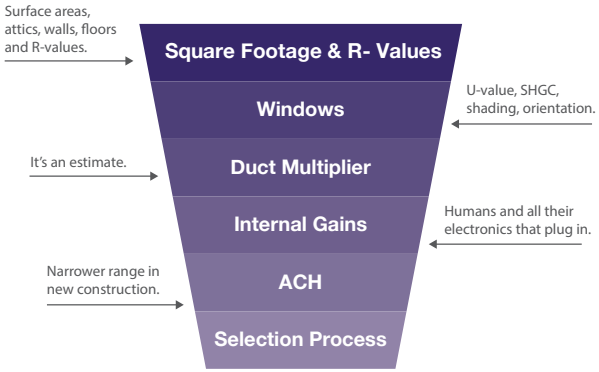
Below are the critical inputs to consider when determining heating loads and the seven heat pump sizes to choose from.



Seven Heat Pump Sizing Choices:

4. Manual J Cooling Load Inputs

Below are the critical inputs to consider when determining cooling loads and the seven heat pump sizes to choose from.



Seven Heat Pump Sizing Choices:

5. Duct Multipliers (Typically 5–20%)

Duct multipliers are often an educated guess. Use the ranges below for estimating duct multipliers.

- **0%**: Ducts inside conditioned space.
- **10%**: Tight and insulated.
- **20%**: Leaky or disconnected ducts outside conditioned space.
- **30%**: Leaky old ducts under rodent barrier in manufactured home.
- **20% or More**: Ducts should be fixed.

6. Balance Point

Balance Point: Lowest outdoor temperature for which the output of the heat pump can heat the house by using the compressor only.

- Below this temperature, the strip heat is needed to help heat the house.
- If it's a gas backup heat pump, use economic considerations to determine balance point (usually around 40°F).