Simple Heating System Size: Washington State

This heating system sizing calculator is based on the Prescriptive Requirements of the 2018 Washington State Energy Code (WSEC) and ACCA Manuals J and S. This tool will calculate heating loads only. ACCA procedures for sizing cooling systems should be used to determine cooling loads.

Please complete the green drop-downs and boxes that are applicable to your project. As you make selections in the drop-downs for each section, some values will be calculated for you. If you do not see the selection you need in the drop-down options, please contact the WSU Energy Program at energycode@energy.wsu.edu or (360) 956-2042 for assistance.

Project Information	*Contact Information*
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Heating System Type: ○ All Other Systems   ● Heat Pump

To see detailed instructions for each section, place your cursor on the word "Instructions"

Design Temperature
Instructions

Mercer Island

Design Temperature Difference (∆T)   45

∆T = Indoor (70 degrees) - Outdoor Design Temp

Area of Building

Conditioned Floor Area
Instructions   Conditioned Floor Area (sq ft)   **3,863**

Average Ceiling Height
Instructions   Average Ceiling Height (ft)   **9.5**   Conditioned Volume   36,699

Glazing and Doors
Instructions

U–0.30

	U-Factor	X	Area	=	UA
	0.300		763		228.90

Skylights
Instructions

	U-Factor	X	Area	=	UA
	0.50				---

Insulation

Attic
Instructions

R–49

	U-Factor	X	Area	=	UA
	0.026		1,378		35.83

Single Rafter or Joist Vaulted Ceilings
Instructions

R–49 Advanced

	U-Factor	X	Area		UA
	0.020				_____

Above Grade Walls *(see Figure 1)*
Instructions

R–21 Intermediate

	U-Factor	X	Area		UA
	0.056		2,923		163.69

Floors
Instructions

R–30

	U-Factor	X	Area		UA
	0.029		2,860		82.94

Below Grade Walls *(see Figure 1)*
Instructions

R–21 int plus R–5 ci

	U-Factor	X	Area		UA
	0.028		1,043		29.19

Slab Below Grade *(see Figure 1)*
Instructions

Select conditioning

	F-Factor	X	Length		UA
	No selection				---

Slab on Grade *(see Figure 1)*
Instructions

R–10 Fully Insulated

	F-Factor	X	Length		UA
	0.360		137		49.32

Location of Ducts
Instructions

Unconditioned Space

Duct Leakage Coefficient
1.10

Figure 1.
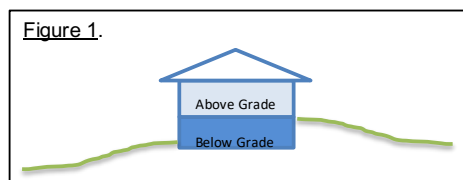
Sum of UA   589.87

Envelope Heat Load   26,544   Btu / Hour
Sum of UA x ∆T

Air Leakage Heat Load   17,835   Btu / Hour
Volume x 0.6 x ∆T x 0.018

Building Design Heat Load   44,379   Btu / Hour
Air leakage + envelope heat loss

Building and Duct Heat Load   48,817   Btu / Hour
Ducts in unconditioned space: sum of building heat loss x 1.10
Ducts in conditioned space: sum of building heat loss x 1

Maximum Heat Equipment Output   61,022   Btu / Hour
Building and duct heat loss x 1.40 for forced air furnace
Building and duct heat loss x 1.25 for heat pump