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 (ΔT)   45
ΔT = Indoor (70 degrees) - Outdoor Design Temp

Area of Building

Conditioned Floor Area
Instructions   Conditioned Floor Area (sq ft)   **3,552**

Average Ceiling Height
Instructions   Average Ceiling Height (ft)   **9.5**   Conditioned Volume   33,744

Glazing and Doors
Instructions

U-0.28 ▼

	U-Factor	X	Area	=	UA
	0.280		1,105		309.40

Skylights
Instructions

	U-Factor	X	Area	=	UA
	0.50		0		---

Insulation

Attic
Instructions

Select R-Value ▼

	U-Factor	X	Area	=	UA
	No selection		0		---

Single Rafter or Joist Vaulted Ceilings
Instructions

R-38 Vented ▼

	U-Factor	X	Area		UA
	0.027		1,492		40.28

Above Grade Walls *(see Figure 1)*
Instructions

R-21 Intermediate ▼

	U-Factor	X	Area		UA
	0.056		1,036		58.02

Floors
Instructions

R-30 ▼

	U-Factor	X	Area		UA
	0.029		2,116		61.36

Below Grade Walls *(see Figure 1)*
Instructions

R-21 Interior ▼

	U-Factor	X	Area		UA
	0.042		456		19.15

Slab Below Grade *(see Figure 1)*
Instructions

R-10 Fully insulated ▼

	F-Factor	X	Length		UA
	0.303		108		32.72

Slab on Grade *(see Figure 1)*
Instructions

R-10 Perimeter ▼

	F-Factor	X	Length		UA
	0.540		82		44.28

Location of Ducts
Instructions

Unconditioned Space ▼

Duct Leakage Coefficient
1.10

Figure 1.
Above Grade
Below Grade
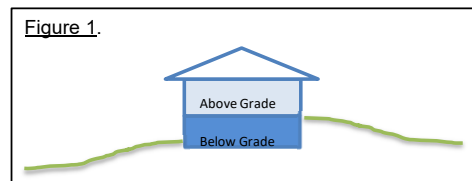
Sum of UA	565.22	
Envelope Heat Load	25,435	Btu / Hour
Sum of UA x ΔT		
Air Leakage Heat Load	16,400	Btu / Hour
Volume x 0.6 x ΔT x 0.018		
Building Design Heat Load	41,834	Btu / Hour
Air leakage + envelope heat loss		
Building and Duct Heat Load	46,018	Btu / Hour
Ducts in unconditioned space: sum of building heat loss x 1.10		
Ducts in conditioned space: sum of building heat loss x 1		
Maximum Heat Equipment Output	57,522	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		