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*
Simpson Residence	Brad Sturman - Sturman Architects
6454 E Mercer Way	9 103rd Ave NE Suite 203
Mercer Island, WA 98004	Bellevue, WA 98040

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) 4,789

Average Ceiling Height

Instructions: Average Ceiling Height (ft) 9.5

Conditioned Volume 45,498

Glazing and Doors

Instructions: U-0.28

U-Factor	X	Area	=	UA
0.280		1,058		296.21

Skylights

Instructions

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

Insulation

Attic

Instructions: R-49

U-Factor	X	Area	=	UA
0.026		2,240		58.23

Single Rafter or Joist Vaulted Ceilings

Instructions: R-38 Vented

U-Factor	X	Area	UA
0.027		1,081	29.19

Above Grade Walls *(see Figure 1)*

Instructions: R-21 Intermediate

U-Factor	X	Area	UA
0.056		5,094	285.24

Floors

Instructions: R-38

U-Factor	X	Area	UA
0.025		2,051	51.28

Below Grade Walls *(see Figure 1)*

Instructions: No Below Grade Walls in this project.

U-Factor	X	Area	UA
0.028			_____

Slab Below Grade *(see Figure 1)*

Instructions: No Slab Below Grade in this project.

F-Factor	X	Length	UA
0.303			---

Slab on Grade *(see Figure 1)*

Instructions: R-10 Perimeter

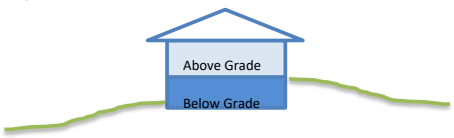
F-Factor	X	Length	UA
0.540		21	11.07

Location of Ducts

Instructions: Unconditioned Space

Duct Leakage Coefficient
1.10

Figure 1.



Sum of UA	731.22	
Envelope Heat Load	32,905	Btu / Hour
Sum of UA x ΔT		
Air Leakage Heat Load	22,112	Btu / Hour
Volume x 0.6 x ΔT x 0.018		
Building Design Heat Load	55,017	Btu / Hour
Air leakage + envelope heat loss		
Building and Duct Heat Load	60,519	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	75,649	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		