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

Koneru Residence
6610 E Mercer Way
Mercer Ilsland, WA

Contact Information

Devlin Rose
McCullough Architects

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): 9,966

Average Ceiling Height

Instructions — Average Ceiling Height (ft): 11.0

Conditioned Volume: 109,626

Glazing and Doors

Instructions — U-0.28

U-Factor	X	Area	=	UA
0.280		4,153		1162.84

Skylights

Instructions

U-Factor	X	Area	=	UA
0.50		150		75.00

Insulation

Attic

Instructions — Select R-Value

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

Single Rafter or Joist Vaulted Ceilings

Instructions — R-38 [redacted] Unvented

U-Factor	X	Area	UA
0.027		6,177	166.78

Above Grade Walls ***(see Figure 1)***

Instructions — R-21 Intermediate

U-Factor	X	Area	UA
0.056		4,788	268.13

Floors

Instructions — R-38

U-Factor	X	Area	UA
0.025		658	16.45

Below Grade Walls ***(see Figure 1)***

Instructions — Select R-value

U-Factor	X	Area	UA
No selection			---

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

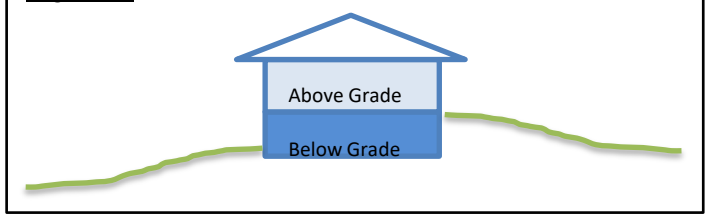
F-Factor	X	Length	UA
0.360		5,498	1979.28

Location of Ducts

Instructions — Conditioned Space

Duct Leakage Coefficient
1.00

Figure 1.



Sum of UA	3668.48	
Envelope Heat Load	165,081	Btu / Hour
Sum of UA x ΔT		
Air Leakage Heat Load	53,278	Btu / Hour
Volume x 0.6 x ΔT x 0.018		
Building Design Heat Load	218,360	Btu / Hour
Air leakage + envelope heat loss		
Building and Duct Heat Load	218,360	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	272,950	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		