

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

Wang & Yang ADU
6450 E Mercer Way
Mercer Island, WA 98040

Contact Information

Siyao Wang

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
 $\Delta T = \text{Indoor (70 degrees)} - \text{Outdoor Design Temp}$

Area of Building

Conditioned Floor Area

[Instructions](#)

Conditioned Floor Area (sq ft)

849

Average Ceiling Height

[Instructions](#)

Average Ceiling Height (ft)

10.2

Conditioned Volume
8,617

Glazing and Doors

[Instructions](#)

U-0.28

U-Factor X Area = UA
0.280 X 328 = 91.84

Skylights

[Instructions](#)

U-Factor X Area = UA
0.50 X 24 = 12.00

Insulation

Attic

[Instructions](#)

Select R-Value

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

Single Rafter or Joist Vaulted Ceilings

[Instructions](#)

R-38 Vented

U-Factor X Area = UA
0.027 X 798 = 21.55

Above Grade Walls (see Figure 1)

[Instructions](#)

R-21 Intermediate

U-Factor X Area = UA
0.056 X 1,350 = 75.60

Floors

[Instructions](#)

R-38

U-Factor X Area = UA
0.025 X 513 = 12.83

Below Grade Walls (see Figure 1)

[Instructions](#)

No Below Grade Walls in this project.

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

Slab Below Grade (see Figure 1)

[Instructions](#)

R-21 int Plus R-5 ci

F-Factor X Length = UA
0.560 X 0 = ---

Slab on Grade (see Figure 1)

[Instructions](#)

R-10 Fully Insulated

F-Factor X Length = UA
0.360 X 293 = 105.48

Location of Ducts

[Instructions](#)

Conditioned Space

Duct Leakage Coefficient
1.00

Sum of UA 319.30
Envelope Heat Load 14,368 Btu / Hour
Sum of UA x ΔT
Air Leakage Heat Load 4,188 Btu / Hour
Volume x 0.6 x ΔT x 0.018
Building Design Heat Load 18,556 Btu / Hour
Air leakage + envelope heat loss
Building and Duct Heat Load 18,556 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 23,195 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

Figure 1.

