

Simple Heating System Size: Washington State

This heating system sizing calculator is based on the Prescriptive Requirements of the 2018 and 2021 Washington State Energy Code (WSEC) . 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.

This tool is for the permitting purposes only. A Manual J calculation is required to meet the requirement of the Washington State Energy Code.

Project Information

Hackett Residence
 2965 74th Ave SE
 Mercer Island, WA 98040

Contact Information

Matt Mawer
 425.417.7817

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 25
 Design Temperature Difference (ΔT) 45
 ΔT = Indoor (70 degrees) - Outdoor Design Temp

Area of Building

Conditioned Floor Area

[Instructions](#)

Conditioned Floor Area (sq ft)

3,751

Average Ceiling Height

[Instructions](#)

Average Ceiling Height (ft)

9.5

Conditioned Volume
 35,635

Glazing and Doors

[Instructions](#)

U-0.25

U-Factor X Area = UA
 0.250 X 688 = 172.10

Skylights

[Instructions](#)

0

U-Factor X Area = UA
 0.50 X 0 = 0.00

Insulation

Attic

[Instructions](#)

R-60

U-Factor X Area = UA
 0.024 X 1,426 = 34.22

Single Rafter or Joist Vaulted Ceilings

[Instructions](#)

R-38

U-Factor X Area = UA
 0.026 X 1,488 = 38.69

Above Grade Walls (see Figure 1)

[Instructions](#)

R-20 STD +R-5 ci

U-Factor X Area = UA
 0.045 X 2,888 = 129.96

Floors

[Instructions](#)

R-38

U-Factor X Area = UA
 0.025 X 2,744 = 68.60

Below Grade Walls and Slabs (see Figure 1)

[Instructions](#)

Wall & Slab None

Depth Select nearest slab depth

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

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

Slab on Grade (see Figure 1)

[Instructions](#)

None

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

Location of Ducts

[Instructions](#)

Unconditioned Space

Duct Leakage Coefficient
 1.100

Sum of UA 443.57
 Envelope Heat Load 19,961 Btu / Hour
 Sum of UA x ΔT
 Air Leakage Heat Load 17,318 Btu / Hour
 Volume x 0.6 x ΔT x 0.018
 Building Design Heat Load 37,279 Btu / Hour
 Air leakage + envelope heat loss
 Building and Duct Heat Load 41,007 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 51,259 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.

