

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

MI TREEHOUSE
 5637 EAST MERCER WAY
 MERCER ISLAND WA.

Contact Information

THE HEALEY ALLIANCE AZ
 4/23/2021

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

45

Area of Building

Conditioned Floor Area

Instructions

Conditioned Floor Area (sq ft)

3,371

Average Ceiling Height

Instructions

Average Ceiling Height (ft)

10.0

Conditioned Volume
 33,710

Glazing and Doors

Instructions

U-0.24

U-Factor X Area = UA
 0.240 X 601 = 144.12

Skylights

Instructions

U-Factor X Area = UA
 0.50 X [] = ---

Insulation

Attic

Instructions

R-38 Advanced

U-Factor X Area = UA
 0.026 X [] = ---

Single Rafter or Joist Vaulted Ceilings

Instructions

R-38 Vented

U-Factor X Area = UA
 0.027 X 1,740 = 46.98

Above Grade Walls (see Figure 1)

Instructions

R-21 Intermediate

U-Factor X Area = UA
 0.056 X 3,146 = 176.18

Floors

Instructions

R-38

U-Factor X Area = UA
 0.025 X 1,770 = 44.25

Below Grade Walls (see Figure 1)

Instructions

Select R-value

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

Slab Below Grade (see Figure 1)

Instructions

Select conditioning

F-Factor X Length = UA
 No selection X [] = ---

Slab on Grade (see Figure 1)

Instructions

Select R-Value

F-Factor X Length = UA
 No selection X [] = ---

Location of Ducts

Instructions

Unconditioned Space

Duct Leakage Coefficient
 1.10

Sum of UA 411.53

Envelope Heat Load 18,519 Btu / Hour

Sum of UA x ΔT

Air Leakage Heat Load 16,383 Btu / Hour

Volume x 0.6 x ΔT x 0.018

Building Design Heat Load 34,902 Btu / Hour

Air leakage + envelope heat loss

Building and Duct Heat Load 38,392 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 47,990 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.

