

Simple Heating System Size: Washington State

This heating system sizing calculator is based on the Prescriptive Requirements of the 2015 Washington State Energy Code (WSEC) and ACCA Manuals J and S. This calculator will calculate heating loads only. ACCA procedures for sizing cooling systems should be used to determine cooling loads.

Please fill out all of 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 call the WSU Energy Extension Program at (360) 956-2042 for assistance.

Project Information

Talerman Residence
 3879 West Mecer Way
 Mercer Island, WA 98040

Contact Information

Edward Talerman
 206-250-4896
 etalerman@hotmail.com

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)

867

Average Ceiling Height

Instructions

Average Ceiling Height (ft)

8.5

Conditioned Volume
 7,370

Glazing and Doors

Instructions

U-0.30

U-Factor X Area = UA
 0.300 X 213 = 63.75

Skylights

Instructions

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

Insulation

Attic

Instructions

R-49

U-Factor X Area = UA
 0.026 X 867 = 22.54

Single Rafter or Joist Vaulted Ceilings

Instructions

R-38 Vented

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

Above Grade Walls (see Figure 1)

Instructions

R-21 Intermediate

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

Floors

Instructions

R-38

U-Factor X Area = UA
 0.025 X 98 = 2.46

Below Grade Walls (see Figure 1)

Instructions

R-21 int plus R-5 ci

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

Slab Below Grade (see Figure 1)

Instructions

R-10 Fully insulated

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

Slab on Grade (see Figure 1)

Instructions

Select R-Value

F-Factor X Length = UA
 No selection X 0 = ---

Location of Ducts

Instructions

Unconditioned Space

Duct Leakage Coefficient

1.10

Sum of UA 88.75

Envelope Heat Load 3,994 Btu / Hour
 Sum of UA X ΔT

Air Leakage Heat Load 3,582 Btu / Hour
 Volume X 0.6 X ΔT X .018

Building Design Heat Load 7,575 Btu / Hour
 Air Leakage + Envelope Heat Loss

Building and Duct Heat Load 8,333 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 11,666 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.

