

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

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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) 2,793

Average Ceiling Height

[Instructions](#) Average Ceiling Height (ft) 10.3

Conditioned Volume 28,656

Glazing and Doors

[Instructions](#) U-0.28

U-Factor X Area = UA
 0.280 X 1,406 = 393.71

Skylights

[Instructions](#) 0.50 0

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

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 2,793 = 75.41

Above Grade Walls (see Figure 1)

[Instructions](#) R-21 Intermediate

U-Factor X Area = UA
 0.056 X 1,786 = 100.04

Floors

[Instructions](#) R-30

U-Factor X Area = UA
 0.029 X 2,793 = 81.00

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](#) No Slab Below Grade in this project.

F-Factor X Length = UA
 0.000 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 650.16

Envelope Heat Load 29,257 Btu / Hour

Sum of UA x ΔT

Air Leakage Heat Load 13,927 Btu / Hour

Volume x 0.6 x ΔT x 0.018

Building Design Heat Load 43,184 Btu / Hour

Air leakage + envelope heat loss

Building and Duct Heat Load 47,502 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 59,378 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.

