

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

Helix Design Build
6922 SE 33rd Street
Mercer Island, WA 98040

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

45

Area of Building

Conditioned Floor Area

[Instructions](#)

Conditioned Floor Area (sq ft)

4,758

Average Ceiling Height

[Instructions](#)

Average Ceiling Height (ft)

8.8

Conditioned Volume

41,870

Glazing and Doors

[Instructions](#)

U-0.28

U-Factor X Area = UA
0.280 X 627 = 175.56

U-Factor X Area = UA
0.50 X 40 = 20.00

Skylights

[Instructions](#)

Insulation

Attic

[Instructions](#)

R-49

U-Factor X Area = UA
0.026 X 2,346 = 61.00

Single Rafter or Joist Vaulted Ceilings

[Instructions](#)

R-38 Vented

U-Factor X Area = UA
0.027 X 434 = 11.72

Above Grade Walls (see Figure 1)

[Instructions](#)

R-21 Intermediate

U-Factor X Area = UA
0.056 X 2,869 = 160.66

Floors

[Instructions](#)

R-38

U-Factor X Area = UA
0.025 X 1,616 = 40.40

Below Grade Walls (see Figure 1)

[Instructions](#)

R-21 Interior

U-Factor X Area = UA
0.042 X 981 = 41.20

Slab Below Grade (see Figure 1)

[Instructions](#)

R-10 Fully insulated

F-Factor X Length = UA
0.303 X 106 = 32.12

Slab on Grade (see Figure 1)

[Instructions](#)

R-10 Fully Insulated

F-Factor X Length = UA
0.360 X 64 = 23.04

Location of Ducts

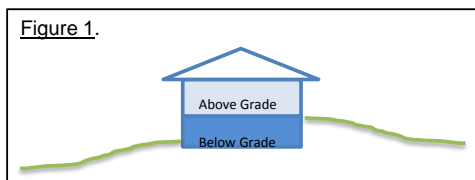
[Instructions](#)

Conditioned Space

Duct Leakage Coefficient

1.00

Figure 1.



Sum of UA	565.70
Envelope Heat Load	25,456 Btu / Hour
<i>Sum of UA x ΔT</i>	
Air Leakage Heat Load	20,349 Btu / Hour
<i>Volume x 0.6 x ΔT x 0.018</i>	
Building Design Heat Load	45,805 Btu / Hour
<i>Air leakage + envelope heat loss</i>	
Building and Duct Heat Load	45,805 Btu / Hour
<i>Ducts in unconditioned space: sum of building heat loss x 1.10</i>	
<i>Ducts in conditioned space: sum of building heat loss x 1</i>	
Maximum Heat Equipment Output	57,257 Btu / Hour
<i>Building and duct heat loss x 1.40 for forced air furnace</i>	
<i>Building and duct heat loss x 1.25 for heat pump</i>	