

# 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](mailto: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

Dickinson residence  
2800 60th Ave. SE, 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 25  
Design Temperature Difference ( $\Delta T$ ) 45  
 $\Delta T = \text{Indoor (70 degrees)} - \text{Outdoor Design Temp}$

### Area of Building

#### Conditioned Floor Area

[Instructions](#)

Conditioned Floor Area (sq ft) 856

#### Average Ceiling Height

[Instructions](#)

Average Ceiling Height (ft) 7.9

Conditioned Volume 6,762

### Glazing and Doors

[Instructions](#)

U-0.30

**U-Factor X Area = UA**  
0.300 X 125 = 37.50

### 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 291 = 6.98

#### Single Rafter or Joist Vaulted Ceilings

[Instructions](#)

Select R-Value

**U-Factor X Area = UA**  
No selection X 0 = --

#### Above Grade Walls (see Figure 1)

[Instructions](#)

R-21 INT plus R-5 ci

**U-Factor X Area = UA**  
0.041 X 1,717 = 70.40

#### Floors

[Instructions](#)

R-30

**U-Factor X Area = UA**  
0.029 X 464 = 13.46

#### Below Grade Walls and Slabs (see Figure 1)

[Instructions](#)

Wall & Slab Select Wall & Slab Insulation

Depth Select nearest slab depth

**Wall U-Factor X Area = UA**  
No Selection X 0 = --

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

#### Slab on Grade (see Figure 1)

[Instructions](#)

Select R-Value

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

### Location of Ducts

[Instructions](#)

Select Location of Ducts

### Duct Leakage Coefficient

No Selection

**Sum of UA** 128.34

**Envelope Heat Load** 5,775 Btu / Hour

Sum of UA x  $\Delta T$

**Air Leakage Heat Load** 3,287 Btu / Hour

Volume x 0.6 x  $\Delta T$  x 0.018

**Building Design Heat Load** 9,062 Btu / Hour

Air leakage + envelope heat loss

**Building and Duct Heat Load** \_\_\_\_\_ 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** \_\_\_\_\_ 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.

