

# 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

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

45

### Area of Building

#### Conditioned Floor Area

Instructions

Conditioned Floor Area (sq ft)

693

#### Average Ceiling Height

Instructions

Average Ceiling Height (ft)

8.5

Conditioned Volume

5,889

### Glazing and Doors

Instructions

U-0.30

U-Factor X Area = UA

0.300 X 200 = 60.03

### Skylights

Instructions

U-Factor X Area = UA

0.50 X 0 = ---

### Insulation

#### Attic

Instructions

R-49

U-Factor X Area = UA

0.026 X 693 = 18.01

#### Single Rafter or Joist Vaulted Ceilings

Instructions

R-38 Vented

U-Factor X Area = UA

0.027 X [ ] = [ ]

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

Instructions

R-21 Intermediate

U-Factor X Area = UA

0.056 X 0 = [ ]

#### Floors

Instructions

R-30

U-Factor X Area = UA

0.029 X 542 = 15.70

#### 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

93.75

Envelope Heat Load

4,219 Btu / Hour

*Sum of UA X  $\Delta T$*

Air Leakage Heat Load

2,862 Btu / Hour

*Volume X 0.6 X  $\Delta T$  X .018*

Building Design Heat Load

7,081 Btu / Hour

*Air Leakage + Envelope Heat Loss*

Building and Duct Heat Load

7,789 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

10,904 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.

