

# Simple Heating System Size: Washington State

This heating system sizing calculator is based on the Prescriptive Requirements of the 2012 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. The glazing (window) and door portion of this calculator assumes the installed glazing and door products have an area weighted average U-factor of 0.30. The incorporated insulation requirements are the minimum prescriptive amounts specified by the 2012 WSEC. 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

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## 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](#)

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)

### Average Ceiling Height

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

Conditioned Volume  
 20,651

## Glazing and Doors

[Instructions](#)

<b>U-Factor</b>	<b>X</b>	<b>Area</b>	<b>=</b>	<b>UA</b>
0.30		<input type="text" value="277"/>		83.10

## Skylights

[Instructions](#)

<b>U-Factor</b>	<b>X</b>	<b>Area</b>	<b>=</b>	<b>UA</b>
0.50		<input type="text" value="0"/>		---

## Insulation

### Attic

[Instructions](#)

<b>U-Factor</b>	<b>X</b>	<b>Area</b>	<b>=</b>	<b>UA</b>
0.026		<input type="text" value="1,950"/>		50.70

### Single Rafter or Joist Vaulted Ceilings

[Instructions](#)

<b>U-Factor</b>	<b>X</b>	<b>Area</b>	<b>=</b>	<b>UA</b>
0.027		<input type="text" value="0"/>		---

### Above Grade Walls (see Figure 1)

[Instructions](#)

<b>U-Factor</b>	<b>X</b>	<b>Area</b>	<b>=</b>	<b>UA</b>
0.056		<input type="text" value="1,541"/>		86.30

### Floors

[Instructions](#)

<b>U-Factor</b>	<b>X</b>	<b>Area</b>	<b>=</b>	<b>UA</b>
0.029		<input type="text" value="1,950"/>		56.55

### Below Grade Walls (see Figure 1)

[Instructions](#)

<b>U-Factor</b>	<b>X</b>	<b>Area</b>	<b>=</b>	<b>UA</b>
---		<input type="text" value="0"/>		---

### Slab Below Grade (see Figure 1)

[Instructions](#)

<b>F-Factor</b>	<b>X</b>	<b>Length</b>	<b>=</b>	<b>UA</b>
---		<input type="text" value="0"/>		---

### Slab on Grade (see Figure 1)

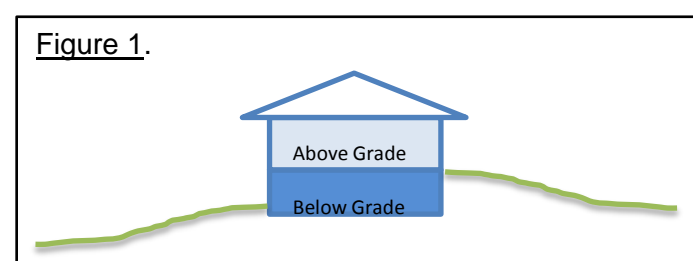
[Instructions](#)

<b>F-Factor</b>	<b>X</b>	<b>Length</b>	<b>=</b>	<b>UA</b>
---		<input type="text" value="0"/>		---

## Location of Ducts

[Instructions](#)

**Duct Leakage Coefficient**  
 1.10



<b>Sum of UA</b>	276.65
<b>Envelope Heat Load</b>	12,449 Btu / Hour
<i>Sum of UA X <math>\Delta T</math></i>	
<b>Air Leakage Heat Load</b>	10,036 Btu / Hour
<i>Volume X 0.6 X <math>\Delta T</math> X .018</i>	
<b>Building Design Heat Load</b>	22,485 Btu / Hour
<i>Air Leakage + Envelope Heat Loss</i>	
<b>Building and Duct Heat Load</b>	24,734 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>	
<b>Maximum Heat Equipment Output</b>	34,627 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>	