



PRMU20240286

### 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

1 Bed End Unit - 3 Story Stack w/ Basement  
 Bradley Heights Apartments  
 Puyallup, WA

#### Contact Information

Milbrandt Architects  
 25 Central Way Suite 210  
 Kirkland, WA 98033 425.454.7130

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 ( $\Delta T$ ) 51  
 $\Delta T = \text{Indoor (70 degrees)} - \text{Outdoor Design Temp}$

#### Area of Building

##### Conditioned Floor Area

Instructions Conditioned Floor Area (sq ft)

##### Average Ceiling Height

Instructions Average Ceiling Height (ft)

##### Conditioned Volume

25,125

#### Glazing and Doors

Instructions

**U-Factor X Area = UA**  
 0.220 X 476 = 104.72

#### Skylights

Instructions

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

#### Insulation

##### Attic

Instructions

**U-Factor X Area = UA**  
 0.026 X 825 = 21.45

##### Single Rafter or Joist Vaulted Ceilings

Instructions

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

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

Instructions

**U-Factor X Area = UA**  
 0.056 X 3,236 = 181.21

##### Floors

Instructions

**U-Factor X Area = UA**  
 --- X --- = ---

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

Instructions

**U-Factor X Area = UA**  
 0.042 X 501 = 21.02

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

Instructions

**F-Factor X Length = UA**  
 0.303 X 0 = ---

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

Instructions

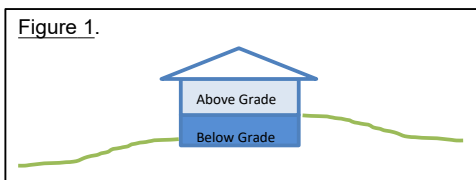
**F-Factor X Length = UA**  
 0.540 X 712 = 384.48

#### Location of Ducts

Instructions

Duct Leakage Coefficient 1.10

Figure 1.



<b>Sum of UA</b>	712.89
<b>Envelope Heat Load</b>	36,357 Btu / Hour
<i>Sum of UA x <math>\Delta T</math></i>	
<b>Air Leakage Heat Load</b>	13,839 Btu / Hour
<i>Volume x 0.6 x <math>\Delta T</math> x 0.018</i>	
<b>Building Design Heat Load</b>	50,196 Btu / Hour
<i>Air leakage + envelope heat loss</i>	
<b>Building and Duct Heat Load</b>	55,216 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>	69,020 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>	

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