



### 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](mailto:energycode@energy.wsu.edu) or (360) 956-2042 for assistance.

#### Project Information

1 Bed End Unit - 3 Story Stack  
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  
19,438

#### Glazing and Doors

Instructions

U-Factor X Area = UA  
0.220 X 357 = 78.54

#### 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 2,624 = 146.96

##### Floors

Instructions

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

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

Instructions

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

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

Instructions

F-Factor X Length = UA  
0.303 X b = ---

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

Instructions

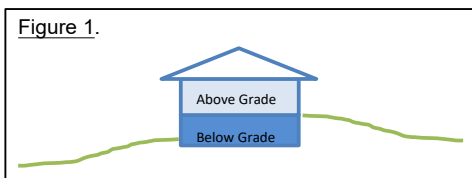
F-Factor X Length = UA  
0.540 X 67 = 36.18

#### Location of Ducts

Instructions

Duct Leakage Coefficient  
1.10

Figure 1.



<b>Sum of UA</b>	283.13
<b>Envelope Heat Load</b>	14,439 Btu / Hour
<i>Sum of UA x <math>\Delta T</math></i>	
<b>Air Leakage Heat Load</b>	10,706 Btu / Hour
<i>Volume x 0.6 x <math>\Delta T</math> x 0.018</i>	
<b>Building Design Heat Load</b>	25,146 Btu / Hour
<i>Air leakage + envelope heat loss</i>	
<b>Building and Duct Heat Load</b>	27,660 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>	34,575 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>	