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.

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 2015 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

Ogden Point Residence - ADU Garage
3675 W Mercer Way
Mercer Island, WA 98040

Contact Information

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 (ΔT) 45
ΔT = Indoor (70 degrees) - Outdoor Design Temp

Area of Building

Conditioned Floor Area

Instructions — Conditioned Floor Area (sq ft): 1,613

Average Ceiling Height

Instructions — Average Ceiling Height (ft): 10.5

Conditioned Volume: 16,969

Glazing and Doors

Instructions

U-Factor	X	Area	=	UA
0.30		815		244.50

Skylights

Instructions

U-Factor	X	Area	=	UA
0.50				---

Insulation

Attic

Instructions — R-49

U-Factor	X	Area	=	UA
0.026		716		18.62

Single Rafter or Joist Vaulted Ceilings

Instructions — Select R-Value

U-Factor	X	Area	UA
No selection			---

Above Grade Walls *(see Figure 1)*

Instructions — R-21 Intermediate

U-Factor	X	Area	UA
0.056		1,421	79.58

Floors

Instructions — Select R-Value

U-Factor	X	Area	UA
No selection			---

Below Grade Walls *(see Figure 1)*

Instructions — R-21 Interior

U-Factor	X	Area	UA
0.042		332	13.94

Slab Below Grade *(see Figure 1)*

Instructions — Select conditioning

F-Factor	X	Length	UA
No selection			---

Slab on Grade *(see Figure 1)*

Instructions — R-10 Perimeter

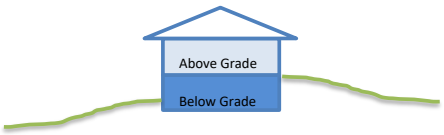
F-Factor	X	Length	UA
0.540		120	64.80

Location of Ducts

Instructions — Unconditioned Space

Duct Leakage Coefficient
1.10

Figure 1.



Sum of UA	421.44	
Envelope Heat Load *Sum of UA X ΔT*	18,965	Btu / Hour
Air Leakage Heat Load *Volume X 0.6 X ΔT X .018*	8,247	Btu / Hour
Building Design Heat Load *Air Leakage + Envelope Heat Loss*	27,211	Btu / Hour
Building and Duct Heat Load *Ducts in unconditioned space: Sum of Building Heat Loss X 1.10* *Ducts in conditioned space: Sum of Building Heat Loss X 1*	29,933	Btu / Hour
Maximum Heat Equipment Output *Building and Duct Heat Loss X 1.40 for Forced Air Furnace* *Building and Duct Heat Loss X 1.25 for Heat Pump*	41,906	Btu / Hour