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.

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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 (ΔT) 45

ΔT = Indoor (70 degrees) - Outdoor Design Temp

Area of Building

Conditioned Floor Area

Instructions — Conditioned Floor Area (sq ft): 3,929

Average Ceiling Height

Instructions — Average Ceiling Height (ft): 11.8

Conditioned Volume: 46,166

Glazing and Doors

Instructions

U-Factor	X	Area	=	UA
0.30		1,657		496.95

Skylights

Instructions

U-Factor	X	Area	=	UA
0.50		21		10.50

Insulation

Attic

Instructions — Select R-Value

U-Factor	X	Area	=	UA
No selection				---

Single Rafter or Joist Vaulted Ceilings

Instructions — R-38 Vented

U-Factor	X	Area	UA
0.027		2,102	56.75

Above Grade Walls *(see Figure 1)*

Instructions — R-21 Intermediate

U-Factor	X	Area	UA
0.056		3,313	185.51

Floors

Instructions — No Floors above unconditioned spaces.

U-Factor	X	Area	UA

Below Grade Walls *(see Figure 1)*

Instructions — R-10 Continuous Exterior

U-Factor	X	Area	UA
0.064		862	55.17

Slab Below Grade *(see Figure 1)*

Instructions — R-5 Thermal Break at slab edge

F-Factor	X	Length	UA
0.570		114	64.70

Slab on Grade *(see Figure 1)*

Instructions — R-10 Fully Insulated

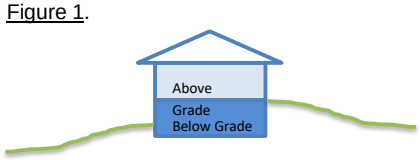
F-Factor	X	Length	UA
0.360		190	68.22

Location of Ducts

Instructions — No Ducts

Duct Leakage Coefficient
1.00

Figure 1.



Sum of UA	937.80	
Envelope Heat Load *Sum of UA X ΔT*	42,201	Btu / Hour
Air Leakage Heat Load *Volume X 0.6 X ΔT X .018*	22,437	Btu / Hour
Building Design Heat Load *Air Leakage + Envelope Heat Loss*	64,638	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*	64,638	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*	90,493	Btu / Hour