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	*Contact Information*
MONAHAN RESIDENCE	H2D ARCHITECTURE + DESIGN
2424 67TH AVE SE	23020 EDMONDS WAY #113
MERCER ISLAND, WA 98040	EDMONDS, WA 98020

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): 811

Average Ceiling Height

Instructions — Average Ceiling Height (ft): 9.0

Conditioned Volume: 7,296

Glazing and Doors

Instructions: U-0.28

U-Factor	X	Area	=	UA
0.280		1,120		313.57

Skylights

Instructions

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

Insulation

Attic

Instructions: R-49

U-Factor	X	Area	=	UA
0.026		827		21.49

Single Rafter or Joist Vaulted Ceilings

Instructions: No Vaulted Ceilings in this project.

U-Factor	X	Area	UA
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Above Grade Walls *(see Figure 1)*

Instructions: R-21 Intermediate

U-Factor	X	Area	UA
0.056		3,221	180.35

Floors

Instructions: R-38

U-Factor	X	Area	UA
0.025		73	1.82

Below Grade Walls *(see Figure 1)*

Instructions: No Below Grade Walls in this project.

U-Factor	X	Area	UA
0.028		0	

Slab Below Grade *(see Figure 1)*

Instructions: No Slab Below Grade in this project.

F-Factor	X	Length	UA
0.303		0	---

Slab on Grade *(see Figure 1)*

Instructions: R-10 Fully Insulated

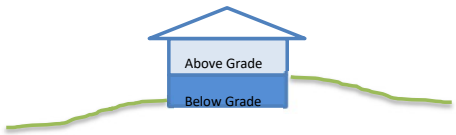
F-Factor	X	Length	UA
0.360		348	125.28

Location of Ducts

Instructions: Unconditioned Space

Duct Leakage Coefficient 1.10

Figure 1.



Sum of UA	642.51	
Envelope Heat Load	28,913	Btu / Hour
Sum of UA x ΔT		
Air Leakage Heat Load	3,546	Btu / Hour
Volume x 0.6 x ΔT x 0.018		
Building Design Heat Load	32,459	Btu / Hour
Air leakage + envelope heat loss		
Building and Duct Heat Load	35,705	Btu / Hour
Ducts in unconditioned space: sum of building heat loss x 1.10		
Ducts in conditioned space: sum of building heat loss x 1		
Maximum Heat Equipment Output	44,631	Btu / Hour
Building and duct heat loss x 1.40 for forced air furnace		
Building and duct heat loss x 1.25 for heat pump		