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

Ehrhardt Remodel
8456 N Mercer Way
Mercer Island, WA 98040

Contact Information

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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

Deisgn Temperature 25

Design Temperature Difference (ΔT) 45

ΔT = Indoor (70 degrees) - Outdoor Design Temp

Area of Building

Conditioned Floor Area

Instructions

Conditioned Floor Area (sq ft): 4,582

Average Ceiling Height

Instructions

Average Ceiling Height (ft): 8.5

Conditioned Volume: 38,947

Glazing and Doors

Instructions

U-0.28

U-Factor	X	Area	=	UA
0.280		876		245.34

Skylights

Instructions

U-Factor	X	Area	=	UA
0.50		64		32.00

Insulation

Attic

Instructions

R-49

U-Factor	X	Area	=	UA
0.026		1,561		40.59

Single Rafter or Joist Vaulted Ceilings

Instructions

R-38 Advanced

U-Factor	X	Area	UA
0.026		1,240	32.24

Above Grade Walls *(see Figure 1)*

Instructions

R-21 Intermediate

U-Factor	X	Area	UA
0.056		2,601	145.66

Floors

Instructions

R-38

U-Factor	X	Area	UA
0.025		891	22.28

Below Grade Walls and Slabs *(see Figure 1)*

Instructions

Wall & Slab: R21 Batt w/TB

Depth: 3.5' depth

Wall U-Factor	X	Area	UA
0.040		713	28.52

Slab F-Factor	X	Length	UA
0.560		216	120.96

Slab on Grade *(see Figure 1)*

Instructions

R-10 Fully Insulated

F-Factor	X	Length	UA
0.360		1,781	641.16

Location of Ducts

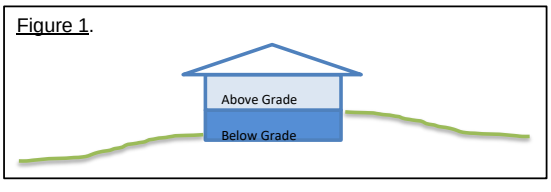
Instructions

Conditioned Space

Duct Leakage Coefficient

1.000

Figure 1.



Sum of UA	1308.73	
Envelope Heat Load	58,893	Btu / Hour
Sum of UA x ΔT		
Air Leakage Heat Load	18,928	Btu / Hour
Volume x 0.6 x ΔT x 0.018		
Building Design Heat Load	77,821	Btu / Hour
Air leakage + envelope heat loss		
Building and Duct Heat Load	77,821	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	97,277	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		