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

Lund Residence Fire Restoration and Addition
8520 SE 82nd ST.
Mercer Island, WA 98040

Contact Information

Rich Design Group, LLC
Rich Melchior
(253) 951-8049

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): 3,915

Average Ceiling Height

Instructions — Average Ceiling Height (ft): 9.0

Conditioned Volume: 35,235

Glazing and Doors

Instructions — U-0.30

U-Factor	X	Area	=	UA
0.300		610		183.09

Skylights

Instructions

U-Factor	X	Area	=	UA
0.50		16		8.00

Insulation

Attic

Instructions — Select R-Value

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

Single Rafter or Joist Vaulted Ceilings

Instructions — R-49 Advanced

U-Factor	X	Area	UA
0.020		737	14.74

Above Grade Walls ***(see Figure 1)***

Instructions — R-21 Intermediate

U-Factor	X	Area	UA
0.056		2,171	121.58

Floors

Instructions — R-30

U-Factor	X	Area	UA
0.029		196	5.68

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

Instructions — R-10 Continuous Exterior

U-Factor	X	Area	UA
0.064		809	51.78

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

Instructions — R-5 Thermal Break at slab edge

F-Factor	X	Length	UA
0.570		83	47.31

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

Instructions — R-10 Perimeter

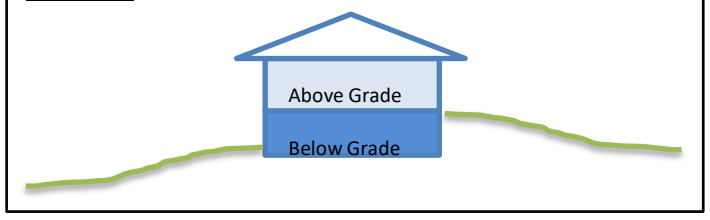
F-Factor	X	Length	UA
0.540		196	105.57

Location of Ducts

Instructions — Conditioned Space

Duct Leakage Coefficient
1.00

Figure 1.



Sum of UA	537.75	
Envelope Heat Load	24,199	Btu / Hour
Sum of UA x ΔT		
Air Leakage Heat Load	17,124	Btu / Hour
Volume x 0.6 x ΔT x 0.018		
Building Design Heat Load	41,323	Btu / Hour
Air leakage + envelope heat loss		
Building and Duct Heat Load	41,323	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	51,653	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		