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)   3,530

Average Ceiling Height
Instructions   Average Ceiling Height (ft)   9.0

Conditioned Volume
31,770

Glazing and Doors
Instructions

	U-Factor	X	Area	=	UA
	0.30		812		243.60

Skylights
Instructions

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

Insulation
Attic
Instructions   R-49 ▼

	U-Factor	X	Area	=	UA
	0.026		1,776		46.18

Single Rafter or Joist Vaulted Ceilings
Instructions   R-38 Vented ▼

	U-Factor	X	Area		UA
	0.027		0		

Above Grade Walls *(see Figure 1)*
Instructions   R-21 Intermediate ▼

	U-Factor	X	Area		UA
	0.056		3,592		201.15

Floors
Instructions   R-38 ▼

	U-Factor	X	Area		UA
	0.025		1,776		44.40

Below Grade Walls *(see Figure 1)*
Instructions   R-21 Interior ▼

	U-Factor	X	Area		UA
	0.042		0		

Slab Below Grade *(see Figure 1)*
Instructions   Select conditioning ▼

	F-Factor	X	Length		UA
	No selection		0		---

Slab on Grade *(see Figure 1)*
Instructions   R-10 Fully Insulated ▼

	F-Factor	X	Length		UA
	0.360		0		

Location of Ducts
Instructions   Conditioned Space ▼

Duct Leakage Coefficient
1.00

Figure 1.

Above Grade

Below Grade

Sum of UA	535.33
Envelope Heat Load *Sum of UA X ΔT*	24,090 Btu / Hour
Air Leakage Heat Load *Volume X 0.6 X ΔT X .018*	15,440 Btu / Hour
Building Design Heat Load *Air Leakage + Envelope Heat Loss*	39,530 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*	39,530 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*	55,342 Btu / Hour
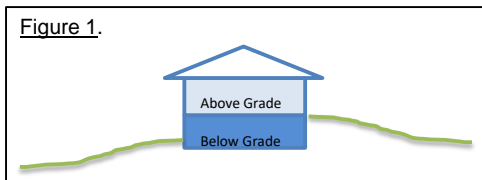
Compatibility Report for WSEC Heat Sizing Specs.xls
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Version

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