

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.

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Project Information

2854 Fairview Ave E
 TH1
 Seattle, WA 98102

Contact Information

Emily Morgan
 Cone Architecture
 morgan@cone-arch.com

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](#)

Seattle: Sea-Tac AP

Design Temperature Difference (ΔT) 46
 $\Delta T = \text{Indoor (70 degrees)} - \text{Outdoor Design Temp}$

Area of Building

Conditioned Floor Area

[Instructions](#)

Conditioned Floor Area (sq ft)

1,070

Average Ceiling Height

[Instructions](#)

Average Ceiling Height (ft)

8.8

Conditioned Volume
 9,363

Glazing and Doors

[Instructions](#)

U-0.28

U-Factor X Area = UA
 0.280 X 353 = 98.84

Skylights

[Instructions](#)

U-Factor X Area = UA
 0.50 X [] = ---

Insulation

Attic

[Instructions](#)

R-49

U-Factor X Area = UA
 0.026 X 348 = 9.05

Single Rafter or Joist Vaulted Ceilings

[Instructions](#)

No Vaulted Ceilings in this project.

U-Factor X Area = UA
 --- X [] = ---

Above Grade Walls (see Figure 1)

[Instructions](#)

R-21 Intermediate

U-Factor X Area = UA
 0.056 X 1,501 = 84.06

Floors

[Instructions](#)

R-38

U-Factor X Area = UA
 0.025 X 368 = 9.20

Below Grade Walls (see Figure 1)

[Instructions](#)

No Below Grade Walls in this project.

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

Slab Below Grade (see Figure 1)

[Instructions](#)

No Slab Below Grade in this project.

F-Factor X Length = UA
 0.303 X [] = ---

Slab on Grade (see Figure 1)

[Instructions](#)

No Slab on Grade in this project.

F-Factor X Length = UA
 --- X [] = ---

Location of Ducts

[Instructions](#)

Conditioned Space

Duct Leakage Coefficient
 1.00

Sum of UA 201.14

Envelope Heat Load 9,253 Btu / Hour
Sum of UA X ΔT

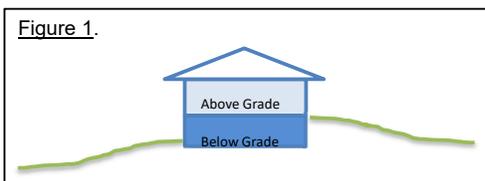
Air Leakage Heat Load 4,651 Btu / Hour
Volume X 0.6 X ΔT X 0.018

Building Design Heat Load 13,904 Btu / Hour
Air Leakage + Envelope Heat Loss

Building and Duct Heat Load 13,904 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 17,380 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*

Figure 1.



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Project Information

2854 Fairview Ave E
 TH2
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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](#)

Seattle: Sea-Tac AP

Design Temperature Difference (ΔT) 46
 $\Delta T = \text{Indoor (70 degrees)} - \text{Outdoor Design Temp}$

Area of Building

Conditioned Floor Area

[Instructions](#)

Conditioned Floor Area (sq ft) 1,070

Average Ceiling Height

[Instructions](#)

Average Ceiling Height (ft) 8.8

Conditioned Volume 9,363

Glazing and Doors

[Instructions](#)

U-0.28

U-Factor X Area = UA
 0.280 X 353 = 98.84

Skylights

[Instructions](#)

U-Factor X Area = UA
 0.50 X [] = ---

Insulation

Attic

[Instructions](#)

R-49

U-Factor X Area = UA
 0.026 X 348 = 9.05

Single Rafter or Joist Vaulted Ceilings

[Instructions](#)

No Vaulted Ceilings in this project.

U-Factor X Area = UA
 --- X [] = ---

Above Grade Walls (see Figure 1)

[Instructions](#)

R-21 Intermediate

U-Factor X Area = UA
 0.056 X 1,501 = 84.06

Floors

[Instructions](#)

R-38

U-Factor X Area = UA
 0.025 X 368 = 9.20

Below Grade Walls (see Figure 1)

[Instructions](#)

No Below Grade Walls in this project.

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

Slab Below Grade (see Figure 1)

[Instructions](#)

No Slab Below Grade in this project.

F-Factor X Length = UA
 0.303 X [] = ---

Slab on Grade (see Figure 1)

[Instructions](#)

No Slab on Grade in this project.

F-Factor X Length = UA
 --- X [] = ---

Location of Ducts

[Instructions](#)

Conditioned Space

Duct Leakage Coefficient 1.00

Sum of UA 201.14

Envelope Heat Load 9,253 Btu / Hour
Sum of UA X ΔT

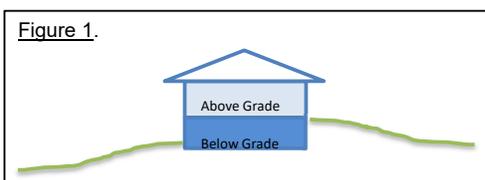
Air Leakage Heat Load 4,651 Btu / Hour
Volume X 0.6 X ΔT X 0.018

Building Design Heat Load 13,904 Btu / Hour
Air Leakage + Envelope Heat Loss

Building and Duct Heat Load 13,904 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 17,380 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*

Figure 1.



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Project Information

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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](#)

Seattle: Sea-Tac AP

Design Temperature Difference (ΔT) 46
 $\Delta T = \text{Indoor (70 degrees)} - \text{Outdoor Design Temp}$

Area of Building

Conditioned Floor Area

[Instructions](#)

Conditioned Floor Area (sq ft)

1,070

Average Ceiling Height

[Instructions](#)

Average Ceiling Height (ft)

8.8

Conditioned Volume
 9,363

Glazing and Doors

[Instructions](#)

U-0.28

U-Factor X Area = UA
 0.280 X 353 = 98.84

Skylights

[Instructions](#)

U-Factor X Area = UA
 0.50 X [] = ---

Insulation

Attic

[Instructions](#)

R-49

U-Factor X Area = UA
 0.026 X 348 = 9.05

Single Rafter or Joist Vaulted Ceilings

[Instructions](#)

No Vaulted Ceilings in this project.

U-Factor X Area = UA
 --- X [] = ---

Above Grade Walls (see Figure 1)

[Instructions](#)

R-21 Intermediate

U-Factor X Area = UA
 0.056 X 1,501 = 84.06

Floors

[Instructions](#)

R-38

U-Factor X Area = UA
 0.025 X 368 = 9.20

Below Grade Walls (see Figure 1)

[Instructions](#)

No Below Grade Walls in this project.

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

Slab Below Grade (see Figure 1)

[Instructions](#)

No Slab Below Grade in this project.

F-Factor X Length = UA
 0.303 X [] = ---

Slab on Grade (see Figure 1)

[Instructions](#)

No Slab on Grade in this project.

F-Factor X Length = UA
 --- X [] = ---

Location of Ducts

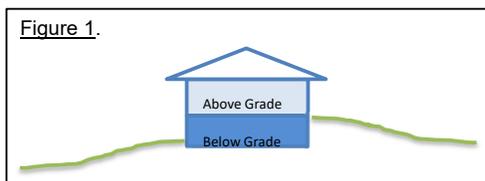
[Instructions](#)

Conditioned Space

Duct Leakage Coefficient
 1.00

Sum of UA	201.14
Envelope Heat Load	9,253 Btu / Hour
<i>Sum of UA X ΔT</i>	
Air Leakage Heat Load	4,651 Btu / Hour
<i>Volume X 0.6 X ΔT X .018</i>	
Building Design Heat Load	13,904 Btu / Hour
<i>Air Leakage + Envelope Heat Loss</i>	
Building and Duct Heat Load	13,904 Btu / Hour
<i>Ducts in unconditioned space: Sum of Building Heat Loss X 1.10</i>	
<i>Ducts in conditioned space: Sum of Building Heat Loss X 1</i>	
Maximum Heat Equipment Output	17,380 Btu / Hour
<i>Building and Duct Heat Loss X 1.40 for Forced Air Furnace</i>	
<i>Building and Duct Heat Loss X 1.25 for Heat Pump</i>	

Figure 1.



Simple Heating System Size: Washington State

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Project Information

2854 Fairview Ave E
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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](#)

Seattle: Sea-Tac AP

Design Temperature Difference (ΔT)
 $\Delta T = \text{Indoor (70 degrees)} - \text{Outdoor Design Temp}$

46

Area of Building

Conditioned Floor Area

[Instructions](#)

Conditioned Floor Area (sq ft)

1,070

Average Ceiling Height

[Instructions](#)

Average Ceiling Height (ft)

8.8

Conditioned Volume

9,363

Glazing and Doors

[Instructions](#)

U-0.28

U-Factor X Area = UA

0.280 X 353 = 98.84

Skylights

[Instructions](#)

U-Factor X Area = UA

0.50 X --- = ---

Insulation

Attic

[Instructions](#)

R-49

U-Factor X Area = UA

0.026 X 348 = 9.05

Single Rafter or Joist Vaulted Ceilings

[Instructions](#)

No Vaulted Ceilings in this project.

U-Factor X Area = UA

--- X --- = ---

Above Grade Walls (see Figure 1)

[Instructions](#)

R-21 Intermediate

U-Factor X Area = UA

0.056 X 1,501 = 84.06

Floors

[Instructions](#)

R-38

U-Factor X Area = UA

0.025 X 368 = 9.20

Below Grade Walls (see Figure 1)

[Instructions](#)

No Below Grade Walls in this project.

U-Factor X Area = UA

0.028 X 0 = 0

Slab Below Grade (see Figure 1)

[Instructions](#)

No Slab Below Grade in this project.

F-Factor X Length = UA

0.303 X --- = ---

Slab on Grade (see Figure 1)

[Instructions](#)

No Slab on Grade in this project.

F-Factor X Length = UA

--- X --- = ---

Location of Ducts

[Instructions](#)

Conditioned Space

Duct Leakage Coefficient

1.00

Sum of UA 201.14

Envelope Heat Load 9,253 Btu / Hour

Sum of UA X ΔT

Air Leakage Heat Load 4,651 Btu / Hour

Volume X 0.6 X ΔT X 0.018

Building Design Heat Load 13,904 Btu / Hour

Air Leakage + Envelope Heat Loss

Building and Duct Heat Load 13,904 Btu / Hour

Ducts in unconditioned space: Sum of Building Heat Loss X 1.10

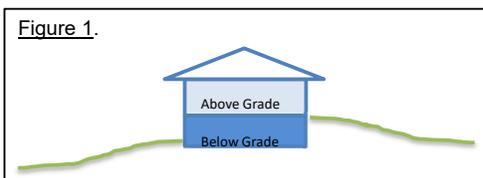
Ducts in conditioned space: Sum of Building Heat Loss X 1

Maximum Heat Equipment Output 17,380 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

Figure 1.



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Contact Information

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Heating System Type: All Other Systems Heat Pump

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Design Temperature

[Instructions](#)

Seattle: Sea-Tac AP

Design Temperature Difference (ΔT) 46
 $\Delta T = \text{Indoor (70 degrees)} - \text{Outdoor Design Temp}$

Area of Building

Conditioned Floor Area

[Instructions](#)

Conditioned Floor Area (sq ft)

1,412

Average Ceiling Height

[Instructions](#)

Average Ceiling Height (ft)

9.0

Conditioned Volume
 12,736

Glazing and Doors

[Instructions](#)

U-0.28

U-Factor X Area = UA
 0.280 X 457 = 127.96

Skylights

[Instructions](#)

U-Factor X Area = UA
 0.50 X [] = ---

Insulation

Attic

[Instructions](#)

R-49

U-Factor X Area = UA
 0.026 X 346 = 9.00

Single Rafter or Joist Vaulted Ceilings

[Instructions](#)

No Vaulted Ceilings in this project.

U-Factor X Area = UA
 --- X [] = ---

Above Grade Walls (see Figure 1)

[Instructions](#)

R-21 Intermediate

U-Factor X Area = UA
 0.056 X 2,239 = 125.38

Floors

[Instructions](#)

R-38

U-Factor X Area = UA
 0.025 X 346 = 8.65

Below Grade Walls (see Figure 1)

[Instructions](#)

No Below Grade Walls in this project.

U-Factor X Area = UA
 0.028 X 390 = 10.92

Slab Below Grade (see Figure 1)

[Instructions](#)

No Slab Below Grade in this project.

F-Factor X Length = UA
 0.303 X 0 = ---

Slab on Grade (see Figure 1)

[Instructions](#)

No Slab on Grade in this project.

F-Factor X Length = UA
 --- X 0 = ---

Location of Ducts

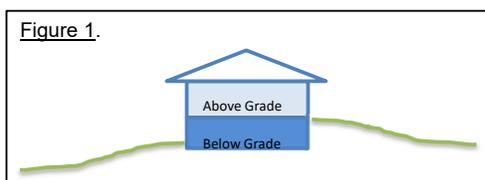
[Instructions](#)

Conditioned Space

Duct Leakage Coefficient
 1.00

Sum of UA	281.91
Envelope Heat Load	12,968 Btu / Hour
<i>Sum of UA X ΔT</i>	
Air Leakage Heat Load	6,327 Btu / Hour
<i>Volume X 0.6 X ΔT X .018</i>	
Building Design Heat Load	19,295 Btu / Hour
<i>Air Leakage + Envelope Heat Loss</i>	
Building and Duct Heat Load	19,295 Btu / Hour
<i>Ducts in unconditioned space: Sum of Building Heat Loss X 1.10</i>	
<i>Ducts in conditioned space: Sum of Building Heat Loss X 1</i>	
Maximum Heat Equipment Output	24,119 Btu / Hour
<i>Building and Duct Heat Loss X 1.40 for Forced Air Furnace</i>	
<i>Building and Duct Heat Loss X 1.25 for Heat Pump</i>	

Figure 1.



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Project Information

2854 Fairview Ave E
 TH6
 Seattle, WA 98102

Contact Information

Emily Morgan
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Heating System Type: All Other Systems Heat Pump

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Design Temperature

[Instructions](#)

Seattle: Sea-Tac AP

Design Temperature Difference (ΔT) 46
 $\Delta T = \text{Indoor (70 degrees)} - \text{Outdoor Design Temp}$

Area of Building

Conditioned Floor Area

[Instructions](#)

Conditioned Floor Area (sq ft) 1,398

Average Ceiling Height

[Instructions](#)

Average Ceiling Height (ft) 9.0 Conditioned Volume 12,582

Glazing and Doors

[Instructions](#)

U-0.28

U-Factor X Area = UA
 0.280 X 378 = 105.84

Skylights

[Instructions](#)

U-Factor X Area = UA
 0.50 X [] = ---

Insulation

Attic

[Instructions](#)

R-49

U-Factor X Area = UA
 0.026 X 350 = 9.10

Single Rafter or Joist Vaulted Ceilings

[Instructions](#)

No Vaulted Ceilings in this project.

U-Factor X Area = UA
 --- X [] = ---

Above Grade Walls (see Figure 1)

[Instructions](#)

R-21 Intermediate

U-Factor X Area = UA
 0.056 X 1,550 = 86.80

Floors

[Instructions](#)

R-38

U-Factor X Area = UA
 0.025 X 350 = 8.75

Below Grade Walls (see Figure 1)

[Instructions](#)

No Below Grade Walls in this project.

U-Factor X Area = UA
 0.028 X 192 = 5.38

Slab Below Grade (see Figure 1)

[Instructions](#)

No Slab Below Grade in this project.

F-Factor X Length = UA
 0.303 X [] = ---

Slab on Grade (see Figure 1)

[Instructions](#)

No Slab on Grade in this project.

F-Factor X Length = UA
 --- X [] = ---

Location of Ducts

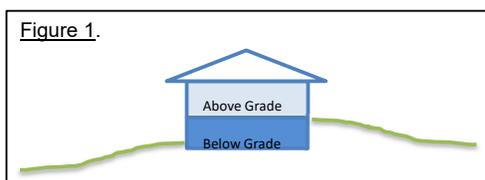
[Instructions](#)

Conditioned Space

Duct Leakage Coefficient 1.00

Sum of UA	215.87
Envelope Heat Load	9,930 Btu / Hour
<i>Sum of UA X ΔT</i>	
Air Leakage Heat Load	6,251 Btu / Hour
<i>Volume X 0.6 X ΔT X .018</i>	
Building Design Heat Load	16,181 Btu / Hour
<i>Air Leakage + Envelope Heat Loss</i>	
Building and Duct Heat Load	16,181 Btu / Hour
<i>Ducts in unconditioned space: Sum of Building Heat Loss X 1.10</i>	
<i>Ducts in conditioned space: Sum of Building Heat Loss X 1</i>	
Maximum Heat Equipment Output	20,226 Btu / Hour
<i>Building and Duct Heat Loss X 1.40 for Forced Air Furnace</i>	
<i>Building and Duct Heat Loss X 1.25 for Heat Pump</i>	

Figure 1.



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 TH7
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Contact Information

Emily Morgan
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Heating System Type: All Other Systems Heat Pump

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Design Temperature

[Instructions](#)

Seattle: Sea-Tac AP

Design Temperature Difference (ΔT) 46
 $\Delta T = \text{Indoor (70 degrees)} - \text{Outdoor Design Temp}$

Area of Building

Conditioned Floor Area

[Instructions](#)

Conditioned Floor Area (sq ft)

1,412

Average Ceiling Height

[Instructions](#)

Average Ceiling Height (ft)

9.0

Conditioned Volume
 12,736

Glazing and Doors

[Instructions](#)

U-0.28

U-Factor X Area = UA
 0.280 X 457 = 127.96

Skylights

[Instructions](#)

U-Factor X Area = UA
 0.50 X [] = ---

Insulation

Attic

[Instructions](#)

R-49

U-Factor X Area = UA
 0.026 X 346 = 9.00

Single Rafter or Joist Vaulted Ceilings

[Instructions](#)

No Vaulted Ceilings in this project.

U-Factor X Area = UA
 --- X [] = ---

Above Grade Walls (see Figure 1)

[Instructions](#)

R-21 Intermediate

U-Factor X Area = UA
 0.056 X 2,239 = 125.38

Floors

[Instructions](#)

R-38

U-Factor X Area = UA
 0.025 X 346 = 8.65

Below Grade Walls (see Figure 1)

[Instructions](#)

No Below Grade Walls in this project.

U-Factor X Area = UA
 0.028 X 390 = 10.92

Slab Below Grade (see Figure 1)

[Instructions](#)

No Slab Below Grade in this project.

F-Factor X Length = UA
 0.303 X 0 = ---

Slab on Grade (see Figure 1)

[Instructions](#)

No Slab on Grade in this project.

F-Factor X Length = UA
 --- X 0 = ---

Location of Ducts

[Instructions](#)

Conditioned Space

Duct Leakage Coefficient
 1.00

Sum of UA	281.91
Envelope Heat Load	12,968 Btu / Hour
<i>Sum of UA X ΔT</i>	
Air Leakage Heat Load	6,327 Btu / Hour
<i>Volume X 0.6 X ΔT X 0.018</i>	
Building Design Heat Load	19,295 Btu / Hour
<i>Air Leakage + Envelope Heat Loss</i>	
Building and Duct Heat Load	19,295 Btu / Hour
<i>Ducts in unconditioned space: Sum of Building Heat Loss X 1.10</i>	
<i>Ducts in conditioned space: Sum of Building Heat Loss X 1</i>	
Maximum Heat Equipment Output	24,119 Btu / Hour
<i>Building and Duct Heat Loss X 1.40 for Forced Air Furnace</i>	
<i>Building and Duct Heat Loss X 1.25 for Heat Pump</i>	

