

## Project Information

For:

Notes:

## Design Information

Weather: Minneapolis/St.paul, MN, US

### Winter Design Conditions

Outside db	-6 °F
Inside db	70 °F
Design TD	76 °F

### Summer Design Conditions

Outside db	88 °F
Inside db	75 °F
Design TD	13 °F
Daily range	M
Relative humidity	50 %
Moisture difference	29 gr/lb

### Heating Summary

Structure	21572 Btuh
Ducts	0 Btuh
Central vent (36 cfm)	1026 Btuh
Humidification	0 Btuh
Piping	0 Btuh
Equipment load	22598 Btuh

### Sensible Cooling Equipment Load Sizing

Structure	13457 Btuh
Ducts	0 Btuh
Central vent (36 cfm)	175 Btuh
Blower	0 Btuh
Use manufacturer's data	n
Rate/swing multiplier	0.93
Equipment sensible load	12678 Btuh

### Infiltration

Method	Simplified
Construction quality	Semi-tight
Fireplaces	1 (Tight)

### Latent Cooling Equipment Load Sizing

Structure	1302 Btuh
Ducts	0 Btuh
Central vent (36 cfm)	444 Btuh
Equipment latent load	1302 Btuh
<b>Equipment Total Load (Sen+Lat)</b>	<b>13980 Btuh</b>
Req. total capacity at 0.70 SHR	1.5 ton

	Heating	Cooling
Area (ft <sup>2</sup> )	2244	2244
Volume (ft <sup>3</sup> )	20196	20196
Air changes/hour	0.22	0.11
Equiv. AVF (cfm)	74	37

### Heating Equipment Summary

Make	n/a
Trade	n/a
Model	n/a
AHRI ref	n/a
Efficiency	n/a
Heating input	
Heating output	0 Btuh
Temperature rise	0 °F
Actual air flow	0 cfm
Air flow factor	0 cfm/Btuh
Static pressure	0 in H2O
Space thermostat	n/a

### Cooling Equipment Summary

Make	n/a
Trade	n/a
Cond	n/a
Coil	n/a
AHRI ref	n/a
Efficiency	n/a
Sensible cooling	0 Btuh
Latent cooling	0 Btuh
Total cooling	0 Btuh
Actual air flow	0 cfm
Air flow factor	0 cfm/Btuh
Static pressure	0 in H2O
Load sensible heat ratio	0

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### Summer Design Conditions

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Inside db	75 °F
Design TD	13 °F
Daily range	M
Relative humidity	50 %
Moisture difference	29 gr/lb

### Heating Summary

Structure	13350 Btuh
Ducts	0 Btuh
Central vent (SER=65% 36 cfm)	1026 Btuh
Energy recovery	
Humidification	0 Btuh
Piping	0 Btuh
Equipment load	14377 Btuh

### Sensible Cooling Equipment Load Sizing

Structure	9844 Btuh
Ducts	0 Btuh
Central vent (SER=65% 36 cfm)	175 Btuh
Energy recovery	
Blower	0 Btuh
Use manufacturer's data	n
Rate/swing multiplier	0.93
Equipment sensible load	9317 Btuh

### Infiltration

Method	Simplified
Construction quality	Semi-tight
Fireplaces	1 (Tight)

### Latent Cooling Equipment Load Sizing

Structure	1006 Btuh
Ducts	0 Btuh
Central vent (LER=35% 36 cfm)	444 Btuh
Energy recovery	
Equipment latent load	1450 Btuh

	Heating	Cooling
Area (ft <sup>2</sup> )	1356	1356
Volume (ft <sup>3</sup> )	12204	12204
Air changes/hour	0.21	0.11
Equiv. AVF (cfm)	43	21

<b>Equipment Total Load (Sen+Lat)</b>	10767 Btuh
Req. total capacity at 0.70 SHR	1.1 ton

### Heating Equipment Summary

Make	Generic
Trade	
Model	SEER 15.0, HSPF 8.5
AHRI ref	
Efficiency	8.5 HSPF
Heating input	
Heating output	13244 Btuh @ 47°F
Temperature rise	28 °F
Actual air flow	444 cfm
Air flow factor	0.033 cfm/Btuh
Static pressure	0 in H2O
Space thermostat	
Capacity balance point = 7 °F	

### Cooling Equipment Summary

Make	Generic
Trade	
Cond	SEER 15.0, HSPF 8.5
Coil	
AHRI ref	
Efficiency	12.8 EER, 15 SEER
Sensible cooling	9317 Btuh
Latent cooling	3993 Btuh
Total cooling	13310 Btuh
Actual air flow	444 cfm
Air flow factor	0.045 cfm/Btuh
Static pressure	0 in H2O
Load sensible heat ratio	0.87

Backup:  
 Input = 4 kW, Output = 14028 Btuh, 100 AFUE

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Inside db	70 °F
Design TD	76 °F

### Summer Design Conditions

Outside db	88 °F
Inside db	75 °F
Design TD	13 °F
Daily range	M
Relative humidity	50 %
Moisture difference	29 gr/lb

### Heating Summary

Structure	2756 Btuh
Ducts	0 Btuh
Central vent (0 cfm)	0 Btuh
(none)	
Humidification	0 Btuh
Piping	0 Btuh
Equipment load	2756 Btuh

### Sensible Cooling Equipment Load Sizing

Structure	1630 Btuh
Ducts	0 Btuh
Central vent (0 cfm)	0 Btuh
(none)	
Blower	0 Btuh
Use manufacturer's data	n
Rate/swing multiplier	0.93
Equipment sensible load	1516 Btuh

### Infiltration

Method	Simplified
Construction quality	Semi-tight
Fireplaces	1 (Tight)

	Heating	Cooling
Area (ft <sup>2</sup> )	430	430
Volume (ft <sup>3</sup> )	3870	3870
Air changes/hour	0.17	0.08
Equiv. AVF (cfm)	11	5

### Latent Cooling Equipment Load Sizing

Structure	101 Btuh
Ducts	0 Btuh
Central vent (0 cfm)	0 Btuh
(none)	
Equipment latent load	101 Btuh

<b>Equipment Total Load (Sen+Lat)</b>	1617 Btuh
Req. total capacity at 0.70 SHR	0.2 ton

### Heating Equipment Summary

Make	
Trade	
Model	
AHRI ref	
Efficiency	80 AFUE
Heating input	0 Btuh
Heating output	0 Btuh
Temperature rise	0 °F
Actual air flow	76 cfm
Air flow factor	0.028 cfm/Btuh
Static pressure	0 in H2O
Space thermostat	

### Cooling Equipment Summary

Make	
Trade	
Cond	
Coil	
AHRI ref	
Efficiency	0 SEER
Sensible cooling	0 Btuh
Latent cooling	0 Btuh
Total cooling	0 Btuh
Actual air flow	76 cfm
Air flow factor	0.047 cfm/Btuh
Static pressure	0 in H2O
Load sensible heat ratio	0.94

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Inside db	70 °F
Design TD	76 °F

### Summer Design Conditions

Outside db	88 °F
Inside db	75 °F
Design TD	13 °F
Daily range	M
Relative humidity	50 %
Moisture difference	29 gr/lb

### Heating Summary

Structure	3492 Btuh
Ducts	0 Btuh
Central vent (0 cfm) (none)	0 Btuh
Humidification	0 Btuh
Piping	0 Btuh
Equipment load	3492 Btuh

### Sensible Cooling Equipment Load Sizing

Structure	1582 Btuh
Ducts	0 Btuh
Central vent (0 cfm) (none)	0 Btuh
Blower	0 Btuh
Use manufacturer's data	n
Rate/swing multiplier	0.93
Equipment sensible load	1472 Btuh

### Infiltration

Method	Simplified
Construction quality	Semi-tight
Fireplaces	1 (Tight)

	Heating	Cooling
Area (ft <sup>2</sup> )	248	248
Volume (ft <sup>3</sup> )	2234	2234
Air changes/hour	0.37	0.18
Equiv. AVF (cfm)	14	7

### Latent Cooling Equipment Load Sizing

Structure	130 Btuh
Ducts	0 Btuh
Central vent (0 cfm) (none)	0 Btuh
Equipment latent load	130 Btuh
<b>Equipment Total Load (Sen+Lat)</b>	<b>1601 Btuh</b>
Req. total capacity at 0.70 SHR	0.2 ton

### Heating Equipment Summary

Make	
Trade	
Model	
AHRI ref	
Efficiency	80 AFUE
Heating input	0 Btuh
Heating output	0 Btuh
Temperature rise	0 °F
Actual air flow	74 cfm
Air flow factor	0.021 cfm/Btuh
Static pressure	0 in H2O
Space thermostat	

### Cooling Equipment Summary

Make	
Trade	
Cond	
Coil	
AHRI ref	
Efficiency	0 SEER
Sensible cooling	0 Btuh
Latent cooling	0 Btuh
Total cooling	0 Btuh
Actual air flow	74 cfm
Air flow factor	0.047 cfm/Btuh
Static pressure	0 in H2O
Load sensible heat ratio	0.92

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Inside db	70 °F
Design TD	76 °F

### Summer Design Conditions

Outside db	88 °F
Inside db	75 °F
Design TD	13 °F
Daily range	M
Relative humidity	50 %
Moisture difference	29 gr/lb

### Heating Summary

Structure	1974 Btuh
Ducts	0 Btuh
Central vent (0 cfm) (none)	0 Btuh
Humidification	0 Btuh
Piping	0 Btuh
Equipment load	1974 Btuh

### Sensible Cooling Equipment Load Sizing

Structure	715 Btuh
Ducts	0 Btuh
Central vent (0 cfm) (none)	0 Btuh
Blower	0 Btuh
Use manufacturer's data	n
Rate/swing multiplier	0.93
Equipment sensible load	665 Btuh

### Infiltration

Method	Simplified
Construction quality	Semi-tight
Fireplaces	1 (Tight)

	Heating	Cooling
Area (ft <sup>2</sup> )	210	210
Volume (ft <sup>3</sup> )	1888	1888
Air changes/hour	0.22	0.11
Equiv. AVF (cfm)	7	3

### Latent Cooling Equipment Load Sizing

Structure	65 Btuh
Ducts	0 Btuh
Central vent (0 cfm) (none)	0 Btuh
Equipment latent load	65 Btuh

<b>Equipment Total Load (Sen+Lat)</b>	730 Btuh
Req. total capacity at 0.70 SHR	0.1 ton

### Heating Equipment Summary

Make	
Trade	
Model	
AHRI ref	
Efficiency	80 AFUE
Heating input	0 Btuh
Heating output	0 Btuh
Temperature rise	0 °F
Actual air flow	33 cfm
Air flow factor	0.017 cfm/Btuh
Static pressure	0 in H2O
Space thermostat	

### Cooling Equipment Summary

Make	
Trade	
Cond	
Coil	
AHRI ref	
Efficiency	0 SEER
Sensible cooling	0 Btuh
Latent cooling	0 Btuh
Total cooling	0 Btuh
Actual air flow	33 cfm
Air flow factor	0.047 cfm/Btuh
Static pressure	0 in H2O
Load sensible heat ratio	0.92

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