

Residential System Sizing Calculation

Summary

Primosch Res

Project Title:
210492 Primosch

Lake City, FL

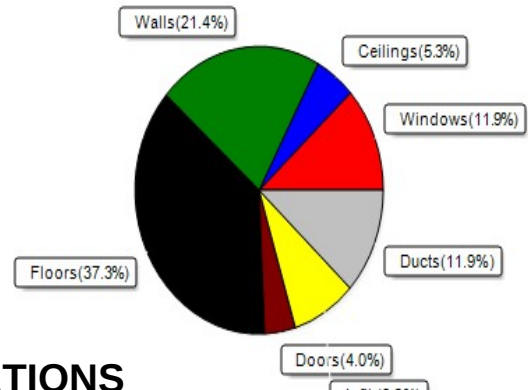
2021-04-05

Location for weather data: Gainesville, FL - Defaults: Latitude(29.7) Altitude(152 ft.) Temp Range(M)			
Humidity data: Interior RH (50%) Outdoor wet bulb (77F) Humidity difference(51gr.)			
Winter design temperature(TMY3 99%)	30 F	Summer design temperature(TMY3 99%)	94 F
Winter setpoint	70 F	Summer setpoint	75 F
Winter temperature difference	40 F	Summer temperature difference	19 F
Total heating load calculation	25451 Btuh	Total cooling load calculation	23251 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	106.1 27000	Sensible (SHR = 0.75)	100.9 20250
Heat Pump + Auxiliary(0.0kW)	106.1 27000	Latent	212.8 6750
		Total (Electric Heat Pump)	116.1 27000

WINTER CALCULATIONS

Winter Heating Load (for 1283 sqft)

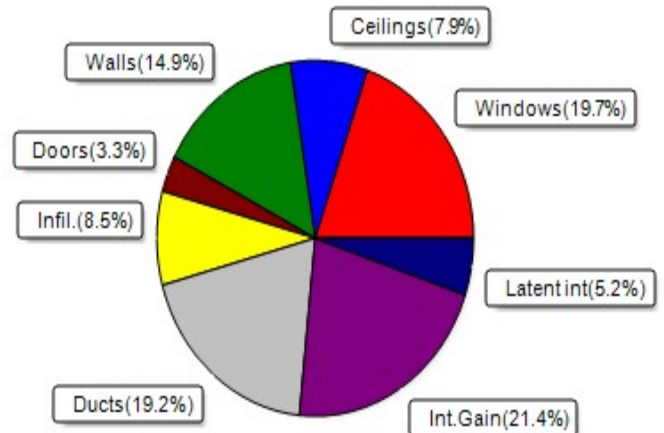
Load component		Load	
Window total	252 sqft	3018	Btuh
Wall total	1534 sqft	5446	Btuh
Door total	64 sqft	1024	Btuh
Ceiling total	1332 sqft	1352	Btuh
Floor total	See detail report	9487	Btuh
Infiltration	48 cfm	2087	Btuh
Duct loss		3036	Btuh
Subtotal		25451	Btuh
Ventilation	0 cfm	0	Btuh
TOTAL HEAT LOSS		25451	Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 1283 sqft)

Load component		Load	
Window total	252 sqft	4573	Btuh
Wall total	1534 sqft	3472	Btuh
Door total	64 sqft	768	Btuh
Ceiling total	1332 sqft	1826	Btuh
Floor total		0	Btuh
Infiltration	36 cfm	743	Btuh
Internal gain		4980	Btuh
Duct gain		3717	Btuh
Sens. Ventilation	0 cfm	0	Btuh
Blower Load		0	Btuh
Total sensible gain		20079	Btuh
Latent gain(ducts)		738	Btuh
Latent gain(infiltration)		1234	Btuh
Latent gain(ventilation)		0	Btuh
Latent gain(internal/occupants/other)		1200	Btuh
Total latent gain		3172	Btuh
TOTAL HEAT GAIN		23251	Btuh



8th Edition

EnergyGauge® System Sizing
PREPARED BY: Evan Beamsley
DATE: 2021-04-05

System Sizing Calculations - Winter

Residential Load - Room by Room Component Details

Primosch Res
Lake City, FL

Project Title:
210492 Primosch
Building Type: User

2021-04-05

Reference City: Gainesville, FL (Defaults) Winter Temperature Difference: 40.0 F (TMY3 99%)
This calculation is for Worst Case. The house has been rotated 225 degrees.

Component Loads for Room #1: Main House

Window	Panes/Type	Frame	U	Orientation	Area(sqft)	X	HTM=	Load
1	2, NFRC 0.20	Metal	0.30	NW	10.0		12.0	120 Btuh
2	2, NFRC 0.20	Metal	0.30	SW	72.0		12.0	864 Btuh
3	2, NFRC 0.20	Metal	0.30	NW	10.0		12.0	120 Btuh
4	2, NFRC 0.20	Metal	0.30	NW	4.0		12.0	48 Btuh
5	2, NFRC 0.20	Metal	0.30	NW	7.5		12.0	90 Btuh
6	2, NFRC 0.20	Metal	0.30	NE	72.0		12.0	864 Btuh
7	2, NFRC 0.20	Metal	0.30	SE	8.0		12.0	96 Btuh
	Window Total				183.5(sqft)			2202 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	63		3.55	224 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	26		3.55	92 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	89		3.55	314 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	26		3.55	92 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	95		3.55	336 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	243		3.55	862 Btuh
7	Frame - Wood	- Ext	(0.089)	13.0/0.0	246		3.55	873 Btuh
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	246		3.55	874 Btuh
	Wall Total				1033(sqft)			3667 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior, n		(0.400)		24		16.0	384 Btuh
2	Insulated - Exterior, n		(0.400)		24		16.0	384 Btuh
	Door Total				48(sqft)			768Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load
1	Vented Attic/D/Shing		(0.025)	38.0/0.0	1147		1.0	1164 Btuh
	Ceiling Total				1147(sqft)			1164Btuh
Floors	Type		Ueff.	R-Value	Size	X	HTM=	Load
1	Slab On Grade		(1.180)	0.0	141.0 ft(perim.)		47.2	6655 Btuh
	Floor Total				1098 sqft			6655 Btuh
	Room Envelope Subtotal:							14457 Btuh
Infiltration	Type	Wholehouse	ACH	Room Volume	Wall Ratio		CFM=	Load
	Natural		0.23	10321	0.67		32.1	1405 Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic) (DLM of 0.135)							2149 Btuh
Room #1	Sensible Room Subtotal							18011 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Primosch Res
Lake City, FL

Project Title:
210492 Primosch
Building Type: User

2021-04-05

Component Loads for Room #2: Office								
Window	Panes/Type	Frame	U	Orientation	Area(sqft)	X	HTM=	Load
8	2, NFRC 0.20	Metal	0.30	SW	30.0		12.0	360 Btuh
9	2, NFRC 0.20	Metal	0.30	NW	6.0		12.0	72 Btuh
10	2, NFRC 0.20	Metal	0.30	SE	32.0		12.0	384 Btuh
	Window Total				68.0(sqft)			816 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
9	Frame - Wood	- Ext	(0.089)	13.0/0.0	165		3.55	586 Btuh
10	Frame - Wood	- Ext	(0.089)	13.0/0.0	92		3.55	325 Btuh
11	Frame - Wood	- Ext	(0.089)	13.0/0.0	195		3.55	692 Btuh
12	Frame - Wood	- Ext	(0.089)	13.0/0.0	50		3.55	176 Btuh
	Wall Total				501(sqft)			1779 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
3	Insulated - Exterior, n		(0.400)		16		16.0	256 Btuh
	Door Total				16(sqft)			256Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load
2	Vented Attic/D/Shing		(0.025)	38.0/0.0	185		1.0	188 Btuh
	Ceiling Total				185(sqft)			188Btuh
Floors	Type		Ueff.	R-Value	Size	X	HTM=	Load
2	Slab On Grade		(1.180)	0.0	60.0 ft(perim.)		47.2	2832 Btuh
	Floor Total				185 sqft			2832 Btuh
	Room Envelope Subtotal:							5871 Btuh
Infiltration	Type	Wholehouse	ACH	Room Volume	Wall Ratio	CFM=		
	Natural		0.23	1850	0.33	15.6		682 Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic)						(DLM of 0.135)	888 Btuh
Room #2	Sensible Room Subtotal							7440 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Primosch Res
Lake City, FL

Project Title:
210492 Primosch
Building Type: User

2021-04-05

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss	25451 Btuh
	Ventilation Sensible Heat Loss	0 Btuh
	Total Heat Loss	25451 Btuh

EQUIPMENT

1. Electric Heat Pump	#	27000 Btuh
-----------------------	---	------------

Key: Window types - NFRC (Requires U-Factor and Shading coefficient(SHGC) of glass as numerical values)
or - Glass as 'Clear' or 'Tint' (Uses U-Factor and SHGC defaults)
U - (Window U-Factor)
HTM - (ManualJ Heat Transfer Multiplier)



Version 8

System Sizing Calculations - Summer

Residential Load - Room by Room Component Details

Primosch Res

Project Title:
210492 Primosch

Lake City, FL

2021-04-05

Reference City: Gainesville, FL

Temperature Difference: 19.0F(TMY3 99%)

Humidity difference: 51gr.

This calculation is for Worst Case. The house has been rotated 225 degrees.

Component Loads for Room #1: Main House

Window	Type*					Overhang		Window Area(sqft)			HTM		Load				
	Panes	SHGC	U	InSh	IS Ornt	Len	Hgt	Gross	Shaded	Unshaded	Shaded	Unshaded					
1	2 NFRC	0.20, 0.30	No	No	NW	7.0ft	0.5ft	10.0	0.0	10.0	10	19	191	Btuh			
2	2 NFRC	0.20, 0.30	No	No	SW	8.0ft	0.0ft	72.0	72.0	0.0	10	20	713	Btuh			
3	2 NFRC	0.20, 0.30	No	No	NW	99.0f	0.5ft	10.0	0.0	10.0	10	19	191	Btuh			
4	2 NFRC	0.20, 0.30	No	No	NW	99.0f	1.5ft	4.0	0.0	4.0	10	19	77	Btuh			
5	2 NFRC	0.20, 0.30	No	No	NW	99.0f	1.5ft	7.5	0.0	7.5	10	19	144	Btuh			
6	2 NFRC	0.20, 0.30	No	No	NE	9.5ft	0.5ft	72.0	0.0	72.0	10	19	1378	Btuh			
7	2 NFRC	0.20, 0.30	No	No	SE	1.5ft	7.5ft	8.0	0.0	8.0	10	20	160	Btuh			
	Window Total								184 (sqft)					2855	Btuh		
Walls	Type	U-Value					R-Value		Area(sqft)		HTM		Load				
							Cav/Sheath										
1	Frame - Wood - Ext	0.09					13.0/0.0		63.0		2.3		143		Btuh		
2	Frame - Wood - Ext	0.09					13.0/0.0		26.0		2.3		59		Btuh		
3	Frame - Wood - Ext	0.09					13.0/0.0		88.5		2.3		200		Btuh		
4	Frame - Wood - Ext	0.09					13.0/0.0		26.0		2.3		59		Btuh		
5	Frame - Wood - Ext	0.09					13.0/0.0		94.5		2.3		214		Btuh		
6	Frame - Wood - Ext	0.09					13.0/0.0		242.8		2.3		549		Btuh		
7	Frame - Wood - Ext	0.09					13.0/0.0		246.0		2.3		557		Btuh		
8	Frame - Wood - Ext	0.09					13.0/0.0		246.3		2.3		557		Btuh		
	Wall Total								1033 (sqft)					2338	Btuh		
Doors	Type								Area (sqft)		HTM		Load				
1	Insulated - Exterior								24.0		12.0		288		Btuh		
2	Insulated - Exterior								24.0		12.0		288		Btuh		
	Door Total								48 (sqft)					576	Btuh		
Ceilings	Type/Color/Surface	U-Value					R-Value		Area(sqft)		HTM		Load				
1	Vented Attic/DarkShingle	0.025					38.0/0.0		1147.0		1.37		1572		Btuh		
	Ceiling Total								1147 (sqft)					1572	Btuh		
Floors	Type						R-Value		Size		HTM		Load				
1	Slab On Grade						0.0		1098 (ft-perimeter)		0.0		0		Btuh		
	Floor Total								1098.0 (sqft)					0	Btuh		
	Zone Envelope Subtotal:												7341		Btuh		
Infiltration	Type	Wholehouse ACH					Volume(cuft)		Wall Ratio		CFM=		Load				
	Natural	0.18					10321		0.67		24.1		501		Btuh		
Internal gain		Occupants					Btuh/occupant		Appliance		Load						
		4					X 230		+		2400		3320		Btuh		
	Sensible Envelope Load:												11161		Btuh		
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic)												(DGM of 0.227)		2535		Btuh
	Sensible Zone Load												13697		Btuh		

Manual J Summer Calculations

Residential Load - Component Details (continued)

Primosch Res
Lake City, FL

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
210492 Primosch

2021-04-05

Component Loads for Room #2: Office

Window	Type*						Overhang		Window Area(sqft)			HTM		Load	
	Panes	SHGC	U	InSh	IS	Ornt	Len	Hgt	Gross	Shaded	Unshaded	Shaded	Unshaded		
8	2 NFRC	0.20, 0.30	No	No	SW		1.5ft	1.5ft	30.0	5.8	24.2	10	20	542 Btuh	
9	2 NFRC	0.20, 0.30	No	No	NW		1.5ft	4.0ft	6.0	0.0	6.0	10	19	115 Btuh	
10	2 NFRC	0.20, 0.30	No	No	SE		99.0f	2.0ft	32.0	32.0	0.0	10	20	317 Btuh	
Window Total									68 (sqft)					974 Btuh	
Walls	Type						U-Value		R-Value		Area(sqft)		HTM		Load
									Cav/Sheath						
9	Frame - Wood - Ext						0.09		13.0/0.0		165.0		2.3		373 Btuh
10	Frame - Wood - Ext						0.09		13.0/0.0		91.5		2.3		207 Btuh
11	Frame - Wood - Ext						0.09		13.0/0.0		195.0		2.3		441 Btuh
12	Frame - Wood - Ext						0.09		13.0/0.0		49.5		2.3		112 Btuh
Wall Total									501 (sqft)					1134 Btuh	
Doors	Type								Area (sqft)		HTM		Load		
3	Insulated - Exterior								16.0		12.0		192 Btuh		
Door Total									16 (sqft)					192 Btuh	
Ceilings	Type/Color/Surface						U-Value		R-Value		Area(sqft)		HTM		Load
2	Vented Attic/DarkShingle						0.025		38.0/0.0		185.0		1.37		254 Btuh
Ceiling Total									185 (sqft)					254 Btuh	
Floors	Type								R-Value		Size		HTM		Load
2	Slab On Grade								0.0		185 (ft-perimeter)		0.0		0 Btuh
Floor Total									185.0 (sqft)					0 Btuh	
	Zone Envelope Subtotal:													2553 Btuh	
Infiltration	Type						Wholehouse ACH		Volume(cuft)		Wall Ratio		CFM=		Load
	Natural						0.18		1850		0.33		11.7		
Internal gain							Occupants		Btuh/occupant		Appliance		Load		
							2		X 230		+		1200		1660 Btuh
	Sensible Envelope Load:													4456 Btuh	
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic) (DGM of 0.227)													1012 Btuh	
	Sensible Zone Load													5469 Btuh	

The following window Excursion will be assigned to the system loads.

Windows	July excursion for System 1	Excursion Subtotal:	745 Btuh
			745 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Primosch Res

Project Title:
210492 Primosch

Climate:FL_GAINESVILLE_REGIONAL_A

Lake City, FL

2021-04-05

Duct load		169 Btuh
	Sensible Excursion Load	914 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Primosch Res
Lake City, FL

Project Title:
210492 Primosch

Climate:FL_GAINESVILLE_REGIONAL_A

2021-04-05

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	16362 Btuh
	Sensible Duct Load	3717 Btuh
	Total Sensible Zone Loads	20079 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	20079 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	1234 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	738 Btuh
	Latent occupant gain (6.0 people @ 200 Btuh per person)	1200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	3172 Btuh
	TOTAL GAIN	23251 Btuh

EQUIPMENT

1. Central Unit	#	27000 Btuh
-----------------	---	------------

*Key: Window types (Panels - Number and type of panes of glass)
(SHGC - Shading coefficient of glass as SHGC numerical value)
(U - Window U-Factor)
(InSh - Interior shading device: none(No), Blinds(B), Draperies(D) or Roller Shades(R))
- For Blinds: Assume medium color, half closed
For Draperies: Assume medium weave, half closed
For Roller shades: Assume translucent, half closed
(IS - Insect screen: none(N), Full(F) or Half(½))
(Ornt - compass orientation)



Version 8