

Residential System Sizing Calculation

Summary

Spec House
Lake City, FL

Project Title:
201364 Sunset Lot 6

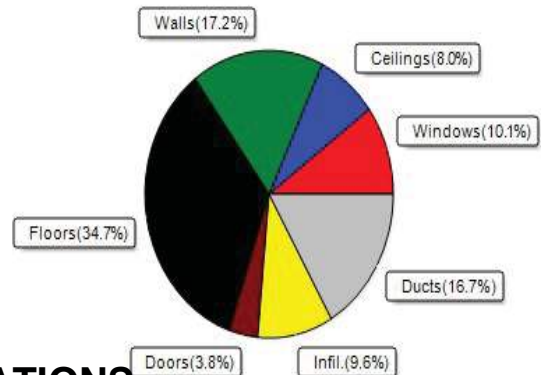
2020-12-16

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	22718 Btuh	Total cooling load calculation	20538 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	110.0 25000	Sensible (SHR = 0.75)	109.5 18750
Heat Pump + Auxiliary(0.0kW)	110.0 25000	Latent	182.7 6250
		Total (Electric Heat Pump)	121.7 25000

WINTER CALCULATIONS

Winter Heating Load (for 1600 sqft)

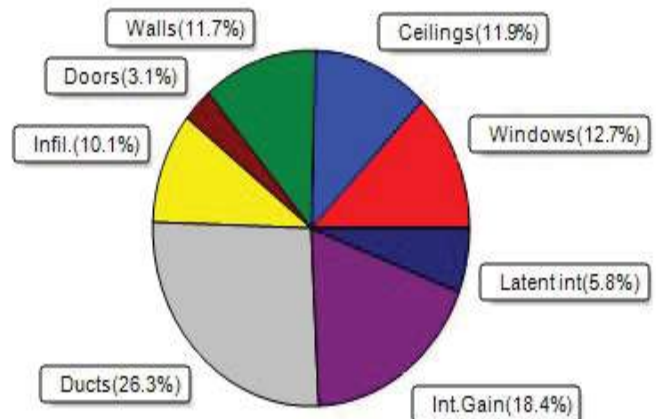
Load component	Load
Window total 179 sqft	2291 Btuh
Wall total 1101 sqft	3909 Btuh
Door total 53 sqft	853 Btuh
Ceiling total 1780 sqft	1807 Btuh
Floor total 1600 sqft	7882 Btuh
Infiltration 50 cfm	2186 Btuh
Duct loss	3789 Btuh
Subtotal	22718 Btuh
Ventilation 0 cfm	0 Btuh
TOTAL HEAT LOSS	22718 Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 1600 sqft)

Load component	Load
Window total 179 sqft	2602 Btuh
Wall total 1101 sqft	2403 Btuh
Door total 53 sqft	640 Btuh
Ceiling total 1780 sqft	2440 Btuh
Floor total	0 Btuh
Infiltration 37 cfm	779 Btuh
Internal gain	3780 Btuh
Duct gain	4472 Btuh
Sens. Ventilation 0 cfm	0 Btuh
Blower Load	0 Btuh
Total sensible gain	17116 Btuh
Latent gain(ducts)	929 Btuh
Latent gain(infiltration)	1292 Btuh
Latent gain(ventilation)	0 Btuh
Latent gain(internal/occupants/other)	1200 Btuh
Total latent gain	3421 Btuh
TOTAL HEAT GAIN	20538 Btuh



8th Edition

EnergyGauge® System Sizing
PREPARED BY: Evan Beamsley
DATE: 2020-12-16

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Spec House
Lake City, FL

Project Title:
201364 Sunset Lot 6
Building Type: User

2020-12-16

Reference City: Gainesville, FL (Defaults) Winter Temperature Difference: 40.0 F (TMY3 99%)

Component Loads for Whole House

Window	Panes/Type	Frame	U	Orientation	Area(sqft)	X	HTM=	Load
1	2, NFRC 0.22	Metal	0.32	N	15.0		12.8	192 Btuh
2	2, NFRC 0.22	Metal	0.32	N	26.7		12.8	341 Btuh
3	2, NFRC 0.22	Metal	0.32	N	45.0		12.8	576 Btuh
4	2, NFRC 0.22	Metal	0.32	E	5.3		12.8	68 Btuh
5	2, NFRC 0.22	Metal	0.32	S	15.0		12.8	192 Btuh
6	2, NFRC 0.22	Metal	0.32	S	36.0		12.8	461 Btuh
7	2, NFRC 0.22	Metal	0.32	W	16.0		12.8	205 Btuh
8	2, NFRC 0.22	Metal	0.32	W	20.0		12.8	256 Btuh
	Window Total				179.0(sqft)			2291 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	77		3.55	273 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	83		3.55	293 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	167		3.55	593 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	235		3.55	833 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	100		3.55	356 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	36		3.55	128 Btuh
7	Frame - Wood	- Ext	(0.089)	13.0/0.0	46		3.55	163 Btuh
8	Frame - Wood	- Adj	(0.089)	13.0/0.0	153		3.55	544 Btuh
9	Frame - Wood	- Ext	(0.089)	13.0/0.0	204		3.55	724 Btuh
	Wall Total				1101(sqft)			3909 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior, n		(0.400)		13		16.0	213 Btuh
2	Insulated - Exterior, n		(0.400)		20		16.0	320 Btuh
3	Insulated - Garage, n		(0.400)		20		16.0	320 Btuh
	Door Total				53(sqft)			853Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load
1	Vented Attic/D/Shing		(0.025)	38.0/0.0	1780		1.0	1807 Btuh
	Ceiling Total				1780(sqft)			1807Btuh
Floors	Type		Ueff.	R-Value	Size	X	HTM=	Load
1	Slab On Grade		(1.180)	0.0	167.0 ft(perim.)		47.2	7882 Btuh
	Floor Total				1600 sqft			7882 Btuh
	Envelope Subtotal:							16743 Btuh
Infiltration	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio	CFM=		Load
	Natural		0.23	13280	1.00	49.9		2186 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.200)							3789 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Spec House
Lake City, FL

Project Title:
201364 Sunset Lot 6
Building Type: User

2020-12-16

All Zones	Sensible Subtotal All Zones	22718 Btuh
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WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	22718 Btuh 0 Btuh 22718 Btuh
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EQUIPMENT

1. Electric Heat Pump	#	25000 Btuh
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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 - Whole House Component Details

Spec House

Project Title:
201364 Sunset Lot 6

Lake City, FL

2020-12-16

Reference City: Gainesville, FL

Temperature Difference: 19.0F(TMY3 99%)

Humidity difference: 51gr.

Component Loads for Whole 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	0.22, 0.32	No	No	N		1.5ft	2.0ft	15.0	0.0	15.0	11	11	161	Btuh	
2	2 NFRC	0.22, 0.32	No	No	N		11.2f	1.0ft	26.7	0.0	26.7	11	11	286	Btuh	
3	2 NFRC	0.22, 0.32	No	No	N		1.5ft	2.0ft	45.0	0.0	45.0	11	11	482	Btuh	
4	2 NFRC	0.22, 0.32	No	No	E		1.5ft	2.0ft	5.3	0.0	5.3	11	27	146	Btuh	
5	2 NFRC	0.22, 0.32	No	No	S		6.5ft	1.0ft	15.0	15.0	0.0	11	12	161	Btuh	
6	2 NFRC	0.22, 0.32	No	No	S		1.5ft	2.0ft	36.0	36.0	0.0	11	12	385	Btuh	
7	2 NFRC	0.22, 0.32	No	No	W		1.5ft	2.0ft	16.0	0.0	16.0	11	27	437	Btuh	
8	2 NFRC	0.22, 0.32	No	No	W		1.5ft	2.0ft	20.0	0.0	20.0	11	27	546	Btuh	
	Window Total								179 (sqft)					2602 Btuh		
Walls	Type						U-Value		R-Value		Area(sqft)		HTM		Load	
									Cav/Sheath							
1	Frame - Wood - Ext						0.09		13.0/0.0		77.0		2.3		174 Btuh	
2	Frame - Wood - Ext						0.09		13.0/0.0		82.7		2.3		187 Btuh	
3	Frame - Wood - Ext						0.09		13.0/0.0		167.0		2.3		378 Btuh	
4	Frame - Wood - Ext						0.09		13.0/0.0		234.7		2.3		531 Btuh	
5	Frame - Wood - Ext						0.09		13.0/0.0		100.3		2.3		227 Btuh	
6	Frame - Wood - Ext						0.09		13.0/0.0		36.0		2.3		81 Btuh	
7	Frame - Wood - Ext						0.09		13.0/0.0		46.0		2.3		104 Btuh	
8	Frame - Wood - Adj						0.09		13.0/0.0		153.3		1.7		259 Btuh	
9	Frame - Wood - Ext						0.09		13.0/0.0		204.0		2.3		462 Btuh	
	Wall Total								1101 (sqft)					2403 Btuh		
Doors	Type										Area (sqft)		HTM		Load	
1	Insulated - Exterior										13.3		12.0		160 Btuh	
2	Insulated - Exterior										20.0		12.0		240 Btuh	
3	Insulated - Garage										20.0		12.0		240 Btuh	
	Door Total								53 (sqft)					640 Btuh		
Ceilings	Type/Color/Surface						U-Value		R-Value		Area(sqft)		HTM		Load	
1	Vented Attic/DarkShingle						0.025		38.0/0.0		1780.0		1.37		2440 Btuh	
	Ceiling Total								1780 (sqft)					2440 Btuh		
Floors	Type								R-Value		Size		HTM		Load	
1	Slab On Grade								0.0		1600 (ft-perimeter)		0.0		0 Btuh	
	Floor Total								1600.0 (sqft)					0 Btuh		
	Envelope Subtotal:													8085 Btuh		
Infiltration	Type						Average ACH		Volume(cuft)		Wall Ratio		CFM=		Load	
	Natural						0.17		13280		1		37.4		779 Btuh	
Internal gain							Occupants		Btuh/occupant				Appliance		Load	
							6		X 230		+		2400		3780 Btuh	
	Sensible Envelope Load:													12644 Btuh		
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic)										(DGM of 0.354)			4472 Btuh		
	Sensible Load All Zones													17116 Btuh		

Manual J Summer Calculations

Residential Load - Component Details (continued)

Spec House
Lake City, FL

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
201364 Sunset Lot 6

2020-12-16

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	12644 Btuh
	Sensible Duct Load	4472 Btuh
	Total Sensible Zone Loads	17116 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	17116 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	1292 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	929 Btuh
	Latent occupant gain (6.0 people @ 200 Btuh per person)	1200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	3421 Btuh
	TOTAL GAIN	20538 Btuh

EQUIPMENT

1. Central Unit	#	25000 Btuh
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*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