

Residential System Sizing Calculation

Summary

431 SW Pinehurst Drive
Lake City, FL

Project Title:
200848 Adams

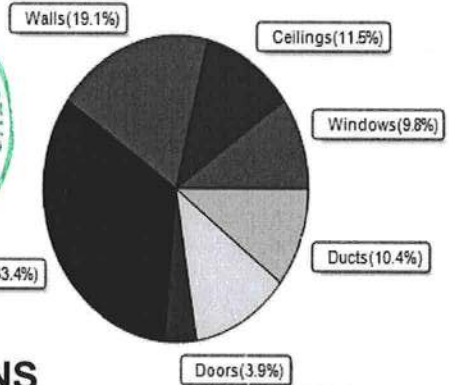
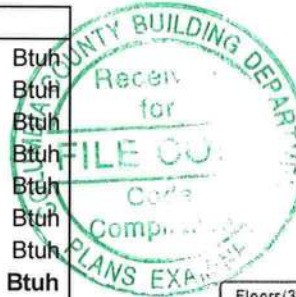
2020-08-04

Location for weather data: Gainesville, FL - Defaults: Latitude(29.7) Altitude(152 ft.) Temp Range(M)			
Humidity data: Interior RH (50%) Outdoor wet bulb (79F) Humidity difference(54gr.)			
Winter design temperature(MJ8 99%)	32 F	Summer design temperature(MJ8 99%)	99 F
Winter setpoint	70 F	Summer setpoint	75 F
Winter temperature difference	38 F	Summer temperature difference	24 F
Total heating load calculation	28967 Btuh	Total cooling load calculation	24645 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	107.0 31000	Sensible (SHR = 0.75)	116.3 23250
Heat Pump + Auxiliary(0.0kW)	107.0 31000	Latent	166.3 7750
		Total (Electric Heat Pump)	125.8 31000

WINTER CALCULATIONS

Winter Heating Load (for 2000 sqft)

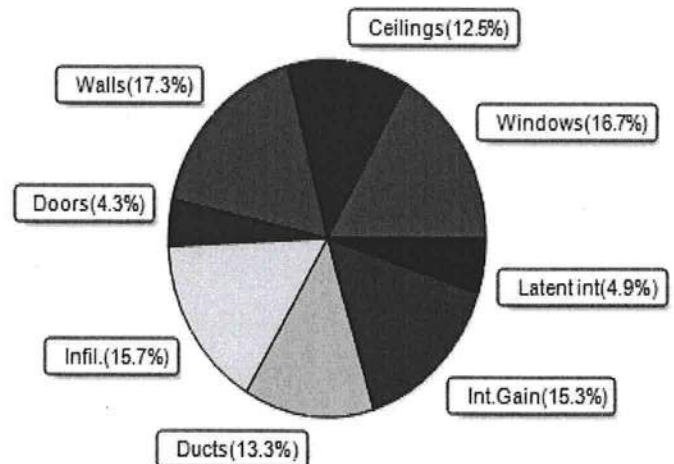
Load component		Load	
Window total	233 sqft	2828 Btuh	
Wall total	1644 sqft	5544 Btuh	
Door total	75 sqft	1142 Btuh	
Ceiling total	2098 sqft	3336 Btuh	
Floor total	2000 sqft	9685 Btuh	
Infiltration	82 cfm	3411 Btuh	
Duct loss		3022 Btuh	
Subtotal		28967 Btuh	
Ventilation	0 cfm	0 Btuh	
TOTAL HEAT LOSS		28967 Btuh	



SUMMER CALCULATIONS

Summer Cooling Load (for 2000 sqft)

Load component		Load	
Window total	233 sqft	4123 Btuh	
Wall total	1644 sqft	4271 Btuh	
Door total	75 sqft	1052 Btuh	
Ceiling total	2098 sqft	3072 Btuh	
Floor total		0 Btuh	
Infiltration	61 cfm	1616 Btuh	
Internal gain		3780 Btuh	
Duct gain		2072 Btuh	
Sens. Ventilation	0 cfm	0 Btuh	
Blower Load		0 Btuh	
Total sensible gain		19985 Btuh	
Latent gain(ducts)		1213 Btuh	
Latent gain(infiltration)		2247 Btuh	
Latent gain(ventilation)		0 Btuh	
Latent gain(internal/occupants/other)		1200 Btuh	
Total latent gain		4660 Btuh	
TOTAL HEAT GAIN		24645 Btuh	



8th Edition

EnergyGauge® System Sizing
PREPARED BY: Evan Beamsley
DATE: 2020-08-05

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

431 SW Pinehurst Drive
Lake City, FL

Project Title:
200848 Adams
Building Type: User

2020-08-04

Reference City: Gainesville, FL (Defaults) Winter Temperature Difference: 38.0 F (MJ8 99%)

Component Loads for Whole House								
Window	Panes/Type	Frame	U	Orientation	Area(sqft)	X	HTM=	Load
1	2, NFRC 0.22	Vinyl	0.32	E	11.1		12.2	135 Btuh
2	2, NFRC 0.22	Vinyl	0.32	N	44.4		12.2	540 Btuh
3	2, NFRC 0.22	Vinyl	0.32	N	9.0		12.2	109 Btuh
4	2, NFRC 0.22	Vinyl	0.32	N	6.0		12.2	73 Btuh
5	2, NFRC 0.22	Vinyl	0.32	E	6.0		12.2	73 Btuh
6	2, NFRC 0.22	Vinyl	0.32	S	24.0		12.2	292 Btuh
7	2, NFRC 0.22	Vinyl	0.32	S	54.0		12.2	657 Btuh
8	2, NFRC 0.22	Vinyl	0.32	S	18.0		12.2	219 Btuh
9	2, NFRC 0.22	Vinyl	0.32	W	60.0		12.2	730 Btuh
Window Total					232.6(sqft)			2828 Btuh
Walls	Type	Omt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	120		3.37	405 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	104		3.37	352 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	232		3.37	782 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	131		3.37	440 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	138		3.37	465 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	8		3.37	25 Btuh
7	Frame - Wood	- Adj	(0.089)	13.0/0.0	57		3.37	192 Btuh
8	Frame - Wood	- Adj	(0.089)	13.0/0.0	176		3.37	593 Btuh
9	Frame - Wood	- Adj	(0.089)	13.0/0.0	78		3.37	263 Btuh
10	Frame - Wood	- Ext	(0.089)	13.0/0.0	161		3.37	541 Btuh
11	Frame - Wood	- Ext	(0.089)	13.0/0.0	99		3.37	334 Btuh
12	Frame - Wood	- Ext	(0.089)	13.0/0.0	341		3.37	1151 Btuh
Wall Total					1644(sqft)			5544 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior,	n	(0.400)		7		15.2	101 Btuh
2	Insulated - Exterior,	n	(0.400)		13		15.2	203 Btuh
3	Insulated - Exterior,	n	(0.400)		13		15.2	203 Btuh
4	Insulated - Garage,	n	(0.400)		18		15.2	270 Btuh
5	Insulated - Exterior,	n	(0.400)		24		15.2	365 Btuh
Door Total					75(sqft)			1142Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load
1	Unvent Attic/D/Shing		(0.042)	1.0/22.0	2098		1.6	3336 Btuh
Ceiling Total					2098(sqft)			3336Btuh
Floors	Type		Ueff.	R-Value	Size	X	HTM=	Load
1	Slab On Grade		(1.180)	0.0	216.0 ft(perim.)		44.8	9685 Btuh
Floor Total					2000 sqft			9685 Btuh
Envelope Subtotal:								22535 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

431 SW Pinehurst Drive
Lake City, FL

Project Title:
200848 Adams
Building Type: User

2020-08-04

Infiltration	Type Natural	Wholehouse ACH 0.26	Volume(cuft) 18600	Wall Ratio 1.00	CFM= 82.0	3411 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.116)					3022 Btuh
All Zones	Sensible Subtotal All Zones					28967 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	28967 Btuh 0 Btuh 28967 Btuh
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EQUIPMENT

1. Electric Heat Pump	#	31000 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

431 SW Pinehurst Drive
Lake City, FL

Project Title:
200848 Adams

2020-08-04

Reference City: Gainesville, FL

Temperature Difference: 24.0F(MJ8 99%)

Humidity difference: 54gr.

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	E	2.0ft	1.0ft	11.1	1.1	10.0	12	29	303	Btuh
2	2 NFRC	0.22, 0.32	No	No	N	15.6f	1.0ft	44.4	0.0	44.4	12	12	547	Btuh
3	2 NFRC	0.22, 0.32	No	No	N	15.6f	1.0ft	9.0	0.0	9.0	12	12	111	Btuh
4	2 NFRC	0.22, 0.32	No	No	N	2.0ft	1.5ft	6.0	0.0	6.0	12	12	74	Btuh
5	2 NFRC	0.22, 0.32	No	No	E	2.0ft	6.0ft	6.0	0.0	6.0	12	29	173	Btuh
6	2 NFRC	0.22, 0.32	No	No	S	7.0ft	0.5ft	24.0	24.0	0.0	12	14	295	Btuh
7	2 NFRC	0.22, 0.32	No	No	S	7.0ft	0.5ft	54.0	54.0	0.0	12	14	665	Btuh
8	2 NFRC	0.22, 0.32	No	No	S	2.0ft	1.5ft	18.0	18.0	0.0	12	14	222	Btuh
9	2 NFRC	0.22, 0.32	No	No	W	2.0ft	9.0ft	60.0	0.0	60.0	12	29	1733	Btuh
	Window Total							233 (sqft)					4123 Btuh	
Walls	Type	U-Value					R-Value		Area(sqft)		HTM		Load	
							Cav/Sheath							
1	Frame - Wood - Ext	0.09					13.0/0.0		120.0		2.7		325 Btuh	
2	Frame - Wood - Ext	0.09					13.0/0.0		104.5		2.7		283 Btuh	
3	Frame - Wood - Ext	0.09					13.0/0.0		231.9		2.7		628 Btuh	
4	Frame - Wood - Ext	0.09					13.0/0.0		130.5		2.7		353 Btuh	
5	Frame - Wood - Ext	0.09					13.0/0.0		138.0		2.7		374 Btuh	
6	Frame - Wood - Ext	0.09					13.0/0.0		7.5		2.7		20 Btuh	
7	Frame - Wood - Adj	0.09					13.0/0.0		57.0		2.1		121 Btuh	
8	Frame - Wood - Adj	0.09					13.0/0.0		175.7		2.1		374 Btuh	
9	Frame - Wood - Adj	0.09					13.0/0.0		78.0		2.1		166 Btuh	
10	Frame - Wood - Ext	0.09					13.0/0.0		160.5		2.7		434 Btuh	
11	Frame - Wood - Ext	0.09					13.0/0.0		99.0		2.7		268 Btuh	
12	Frame - Wood - Ext	0.09					13.0/0.0		341.3		2.7		924 Btuh	
	Wall Total							1644 (sqft)					4271 Btuh	
Doors	Type								Area (sqft)		HTM		Load	
1	Insulated - Exterior								6.7		14.0		93 Btuh	
2	Insulated - Exterior								13.3		14.0		187 Btuh	
3	Insulated - Exterior								13.3		14.0		187 Btuh	
4	Insulated - Garage								17.8		14.0		249 Btuh	
5	Insulated - Exterior								24.0		14.0		336 Btuh	
	Door Total							75 (sqft)					1052 Btuh	
Ceilings	Type/Color/Surface	U-Value					R-Value		Area(sqft)		HTM		Load	
1	Unvented Attic/DarkShingle	0.042					1.0/22.0		2098.0		1.46		3072 Btuh	
	Ceiling Total							2098 (sqft)					3072 Btuh	
Floors	Type						R-Value		Size		HTM		Load	
1	Slab On Grade						0.0		2000 (ft-perimeter)		0.0		0 Btuh	
	Floor Total							2000.0 (sqft)					0 Btuh	
	Envelope Subtotal:												12517 Btuh	

Manual J Summer Calculations

Residential Load - Component Details (continued)

431 SW Pinehurst Drive
Lake City, FL

Project Title:
200848 Adams

Climate:FL_GAINESVILLE_REGIONAL_A

2020-08-04

Infiltration	Type Natural	Average ACH 0.20	Volume(cuft) 18600	Wall Ratio 1	CFM= 61.5	Load 1616 Btuh
Internal gain		Occupants 6	Btuh/occupant X 230	Appliance +	2400	Load 3780 Btuh
					Sensible Envelope Load:	17913 Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic)				(DGM of 0.116)	2072 Btuh
					Sensible Load All Zones	19985 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

431 SW Pinehurst Drive
Lake City, FL

Project Title:
200848 Adams

Climate: FL_GAINESVILLE_REGIONAL_A

2020-08-04

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	17913 Btuh
	Sensible Duct Load	2072 Btuh
	Total Sensible Zone Loads	19985 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	19985 Btuh
	Latent infiltration gain (for 54 gr. humidity difference)	2247 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1213 Btuh
	Latent occupant gain (6.0 people @ 200 Btuh per person)	1200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	4660 Btuh
	TOTAL GAIN	24645 Btuh

EQUIPMENT

1. Central Unit	#	31000 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