

Residential System Sizing Calculation

Summary

Reiter Res

Project Title:
201135 Reiter

Lake City, FL

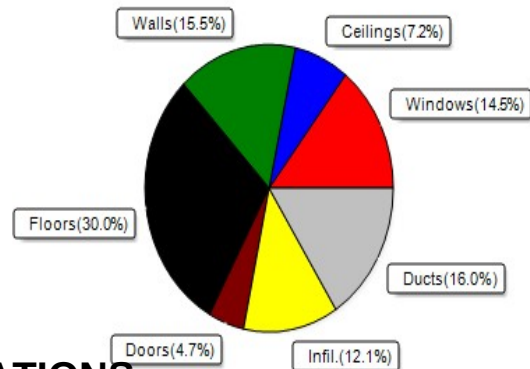
2020-10-20

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	31605 Btuh	Total cooling load calculation	33749 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	123.4 39000	Sensible (SHR = 0.75)	100.8 29250
Heat Pump + Auxiliary(0.0kW)	123.4 39000	Latent	206.6 9750
		Total (Electric Heat Pump)	115.6 39000

WINTER CALCULATIONS

Winter Heating Load (for 2132 sqft)

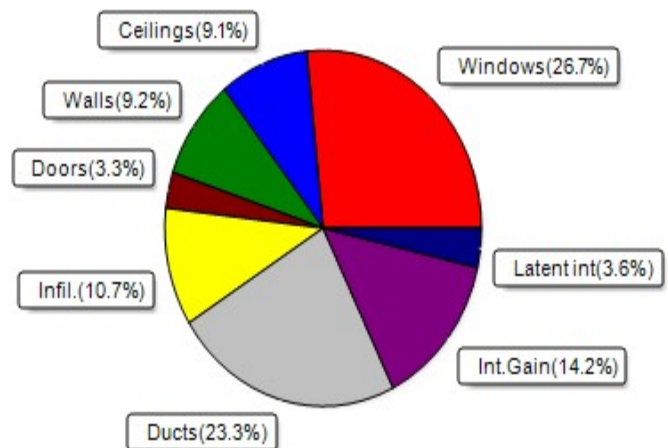
Load component		Load	
Window total	327 sqft	4578 Btuh	
Wall total	1384 sqft	4914 Btuh	
Door total	92 sqft	1472 Btuh	
Ceiling total	2236 sqft	2270 Btuh	
Floor total	2132 sqft	9487 Btuh	
Infiltration	87 cfm	3827 Btuh	
Duct loss		5057 Btuh	
Subtotal		31605 Btuh	
Ventilation	0 cfm	0 Btuh	
TOTAL HEAT LOSS		31605 Btuh	



SUMMER CALCULATIONS

Summer Cooling Load (for 2132 sqft)

Load component		Load	
Window total	327 sqft	9000 Btuh	
Wall total	1384 sqft	3095 Btuh	
Door total	92 sqft	1104 Btuh	
Ceiling total	2236 sqft	3065 Btuh	
Floor total		0 Btuh	
Infiltration	66 cfm	1363 Btuh	
Internal gain		4780 Btuh	
Duct gain		6624 Btuh	
Sens. Ventilation	0 cfm	0 Btuh	
Blower Load		0 Btuh	
Total sensible gain		29030 Btuh	
Latent gain(ducts)		1256 Btuh	
Latent gain(infiltration)		2262 Btuh	
Latent gain(ventilation)		0 Btuh	
Latent gain(internal/occupants/other)		1200 Btuh	
Total latent gain		4718 Btuh	
TOTAL HEAT GAIN		33749 Btuh	



8th Edition

EnergyGauge® System Sizing
PREPARED BY: **Evan Beamsley**
DATE: **2020-10-20**

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Reiter Res

Project Title:
201135 Reiter
Building Type: User

Lake City, FL

2020-10-20

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 Whole House

Window	Panes/Type	Frame	U	Orientation	Area(sqft)	X	HTM=	Load
1	2, NFRC 0.30	Metal	0.35	SW	15.0		14.0	210 Btuh
2	2, NFRC 0.30	Metal	0.35	SW	36.0		14.0	504 Btuh
3	2, NFRC 0.30	Metal	0.35	NW	48.0		14.0	672 Btuh
4	2, NFRC 0.30	Metal	0.35	SW	72.0		14.0	1008 Btuh
5	2, NFRC 0.30	Metal	0.35	SW	24.0		14.0	336 Btuh
6	2, NFRC 0.30	Metal	0.35	NW	12.5		14.0	175 Btuh
7	2, NFRC 0.30	Metal	0.35	NW	6.0		14.0	84 Btuh
8	2, NFRC 0.30	Metal	0.35	NE	4.0		14.0	56 Btuh
9	2, NFRC 0.30	Metal	0.35	NE	12.0		14.0	168 Btuh
10	2, NFRC 0.30	Metal	0.35	NE	32.0		14.0	448 Btuh
11	2, NFRC 0.30	Metal	0.35	NE	36.0		14.0	504 Btuh
12	2, NFRC 0.30	Metal	0.35	NE	10.5		14.0	147 Btuh
13	2, NFRC 0.30	Metal	0.35	SE	15.0		14.0	210 Btuh
14	2, NFRC 0.30	Metal	0.35	SE	4.0		14.0	56 Btuh
Window Total					327.0(sqft)			4578 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	203		3.55	719 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	20		3.55	71 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	100		3.55	353 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	294		3.55	1042 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	118		3.55	417 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	18		3.55	64 Btuh
7	Frame - Wood	- Ext	(0.089)	13.0/0.0	17		3.55	59 Btuh
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	18		3.55	64 Btuh
9	Frame - Wood	- Ext	(0.089)	13.0/0.0	242		3.55	857 Btuh
10	Frame - Wood	- Adj	(0.089)	13.0/0.0	66		3.55	233 Btuh
11	Frame - Wood	- Ext	(0.089)	13.0/0.0	292		3.55	1035 Btuh
Wall Total					1384(sqft)			4914 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior, n		(0.400)		16		16.0	256 Btuh
2	Insulated - Exterior, n		(0.400)		24		16.0	384 Btuh
3	Insulated - Exterior, n		(0.400)		16		16.0	256 Btuh
4	Insulated - Exterior, n		(0.400)		16		16.0	256 Btuh
5	Insulated - Garage, n		(0.400)		20		16.0	320 Btuh
Door Total					92(sqft)			1472Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load
1	Vented Attic/D/Shing		(0.025)	38.0/0.0	2132		1.0	2164 Btuh
2	Knee Wall/D/Shing		(0.025)	38.0/0.0	104		1.0	106 Btuh
Ceiling Total					2236(sqft)			2270Btuh
Floors	Type		Ueff.	R-Value	Size	X	HTM=	Load
1	Slab On Grade		(1.180)	0.0	201.0 ft(perim.)		47.2	9487 Btuh
Floor Total					2132 sqft			9487 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Reiter Res
Lake City, FL

Project Title:
201135 Reiter
Building Type: User

2020-10-20

	Envelope Subtotal:	22721 Btuh
Infiltration	Type Wholehouse ACH Volume(cuft) Wall Ratio CFM= Natural 0.26 19828 1.00 87.4	3827 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.190)	5057 Btuh
All Zones	Sensible Subtotal All Zones	31605 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	31605 Btuh 0 Btuh 31605 Btuh
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EQUIPMENT

1. Electric Heat Pump	#	39000 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

Reiter Res

Project Title:
201135 Reiter

Lake City, FL

2020-10-20

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 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	0.30, 0.35	No	No	SW	1.5ft	1.5ft	15.0	2.9	12.1	13	28	378	Btuh	
2	2 NFRC	0.30, 0.35	No	No	SW	1.5ft	1.5ft	36.0	5.8	30.2	13	28	925	Btuh	
3	2 NFRC	0.30, 0.35	No	No	NW	27.7f	0.0ft	48.0	0.0	48.0	13	27	1287	Btuh	
4	2 NFRC	0.30, 0.35	No	No	SW	10.8f	0.0ft	72.0	72.0	0.0	13	28	933	Btuh	
5	2 NFRC	0.30, 0.35	No	No	SW	10.8f	0.0ft	24.0	24.0	0.0	13	28	311	Btuh	
6	2 NFRC	0.30, 0.35	No	No	NW	1.5ft	1.5ft	12.5	0.0	12.5	13	27	335	Btuh	
7	2 NFRC	0.30, 0.35	No	No	NW	1.5ft	1.5ft	6.0	0.0	6.0	13	27	161	Btuh	
8	2 NFRC	0.30, 0.35	No	No	NE	1.5ft	1.5ft	4.0	0.0	4.0	13	27	107	Btuh	
9	2 NFRC	0.30, 0.35	No	No	NE	1.5ft	1.5ft	12.0	0.0	12.0	13	27	322	Btuh	
10	2 NFRC	0.30, 0.35	No	No	NE	10.2f	1.0ft	32.0	0.0	32.0	13	27	858	Btuh	
11	2 NFRC	0.30, 0.35	No	No	NE	7.0ft	0.5ft	36.0	0.0	36.0	13	27	965	Btuh	
12	2 NFRC	0.30, 0.35	No	No	NE	7.0ft	0.5ft	10.5	0.0	10.5	13	27	282	Btuh	
13	2 NFRC	0.30, 0.35	No	No	SE	1.5ft	1.5ft	15.0	2.9	12.1	13	28	378	Btuh	
14	2 NFRC	0.30, 0.35	No	No	SE	1.5ft	1.5ft	4.0	3.9	0.1	13	28	54	Btuh	
	Excursion												1704	Btuh	
	Window Total							327 (sqft)						9000	Btuh
Walls	Type					U-Value	R-Value	Area(sqft)			HTM		Load		
							Cav/Sheath								
	1	Frame - Wood - Ext				0.09	13.0/0.0	202.5			2.3		458 Btuh		
	2	Frame - Wood - Ext				0.09	13.0/0.0	20.0			2.3		45 Btuh		
	3	Frame - Wood - Ext				0.09	13.0/0.0	99.5			2.3		225 Btuh		
	4	Frame - Wood - Ext				0.09	13.0/0.0	293.5			2.3		664 Btuh		
	5	Frame - Wood - Ext				0.09	13.0/0.0	117.5			2.3		266 Btuh		
	6	Frame - Wood - Ext				0.09	13.0/0.0	18.0			2.3		41 Btuh		
	7	Frame - Wood - Ext				0.09	13.0/0.0	16.5			2.3		37 Btuh		
	8	Frame - Wood - Ext				0.09	13.0/0.0	18.0			2.3		41 Btuh		
	9	Frame - Wood - Ext				0.09	13.0/0.0	241.5			2.3		547 Btuh		
	10	Frame - Wood - Adj				0.09	13.0/0.0	65.5			1.7		110 Btuh		
	11	Frame - Wood - Ext				0.09	13.0/0.0	291.5			2.3		660 Btuh		
	Wall Total							1384 (sqft)					3095 Btuh		
Doors	Type							Area (sqft)			HTM		Load		
	1	Insulated - Exterior						16.0			12.0		192 Btuh		
	2	Insulated - Exterior						24.0			12.0		288 Btuh		
	3	Insulated - Exterior						16.0			12.0		192 Btuh		
	4	Insulated - Exterior						16.0			12.0		192 Btuh		
	5	Insulated - Garage						20.0			12.0		240 Btuh		
		Door Total							92 (sqft)					1104 Btuh	
Ceilings	Type/Color/Surface					U-Value	R-Value	Area(sqft)			HTM		Load		
	1	Vented Attic/DarkShingle				0.025	38.0/0.0	2132.0			1.37		2922 Btuh		
	2	Knee Wall/DarkShingle				0.025	38.0/0.0	104.0			1.37		143 Btuh		
		Ceiling Total							2236 (sqft)					3065 Btuh	
Floors	Type						R-Value	Size			HTM		Load		
	1	Slab On Grade					0.0	2132 (ft-perimeter)			0.0		0 Btuh		
		Floor Total							2132.0 (sqft)					0 Btuh	

Manual J Summer Calculations

Residential Load - Component Details (continued)

Reiter Res

Project Title:
201135 Reiter

Climate:FL_GAINESVILLE_REGIONAL_A

Lake City, FL

2020-10-20

	Envelope Subtotal:					16263 Btuh
Infiltration	Type	Average ACH	Volume(cuft)	Wall Ratio	CFM=	Load
	Natural	0.20	19828	1	65.5	1363 Btuh
Internal gain		Occupants	Btuh/occupant		Appliance	Load
		6	X 230	+	3400	4780 Btuh
	Sensible Envelope Load:					22407 Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic) (DGM of 0.296)					6624 Btuh
	Sensible Load All Zones					29030 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Reiter Res

Project Title:
201135 Reiter

Climate:FL_GAINESVILLE_REGIONAL_A

Lake City, FL

2020-10-20

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	22407 Btuh
	Sensible Duct Load	6624 Btuh
	Total Sensible Zone Loads	29030 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	29030 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	2262 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1256 Btuh
	Latent occupant gain (6.0 people @ 200 Btuh per person)	1200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	4718 Btuh
	TOTAL GAIN	33749 Btuh

EQUIPMENT

1. Central Unit	#	39000 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