

Residential System Sizing Calculation

Summary

Ricky Mershon Res

Project Title:
221146 Mershon Res

Lake City, FL

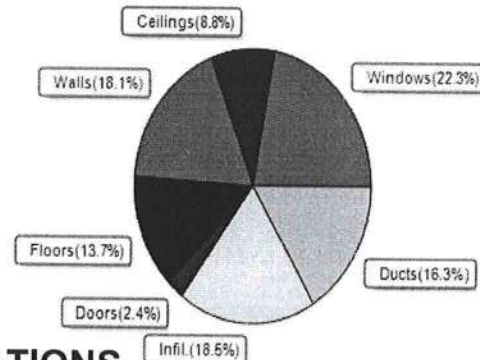
2023-02-02

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	29603 Btuh	Total cooling load calculation	34465 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	125.0 37000	Sensible (SHR = 0.75)	92.9 27750
Heat Pump + Auxiliary(0.0kW)	125.0 37000	Latent	201.8 9250
		Total (Electric Heat Pump)	107.4 37000

WINTER CALCULATIONS

Winter Heating Load (for 2016 sqft)

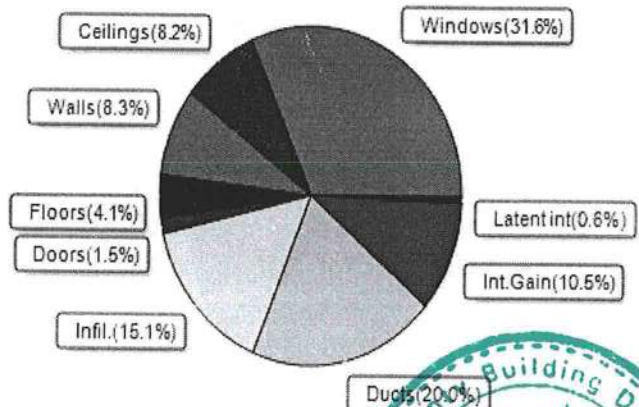
Load component			Load	
Window total	471	sqft	6599	Btuh
Wall total	1733	sqft	5357	Btuh
Door total	44	sqft	704	Btuh
Ceiling total	2546	sqft	2597	Btuh
Floor total	2016	sqft	4044	Btuh
Infiltration	125	cfm	5486	Btuh
Duct loss			4817	Btuh
Subtotal			29603	Btuh
Ventilation	0	cfm	0	Btuh
TOTAL HEAT LOSS			29603	Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 2016 sqft)

Load component			Load	
Window total	471	sqft	10894	Btuh
Wall total	1733	sqft	2866	Btuh
Door total	44	sqft	528	Btuh
Ceiling total	2546	sqft	2831	Btuh
Floor total			1415	Btuh
Infiltration	94	cfm	1954	Btuh
Internal gain			3630	Btuh
Duct gain			5762	Btuh
Sens. Ventilation	0	cfm	0	Btuh
Blower Load			0	Btuh
Total sensible gain			29880	Btuh
Latent gain(ducts)			1142	Btuh
Latent gain(infiltration)			3243	Btuh
Latent gain(ventilation)			0	Btuh
Latent gain(internal/occupants/other)			200	Btuh
Total latent gain			4585	Btuh
TOTAL HEAT GAIN			34465	Btuh



8th Edition

EnergyGauge® System Sizing
PREPARED BY: Evan Beamsley
DATE: 2023-02-02



System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Ricky Mershon Res
Lake City, FL

Project Title:
221146 Mershon Res
Building Type: User

2023-02-02

Reference City: Gainesville, FL (Defaults) Winter Temperature Difference: 40.0 F (TMY3 99%)
This calculation is for Worst Case. The house has been rotated 45 degrees.

Component Loads for Whole House

Window	Panes/Type	Frame	U	Orientation	Area(sqft)	X	HTM=	Load
1	2, NFRC 0.25	Metal	0.35	NE	30.0		14.0	420 Btuh
2	2, NFRC 0.25	Metal	0.35	NE	32.0		14.0	448 Btuh
3	2, NFRC 0.25	Metal	0.35	NE	54.0		14.0	756 Btuh
4	2, NFRC 0.25	Metal	0.35	NE	32.0		14.0	448 Btuh
5	2, NFRC 0.25	Metal	0.35	SE	54.0		14.0	756 Btuh
6	2, NFRC 0.25	Metal	0.35	SE	12.0		14.0	168 Btuh
7	2, NFRC 0.25	Metal	0.35	SW	36.0		14.0	504 Btuh
8	2, NFRC 0.25	Metal	0.35	SW	36.0		14.0	504 Btuh
9	2, NFRC 0.25	Metal	0.35	SW	21.3		14.0	299 Btuh
10	2, NFRC 0.25	Metal	0.35	SW	12.0		14.0	168 Btuh
11	2, NFRC 0.25	Metal	0.35	SW	36.0		14.0	504 Btuh
12	2, NFRC 0.25	Metal	0.35	NW	18.0		14.0	252 Btuh
13	2, NFRC 0.25	Metal	0.35	NW	20.0		14.0	280 Btuh
14	2, NFRC 0.25	Metal	0.35	NE	24.0		14.0	336 Btuh
15	2, NFRC 0.25	Metal	0.35	NE	15.0		14.0	210 Btuh
16	2, NFRC 0.25	Metal	0.35	SW	24.0		14.0	336 Btuh
17	2, NFRC 0.25	Metal	0.35	SW	15.0		14.0	210 Btuh
Window Total					471.3(sqft)			6599 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.077)	19.0/0.0	380		3.09	1175 Btuh
2	Frame - Wood	- Ext	(0.077)	19.0/0.0	294		3.09	909 Btuh
3	Frame - Wood	- Ext	(0.077)	19.0/0.0	104		3.09	321 Btuh
4	Frame - Wood	- Ext	(0.077)	19.0/0.0	199		3.09	614 Btuh
5	Frame - Wood	- Ext	(0.077)	19.0/0.0	104		3.09	321 Btuh
6	Frame - Wood	- Ext	(0.077)	19.0/0.0	322		3.09	995 Btuh
7	Frame - Wood	- Ext	(0.077)	19.0/0.0	165		3.09	511 Btuh
8	Frame - Wood	- Ext	(0.077)	19.0/0.0	165		3.09	511 Btuh
Wall Total					1733(sqft)			5357 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior,	n	(0.400)		8		16.0	128 Btuh
2	Insulated - Exterior,	n	(0.400)		8		16.0	128 Btuh
3	Insulated - Exterior,	n	(0.400)		16		16.0	256 Btuh
4	Insulated - Exterior,	n	(0.400)		12		16.0	192 Btuh
Door Total					44(sqft)			704Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load
1	Vented Attic/D/Metal		(0.025)	38.0/0.0	1176		1.0	1194 Btuh
2	Cathedral/D/Metal		(0.026)	38.0/0.0	938		1.0	965 Btuh
3	Knee Wall/D/Metal		(0.025)	38.0/0.0	432		1.0	439 Btuh
Ceiling Total					2546(sqft)			2597Btuh
Floors	Type		Ueff.	R-Value	Size	X	HTM=	Load
1	Raised - Open		(0.050)	19.0	2016.0	sqft	2.0	4044 Btuh
Floor Total					2016	sqft		4044 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Ricky Mershon Res

Lake City, FL

Project Title:
221146 Mershon Res
Building Type: User

2023-02-02

	Envelope Subtotal:						19300 Btuh
Infiltration	Type Natural	Wholehouse	ACH 0.27	Volume(cuft) 27619	Wall Ratio 1.00	CFM= 125.3	5486 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.194)						4817 Btuh
All Zones	Sensible Subtotal All Zones						29603 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	29603 Btuh 0 Btuh 29603 Btuh
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EQUIPMENT

1. Electric Heat Pump	#	37000 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

Ricky Mershon Res

Project Title:
221146 Mershon Res

Lake City, FL

2023-02-02

Reference City: Gainesville, FL Temperature Difference: 19.0F(TMY3 99%) Humidity difference: 51gr.
This calculation is for Worst Case. The house has been rotated 45 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	0.25, 0.35	No	No	NE	13.5f	0.0ft	30.0	0.0	30.0	12	23	703 Btuh
2	2 NFRC	0.25, 0.35	No	No	NE	13.5f	0.0ft	32.0	0.0	32.0	12	23	750 Btuh
3	2 NFRC	0.25, 0.35	No	No	NE	13.5f	0.0ft	54.0	0.0	54.0	12	23	1266 Btuh
4	2 NFRC	0.25, 0.35	No	No	NE	13.5f	0.0ft	32.0	0.0	32.0	12	23	750 Btuh
5	2 NFRC	0.25, 0.35	No	No	SE	1.5ft	1.0ft	54.0	13.2	40.8	12	25	1159 Btuh
6	2 NFRC	0.25, 0.35	No	No	SE	1.5ft	1.0ft	12.0	4.4	7.6	12	25	239 Btuh
7	2 NFRC	0.25, 0.35	No	No	SW	1.5ft	6.0ft	36.0	0.0	36.0	12	25	884 Btuh
8	2 NFRC	0.25, 0.35	No	No	SW	9.0ft	0.0ft	36.0	36.0	0.0	12	25	429 Btuh
9	2 NFRC	0.25, 0.35	No	No	SW	9.0ft	0.0ft	21.3	21.3	0.0	12	25	254 Btuh
10	2 NFRC	0.25, 0.35	No	No	SW	9.0ft	0.0ft	12.0	12.0	0.0	12	25	143 Btuh
11	2 NFRC	0.25, 0.35	No	No	SW	1.5ft	6.0ft	36.0	0.0	36.0	12	25	884 Btuh
12	2 NFRC	0.25, 0.35	No	No	NW	1.5ft	1.0ft	18.0	0.0	18.0	12	23	422 Btuh
13	2 NFRC	0.25, 0.35	No	No	NW	1.5ft	1.0ft	20.0	0.0	20.0	12	23	469 Btuh
14	2 NFRC	0.25, 0.35	No	No	NE	1.5ft	5.0ft	24.0	0.0	24.0	12	23	563 Btuh
15	2 NFRC	0.25, 0.35	No	No	NE	1.5ft	5.0ft	15.0	0.0	15.0	12	23	352 Btuh
16	2 NFRC	0.25, 0.35	No	No	SW	1.5ft	5.0ft	24.0	0.0	24.0	12	25	590 Btuh
17	2 NFRC	0.25, 0.35	No	No	SW	1.5ft	5.0ft	15.0	0.0	15.0	12	25	368 Btuh
Excursion													668 Btuh
Window Total								471 (sqft)					10894 Btuh
Walls	Type					U-Value	R-Value	Area(sqft)		HTM		Load	
						Cav/Sheath							
1	Frame - Wood - Ext					0.08	19.0/0.0	380.0		1.7		628 Btuh	
2	Frame - Wood - Ext					0.08	19.0/0.0	294.0		1.7		486 Btuh	
3	Frame - Wood - Ext					0.08	19.0/0.0	104.0		1.7		172 Btuh	
4	Frame - Wood - Ext					0.08	19.0/0.0	198.7		1.7		329 Btuh	
5	Frame - Wood - Ext					0.08	19.0/0.0	104.0		1.7		172 Btuh	
6	Frame - Wood - Ext					0.08	19.0/0.0	322.0		1.7		532 Btuh	
7	Frame - Wood - Ext					0.08	19.0/0.0	165.2		1.7		273 Btuh	
8	Frame - Wood - Ext					0.08	19.0/0.0	165.2		1.7		273 Btuh	
Wall Total								1733 (sqft)			2866 Btuh		
Doors	Type							Area (sqft)		HTM		Load	
1	Insulated - Exterior							8.0		12.0		96 Btuh	
2	Insulated - Exterior							8.0		12.0		96 Btuh	
3	Insulated - Exterior							16.0		12.0		192 Btuh	
4	Insulated - Exterior							12.0		12.0		144 Btuh	
Door Total								44 (sqft)			528 Btuh		
Ceilings	Type/Color/Surface					U-Value	R-Value	Area(sqft)		HTM		Load	
1	Vented Attic/DarkMetal					0.025	38.0/0.0	1176.0		1.37		1612 Btuh	
2	Cath/Sngl Assem/DarkMetal					0.026	38.0/0.0	938.0		0.67		627 Btuh	
3	Knee Wall/DarkMetal					0.025	38.0/0.0	432.0		1.37		592 Btuh	
Ceiling Total								2546 (sqft)			2831 Btuh		
Floors	Type					R-Value		Size		HTM		Load	
1	Raised - Open					19.0		2016 (sqft)		0.7		1415 Btuh	
Floor Total								2016.0 (sqft)			1415 Btuh		

Manual J Summer Calculations

Residential Load - Component Details (continued)

Ricky Mershon Res

Project Title: 221146 Mershon Res

Climate: FL_GAINESVILLE_REGIONAL_A

Lake City, FL

2023-02-02

	Envelope Subtotal:					18534 Btuh
Infiltration	Type	Average ACH	Volume(cuft)	Wall Ratio	CFM=	Load
	Natural	0.20	27619	1	94.0	1954 Btuh
Internal gain		Occupants	Btuh/occupant		Appliance	Load
		1	X 230 +		3400	3630 Btuh
	Sensible Envelope Load:					24119 Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic)				(DGM of 0.239)	5762 Btuh
	Sensible Load All Zones					29880 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Ricky Mershon Res

Project Title: 221146 Mershon Res

Climate: FL_GAINESVILLE_REGIONAL_A

Lake City, FL

2023-02-02

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	24119 Btuh
	Sensible Duct Load	5762 Btuh
	Total Sensible Zone Loads	29880 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	29880 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	3243 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1142 Btuh
	Latent occupant gain (1.0 people @ 200 Btuh per person)	200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	4585 Btuh
	TOTAL GAIN	34465 Btuh

EQUIPMENT

1. Central Unit	#	37000 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