Residential System Sizing Calculation

Summary

Matthew & Lyndi Karlton
NW Delaney Ct
Lake City, FL 23055

Project Title:
231256 Karlton - Main House

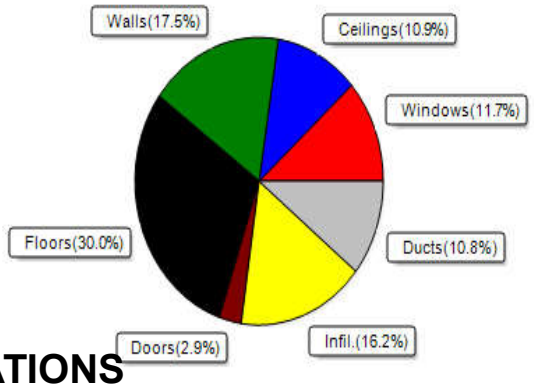
2023-10-09

Location for weather data: Gainesville, FL - Defaults: Latitude(29.7) Altitude(100 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	**53909**	**Btuh**	**Total cooling load calculation**	**43614**	**Btuh**
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	109.4	59000	Sensible (SHR = 0.75)	125.4	44250
Heat Pump + Auxiliary(0.0kW)	109.4	59000	Latent	177.0	14750
			Total (Electric Heat Pump)	135.3	59000

WINTER CALCULATIONS

Winter Heating Load (for 3691 sqft)

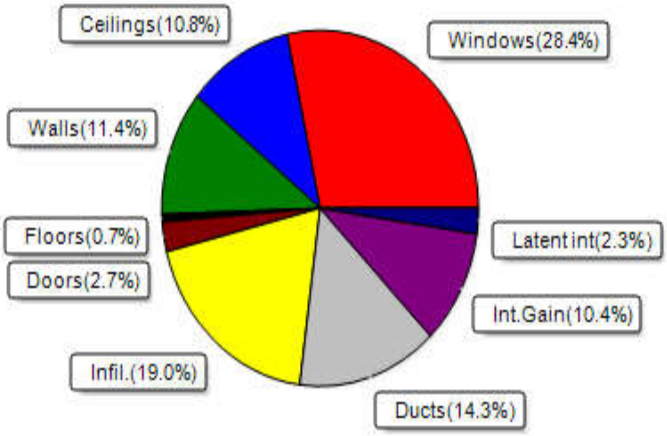
Load component			Load	
Window total	524	sqft	6291	Btuh
Wall total	2989	sqft	9415	Btuh
Door total	98	sqft	1564	Btuh
Ceiling total	4896	sqft	5900	Btuh
Floor total	See detail report		16163	Btuh
Infiltration	200	cfm	8751	Btuh
Duct loss			5824	Btuh
Subtotal			**53909**	**Btuh**
Ventilation	Ex:0 cfm; Sup:0 cfm		0	Btuh
TOTAL HEAT LOSS			**53909**	**Btuh**



SUMMER CALCULATIONS

Summer Cooling Load (for 3691 sqft)

Load component			Load	
Window total	524	sqft	12369	Btuh
Wall total	2989	sqft	4955	Btuh
Door total	98	sqft	1173	Btuh
Ceiling total	4896	sqft	4720	Btuh
Floor total			305	Btuh
Infiltration	150	cfm	3117	Btuh
Internal gain			4550	Btuh
Duct gain			4093	Btuh
Sens.Ventilation	Ex:0 cfm; Sup:0 cfm		0	Btuh
Blower Load			0	Btuh
Total sensible gain			**35283**	**Btuh**
Latent gain(ducts)			2158	Btuh
Latent gain(infiltration)			5173	Btuh
Latent gain(ventilation)			0	Btuh
Latent gain(internal/occupants/other)			1000	Btuh
Total latent gain			**8331**	**Btuh**
TOTAL HEAT GAIN			**43614**	**Btuh**



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EnergyGauge® System Sizing
PREPARED BY: Evan Beamsley
DATE: 2023-10-09

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Matthew & Lyndi Karlton
NW Delaney Ct
Lake City, FL 23055

Project Title:
231256 Karlton - Main House
Building Type: User

2023-10-09

Reference City: Gainesville, FL (Defaults) Winter Temperature Difference: 40.0 °F (TMY3 99%)
Winter Setpoint: 70 °F (Required Manual J default)

Component Loads for Whole House

Window	Panes/Type	Frame	U	Orientation	Area(sqft) X	HTM=	Load
1	2, NFRC 0.22	Vinyl	0.30	N	36.0	12.0	432 Btuh
2	2, NFRC 0.22	Vinyl	0.30	N	160.0	12.0	1920 Btuh
3	2, NFRC 0.22	Vinyl	0.30	N	36.0	12.0	432 Btuh
4	2, NFRC 0.22	Vinyl	0.30	N	12.0	12.0	144 Btuh
5	2, NFRC 0.22	Vinyl	0.30	N	18.0	12.0	216 Btuh
6	2, NFRC 0.22	Vinyl	0.30	N	18.0	12.0	216 Btuh
7	2, NFRC 0.22	Vinyl	0.30	N	8.0	12.0	96 Btuh
8	2, NFRC 0.22	Vinyl	0.30	E	8.0	12.0	96 Btuh
9	2, NFRC 0.22	Vinyl	0.30	E	16.0	12.0	192 Btuh
10	2, NFRC 0.22	Vinyl	0.30	S	36.0	12.0	432 Btuh
11	2, NFRC 0.22	Vinyl	0.30	S	12.0	12.0	144 Btuh
12	2, NFRC 0.22	Vinyl	0.30	S	48.0	12.0	576 Btuh
13	2, NFRC 0.22	Vinyl	0.30	S	36.0	12.0	432 Btuh
14	2, NFRC 0.22	Vinyl	0.30	S	12.0	12.0	144 Btuh
15	2, NFRC 0.22	Vinyl	0.30	W	4.0	12.0	48 Btuh
16	2, NFRC 0.22	Vinyl	0.30	W	18.0	12.0	216 Btuh
17	2, NFRC 0.22	Vinyl	0.30	S	26.3	12.0	315 Btuh
18	2, NFRC 0.22	Vinyl	0.30	E	20.0	12.0	240 Btuh
	Window Total				524.3(sqft)		6291 Btuh

Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area X	HTM=	Load
1	Frame - Wood	- Ext	(0.077)	19.0/0.0	95	3.09	292 Btuh
2	Frame - Wood	- Ext	(0.077)	19.0/0.0	108	3.09	334 Btuh
3	Frame - Wood	- Ext	(0.077)	19.0/0.0	106	3.09	328 Btuh
4	Frame - Wood	- Ext	(0.077)	19.0/0.0	144	3.09	445 Btuh
5	Frame - Wood	- Ext	(0.077)	19.0/0.0	94	3.09	291 Btuh
6	Frame - Wood	- Ext	(0.077)	19.0/0.0	65	3.09	201 Btuh
7	Frame - Wood	- Ext	(0.077)	19.0/0.0	174	3.09	538 Btuh
8	Frame - Wood	- Ext	(0.077)	19.0/0.0	117	3.09	362 Btuh
9	Frame - Wood	- Ext	(0.077)	19.0/0.0	38	3.09	118 Btuh
10	Frame - Wood	- Ext	(0.077)	19.0/0.0	50	3.09	155 Btuh
11	Frame - Wood	- Ext	(0.077)	19.0/0.0	122	3.09	377 Btuh
12	Frame - Wood	- Ext	(0.077)	19.0/0.0	50	3.09	155 Btuh
13	Frame - Wood	- Ext	(0.077)	19.0/0.0	143	3.09	440 Btuh
14	Frame - Wood	- Adj	(0.089)	13.0/0.0	224	3.55	797 Btuh
15	Frame - Wood	- Adj	(0.089)	13.0/0.0	159	3.55	565 Btuh
16	Frame - Wood	- Ext	(0.077)	19.0/0.0	72	3.09	223 Btuh
17	Frame - Wood	- Ext	(0.077)	19.0/0.0	70	3.09	216 Btuh
18	Frame - Wood	- Ext	(0.077)	19.0/0.0	124	3.09	383 Btuh
19	Frame - Wood	- Ext	(0.077)	19.0/0.0	70	3.09	216 Btuh
20	Frame - Wood	- Ext	(0.077)	19.0/0.0	97	3.09	300 Btuh
21	Frame - Wood	- Ext	(0.077)	19.0/0.0	125	3.09	386 Btuh
22	Frame - Wood	- Ext	(0.077)	19.0/0.0	54	3.09	167 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

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NW Delaney Ct
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Project Title:
231256 Karlton - Main House
Building Type: User

2023-10-09

Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area X	HTM=	Load
23	Frame - Wood	- Ext	(0.077)	19.0/0.0	136	3.09	419 Btuh
24	Frame - Wood	- Ext	(0.077)	19.0/0.0	54	3.09	167 Btuh
25	Frame - Wood	- Ext	(0.077)	19.0/0.0	153	3.09	473 Btuh
26	Frame - Wood	- Ext	(0.077)	19.0/0.0	24	3.09	74 Btuh
27	Frame - Wood	- Ext	(0.077)	19.0/0.0	54	3.09	166 Btuh
28	Frame - Wood	- Ext	(0.077)	19.0/0.0	24	3.09	74 Btuh
29	Frame - Wood	- Ext	(0.077)	19.0/0.0	32	3.09	99 Btuh
30	Frame - Wood	- Ext	(0.077)	19.0/0.0	68	3.09	210 Btuh
31	Frame - Wood	- Ext	(0.077)	19.0/0.0	32	3.09	99 Btuh
32	Frame - Wood	- Ext	(0.077)	19.0/0.0	112	3.09	346 Btuh
	Wall Total				2989(sqft)		9415 Btuh
Doors	Type	Storm	Ueff.		Area X	HTM=	Load
1	Insulated - Exterior,	n	(0.400)		8	16.0	128 Btuh
2	Insulated - Garage,	n	(0.400)		18	16.0	284 Btuh
3	Insulated - Garage,	n	(0.400)		24	16.0	384 Btuh
4	Wood - Exterior,	n	(0.400)		48	16.0	768 Btuh
	Door Total				98(sqft)		1564Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area X	HTM=	Load
1	Knee wall/D/Shing		(0.241)	0.0/22.0	544	1.2	656 Btuh
2	Knee wall/D/Shing		(0.241)	0.0/22.0	800	1.2	964 Btuh
3	Flat ceil/D/Shing		(0.241)	0.0/22.0	2624	1.2	3162 Btuh
4	Sloped ce/D/Shing		(0.241)	0.0/22.0	322	1.2	388 Btuh
5	Flat ceil/D/Shing		(0.241)	0.0/22.0	606	1.2	730 Btuh
	Ceiling Total				4896(sqft)		5900Btuh
Floors	Type		Ueff.	R-Value	Size X	HTM=	Load
1	Slab On Grade		(1.180)	0.0	324.0 ft(perim.)	47.2	15293 Btuh
2	Raised Wood - Adj		(0.050)	19.0	434.0 sqft	2.0	871 Btuh
	Floor Total				3519 sqft		16163 Btuh
					Envelope Subtotal:		39334 Btuh
Infiltration	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio	CFM=	
	Natural		0.32	37549	1.00	199.5	8751 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att)					(DLM of 0.121)	5824 Btuh
All Zones					**Sensible Subtotal All Zones**		**53909 Btuh**

Manual J Winter Calculations

Residential Load - Component Details (continued)

Matthew & Lyndi Karlton
NW Delaney Ct
Lake City, FL 23055

Project Title:
231256 Karlton - Main House
Building Type: User

2023-10-09

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss	53909 Btuh
	Ventilation Sens. Heat Loss (Ex:0 cfm; Sup:0 cfm)	0 Btuh
	Total Heat Loss	53909 Btuh

EQUIPMENT

1. Electric Heat Pump	#	59000 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 - Whole House Component Details

Matthew & Lyndi Karlton
NW Delaney Ct
Lake City, FL 23055

Project Title:
231256 Karlton - Main House

2023-10-09

Reference City: Gainesville, FL (Defaults)
Humidity difference: 51gr.

Temperature Difference: 19.0F(TMY3 99%)
Summer Setpoint: 75 °F (Required Manual J default)

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,	0.30	No	No	N	1.5ft	3.3ft	36.0	0.0	36.0	10	27	969	Btuh
2	2 NFRC	0.22,	0.30	No	No	N	20.0f	0.7ft	160.0	160.0	0.0	10	27	1652	Btuh
3	2 NFRC	0.22,	0.30	No	No	N	1.5ft	3.3ft	36.0	0.0	36.0	10	27	969	Btuh
4	2 NFRC	0.22,	0.30	No	No	N	1.5ft	1.3ft	12.0	0.0	12.0	10	27	323	Btuh
5	2 NFRC	0.22,	0.30	No	No	N	1.5ft	3.3ft	18.0	0.0	18.0	10	27	484	Btuh
6	2 NFRC	0.22,	0.30	No	No	N	1.5ft	15.5f	18.0	0.0	18.0	10	27	484	Btuh
7	2 NFRC	0.22,	0.30	No	No	N	1.5ft	4.3ft	8.0	0.0	8.0	10	27	215	Btuh
8	2 NFRC	0.22,	0.30	No	No	E	1.5ft	0.7ft	8.0	0.0	8.0	10	10	83	Btuh
9	2 NFRC	0.22,	0.30	No	No	E	1.5ft	0.3ft	16.0	0.0	16.0	10	10	165	Btuh
10	2 NFRC	0.22,	0.30	No	No	S	1.5ft	9.5ft	36.0	0.0	36.0	10	27	969	Btuh
11	2 NFRC	0.22,	0.30	No	No	S	1.5ft	7.5ft	12.0	0.0	12.0	10	27	323	Btuh
12	2 NFRC	0.22,	0.30	No	No	S	7.0ft	0.7ft	48.0	30.9	17.1	10	27	780	Btuh
13	2 NFRC	0.22,	0.30	No	No	S	1.5ft	9.5ft	36.0	0.0	36.0	10	27	969	Btuh
14	2 NFRC	0.22,	0.30	No	No	S	1.5ft	7.5ft	12.0	0.0	12.0	10	27	323	Btuh
15	2 NFRC	0.22,	0.30	No	No	W	1.5ft	0.7ft	4.0	4.0	0.0	10	12	41	Btuh
16	2 NFRC	0.22,	0.30	No	No	W	1.5ft	0.7ft	18.0	18.0	0.0	10	12	186	Btuh
17	2 NFRC	0.22,	0.30	No	No	S	1.5ft	1.0ft	26.3	1.8	24.4	10	27	676	Btuh
18	2 NFRC	0.22,	0.30	No	No	E	1.5ft	0.5ft	20.0	0.0	20.0	10	10	207	Btuh
	Excursion													2551	Btuh
	Window Total								524 (sqft)					12369	Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Matthew & Lyndi Karlton
NW Delaney Ct
Lake City, FL 23055

Project Title: 231256 Karlton - Main House
Climate:FL_GAINESVILLE_REGIONAL_A

2023-10-09

Walls	Type	U-Value	R-Value	Area(sqft)	HTM	Load
			Cav/Sheath			
1	Frame - Wood - Ext	0.08	19.0/0.0	94.5	1.7	156 Btuh
2	Frame - Wood - Ext	0.08	19.0/0.0	108.0	1.7	179 Btuh
3	Frame - Wood - Ext	0.08	19.0/0.0	106.0	1.7	175 Btuh
4	Frame - Wood - Ext	0.08	19.0/0.0	144.0	1.7	238 Btuh
5	Frame - Wood - Ext	0.08	19.0/0.0	94.0	1.7	155 Btuh
6	Frame - Wood - Ext	0.08	19.0/0.0	65.0	1.7	107 Btuh
7	Frame - Wood - Ext	0.08	19.0/0.0	174.0	1.7	288 Btuh
8	Frame - Wood - Ext	0.08	19.0/0.0	117.0	1.7	193 Btuh
9	Frame - Wood - Ext	0.08	19.0/0.0	38.3	1.7	63 Btuh
10	Frame - Wood - Ext	0.08	19.0/0.0	50.0	1.7	83 Btuh
11	Frame - Wood - Ext	0.08	19.0/0.0	122.0	1.7	202 Btuh
12	Frame - Wood - Ext	0.08	19.0/0.0	50.0	1.7	83 Btuh
13	Frame - Wood - Ext	0.08	19.0/0.0	142.5	1.7	236 Btuh
14	Frame - Wood - Adj	0.09	13.0/0.0	224.5	1.7	379 Btuh
15	Frame - Wood - Adj	0.09	13.0/0.0	159.0	1.7	268 Btuh
16	Frame - Wood - Ext	0.08	19.0/0.0	72.0	1.7	119 Btuh
17	Frame - Wood - Ext	0.08	19.0/0.0	70.0	1.7	116 Btuh
18	Frame - Wood - Ext	0.08	19.0/0.0	124.0	1.7	205 Btuh
19	Frame - Wood - Ext	0.08	19.0/0.0	70.0	1.7	116 Btuh
20	Frame - Wood - Ext	0.08	19.0/0.0	97.0	1.7	160 Btuh
21	Frame - Wood - Ext	0.08	19.0/0.0	125.0	1.7	207 Btuh
22	Frame - Wood - Ext	0.08	19.0/0.0	54.0	1.7	89 Btuh
23	Frame - Wood - Ext	0.08	19.0/0.0	135.5	1.7	224 Btuh
24	Frame - Wood - Ext	0.08	19.0/0.0	54.0	1.7	89 Btuh
25	Frame - Wood - Ext	0.08	19.0/0.0	153.0	1.7	253 Btuh
26	Frame - Wood - Ext	0.08	19.0/0.0	24.0	1.7	40 Btuh
27	Frame - Wood - Ext	0.08	19.0/0.0	53.8	1.7	89 Btuh
28	Frame - Wood - Ext	0.08	19.0/0.0	24.0	1.7	40 Btuh
29	Frame - Wood - Ext	0.08	19.0/0.0	32.0	1.7	53 Btuh
30	Frame - Wood - Ext	0.08	19.0/0.0	68.0	1.7	112 Btuh
31	Frame - Wood - Ext	0.08	19.0/0.0	32.0	1.7	53 Btuh
32	Frame - Wood - Ext	0.08	19.0/0.0	112.0	1.7	185 Btuh
	Wall Total			2989 (sqft)		4955 Btuh

Doors	Type	Area (sqft)	HTM	Load
1	Insulated - Exterior	8.0	12.0	96 Btuh
2	Insulated - Garage	17.8	12.0	213 Btuh
3	Insulated - Garage	24.0	12.0	288 Btuh
4	Wood - Exterior	48.0	12.0	576 Btuh
	Door Total	98 (sqft)		1173 Btuh

Ceilings	Type/Color/Surface	U-Value	R-Value	Area(sqft)	HTM	Load
1	Knee wall to attic/DarkShingle	0.241	0.0/22.0	544.0	0.96	524 Btuh
2	Knee wall to attic/DarkShingle	0.241	0.0/22.0	800.0	0.96	771 Btuh
3	Unvented Attic/DarkShingle	0.241	0.0/22.0	2624.0	0.96	2530 Btuh
4	Unvented Attic/DarkShingle	0.241	0.0/22.0	322.0	0.96	310 Btuh
5	Unvented Attic/DarkShingle	0.241	0.0/22.0	606.0	0.96	584 Btuh
	Ceiling Total			4896 (sqft)		4720 Btuh

Floors	Type	R-Value	Size	HTM	Load
1	Slab On Grade	0.0	3085 (ft-perimeter)	0.0	0 Btuh
2	Raised Wood - Adj	19.0	434 (sqft)	0.7	305 Btuh
	Floor Total		3519.0 (sqft)		305 Btuh

	Envelope Subtotal:	23522 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

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NW Delaney Ct
Lake City, FL 23055

Project Title: 231256 Karlton - Main House

Climate:FL_GAINESVILLE_REGIONAL_A

2023-10-09

Infiltration	Type	Average ACH	Volume(cuft)		Wall Ratio		CFM=	Load	
	Natural	0.24	37549		1		149.6	3117	Btuh
Internal gain		Occupants	Btuh/occupant				Appliance	Load	
		5	X	230	+		3400	4550	Btuh
						Sensible Envelope Load:		31189	Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic)					(DGM of 0.131)		4093	Btuh
						Sensible Load All Zones		**35283**	**Btuh**

Manual J Summer Calculations

Residential Load - Component Details (continued)

Matthew & Lyndi Karlton
NW Delaney Ct
Lake City, FL 23055

Project Title: 231256 Karlton - Main House
Climate:FL_GAINESVILLE_REGIONAL_A

2023-10-09

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	**Sensible Envelope Load All Zones**	**31189**	**Btuh**
	Sensible Duct Load	4093	Btuh
	Total Sensible Zone Loads	**35283**	**Btuh**
	Sensible ventilation (Ex:0 cfm; Sup:0 cfm)	0	Btuh
	Blower	0	Btuh
	Total sensible gain	**35283**	**Btuh**
	Latent infiltration gain (for 51 gr. humidity difference)	5173	Btuh
	Latent ventilation gain	0	Btuh
	Latent duct gain	2158	Btuh
	Latent occupant gain (5.0 people @ 200 Btuh per person)	1000	Btuh
	Latent other gain	0	Btuh
	Latent total gain	**8331**	**Btuh**
	TOTAL GAIN	**43614**	**Btuh**

EQUIPMENT

1. Central Unit	#	59000 Btuh

*Key: Window types (Panes - 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