

Residential System Sizing Calculation

Summary

Dicks Res

Project Title:
210206 Dicks

Lake City, FL

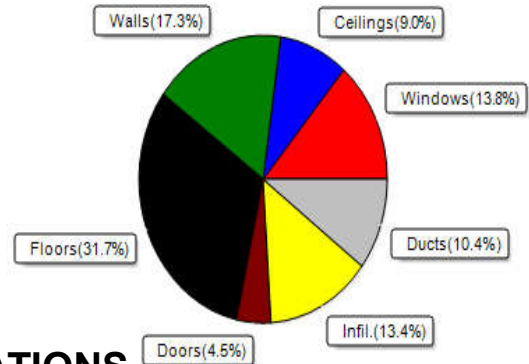
2021-02-08

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	48407 Btuh	Total cooling load calculation	38670 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	109.5 53000	Sensible (SHR = 0.75)	125.4 39750
Heat Pump + Auxiliary(0.0kW)	109.5 53000	Latent	190.3 13250
		Total (Electric Heat Pump)	137.1 53000

WINTER CALCULATIONS

Winter Heating Load (for 3281 sqft)

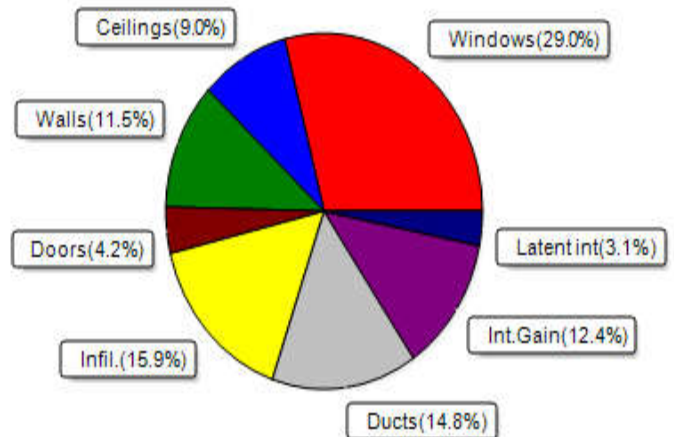
Load component		Load	
Window total	557 sqft	6684 Btuh	
Wall total	2650 sqft	8352 Btuh	
Door total	136 sqft	2176 Btuh	
Ceiling total	3616 sqft	4357 Btuh	
Floor total	3281 sqft	15340 Btuh	
Infiltration	148 cfm	6483 Btuh	
Duct loss		5015 Btuh	
Subtotal		48407 Btuh	
Ventilation	0 cfm	0 Btuh	
TOTAL HEAT LOSS		48407 Btuh	



SUMMER CALCULATIONS

Summer Cooling Load (for 3281 sqft)

Load component		Load	
Window total	557 sqft	11229 Btuh	
Wall total	2650 sqft	4465 Btuh	
Door total	136 sqft	1632 Btuh	
Ceiling total	3616 sqft	3486 Btuh	
Floor total		0 Btuh	
Infiltration	111 cfm	2309 Btuh	
Internal gain		4780 Btuh	
Duct gain		3805 Btuh	
Sens. Ventilation	0 cfm	0 Btuh	
Blower Load		0 Btuh	
Total sensible gain		31707 Btuh	
Latent gain(ducts)		1931 Btuh	
Latent gain(infiltration)		3832 Btuh	
Latent gain(ventilation)		0 Btuh	
Latent gain(internal/occupants/other)		1200 Btuh	
Total latent gain		6963 Btuh	
TOTAL HEAT GAIN		38670 Btuh	



8th Edition

EnergyGauge® System Sizing
PREPARED BY: Evan Beamsley
DATE: 2021-02-08

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Dicks Res

Project Title:
210206 Dicks
Building Type: User

Lake City, FL

2021-02-08

Reference City: Gainesville, FL (Defaults) Winter Temperature Difference: 40.0 F (TMY3 99%)
This calculation is for Worst Case. The house has been rotated 270 degrees.

Component Loads for Whole House

Window	Panes/Type	Frame	U	Orientation	Area(sqft)	X	HTM=	Load
1	2, NFRC 0.20	Metal	0.30	W	32.0		12.0	384 Btuh
2	2, NFRC 0.20	Metal	0.30	W	27.0		12.0	324 Btuh
3	2, NFRC 0.20	Metal	0.30	N	13.3		12.0	160 Btuh
4	2, NFRC 0.20	Metal	0.30	W	120.0		12.0	1440 Btuh
5	2, NFRC 0.20	Metal	0.30	W	120.0		12.0	1440 Btuh
6	2, NFRC 0.20	Metal	0.30	S	13.3		12.0	160 Btuh
7	2, NFRC 0.20	Metal	0.30	W	8.0		12.0	96 Btuh
8	2, NFRC 0.20	Metal	0.30	N	20.0		12.0	240 Btuh
9	2, NFRC 0.20	Metal	0.30	N	8.0		12.0	96 Btuh
10	2, NFRC 0.20	Metal	0.30	N	16.0		12.0	192 Btuh
11	2, NFRC 0.20	Metal	0.30	E	16.0		12.0	192 Btuh
12	2, NFRC 0.20	Metal	0.30	E	12.0		12.0	144 Btuh
13	2, NFRC 0.20	Metal	0.30	S	4.0		12.0	48 Btuh
14	2, NFRC 0.20	Metal	0.30	E	16.0		12.0	192 Btuh
15	2, NFRC 0.20	Metal	0.30	E	32.0		12.0	384 Btuh
16	2, NFRC 0.20	Metal	0.30	E	8.0		12.0	96 Btuh
17	2, NFRC 0.20	Metal	0.30	E	32.0		12.0	384 Btuh
18	2, NFRC 0.20	Metal	0.30	E	32.0		12.0	384 Btuh
19	2, NFRC 0.20	Metal	0.30	S	13.3		12.0	160 Btuh
20	2, NFRC 0.20	Metal	0.30	S	6.0		12.0	72 Btuh
21	2, NFRC 0.20	Metal	0.30	S	8.0		12.0	96 Btuh
Window Total					557.0(sqft)			6684 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.077)	19.0/0.0	113		3.09	348 Btuh
2	Frame - Wood	- Ext	(0.077)	19.0/0.0	107		3.09	331 Btuh
3	Frame - Wood	- Ext	(0.077)	19.0/0.0	164		3.09	506 Btuh
4	Frame - Wood	- Ext	(0.077)	19.0/0.0	107		3.09	331 Btuh
5	Frame - Wood	- Ext	(0.077)	19.0/0.0	62		3.09	192 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	125		3.55	444 Btuh
7	Frame - Wood	- Ext	(0.077)	19.0/0.0	27		3.09	82 Btuh
8	Frame - Wood	- Ext	(0.077)	19.0/0.0	192		3.09	592 Btuh
9	Frame - Wood	- Ext	(0.077)	19.0/0.0	27		3.09	82 Btuh
10	Frame - Wood	- Ext	(0.077)	19.0/0.0	76		3.09	235 Btuh
11	Frame - Wood	- Adj	(0.089)	13.0/0.0	228		3.55	808 Btuh
12	Frame - Wood	- Ext	(0.077)	19.0/0.0	126		3.09	388 Btuh
13	Frame - Wood	- Ext	(0.077)	19.0/0.0	20		3.09	62 Btuh
14	Frame - Wood	- Ext	(0.077)	19.0/0.0	85		3.09	262 Btuh
15	Frame - Wood	- Ext	(0.077)	19.0/0.0	134		3.09	415 Btuh
16	Frame - Wood	- Ext	(0.077)	19.0/0.0	54		3.09	167 Btuh
17	Frame - Wood	- Ext	(0.077)	19.0/0.0	67		3.09	206 Btuh
18	Frame - Wood	- Ext	(0.077)	19.0/0.0	44		3.09	136 Btuh
19	Frame - Wood	- Ext	(0.077)	19.0/0.0	80		3.09	247 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Dicks Res
Lake City, FL

Project Title:
210206 Dicks
Building Type: User

2021-02-08

Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area X	HTM=	Load
20	Frame - Wood	- Ext	(0.077)	19.0/0.0	130	3.09	402 Btuh
21	Frame - Wood	- Ext	(0.077)	19.0/0.0	20	3.09	62 Btuh
22	Frame - Wood	- Ext	(0.077)	19.0/0.0	68	3.09	210 Btuh
23	Frame - Wood	- Ext	(0.077)	19.0/0.0	17	3.09	52 Btuh
24	Frame - Wood	- Ext	(0.077)	19.0/0.0	47	3.09	144 Btuh
25	Frame - Wood	- Ext	(0.077)	19.0/0.0	87	3.09	269 Btuh
26	Frame - Wood	- Ext	(0.077)	19.0/0.0	15	3.09	46 Btuh
27	Frame - Wood	- Ext	(0.077)	19.0/0.0	37	3.09	115 Btuh
28	Frame - Wood	- Ext	(0.077)	19.0/0.0	30	3.09	93 Btuh
29	Frame - Wood	- Ext	(0.077)	19.0/0.0	137	3.09	423 Btuh
30	Frame - Wood	- Ext	(0.077)	19.0/0.0	30	3.09	93 Btuh
31	Frame - Wood	- Ext	(0.077)	19.0/0.0	197	3.09	608 Btuh
	Wall Total					2650(sqft)	8352 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)		40	16.0	640 Btuh
3	Insulated - Exterior,	n	(0.400)		40	16.0	640 Btuh
4	Insulated - Exterior,	n	(0.400)		8	16.0	128 Btuh
5	Insulated - Garage,	n	(0.400)		24	16.0	384 Btuh
6	Insulated - Exterior,	n	(0.400)		16	16.0	256 Btuh
	Door Total					136(sqft)	2176Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area X	HTM=	Load
1	Unvent Attic/D/Shing		(0.241)	0.0/22.0	3616	1.2	4357 Btuh
	Ceiling Total					3616(sqft)	4357Btuh
Floors	Type		Ueff.	R-Value	Size X	HTM=	Load
1	Slab On Grade		(1.180)	0.0	325.0 ft(perim.)	47.2	15340 Btuh
	Floor Total					3281 sqft	15340 Btuh
	Envelope Subtotal:						36909 Btuh
Infiltration	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio	CFM=	
	Natural		0.25	35763	1.00	148.0	6483 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att)					(DLM of 0.116)	5015 Btuh
All Zones	Sensible Subtotal All Zones						48407 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Dicks Res
Lake City, FL

Project Title:
210206 Dicks
Building Type: User

2021-02-08

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss	48407 Btuh
	Ventilation Sensible Heat Loss	0 Btuh
	Total Heat Loss	48407 Btuh

EQUIPMENT

1. Electric Heat Pump	#	53000 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

Dicks Res

Project Title:
210206 Dicks

Lake City, FL

2021-02-08

Reference City: Gainesville, FL

Temperature Difference: 19.0F(TMY3 99%)

Humidity difference: 51gr.

This calculation is for Worst Case. The house has been rotated 270 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	0.20, 0.30	No	No	W	1.5ft	1.0ft	32.0	1.3	30.7	10	25	780	Btuh
2	2 NFRC	0.20, 0.30	No	No	W	1.5ft	1.0ft	27.0	1.1	25.9	10	25	658	Btuh
3	2 NFRC	0.20, 0.30	No	No	N	99.5f	2.3ft	13.3	0.0	13.3	10	10	132	Btuh
4	2 NFRC	0.20, 0.30	No	No	W	14.3f	0.3ft	120.0	120.0	0.0	10	25	1189	Btuh
5	2 NFRC	0.20, 0.30	No	No	W	14.3f	0.3ft	120.0	120.0	0.0	10	25	1189	Btuh
6	2 NFRC	0.20, 0.30	No	No	S	99.5f	2.3ft	13.3	13.3	0.0	10	11	132	Btuh
7	2 NFRC	0.20, 0.30	No	No	W	1.5ft	1.0ft	8.0	0.5	7.5	10	25	192	Btuh
8	2 NFRC	0.20, 0.30	No	No	N	1.5ft	8.0ft	20.0	0.0	20.0	10	10	198	Btuh
9	2 NFRC	0.20, 0.30	No	No	N	22.2f	1.0ft	8.0	0.0	8.0	10	10	79	Btuh
10	2 NFRC	0.20, 0.30	No	No	N	22.2f	1.0ft	16.0	0.0	16.0	10	10	159	Btuh
11	2 NFRC	0.20, 0.30	No	No	E	1.5ft	1.0ft	16.0	1.0	15.0	10	25	385	Btuh
12	2 NFRC	0.20, 0.30	No	No	E	1.5ft	1.0ft	12.0	0.5	11.5	10	25	292	Btuh
13	2 NFRC	0.20, 0.30	No	No	S	1.5ft	1.5ft	4.0	4.0	0.0	10	11	40	Btuh
14	2 NFRC	0.20, 0.30	No	No	E	6.5ft	3.0ft	16.0	6.4	9.6	10	25	303	Btuh
15	2 NFRC	0.20, 0.30	No	No	E	11.7f	3.0ft	32.0	26.7	5.3	10	25	396	Btuh
16	2 NFRC	0.20, 0.30	No	No	E	11.7f	0.5ft	8.0	8.0	0.0	10	25	79	Btuh
17	2 NFRC	0.20, 0.30	No	No	E	6.5ft	3.0ft	32.0	12.8	19.2	10	25	607	Btuh
18	2 NFRC	0.20, 0.30	No	No	E	1.5ft	1.0ft	32.0	1.3	30.7	10	25	780	Btuh
19	2 NFRC	0.20, 0.30	No	No	S	1.5ft	0.5ft	13.3	13.3	0.0	10	11	132	Btuh
20	2 NFRC	0.20, 0.30	No	No	S	1.5ft	1.0ft	6.0	6.0	0.0	10	11	59	Btuh
21	2 NFRC	0.20, 0.30	No	No	S	1.5ft	1.0ft	8.0	8.0	0.0	10	11	79	Btuh
	Excursion												3368	Btuh
	Window Total							557 (sqft)					11229	Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Dicks Res

Project Title:
210206 Dicks

Climate:FL_GAINESVILLE_REGIONAL_A

Lake City, FL

2021-02-08

Walls	Type	U-Value	R-Value	Area(sqft)	HTM	Load
			Cav/Sheath			
1	Frame - Wood - Ext	0.08	19.0/0.0	112.7	1.7	186 Btuh
2	Frame - Wood - Ext	0.08	19.0/0.0	107.0	1.7	177 Btuh
3	Frame - Wood - Ext	0.08	19.0/0.0	163.6	1.7	270 Btuh
4	Frame - Wood - Ext	0.08	19.0/0.0	107.0	1.7	177 Btuh
5	Frame - Wood - Ext	0.08	19.0/0.0	62.0	1.7	103 Btuh
6	Frame - Wood - Ext	0.09	13.0/0.0	125.0	2.3	283 Btuh
7	Frame - Wood - Ext	0.08	19.0/0.0	26.7	1.7	44 Btuh
8	Frame - Wood - Ext	0.08	19.0/0.0	191.7	1.7	317 Btuh
9	Frame - Wood - Ext	0.08	19.0/0.0	26.7	1.7	44 Btuh
10	Frame - Wood - Ext	0.08	19.0/0.0	76.0	1.7	126 Btuh
11	Frame - Wood - Adj	0.09	13.0/0.0	227.7	1.7	384 Btuh
12	Frame - Wood - Ext	0.08	19.0/0.0	125.7	1.7	208 Btuh
13	Frame - Wood - Ext	0.08	19.0/0.0	20.0	1.7	33 Btuh
14	Frame - Wood - Ext	0.08	19.0/0.0	84.7	1.7	140 Btuh
15	Frame - Wood - Ext	0.08	19.0/0.0	134.3	1.7	222 Btuh
16	Frame - Wood - Ext	0.08	19.0/0.0	54.0	1.7	89 Btuh
17	Frame - Wood - Ext	0.08	19.0/0.0	66.7	1.7	110 Btuh
18	Frame - Wood - Ext	0.08	19.0/0.0	44.0	1.7	73 Btuh
19	Frame - Wood - Ext	0.08	19.0/0.0	80.0	1.7	132 Btuh
20	Frame - Wood - Ext	0.08	19.0/0.0	130.0	1.7	215 Btuh
21	Frame - Wood - Ext	0.08	19.0/0.0	20.0	1.7	33 Btuh
22	Frame - Wood - Ext	0.08	19.0/0.0	68.0	1.7	112 Btuh
23	Frame - Wood - Ext	0.08	19.0/0.0	16.7	1.7	28 Btuh
24	Frame - Wood - Ext	0.08	19.0/0.0	46.5	1.7	77 Btuh
25	Frame - Wood - Ext	0.08	19.0/0.0	87.2	1.7	144 Btuh
26	Frame - Wood - Ext	0.08	19.0/0.0	15.0	1.7	25 Btuh
27	Frame - Wood - Ext	0.08	19.0/0.0	37.3	1.7	62 Btuh
28	Frame - Wood - Ext	0.08	19.0/0.0	30.0	1.7	50 Btuh
29	Frame - Wood - Ext	0.08	19.0/0.0	137.0	1.7	227 Btuh
30	Frame - Wood - Ext	0.08	19.0/0.0	30.0	1.7	50 Btuh
31	Frame - Wood - Ext	0.08	19.0/0.0	196.7	1.7	325 Btuh
	Wall Total			2650 (sqft)		4465 Btuh
Doors	Type			Area (sqft)	HTM	Load
1	Insulated - Exterior			8.0	12.0	96 Btuh
2	Insulated - Exterior			40.0	12.0	480 Btuh
3	Insulated - Exterior			40.0	12.0	480 Btuh
4	Insulated - Exterior			8.0	12.0	96 Btuh
5	Insulated - Garage			24.0	12.0	288 Btuh
6	Insulated - Exterior			16.0	12.0	192 Btuh
	Door Total			136 (sqft)		1632 Btuh
Ceilings	Type/Color/Surface	U-Value	R-Value	Area(sqft)	HTM	Load
1	Unvented Attic/DarkShingle	0.241	0.0/22.0	3616.0	0.96	3486 Btuh
	Ceiling Total			3616 (sqft)		3486 Btuh
Floors	Type		R-Value	Size	HTM	Load
1	Slab On Grade		0.0	3281 (ft-perimeter)	0.0	0 Btuh
	Floor Total			3281.0 (sqft)		0 Btuh
	Envelope Subtotal:					20812 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Dicks Res

Project Title:
210206 Dicks

Climate:FL_GAINESVILLE_REGIONAL_A

Lake City, FL

2021-02-08

Infiltration	Type Natural	Average ACH 0.19	Volume(cuft) 35763	Wall Ratio 1	CFM= 111.0	Load 2309 Btuh
Internal gain		Occupants 6	Btuh/occupant X 230	Appliance +	3400	Load 4780 Btuh
	Sensible Envelope Load:					27901 Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic) (DGM of 0.136)					3805 Btuh
	Sensible Load All Zones					31707 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Dicks Res

Project Title:
210206 Dicks

Climate:FL_GAINESVILLE_REGIONAL_A

Lake City, FL

2021-02-08

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	27901 Btuh
	Sensible Duct Load	3805 Btuh
	Total Sensible Zone Loads	31707 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	31707 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	3832 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1931 Btuh
	Latent occupant gain (6.0 people @ 200 Btuh per person)	1200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	6963 Btuh
	TOTAL GAIN	38670 Btuh

EQUIPMENT

1. Central Unit	#	53000 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