

Residential System Sizing Calculation

Summary

Project Title:
Campbell Residence

, FL

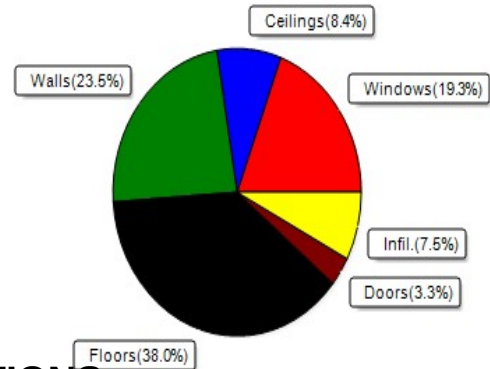
6/10/2021

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	41113	Btuh	Total cooling load calculation	26127	Btuh
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	116.8	48000	Sensible (SHR = 0.85)	179.7	40800
Heat Pump + Auxiliary(0.0kW)	116.8	48000	Latent	210.5	7200
			Total (Electric Heat Pump)	183.7	48000

WINTER CALCULATIONS

Winter Heating Load (for 2902 sqft)

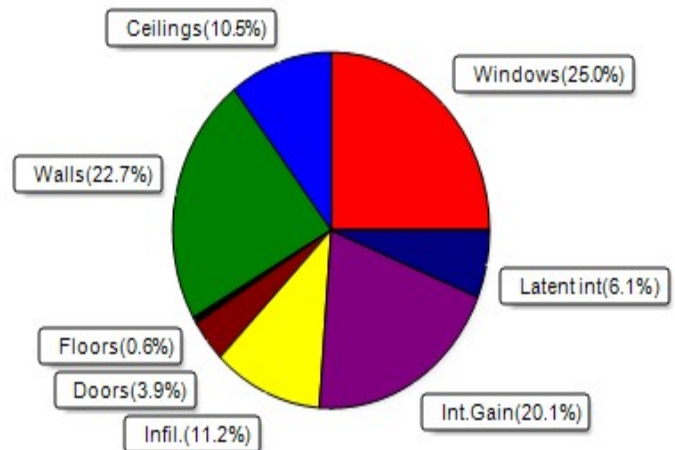
Load component		Load	
Window total	331 sqft	7944	Btuh
Wall total	2787 sqft	9657	Btuh
Door total	161 sqft	1355	Btuh
Ceiling total	2592 sqft	3433	Btuh
Floor total	See detail report	15643	Btuh
Infiltration	70 cfm	3080	Btuh
Duct loss		0	Btuh
Subtotal		41113	Btuh
Ventilation	0 cfm	0	Btuh
TOTAL HEAT LOSS		41113	Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 2902 sqft)

Load component		Load	
Window total	331 sqft	6528	Btuh
Wall total	2787 sqft	5922	Btuh
Door total	161 sqft	1016	Btuh
Ceiling total	2592 sqft	2746	Btuh
Floor total		156	Btuh
Infiltration	53 cfm	1097	Btuh
Internal gain		5240	Btuh
Duct gain		0	Btuh
Sens. Ventilation	0 cfm	0	Btuh
Blower Load		0	Btuh
Total sensible gain		22707	Btuh
Latent gain(ducts)		0	Btuh
Latent gain(infiltration)		1821	Btuh
Latent gain(ventilation)		0	Btuh
Latent gain(internal/occupants/other)		1600	Btuh
Total latent gain		3421	Btuh
TOTAL HEAT GAIN		26127	Btuh



8th Edition

EnergyGauge® System Sizing

PREPARED BY: _____

DATE: _____ 6-10-21

System Sizing Calculations - Summer

Residential Load - Whole House Component Details

Project Title:
Campbell Residence

, FL

6/10/2021

Reference City: Gainesville, FL

Temperature Difference: 19.0F(TMY3 99%) Humidity difference: 51gr.

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	0.27, 0.60	No	No	S		1.5ft.	2.3ft.	15.0	15.0	0.0	17	19	256	Btuh
2	2 NFRC	0.27, 0.60	No	No	S		1.5ft.	2.3ft.	6.0	6.0	0.0	17	19	102	Btuh
3	2 NFRC	0.27, 0.60	No	No	S		13.5f	2.3ft.	72.0	72.0	0.0	17	19	1230	Btuh
4	2 NFRC	0.27, 0.60	No	No	S		13.5f	2.3ft.	20.0	20.0	0.0	17	19	342	Btuh
5	2 NFRC	0.27, 0.60	No	No	S		1.5ft.	2.3ft.	45.0	45.0	0.0	17	19	769	Btuh
6	2 NFRC	0.27, 0.60	No	No	W		1.5ft.	2.3ft.	20.0	0.0	20.0	17	37	749	Btuh
7	2 NFRC	0.27, 0.60	No	No	W		1.5ft.	2.3ft.	8.0	0.0	8.0	17	37	299	Btuh
8	2 NFRC	0.27, 0.60	No	No	S		1.5ft.	2.3ft.	15.0	15.0	0.0	17	19	256	Btuh
9	2 NFRC	0.27, 0.60	No	No	N		1.5ft.	2.3ft.	12.0	0.0	12.0	17	17	205	Btuh
10	2 NFRC	0.27, 0.60	No	No	N		10.2f	2.3ft.	72.0	0.0	72.0	17	17	1230	Btuh
11	2 NFRC	0.27, 0.60	No	No	N		1.5ft.	2.3ft.	15.0	0.0	15.0	17	17	256	Btuh
12	2 NFRC	0.27, 0.60	No	No	E		1.5ft.	2.3ft.	15.0	0.0	15.0	17	37	561	Btuh
13	2 NFRC	0.27, 0.60	No	No	S		1.5ft.	2.3ft.	16.0	16.0	0.0	17	19	273	Btuh
	Window Total								331 (sqft)					6528 Btuh	
Walls	Type	U-Value		R-Value		Area(sqft)		HTM		Load					
					Cav/Sheath										
1	Frame - Wood - Ext		0.09		13.0/0.6		144.0		2.2		317 Btuh				
2	Frame - Wood - Ext		0.09		13.0/0.6		128.7		2.2		283 Btuh				
3	Frame - Wood - Ext		0.09		13.0/0.6		263.3		2.2		579 Btuh				
4	Frame - Wood - Ext		0.09		13.0/0.6		130.0		2.2		286 Btuh				
5	Frame - Wood - Ext		0.09		13.0/0.6		106.5		2.2		234 Btuh				
6	Frame - Wood - Ext		0.09		13.0/0.6		179.0		2.2		394 Btuh				
7	Frame - Wood - Ext		0.09		13.0/0.6		33.0		2.2		73 Btuh				
8	Frame - Wood - Ext		0.09		13.0/0.6		48.0		2.2		106 Btuh				
9	Frame - Wood - Ext		0.09		13.0/0.6		72.0		2.2		158 Btuh				
10	Frame - Wood - Ext		0.09		13.0/0.6		93.0		2.2		204 Btuh				
11	Frame - Wood - Ext		0.09		13.0/0.6		72.0		2.2		158 Btuh				
12	Frame - Wood - Ext		0.09		13.0/0.6		391.7		2.2		861 Btuh				
13	Frame - Wood - Ext		0.09		13.0/0.6		49.5		2.2		109 Btuh				
14	Frame - Wood - Ext		0.09		13.0/0.6		99.0		2.2		218 Btuh				
15	Frame - Wood - Ext		0.09		13.0/0.6		391.5		2.2		861 Btuh				
16	Frame - Wood - Adj		0.09		13.0/0.6		123.0		1.6		201 Btuh				
17	Frame - Wood - Ext		0.09		13.0/0.0		96.0		2.3		217 Btuh				
18	Frame - Wood - Adj		0.09		13.0/0.0		143.3		1.7		242 Btuh				
19	Frame - Wood - Ext		0.09		13.0/0.0		80.0		2.3		181 Btuh				
20	Frame - Wood - Adj		0.09		13.0/0.0		143.3		1.7		242 Btuh				
	Wall Total						2787 (sqft)			5922 Btuh					
Doors	Type	Area (sqft)		HTM		Load									
1	Insulated - Exterior		21.3		6.3		134 Btuh								
2	Insulated - Exterior		48.0		6.3		302 Btuh								
3	Insulated - Exterior		20.0		6.3		126 Btuh								
4	Insulated - Exterior		48.0		6.3		302 Btuh								
5	Insulated - Garage		24.0		6.3		151 Btuh								
	Door Total						1016 Btuh								
Ceilings	Type/Color/Surface	U-Value		R-Value		Area(sqft)		HTM		Load					
1	Unvented Attic/DarkShingle		0.265		0.6/44.0		2592.0		1.06		2746 Btuh				
	Ceiling Total						2746 Btuh								

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
Campbell Residence

, FL

6/10/2021

Floors	Type	R-Value	Size	HTM	Load	
1	Slab On Grade	0.0	2592 (ft-perimeter)	0.0	0 Btuh	
2	Raised - Open	30.0	310 (sqft)	0.5	156 Btuh	
	Floor Total		2902.0 (sqft)		156 Btuh	
	Envelope Subtotal:				16369 Btuh	
Infiltration	Type	Average ACH	Volume(cuft)	Wall Ratio	CFM=	Load
	Natural	0.12	25808	1	52.8	1097 Btuh
Internal gain		Occupants	Btuh/occupant	Appliance		Load
		8	X 230	+	3400	5240 Btuh
	Sensible Envelope Load:					22707 Btuh
Duct load	Extremelysealed, Supply(R6.0-Cond), Return(R6.0-Cond)			(DGM of 0.000)		0 Btuh
	Sensible Load All Zones					22707 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
Campbell Residence

, FL

6/10/2021

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	22707 Btuh
	Sensible Duct Load	0 Btuh
	Total Sensible Zone Loads	22707 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	22707 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	1821 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	0 Btuh
	Latent occupant gain (8.0 people @ 200 Btuh per person)	1600 Btuh
	Latent other gain	0 Btuh
	Latent total gain	3421 Btuh
	TOTAL GAIN	26127 Btuh

EQUIPMENT

1. Central Unit	#	48000 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

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Project Title:
Campbell Residence
Building Type: User

, FL

6/10/2021

Reference City: Gainesville, FL (Defaults) Winter Temperature Difference: 40.0 F (TMY3 99%)

Component Loads for Whole House								
Window	Panes/Type	Frame	U	Orientation	Area(sqft)	X	HTM=	Load
1	2, NFRC 0.27	Vinyl	0.60	S	15.0		24.0	360 Btuh
2	2, NFRC 0.27	Vinyl	0.60	S	6.0		24.0	144 Btuh
3	2, NFRC 0.27	Vinyl	0.60	S	72.0		24.0	1728 Btuh
4	2, NFRC 0.27	Vinyl	0.60	S	20.0		24.0	480 Btuh
5	2, NFRC 0.27	Vinyl	0.60	S	45.0		24.0	1080 Btuh
6	2, NFRC 0.27	Vinyl	0.60	W	20.0		24.0	480 Btuh
7	2, NFRC 0.27	Vinyl	0.60	W	8.0		24.0	192 Btuh
8	2, NFRC 0.27	Vinyl	0.60	S	15.0		24.0	360 Btuh
9	2, NFRC 0.27	Vinyl	0.60	N	12.0		24.0	288 Btuh
10	2, NFRC 0.27	Vinyl	0.60	N	72.0		24.0	1728 Btuh
11	2, NFRC 0.27	Vinyl	0.60	N	15.0		24.0	360 Btuh
12	2, NFRC 0.27	Vinyl	0.60	E	15.0		24.0	360 Btuh
13	2, NFRC 0.27	Vinyl	0.60	S	16.0		24.0	384 Btuh
Window Total					331.0(sqft)			7944 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.086)	13.0/0.6	144		3.45	497 Btuh
2	Frame - Wood	- Ext	(0.086)	13.0/0.6	129		3.45	444 Btuh
3	Frame - Wood	- Ext	(0.086)	13.0/0.6	263		3.45	908 Btuh
4	Frame - Wood	- Ext	(0.086)	13.0/0.6	130		3.45	448 Btuh
5	Frame - Wood	- Ext	(0.086)	13.0/0.6	107		3.45	367 Btuh
6	Frame - Wood	- Ext	(0.086)	13.0/0.6	179		3.45	617 Btuh
7	Frame - Wood	- Ext	(0.086)	13.0/0.6	33		3.45	114 Btuh
8	Frame - Wood	- Ext	(0.086)	13.0/0.6	48		3.45	166 Btuh
9	Frame - Wood	- Ext	(0.086)	13.0/0.6	72		3.45	248 Btuh
10	Frame - Wood	- Ext	(0.086)	13.0/0.6	93		3.45	321 Btuh
11	Frame - Wood	- Ext	(0.086)	13.0/0.6	72		3.45	248 Btuh
12	Frame - Wood	- Ext	(0.086)	13.0/0.6	392		3.45	1351 Btuh
13	Frame - Wood	- Ext	(0.086)	13.0/0.6	50		3.45	171 Btuh
14	Frame - Wood	- Ext	(0.086)	13.0/0.6	99		3.45	341 Btuh
15	Frame - Wood	- Ext	(0.086)	13.0/0.6	392		3.45	1350 Btuh
16	Frame - Wood	- Adj	(0.086)	13.0/0.6	123		3.45	424 Btuh
17	Frame - Wood	- Ext	(0.089)	13.0/0.0	96		3.55	341 Btuh
18	Frame - Wood	- Adj	(0.089)	13.0/0.0	143		3.55	509 Btuh
19	Frame - Wood	- Ext	(0.089)	13.0/0.0	80		3.55	284 Btuh
20	Frame - Wood	- Adj	(0.089)	13.0/0.0	143		3.55	509 Btuh
Wall Total					2787(sqft)			9657 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

, FL

Project Title:
Campbell Residence
Building Type: User

6/10/2021

Doors	Type	Storm Ueff.		Area X	HTM=	Load	
	1	Insulated - Exterior, n	(0.210)	21	8.4	179 Btuh	
	2	Insulated - Exterior, n	(0.210)	48	8.4	403 Btuh	
	3	Insulated - Exterior, n	(0.210)	20	8.4	168 Btuh	
	4	Insulated - Exterior, n	(0.210)	48	8.4	403 Btuh	
	5	Insulated - Garage, n	(0.210)	24	8.4	202 Btuh	
	Door Total			161(sqft)		1355Btuh	
Ceilings	Type/Color/Surface	Ueff.	R-Value	Area X	HTM=	Load	
	1	Unvent Attic/D/Shing	(0.265)	0.6/44.0	2592	1.3	3433 Btuh
	Ceiling Total			2592(sqft)		3433Btuh	
Floors	Type	Ueff.	R-Value	Size X	HTM=	Load	
	1	Slab On Grade	(1.180)	0.0	322.0 ft(perim.)	47.2	15198 Btuh
	2	Raised - Open	(0.036)	30.0	310.0 sqft	1.4	445 Btuh
	Floor Total			2902 sqft		15643 Btuh	
	Envelope Subtotal:					38033 Btuh	
Infiltration	Type	Wholehouse ACH	Volume(cuft)	Wall Ratio	CFM=		
	Natural	0.16	25808	1.00	70.3	3080 Btuh	
Duct load	Extremely sealed, R6.0, Supply(Con), Return(Con) (DLM of 0.000)					0 Btuh	
All Zones	Sensible Subtotal All Zones					41113 Btuh	

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	41113 Btuh 0 Btuh 41113 Btuh
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EQUIPMENT

1. Electric Heat Pump	#	48000 Btuh
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Manual J Winter Calculations

Residential Load - Component Details (continued)

Project Title:
Campbell Residence
Building Type: User

, FL

6/10/2021

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