

Residential System Sizing Calculation

Summary

William Campbell
115 SW Challenger Ln
Lake City, FL 32025

Project Title:
201282 Campbell

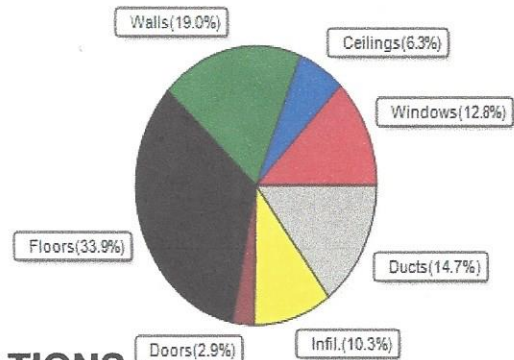
2020-12-16

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	22014 Btuh	Total cooling load calculation	21218 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	109.0 24000	Sensible (SHR = 0.75)	98.5 18000
Heat Pump + Auxiliary(0.0kW)	109.0 24000	Latent	204.2 6000
		Total (Electric Heat Pump)	113.1 24000

WINTER CALCULATIONS

Winter Heating Load (for 1370 sqft)

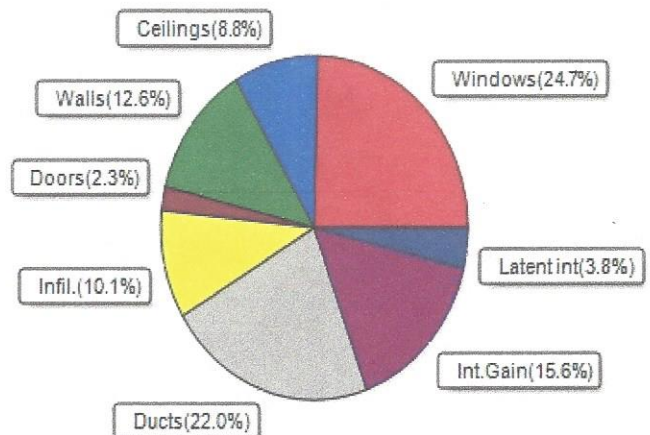
Load component			Load	
Window total	201	sqft	2812	Btuh
Wall total	1181	sqft	4194	Btuh
Door total	40	sqft	640	Btuh
Ceiling total	1370	sqft	1391	Btuh
Floor total	1370	sqft	7458	Btuh
Infiltration	52	cfm	2273	Btuh
Duct loss			3247	Btuh
Subtotal			22014	Btuh
Ventilation	0	cfm	0	Btuh
TOTAL HEAT LOSS			22014	Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 1370 sqft)

Load component			Load	
Window total	201	sqft	5237	Btuh
Wall total	1181	sqft	2673	Btuh
Door total	40	sqft	480	Btuh
Ceiling total	1370	sqft	1878	Btuh
Floor total			0	Btuh
Infiltration	39	cfm	810	Btuh
Internal gain			3320	Btuh
Duct gain			3881	Btuh
Sens. Ventilation	0	cfm	0	Btuh
Blower Load			0	Btuh
Total sensible gain			18279	Btuh
Latent gain(ducts)			795	Btuh
Latent gain(infiltration)			1344	Btuh
Latent gain(ventilation)			0	Btuh
Latent gain(internal/occupants/other)			800	Btuh
Total latent gain			2939	Btuh
TOTAL HEAT GAIN			21218	Btuh



8th Edition

EnergyGauge® System Sizing
PREPARED BY: Evan Beamsley
DATE: 2020-12-16

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

William Campbell
115 SW Challenger Ln
Lake City, FL 32025

Project Title:
201282 Campbell
Building Type: User

2020-12-16

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 0.30	Metal	0.35	E	3.0		14.0	42 Btuh	
2	2, NFRC 0.30	Metal	0.35	E	12.0		14.0	168 Btuh	
3	2, NFRC 0.30	Metal	0.35	E	12.0		14.0	168 Btuh	
4	2, NFRC 0.30	Metal	0.35	E	32.0		14.0	448 Btuh	
5	2, NFRC 0.30	Metal	0.35	S	20.0		14.0	280 Btuh	
6	2, NFRC 0.30	Metal	0.35	S	4.0		14.0	56 Btuh	
7	2, NFRC 0.30	Metal	0.35	S	13.3		14.0	187 Btuh	
8	2, NFRC 0.30	Metal	0.35	S	20.0		14.0	280 Btuh	
9	2, NFRC 0.30	Metal	0.35	W	12.0		14.0	168 Btuh	
10	2, NFRC 0.30	Metal	0.35	W	32.0		14.0	448 Btuh	
11	2, NFRC 0.30	Metal	0.35	W	13.5		14.0	189 Btuh	
12	2, NFRC 0.30	Metal	0.35	N	4.0		14.0	56 Btuh	
13	2, NFRC 0.30	Metal	0.35	N	20.0		14.0	280 Btuh	
14	2, NFRC 0.30	Metal	0.35	N	3.0		14.0	42 Btuh	
	Window Total					200.8(sqft)			2812 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load	
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	238		3.55	845 Btuh	
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	106		3.55	376 Btuh	
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	125		3.55	443 Btuh	
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	70		3.55	249 Btuh	
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	240		3.55	850 Btuh	
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	155		3.55	550 Btuh	
7	Frame - Wood	- Ext	(0.089)	13.0/0.0	36		3.55	128 Btuh	
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	16		3.55	57 Btuh	
9	Frame - Wood	- Ext	(0.089)	13.0/0.0	36		3.55	128 Btuh	
10	Frame - Wood	- Ext	(0.089)	13.0/0.0	160		3.55	568 Btuh	
	Wall Total					1181(sqft)			4194 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load	
1	Insulated - Exterior, n		(0.400)		20		16.0	320 Btuh	
2	Insulated - Exterior, n		(0.400)		20		16.0	320 Btuh	
	Door Total					40(sqft)			640Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load	
1	Vented Attic/D/Shing		(0.025)	38.0/0.0	1370		1.0	1391 Btuh	
	Ceiling Total					1370(sqft)			1391Btuh
Floors	Type		Ueff.	R-Value	Size	X	HTM=	Load	
1	Slab On Grade		(1.180)	0.0	158.0 ft(perim.)		47.2	7458 Btuh	
	Floor Total					1370 sqft			7458 Btuh
	Envelope Subtotal:							16494 Btuh	

Manual J Winter Calculations

Residential Load - Component Details (continued)

William Campbell
115 SW Challenger Ln
Lake City, FL 32025

Project Title:
201282 Campbell
Building Type: User

2020-12-16

Infiltration	Type Natural	Wholehouse ACH 0.25	Volume(cuft) 12330	Wall Ratio 1.00	CFM= 51.9	2273 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.173)					3247 Btuh
All Zones	Sensible Subtotal All Zones					22014 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	22014 Btuh 0 Btuh 22014 Btuh
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EQUIPMENT

1. Electric Heat Pump	#	24000 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

William Campbell
115 SW Challenger Ln
Lake City, FL 32025

Project Title:
201282 Campbell

2020-12-16

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	0.30, 0.35	No	No	E		1.5ft	2.0ft	3.0	0.0	3.0	13	36	107	Btuh
2	2 NFRC	0.30, 0.35	No	No	E		1.5ft	2.0ft	12.0	0.0	12.0	13	36	427	Btuh
3	2 NFRC	0.30, 0.35	No	No	E		1.5ft	2.0ft	12.0	0.0	12.0	13	36	427	Btuh
4	2 NFRC	0.30, 0.35	No	No	E		1.5ft	2.0ft	32.0	0.0	32.0	13	36	1138	Btuh
5	2 NFRC	0.30, 0.35	No	No	S		1.5ft	4.3ft	20.0	20.0	0.0	13	15	259	Btuh
6	2 NFRC	0.30, 0.35	No	No	S		8.0ft	2.0ft	4.0	4.0	0.0	13	15	52	Btuh
7	2 NFRC	0.30, 0.35	No	No	S		8.0ft	2.0ft	13.3	13.3	0.0	13	15	173	Btuh
8	2 NFRC	0.30, 0.35	No	No	S		1.5ft	4.0ft	20.0	20.0	0.0	13	15	259	Btuh
9	2 NFRC	0.30, 0.35	No	No	W		1.5ft	2.0ft	12.0	0.0	12.0	13	36	427	Btuh
10	2 NFRC	0.30, 0.35	No	No	W		1.5ft	2.0ft	32.0	0.0	32.0	13	36	1138	Btuh
11	2 NFRC	0.30, 0.35	No	No	W		1.5ft	2.0ft	13.5	0.0	13.5	13	36	480	Btuh
12	2 NFRC	0.30, 0.35	No	No	N		99.0f	2.0ft	4.0	0.0	4.0	13	13	52	Btuh
13	2 NFRC	0.30, 0.35	No	No	N		99.5f	2.0ft	20.0	0.0	20.0	13	13	259	Btuh
14	2 NFRC	0.30, 0.35	No	No	N		99.5f	2.0ft	3.0	0.0	3.0	13	13	39	Btuh
	Window Total								201 (sqft)					5237 Btuh	
Walls	Type					U-Value		R-Value		Area(sqft)		HTM		Load	
								Cav/Sheath							
1	Frame - Wood - Ext					0.09		13.0/0.0		238.0		2.3		539 Btuh	
2	Frame - Wood - Ext					0.09		13.0/0.0		106.0		2.3		240 Btuh	
3	Frame - Wood - Ext					0.09		13.0/0.0		124.7		2.3		282 Btuh	
4	Frame - Wood - Ext					0.09		13.0/0.0		70.0		2.3		158 Btuh	
5	Frame - Wood - Ext					0.09		13.0/0.0		239.5		2.3		542 Btuh	
6	Frame - Wood - Ext					0.09		13.0/0.0		155.0		2.3		351 Btuh	
7	Frame - Wood - Ext					0.09		13.0/0.0		36.0		2.3		81 Btuh	
8	Frame - Wood - Ext					0.09		13.0/0.0		16.0		2.3		36 Btuh	
9	Frame - Wood - Ext					0.09		13.0/0.0		36.0		2.3		81 Btuh	
10	Frame - Wood - Ext					0.09		13.0/0.0		160.0		2.3		362 Btuh	
	Wall Total								1181 (sqft)					2673 Btuh	
Doors	Type									Area (sqft)		HTM		Load	
1	Insulated - Exterior									20.0		12.0		240 Btuh	
2	Insulated - Exterior									20.0		12.0		240 Btuh	
	Door Total								40 (sqft)					480 Btuh	
Ceilings	Type/Color/Surface					U-Value		R-Value		Area(sqft)		HTM		Load	
1	Vented Attic/DarkShingle					0.025		38.0/0.0		1370.0		1.37		1878 Btuh	
	Ceiling Total								1370 (sqft)					1878 Btuh	
Floors	Type							R-Value		Size		HTM		Load	
1	Slab On Grade							0.0		1370 (ft-perimeter)		0.0		0 Btuh	
	Floor Total								1370.0 (sqft)					0 Btuh	
	Envelope Subtotal:													10268 Btuh	

Manual J Summer Calculations

Residential Load - Component Details (continued)

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115 SW Challenger Ln
Lake City, FL 32025

Project Title:
201282 Campbell

Climate:FL_GAINESVILLE_REGIONAL_A

2020-12-16

Infiltration	Type Natural	Average ACH 0.19	Volume(cuft) 12330	Wall Ratio 1	CFM= 38.9	Load 810 Btuh
Internal gain		Occupants 4	Btuh/occupant X 230	Appliance +	2400	Load 3320 Btuh
					Sensible Envelope Load:	14398 Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic)				(DGM of 0.270)	3881 Btuh
					Sensible Load All Zones	18279 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

William Campbell
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Lake City, FL 32025

Project Title:
201282 Campbell

Climate:FL_GAINESVILLE_REGIONAL_A

2020-12-16

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	14398 Btuh
	Sensible Duct Load	3881 Btuh
	Total Sensible Zone Loads	18279 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	18279 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	1344 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	795 Btuh
	Latent occupant gain (4.0 people @ 200 Btuh per person)	800 Btuh
	Latent other gain	0 Btuh
	Latent total gain	2939 Btuh
	TOTAL GAIN	21218 Btuh

EQUIPMENT

1. Central Unit	#	24000 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