

Residential System Sizing Calculation

Summary

Project Title:
Carter Residence

Lake City, FL

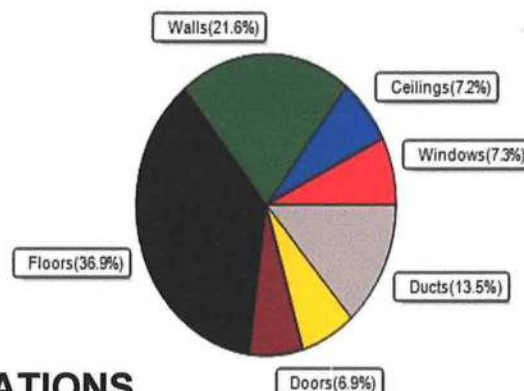
4/9/2020

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	23258	Btuh	Total cooling load calculation	19254	Btuh
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	129.0	30000	Sensible (SHR = 0.85)	155.9	25500
Heat Pump + Auxiliary(0.0kW)	129.0	30000	Latent	155.5	4500
			Total (Electric Heat Pump)	155.8	30000

WINTER CALCULATIONS

Winter Heating Load (for 1314 sqft)

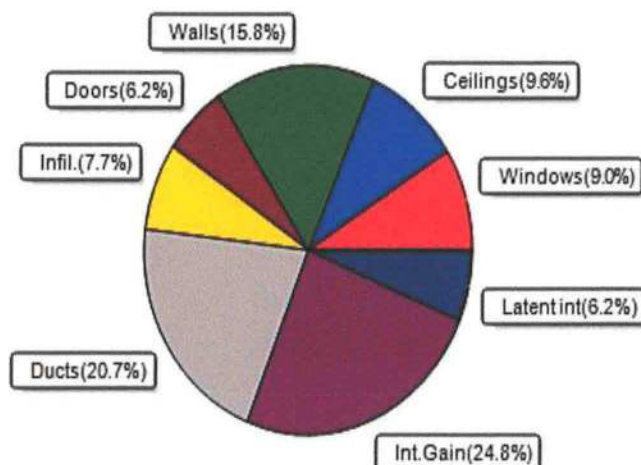
Load component			Load	
Window total	128	sqft	1690	Btuh
Wall total	1413	sqft	5015	Btuh
Door total	100	sqft	1600	Btuh
Ceiling total	1314	sqft	1674	Btuh
Floor total	1314	sqft	8590	Btuh
Infiltration	36	cfm	1557	Btuh
Duct loss			3131	Btuh
Subtotal			23258	Btuh
Ventilation	0	cfm	0	Btuh
TOTAL HEAT LOSS			23258	Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 1314 sqft)

Load component			Load	
Window total	128	sqft	1727	Btuh
Wall total	1413	sqft	3039	Btuh
Door total	100	sqft	1200	Btuh
Ceiling total	1314	sqft	1841	Btuh
Floor total			0	Btuh
Infiltration	27	cfm	555	Btuh
Internal gain			4780	Btuh
Duct gain			3219	Btuh
Sens. Ventilation	0	cfm	0	Btuh
Blower Load			0	Btuh
Total sensible gain			16361	Btuh
Latent gain(ducts)			773	Btuh
Latent gain(infiltration)			921	Btuh
Latent gain(ventilation)			0	Btuh
Latent gain(internal/occupants/other)			1200	Btuh
Total latent gain			2894	Btuh
TOTAL HEAT GAIN			19254	Btuh



8th Edition

EnergyGauge® System Sizing

PREPARED BY: _____

DATE: _____

4-9-20

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
Carter Residence

Lake City, FL

4/9/2020

WHOLE HOUSE TOTALS		
Whole House Totals for Cooling	Sensible Envelope Load All Zones	13142 Btuh
	Sensible Duct Load	3219 Btuh
	Total Sensible Zone Loads	16361 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	16361 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	921 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	773 Btuh
	Latent occupant gain (6.0 people @ 200 Btuh per person)	1200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	2894 Btuh
	TOTAL GAIN	19254 Btuh

EQUIPMENT		
1. Central Unit	#	30000 Btuh

*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))
(Omt - compass orientation)



Version 8

System Sizing Calculations - Summer

Residential Load - Whole House Component Details

Project Title:
Carter Residence

Lake City, FL

4/9/2020

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	0.22, 0.33	No	No	N		1.5ft	1.3ft	24.0	0.0	24.0	11	11	262 Btuh
2	2 NFRC	0.22, 0.33	No	No	N		7.5ft	1.3ft	12.0	0.0	12.0	11	11	131 Btuh
3	2 NFRC	0.22, 0.33	No	No	N		1.5ft	1.3ft	18.0	0.0	18.0	11	11	196 Btuh
4	2 NFRC	0.22, 0.33	No	No	S		1.5ft	1.3ft	18.0	18.0	0.0	11	13	196 Btuh
5	2 NFRC	0.22, 0.33	No	No	S		6.5ft	1.3ft	36.0	36.0	0.0	11	13	392 Btuh
6	2 NFRC	0.22, 0.33	No	No	E		1.5ft	1.3ft	8.0	0.0	8.0	11	27	220 Btuh
7	2 NFRC	0.22, 0.33	No	No	E		1.5ft	1.3ft	12.0	0.0	12.0	11	27	330 Btuh
	Window Total								128 (sqft)					1727 Btuh
Walls	Type	U-Value		R-Value		Area(sqft)		HTM		Load				
1	Frame - Wood - Ext		0.09		13.0/0.0		162.0		2.3		367 Btuh			
2	Frame - Wood - Ext		0.09		13.0/0.0		54.0		2.3		122 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		54.0		2.3		122 Btuh			
5	Frame - Wood - Ext		0.09		13.0/0.0		84.0		2.3		190 Btuh			
6	Frame - Wood - Ext		0.09		13.0/0.0		300.0		2.3		679 Btuh			
7	Frame - Wood - Ext		0.09		13.0/0.0		84.0		2.3		190 Btuh			
8	Frame - Wood - Ext		0.09		13.0/0.0		104.0		2.3		235 Btuh			
9	Frame - Wood - Ext		0.09		13.0/0.0		172.0		2.3		389 Btuh			
10	Frame - Wood - Adj		0.09		13.0/0.0		274.0		1.7		462 Btuh			
	Wall Total								1413 (sqft)			3039 Btuh		
Doors	Type	U-Value		R-Value		Area (sqft)		HTM		Load				
1	Insulated - Exterior						40.0		12.0		480 Btuh			
2	Insulated - Exterior						40.0		12.0		480 Btuh			
3	Insulated - Garage						20.0		12.0		240 Btuh			
	Door Total								100 (sqft)			1200 Btuh		
Ceilings	Type/Color/Surface	U-Value		R-Value		Area(sqft)		HTM		Load				
1	Vented Attic/Light/Shingle		0.032		30.0/0.0		1314.0		1.40		1841 Btuh			
	Ceiling Total								1314 (sqft)			1841 Btuh		
Floors	Type	U-Value		R-Value		Size		HTM		Load				
1	Slab On Grade				0.0		1314 (ft-perimeter)		0.0		0 Btuh			
	Floor Total								1314.0 (sqft)			0 Btuh		
	Envelope Subtotal:											7807 Btuh		
Infiltration	Type	Average ACH		Volume(cuft)		Wall Ratio		CFM=		Load				
	Natural													
			0.14		11826		1		26.7		555 Btuh			
Internal gain	Occupants		Btuh/occupant		Appliance		Load							
			6	X	230	+			3400		4780 Btuh			
	Sensible Envelope Load:											13142 Btuh		
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic)								(DGM of 0.245)		3219 Btuh			
	Sensible Load All Zones											16361 Btuh		

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Lake City, FL

Project Title:
Carter Residence
Building Type: User

4/9/2020

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 0.22	Vinyl	0.33	N	24.0		13.2	317 Btuh
2	2, NFRC 0.22	Vinyl	0.33	N	12.0		13.2	158 Btuh
3	2, NFRC 0.22	Vinyl	0.33	N	18.0		13.2	238 Btuh
4	2, NFRC 0.22	Vinyl	0.33	S	18.0		13.2	238 Btuh
5	2, NFRC 0.22	Vinyl	0.33	S	36.0		13.2	475 Btuh
6	2, NFRC 0.22	Vinyl	0.33	E	8.0		13.2	106 Btuh
7	2, NFRC 0.22	Vinyl	0.33	E	12.0		13.2	158 Btuh
	Window Total				128.0(sqft)			1690 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	162		3.55	575 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	54		3.55	192 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	54		3.55	192 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	84		3.55	298 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	300		3.55	1065 Btuh
7	Frame - Wood	- Ext	(0.089)	13.0/0.0	84		3.55	298 Btuh
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	104		3.55	369 Btuh
9	Frame - Wood	- Ext	(0.089)	13.0/0.0	172		3.55	611 Btuh
10	Frame - Wood	- Adj	(0.089)	13.0/0.0	274		3.55	973 Btuh
	Wall Total				1413(sqft)			5015 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior, n		(0.400)		40		16.0	640 Btuh
2	Insulated - Exterior, n		(0.400)		40		16.0	640 Btuh
3	Insulated - Garage, n		(0.400)		20		16.0	320 Btuh
	Door Total				100(sqft)			1600Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load
1	Vented Attic/L/Shing		(0.032)	30.0/0.0	1314		1.3	1674 Btuh
	Ceiling Total				1314(sqft)			1674Btuh
Floors	Type		Ueff.	R-Value	Size	X	HTM=	Load
1	Slab On Grade		(1.180)	0.0	182.0 ft(perim.)		47.2	8590 Btuh
	Floor Total				1314 sqft			8590 Btuh
	Envelope Subtotal:							18569 Btuh
Infiltration	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio		CFM=	Load
	Natural		0.18	11826	1.00		35.6	1557 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att)					(DLM of 0.156)		3131 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Lake City, FL

Project Title:
Carter Residence
Building Type: User

4/9/2020

All Zones	Sensible Subtotal All Zones	23258 Btuh
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WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	23258 Btuh 0 Btuh 23258 Btuh
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EQUIPMENT

1. Electric Heat Pump	#	30000 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