

Residential System Sizing Calculation

Summary

Project Title:
Evans Residence

, FL

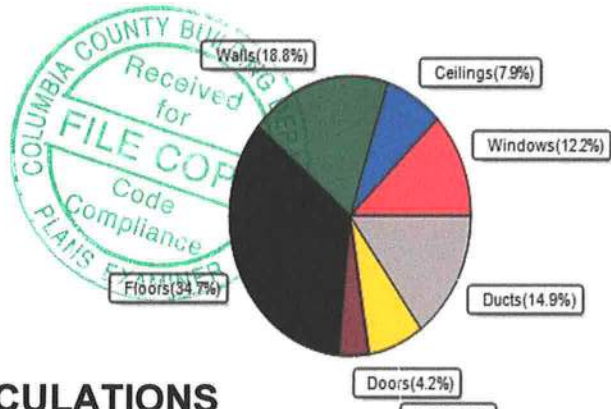
7/30/2020

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	20525 Btuh	Total cooling load calculation	16744 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	146.2 30000	Sensible (SHR = 0.85)	178.6 25500
Heat Pump + Auxiliary(0.0kW)	146.2 30000	Latent	182.8 4500
		Total (Electric Heat Pump)	179.2 30000

WINTER CALCULATIONS

Winter Heating Load (for 1270 sqft)

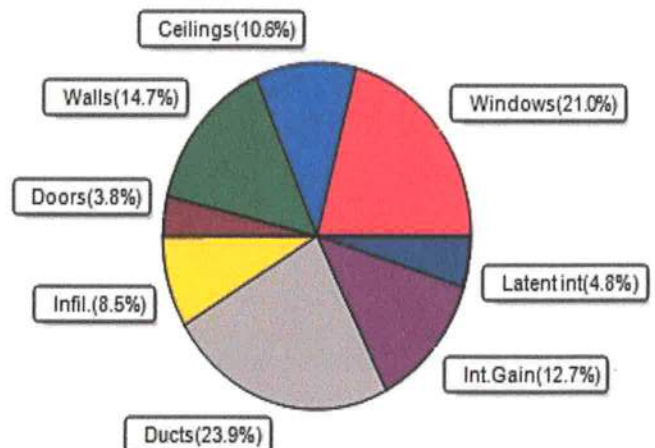
Load component		Load	
Window total	190 sqft	2508	Btuh
Wall total	1119 sqft	3858	Btuh
Door total	53 sqft	853	Btuh
Ceiling total	1270 sqft	1618	Btuh
Floor total	1270 sqft	7127	Btuh
Infiltration	34 cfm	1505	Btuh
Duct loss		3056	Btuh
Subtotal		20525	Btuh
Ventilation	0 cfm	0	Btuh
TOTAL HEAT LOSS		20525	Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 1270 sqft)

Load component		Load	
Window total	190 sqft	3512	Btuh
Wall total	1119 sqft	2459	Btuh
Door total	53 sqft	640	Btuh
Ceiling total	1270 sqft	1780	Btuh
Floor total		0	Btuh
Infiltration	26 cfm	536	Btuh
Internal gain		2120	Btuh
Duct gain		3234	Btuh
Sens. Ventilation	0 cfm	0	Btuh
Blower Load		0	Btuh
Total sensible gain		14281	Btuh
Latent gain(ducts)		773	Btuh
Latent gain(infiltration)		890	Btuh
Latent gain(ventilation)		0	Btuh
Latent gain(internal/occupants/other)		800	Btuh
Total latent gain		2462	Btuh
TOTAL HEAT GAIN		16744	Btuh



8th Edition

EnergyGauge® System Sizing

PREPARED BY: _____

DATE: _____

[Signature]
8-4-20

System Sizing Calculations - Summer

Residential Load - Whole House Component Details

Project Title:
Evans Residence

, FL

7/30/2020

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		9.5ft.	1.3ft.	12.0	0.0	12.0	11	11	131 Btuh
3	2 NFRC	0.22, 0.33	No	No	E		1.5ft.	1.3ft.	36.0	0.0	36.0	11	27	989 Btuh
4	2 NFRC	0.22, 0.33	No	No	S		9.5ft.	1.3ft.	72.0	72.0	0.0	11	13	785 Btuh
5	2 NFRC	0.22, 0.33	No	No	W		1.5ft.	1.3ft.	36.0	0.0	36.0	11	27	989 Btuh
6	2 NFRC	0.22, 0.33	No	No	W		1.5ft.	1.3ft.	6.0	0.0	6.0	11	27	165 Btuh
7	2 NFRC	0.22, 0.33	No	No	W		1.5ft.	1.3ft.	4.0	0.0	4.0	11	27	110 Btuh
	Excursion													82 Btuh
	Window Total								190 (sqft)					3512 Btuh
Walls	Type		U-Value		R-Value		Area(sqft)		HTM		Load			
					Cav/Sheath									
1	Frame - Wood - Ext		0.09		13.0/0.6		117.0		2.2		257 Btuh			
2	Frame - Wood - Ext		0.09		13.0/0.6		72.0		2.2		158 Btuh			
3	Frame - Wood - Ext		0.09		13.0/0.6		136.0		2.2		299 Btuh			
4	Frame - Wood - Ext		0.09		13.0/0.6		264.0		2.2		580 Btuh			
5	Frame - Wood - Ext		0.09		13.0/0.6		203.7		2.2		448 Btuh			
6	Frame - Wood - Ext		0.09		13.0/0.6		326.0		2.2		717 Btuh			
	Wall Total						1119 (sqft)				2459 Btuh			
Doors	Type		Area (sqft)		HTM		Load							
1	Insulated - Exterior		20.0		12.0		240 Btuh							
2	Insulated - Exterior		33.3		12.0		400 Btuh							
	Door Total		53 (sqft)				640 Btuh							
Ceilings	Type/Color/Surface		U-Value		R-Value		Area(sqft)		HTM		Load			
1	Vented Attic/Light/Metal		0.032		30.0/0.0		1270.0		1.40		1780 Btuh			
	Ceiling Total						1270 (sqft)				1780 Btuh			
Floors	Type		R-Value		Size		HTM		Load					
1	Slab On Grade		0.0		1270 (ft-perimeter)		0.0		0 Btuh					
	Floor Total				1270.0 (sqft)				0 Btuh					
	Envelope Subtotal:													8391 Btuh
Infiltration	Type		Average ACH		Volume(cuft)		Wall Ratio		CFM=		Load			
	Natural		0.14		11430		1		25.8		536 Btuh			
Internal gain	Occupants		Btuh/occupant		Appliance		Load							
	4		X 230		+ 1200		2120 Btuh							
	Sensible Envelope Load:													11047 Btuh
Duct load	Averagesealed, Supply(R6.0-Attic), Return(R6.0-Attic)		(DGM of 0.293)		Load									
					3234 Btuh									
	Sensible Load All Zones													14281 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
Evans Residence

, FL

7/30/2020

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	11047 Btuh
	Sensible Duct Load	3234 Btuh
	Total Sensible Zone Loads	14281 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	14281 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	890 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	773 Btuh
	Latent occupant gain (4.0 people @ 200 Btuh per person)	800 Btuh
	Latent other gain	0 Btuh
	Latent total gain	2462 Btuh
	TOTAL GAIN	16744 Btuh

EQUIPMENT

1. Central Unit	#	30000 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:
Evans Residence
Building Type: User

, FL

7/30/2020

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	E	36.0		13.2	475 Btuh
4	2, NFRC 0.22	Vinyl	0.33	S	72.0		13.2	950 Btuh
5	2, NFRC 0.22	Vinyl	0.33	W	36.0		13.2	475 Btuh
6	2, NFRC 0.22	Vinyl	0.33	W	6.0		13.2	79 Btuh
7	2, NFRC 0.22	Vinyl	0.33	W	4.0		13.2	53 Btuh
	Window Total				190.0(sqft)			2508 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.086)	13.0/0.6	117		3.45	403 Btuh
2	Frame - Wood	- Ext	(0.086)	13.0/0.6	72		3.45	248 Btuh
3	Frame - Wood	- Ext	(0.086)	13.0/0.6	136		3.45	469 Btuh
4	Frame - Wood	- Ext	(0.086)	13.0/0.6	264		3.45	910 Btuh
5	Frame - Wood	- Ext	(0.086)	13.0/0.6	204		3.45	702 Btuh
6	Frame - Wood	- Ext	(0.086)	13.0/0.6	326		3.45	1124 Btuh
	Wall Total				1119(sqft)			3858 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)		33		16.0	533 Btuh
	Door Total				53(sqft)			853Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load
1	Vented Attic/L/Metal		(0.032)	30.0/0.0	1270		1.3	1618 Btuh
	Ceiling Total				1270(sqft)			1618Btuh
Floors	Type		Ueff.	R-Value	Size	X	HTM=	Load
1	Slab On Grade		(1.180)	0.0	151.0 ft(perim.)		47.2	7127 Btuh
	Floor Total				1270 sqft			7127 Btuh
	Envelope Subtotal:							15964 Btuh
Infiltration	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio		CFM=	Load
	Natural		0.18	11430	1.00		34.4	1505 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att)					(DLM of 0.175)		3056 Btuh
All Zones	Sensible Subtotal All Zones							20525 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

, FL

Project Title:
Evans Residence
Building Type: User

7/30/2020

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	20525 Btuh 0 Btuh 20525 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