

Residential System Sizing Calculation

Summary

Project Title:
Zieger Residence

, FL

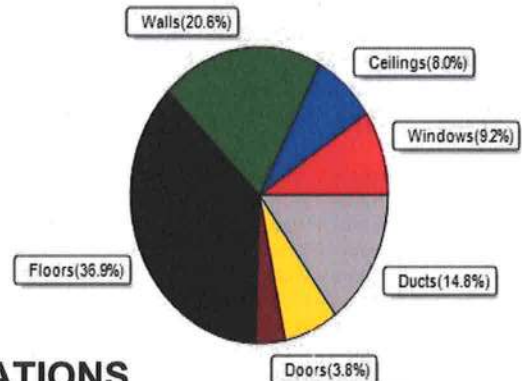
3/23/2022

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	25353	Btuh	Total cooling load calculation	20691	Btuh
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	118.3	30000	Sensible (SHR = 0.85)	145.9	25500
Heat Pump + Auxiliary(0.0kW)	118.3	30000	Latent	140.1	4500
			Total (Electric Heat Pump)	145.0	30000

WINTER CALCULATIONS

Winter Heating Load (for 1584 sqft)

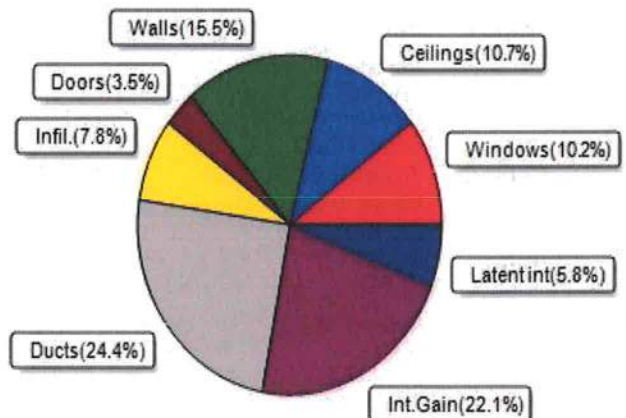
Load component		Load
Window total	224 sqft	2326 Btuh
Wall total	1473 sqft	5229 Btuh
Door total	60 sqft	960 Btuh
Ceiling total	1584 sqft	2018 Btuh
Floor total	1584 sqft	9346 Btuh
Infiltration	39 cfm	1710 Btuh
Duct loss		3765 Btuh
Subtotal		25353 Btuh
Ventilation	0 cfm	0 Btuh
TOTAL HEAT LOSS		25353 Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 1584 sqft)

Load component		Load
Window total	224 sqft	2108 Btuh
Wall total	1473 sqft	3199 Btuh
Door total	60 sqft	720 Btuh
Ceiling total	1584 sqft	2220 Btuh
Floor total		0 Btuh
Infiltration	29 cfm	609 Btuh
Internal gain		4580 Btuh
Duct gain		4043 Btuh
Sens. Ventilation	0 cfm	0 Btuh
Blower Load		0 Btuh
Total sensible gain		17478 Btuh
Latent gain(ducts)		1002 Btuh
Latent gain(infiltration)		1011 Btuh
Latent gain(ventilation)		0 Btuh
Latent gain(internal/occupants/other)		1200 Btuh
Total latent gain		3213 Btuh
TOTAL HEAT GAIN		20691 Btuh



8th Edition



EnergyGauge® / USRC2B v7.0.01

System Sizing Calculations - Summer

Residential Load - Whole House Component Details

Project Title:
Zieger Residence

, FL

3/23/2022

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	0.20, 0.26	No	No	N		7.5ft	2.3ft	6.0	0.0	6.0	9	9	55	Btuh
2	2 NFRC	0.20, 0.26	No	No	N		11.5f	2.3ft	53.3	0.0	53.3	9	9	488	Btuh
3	2 NFRC	0.20, 0.26	No	No	N		11.5f	2.3ft	15.0	0.0	15.0	9	9	137	Btuh
4	2 NFRC	0.20, 0.26	No	No	N		1.5ft	2.3ft	30.0	0.0	30.0	9	9	274	Btuh
5	2 NFRC	0.20, 0.26	No	No	E		1.5ft	2.3ft	4.0	0.0	4.0	9	24	97	Btuh
6	2 NFRC	0.20, 0.26	No	No	S		1.5ft	2.3ft	30.0	30.0	0.0	9	11	274	Btuh
7	2 NFRC	0.20, 0.26	No	No	S		1.5ft	2.3ft	30.0	30.0	0.0	9	11	274	Btuh
8	2 NFRC	0.20, 0.26	No	No	S		1.5ft	2.3ft	13.3	12.4	1.0	9	11	123	Btuh
9	2 NFRC	0.20, 0.26	No	No	S		1.5ft	2.3ft	30.0	30.0	0.0	9	11	274	Btuh
10	2 NFRC	0.20, 0.26	No	No	S		1.5ft	2.3ft	12.0	12.0	0.0	9	11	110	Btuh
	Window Total								224 (sqft)					2108 Btuh	
Walls	Type	U-Value		R-Value		Area(sqft)		HTM		Load					
1	Frame - Wood - Ext		0.09		13.0/0.0		70.5		2.3		160	Btuh			
2	Frame - Wood - Ext		0.09		13.0/0.0		36.0		2.3		81	Btuh			
3	Frame - Wood - Ext		0.09		13.0/0.0		126.7		2.3		287	Btuh			
4	Frame - Wood - Ext		0.09		13.0/0.0		26.5		2.3		60	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		123.0		2.3		278	Btuh			
7	Frame - Wood - Ext		0.09		13.0/0.0		311.0		2.3		704	Btuh			
8	Frame - Wood - Ext		0.09		13.0/0.0		87.0		2.3		197	Btuh			
9	Frame - Wood - Ext		0.09		13.0/0.0		81.0		2.3		183	Btuh			
10	Frame - Wood - Ext		0.09		13.0/0.0		90.0		2.3		204	Btuh			
11	Frame - Wood - Ext		0.09		13.0/0.0		45.0		2.3		102	Btuh			
12	Frame - Wood - Ext		0.09		13.0/0.0		158.7		2.3		359	Btuh			
13	Frame - Wood - Adj		0.09		13.0/0.0		233.5		1.7		394	Btuh			
	Wall Total								1473 (sqft)			3199 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								
3	Insulated - Garage		20.0		12.0	240	Btuh								
	Door Total								60 (sqft)			720 Btuh			
Ceilings	Type/Color/Surface	U-Value		R-Value		Area(sqft)		HTM		Load					
1	Vented Attic/Light/Shingle		0.032		30.0/0.0		1584.0		1.40		2220	Btuh			
	Ceiling Total								1584 (sqft)			2220 Btuh			
Floors	Type	R-Value		Size		HTM		Load							
1	Slab On Grade		0.0		1584 (ft-perimeter)		0.0		0	Btuh					
	Floor Total								1584.0 (sqft)			0 Btuh			
	Envelope Subtotal:											8246 Btuh			

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
Zieger Residence

, FL

3/23/2022

Infiltration	Type Natural	Average ACH 0.12	Volume(cuft) 14256	Wall Ratio 1	CFM= 29.3	Load 609 Btuh
Internal gain		Occupants 6	Btuh/occupant X 230	Appliance +	3200	Load 4580 Btuh
	Sensible Envelope Load:					13435 Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic) (DGM of 0.301)					4043 Btuh
	Sensible Load All Zones					17478 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
Zieger Residence

, FL

3/23/2022

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	13435 Btuh
	Sensible Duct Load	4043 Btuh
	Total Sensible Zone Loads	17478 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	17478 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	1011 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1002 Btuh
	Latent occupant gain (6.0 people @ 200 Btuh per person)	1200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	3213 Btuh
	TOTAL GAIN	20691 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:
Zieger Residence
Building Type: User

, FL

3/23/2022

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 0.20	Vinyl	0.26	N	6.0		10.4	62 Btuh	
2	2, NFRC 0.20	Vinyl	0.26	N	53.3		10.4	555 Btuh	
3	2, NFRC 0.20	Vinyl	0.26	N	15.0		10.4	156 Btuh	
4	2, NFRC 0.20	Vinyl	0.26	N	30.0		10.4	312 Btuh	
5	2, NFRC 0.20	Vinyl	0.26	E	4.0		10.4	42 Btuh	
6	2, NFRC 0.20	Vinyl	0.26	S	30.0		10.4	312 Btuh	
7	2, NFRC 0.20	Vinyl	0.26	S	30.0		10.4	312 Btuh	
8	2, NFRC 0.20	Vinyl	0.26	S	13.3		10.4	139 Btuh	
9	2, NFRC 0.20	Vinyl	0.26	S	30.0		10.4	312 Btuh	
10	2, NFRC 0.20	Vinyl	0.26	S	12.0		10.4	125 Btuh	
	Window Total					223.7(sqft)			2326 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load	
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	71		3.55	250 Btuh	
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	36		3.55	128 Btuh	
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	127		3.55	450 Btuh	
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	27		3.55	94 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	123		3.55	437 Btuh	
7	Frame - Wood	- Ext	(0.089)	13.0/0.0	311		3.55	1104 Btuh	
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	87		3.55	309 Btuh	
9	Frame - Wood	- Ext	(0.089)	13.0/0.0	81		3.55	288 Btuh	
10	Frame - Wood	- Ext	(0.089)	13.0/0.0	90		3.55	320 Btuh	
11	Frame - Wood	- Ext	(0.089)	13.0/0.0	45		3.55	160 Btuh	
12	Frame - Wood	- Ext	(0.089)	13.0/0.0	159		3.55	563 Btuh	
13	Frame - Wood	- Adj	(0.089)	13.0/0.0	234		3.55	829 Btuh	
	Wall Total					1473(sqft)			5229 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	
3	Insulated - Garage, n		(0.400)		20		16.0	320 Btuh	
	Door Total					60(sqft)			960Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load	
1	Vented Attic/L/Shing		(0.032)	30.0/0.0	1584		1.3	2018 Btuh	
	Ceiling Total					1584(sqft)			2018Btuh
Floors	Type		Ueff.	R-Value	Size	X	HTM=	Load	
1	Slab On Grade		(1.180)	0.0	198.0 ft(perim.)		47.2	9346 Btuh	
	Floor Total					1584 sqft			9346 Btuh
	Envelope Subtotal:							19879 Btuh	

Manual J Winter Calculations

Residential Load - Component Details (continued)

, FL

Project Title:
Zieger Residence
Building Type: User

3/23/2022

Infiltration	Type Natural	Wholehouse ACH 0.16	Volume(cuft) 14256	Wall Ratio 1.00	CFM= 39.0	1710 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.174)					3765 Btuh
All Zones	Sensible Subtotal All Zones					25353 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	25353 Btuh 0 Btuh 25353 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