

Residential System Sizing Calculation

Summary

Project Title:
Tim & Sherri Shaheen

, FL

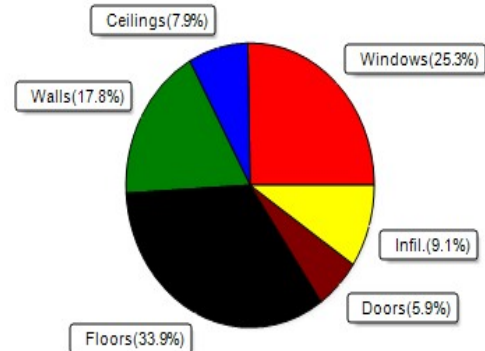
8/20/2021

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	29350	Btuh	Total cooling load calculation	21573	Btuh
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	143.1	42000	Sensible (SHR = 0.85)	194.1	35700
Heat Pump + Auxiliary(0.0kW)	143.1	42000	Latent	197.9	6300
			Total (Electric Heat Pump)	194.7	42000

WINTER CALCULATIONS

Winter Heating Load (for 2482 sqft)

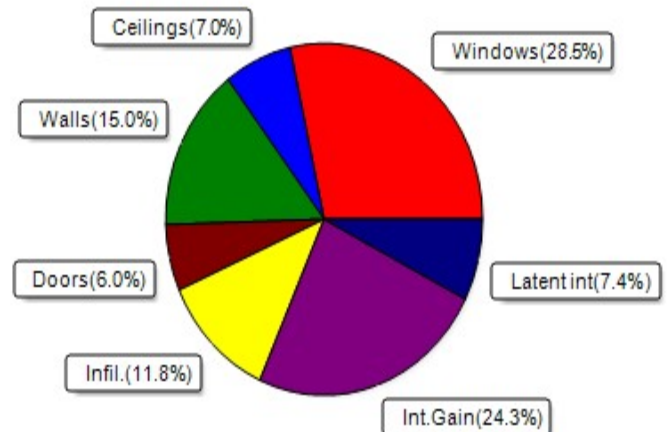
Load component	Load	
Window total	310 sqft	7440 Btuh
Wall total	1513 sqft	5219 Btuh
Door total	109 sqft	1739 Btuh
Ceiling total	2482 sqft	2314 Btuh
Floor total	2482 sqft	9959 Btuh
Infiltration	61 cfm	2679 Btuh
Duct loss		0 Btuh
Subtotal		29350 Btuh
Ventilation	0 cfm	0 Btuh
TOTAL HEAT LOSS		29350 Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 2482 sqft)

Load component	Load	
Window total	310 sqft	6149 Btuh
Wall total	1513 sqft	3237 Btuh
Door total	109 sqft	1304 Btuh
Ceiling total	2482 sqft	1504 Btuh
Floor total		0 Btuh
Infiltration	46 cfm	954 Btuh
Internal gain		5240 Btuh
Duct gain		0 Btuh
Sens. Ventilation	0 cfm	0 Btuh
Blower Load		0 Btuh
Total sensible gain		18389 Btuh
Latent gain(ducts)		0 Btuh
Latent gain(infiltration)		1584 Btuh
Latent gain(ventilation)		0 Btuh
Latent gain(internal/occupants/other)		1600 Btuh
Total latent gain		3184 Btuh
TOTAL HEAT GAIN		21573 Btuh



8th Edition

EnergyGauge® System Sizing

PREPARED BY: _____

DATE: _____

8-19-21

System Sizing Calculations - Summer

Residential Load - Whole House Component Details

Project Title:
Tim & Sherri Shaheen

, FL

8/20/2021

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	N	1.5ft.	2.3ft.	15.0	0.0	15.0	17	17	256	Btuh	
2	2 NFRC	0.27, 0.60	No	No	N	10.5f	2.3ft.	72.0	0.0	72.0	17	17	1230	Btuh	
3	2 NFRC	0.27, 0.60	No	No	N	1.5ft.	2.3ft.	8.0	0.0	8.0	17	17	137	Btuh	
4	2 NFRC	0.27, 0.60	No	No	N	1.5ft.	2.3ft.	25.0	0.0	25.0	17	17	427	Btuh	
5	2 NFRC	0.27, 0.60	No	No	E	1.5ft.	2.3ft.	30.0	0.0	30.0	17	37	1123	Btuh	
6	2 NFRC	0.27, 0.60	No	No	S	1.5ft.	2.3ft.	30.0	30.0	0.0	17	19	512	Btuh	
7	2 NFRC	0.27, 0.60	No	No	S	14.5f	2.3ft.	16.0	16.0	0.0	17	19	273	Btuh	
8	2 NFRC	0.27, 0.60	No	No	S	8.5ft.	2.3ft.	72.0	72.0	0.0	17	19	1230	Btuh	
9	2 NFRC	0.27, 0.60	No	No	S	1.5ft.	2.3ft.	30.0	30.0	0.0	17	19	512	Btuh	
10	2 NFRC	0.27, 0.60	No	No	W	1.5ft.	2.3ft.	12.0	0.0	12.0	17	37	449	Btuh	
Window Total									310 (sqft)					6149 Btuh	
Walls	Type	U-Value	R-Value	Area(sqft)		HTM		Load							
				Cav/Sheath											
1	Frame - Wood - Ext	0.09	13.0/0.6	90.0		2.2		198 Btuh							
2	Frame - Wood - Ext	0.09	13.0/0.6	190.0		2.2		418 Btuh							
3	Frame - Wood - Ext	0.09	13.0/0.6	93.0		2.2		204 Btuh							
4	Frame - Wood - Ext	0.09	13.0/0.6	348.0		2.2		765 Btuh							
5	Frame - Wood - Ext	0.09	13.0/0.6	114.0		2.2		251 Btuh							
6	Frame - Wood - Ext	0.09	13.0/0.6	27.0		2.2		59 Btuh							
7	Frame - Wood - Ext	0.09	13.0/0.6	23.3		2.2		51 Btuh							
8	Frame - Wood - Ext	0.09	13.0/0.6	45.0		2.2		99 Btuh							
9	Frame - Wood - Ext	0.09	13.0/0.6	150.0		2.2		330 Btuh							
10	Frame - Wood - Ext	0.09	13.0/0.6	18.0		2.2		40 Btuh							
11	Frame - Wood - Ext	0.09	13.0/0.6	69.0		2.2		152 Btuh							
12	Frame - Wood - Adj	0.09	13.0/0.6	160.0		1.6		262 Btuh							
13	Frame - Wood - Ext	0.09	13.0/0.6	186.0		2.2		409 Btuh							
Wall Total				1513 (sqft)				3237 Btuh							
Doors	Type	Area (sqft)		HTM		Load									
1	Insulated - Exterior	16.7		12.0		200 Btuh									
2	Insulated - Exterior	48.0		12.0		576 Btuh									
3	Insulated - Exterior	24.0		12.0		288 Btuh									
4	Insulated - Garage	20.0		12.0		240 Btuh									
Door Total		109 (sqft)				1304 Btuh									
Ceilings	Type/Color/Surface	U-Value	R-Value	Area(sqft)	HTM		Load								
1	Cath/Sngl Assem/DarkShingle	0.023	21.0/21.0	2482.0	0.61		1504 Btuh								
Ceiling Total				2482 (sqft)		1504 Btuh									
Floors	Type	R-Value		Size	HTM		Load								
1	Slab On Grade	0.0		2482 (ft-perimeter)	0.0		0 Btuh								
Floor Total				2482.0 (sqft)		0 Btuh									
Envelope Subtotal:											12195 Btuh				

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
 Tim & Sherri Shaheen

, FL

8/20/2021

Infiltration	Type Natural	Average ACH 0.12	Volume(cuft) 22338	Wall Ratio 1	CFM= 45.9	Load 954 Btuh
Internal gain		Occupants 8	Btuh/occupant X 230	+	Appliance 3400	Load 5240 Btuh
			Sensible Envelope Load:			18389 Btuh
Duct load	Extremelysealed, Supply(R6.0-Cond), Return(R6.0-Cond) (DGM of 0.000)					0 Btuh
			Sensible Load All Zones			18389 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
 Tim & Sherri Shaheen

, FL

8/20/2021

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	18389 Btuh
	Sensible Duct Load	0 Btuh
	Total Sensible Zone Loads	18389 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	18389 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	1584 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	3184 Btuh
	TOTAL GAIN	21573 Btuh

EQUIPMENT

1. Central Unit	#	42000 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:
Tim & Sherri Shaheen
Building Type: User

, FL

8/20/2021

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	N	15.0		24.0	360 Btuh	
2	2, NFRC 0.27	Vinyl	0.60	N	72.0		24.0	1728 Btuh	
3	2, NFRC 0.27	Vinyl	0.60	N	8.0		24.0	192 Btuh	
4	2, NFRC 0.27	Vinyl	0.60	N	25.0		24.0	600 Btuh	
5	2, NFRC 0.27	Vinyl	0.60	E	30.0		24.0	720 Btuh	
6	2, NFRC 0.27	Vinyl	0.60	S	30.0		24.0	720 Btuh	
7	2, NFRC 0.27	Vinyl	0.60	S	16.0		24.0	384 Btuh	
8	2, NFRC 0.27	Vinyl	0.60	S	72.0		24.0	1728 Btuh	
9	2, NFRC 0.27	Vinyl	0.60	S	30.0		24.0	720 Btuh	
10	2, NFRC 0.27	Vinyl	0.60	W	12.0		24.0	288 Btuh	
	Window Total					310.0(sqft)			7440 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load	
1	Frame - Wood	- Ext	(0.086)	13.0/0.6	90		3.45	310 Btuh	
2	Frame - Wood	- Ext	(0.086)	13.0/0.6	190		3.45	655 Btuh	
3	Frame - Wood	- Ext	(0.086)	13.0/0.6	93		3.45	321 Btuh	
4	Frame - Wood	- Ext	(0.086)	13.0/0.6	348		3.45	1200 Btuh	
5	Frame - Wood	- Ext	(0.086)	13.0/0.6	114		3.45	393 Btuh	
6	Frame - Wood	- Ext	(0.086)	13.0/0.6	27		3.45	93 Btuh	
7	Frame - Wood	- Ext	(0.086)	13.0/0.6	23		3.45	80 Btuh	
8	Frame - Wood	- Ext	(0.086)	13.0/0.6	45		3.45	155 Btuh	
9	Frame - Wood	- Ext	(0.086)	13.0/0.6	150		3.45	517 Btuh	
10	Frame - Wood	- Ext	(0.086)	13.0/0.6	18		3.45	62 Btuh	
11	Frame - Wood	- Ext	(0.086)	13.0/0.6	69		3.45	238 Btuh	
12	Frame - Wood	- Adj	(0.086)	13.0/0.6	160		3.45	552 Btuh	
13	Frame - Wood	- Ext	(0.086)	13.0/0.6	186		3.45	641 Btuh	
	Wall Total					1513(sqft)			5219 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load	
1	Insulated - Exterior, n		(0.400)		17		16.0	267 Btuh	
2	Insulated - Exterior, n		(0.400)		48		16.0	768 Btuh	
3	Insulated - Exterior, n		(0.400)		24		16.0	384 Btuh	
4	Insulated - Garage, n		(0.400)		20		16.0	320 Btuh	
	Door Total					109(sqft)			1739Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load	
1	Cathedral/D/Shing		(0.023)	21.0/21.0	2482		0.9	2314 Btuh	
	Ceiling Total					2482(sqft)			2314Btuh
Floors	Type		Ueff.	R-Value	Size	X	HTM=	Load	
1	Slab On Grade		(1.180)	0.0	211.0 ft(perim.)		47.2	9959 Btuh	
	Floor Total					2482 sqft			9959 Btuh
Envelope Subtotal:								26671 Btuh	

Manual J Winter Calculations

Residential Load - Component Details (continued)

Project Title:
Tim & Sherri Shaheen
Building Type: User

, FL

8/20/2021

Infiltration	Type Natural	Wholehouse ACH 0.16	Volume(cuft) 22338	Wall Ratio 1.00	CFM= 61.2	2679 Btuh
Duct load	Extremely sealed, R6.0, Supply(Con), Return(Con) (DLM of 0.000)					0 Btuh
All Zones	Sensible Subtotal All Zones					29350 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss	29350 Btuh
	Ventilation Sensible Heat Loss	0 Btuh
	Total Heat Loss	29350 Btuh

EQUIPMENT

1. Electric Heat Pump	#	42000 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