

Residential System Sizing Calculation

Summary

Scott & Michelle Hagan
1780 SW Bethlehem Ave
Ft White, FL

Project Title:
Hagan Residence

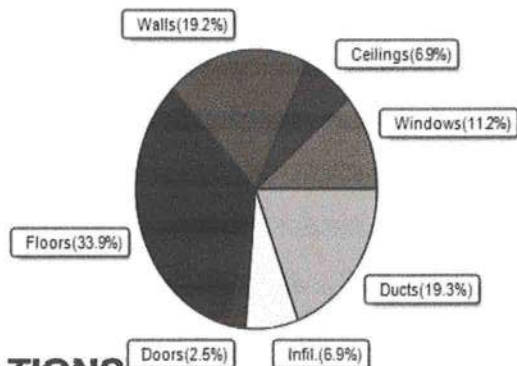


Location for weather data: Gainesville, FL - Defaults: Latitude(29.7) Altitude(152 ft.) Temp Range(M)			
Humidity data: Interior RH (50%) Outdoor wet bulb (77F) Humidity difference(51gr.)			
Winter design temperature(TMY3 99%)	30 F	Summer design temperature(TMY3 99%)	94 F
Winter setpoint	70 F	Summer setpoint	75 F
Winter temperature difference	40 F	Summer temperature difference	19 F
Total heating load calculation	32212 Btuh	Total cooling load calculation	24291 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	100.0 32212	Sensible (SHR = 0.70)	83.4 16810
Heat Pump + Auxiliary(0.0kW)	100.0 32212	Latent	174.7 7204
		Total (Electric Heat Pump)	98.9 24014

WINTER CALCULATIONS

Winter Heating Load (for 2071 sqft)

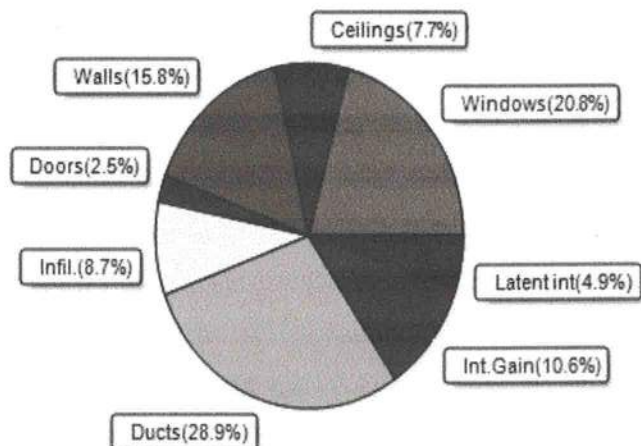
Load component	Load
Window total	251 sqft 3614 Btuh
Wall total	1745 sqft 6195 Btuh
Door total	44 sqft 810 Btuh
Ceiling total	2175 sqft 2208 Btuh
Floor total	2071 sqft 10919 Btuh
Infiltration	51 cfm 2235 Btuh
Duct loss	6231 Btuh
Subtotal	32212 Btuh
Ventilation	0 cfm 0 Btuh
TOTAL HEAT LOSS	32212 Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 2071 sqft)

Load component	Load
Window total	251 sqft 5060 Btuh
Wall total	1745 sqft 3831 Btuh
Door total	44 sqft 607 Btuh
Ceiling total	2175 sqft 1877 Btuh
Floor total	0 Btuh
Infiltration	38 cfm 796 Btuh
Internal gain	2580 Btuh
Duct gain	5416 Btuh
Sens. Ventilation	0 cfm 0 Btuh
Blower Load	0 Btuh
Total sensible gain	20168 Btuh
Latent gain(ducts)	1602 Btuh
Latent gain(infiltration)	1321 Btuh
Latent gain(ventilation)	0 Btuh
Latent gain(internal/occupants/other)	1200 Btuh
Total latent gain	4123 Btuh
TOTAL HEAT GAIN	24291 Btuh



8th Edition

EnergyGauge® System Sizing

PREPARED BY:

DATE:

10 / 18 / 2022

Will C. Hagan

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Scott & Michelle Hagan
1780 SW Bethlehem Ave
Ft White, FL

Project Title:
Hagan Residence
Building Type: User

10/18/2022

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 0.25	Vinyl	0.36	W	16.0		14.4	230 Btuh
2	2, NFRC 0.25	Vinyl	0.36	W	36.0		14.4	518 Btuh
3	2, NFRC 0.25	Vinyl	0.36	N	15.0		14.4	216 Btuh
4	2, NFRC 0.25	Vinyl	0.36	N	15.0		14.4	216 Btuh
5	2, NFRC 0.25	Vinyl	0.36	E	15.0		14.4	216 Btuh
6	2, NFRC 0.25	Vinyl	0.36	E	16.0		14.4	230 Btuh
7	2, NFRC 0.25	Vinyl	0.36	E	30.0		14.4	432 Btuh
8	2, NFRC 0.25	Vinyl	0.36	E	30.0		14.4	432 Btuh
9	2, NFRC 0.25	Vinyl	0.36	W	20.0		14.4	288 Btuh
10	2, NFRC 0.25	Vinyl	0.36	W	6.0		14.4	86 Btuh
11	2, NFRC 0.25	Vinyl	0.36	W	4.0		14.4	58 Btuh
12	2, NFRC 0.25	TIM	0.36	E	48.0		14.4	691 Btuh
Window Total					251.0(sqft)			3614 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	127		3.55	449 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	43		3.55	151 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	67		3.55	239 Btuh
4	Frame - Wood	- Adj	(0.089)	13.0/0.0	205		3.55	728 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	357		3.55	1267 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	99		3.55	351 Btuh
7	Frame - Wood	- Ext	(0.089)	13.0/0.0	137		3.55	485 Btuh
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	101		3.55	357 Btuh
9	Frame - Wood	- Ext	(0.089)	13.0/0.0	97		3.55	344 Btuh
10	Frame - Wood	- Ext	(0.089)	13.0/0.0	81		3.55	288 Btuh
11	Frame - Wood	- Ext	(0.089)	13.0/0.0	116		3.55	410 Btuh
12	Frame - Wood	- Ext	(0.089)	13.0/0.0	317		3.55	1124 Btuh
Wall Total					1745(sqft)			6195 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior, n		(0.460)		24		18.4	442 Btuh
2	Insulated - Garage, n		(0.460)		20		18.4	368 Btuh
Door Total					44(sqft)			810Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load
1	Vented Attic/L/Shing		(0.025)	38.0/0.0	2175		1.0	2208 Btuh
Ceiling Total					2175(sqft)			2208Btuh
Floors	Type		Ueff.	R-Value	Size	X	HTM=	Load
1	Slab On Grade		(1.180)	0.0	231.3 ft(perim.)		47.2	10919 Btuh
Floor Total					2071 sqft			10919 Btuh
Envelope Subtotal:								23746 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Scott & Michelle Hagan
1780 SW Bethlehem Ave
Ft White, FL

Project Title:
Hagan Residence
Building Type: User

10/18/2022

Infiltration	Type Natural	Wholehouse ACH 0.16	Volume(cuft) 18639	Wall Ratio 1.00	CFM= 51.0	2235 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.240)					6231 Btuh
All Zones	Sensible Subtotal All Zones					32212 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss	32212 Btuh
	Ventilation Sensible Heat Loss	0 Btuh
	Total Heat Loss	32212 Btuh

EQUIPMENT

1. Electric Heat Pump	#	32212 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

Scott & Michelle Hagan
1780 SW Bethlehem Ave
Ft White, FL

Project Title:
Hagan Residence

10/18/2022

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	Omt	Len	Hgt	Gross	Shaded	Unshaded	Shaded		Unshaded
1	2 NFRC	0.25, 0.36	No	No	W		1.0ft.	1.0ft.	16.0	0.0	16.0	12	31	495 Btuh
2	2 NFRC	0.25, 0.36	No	No	W		7.5ft.	1.0ft.	36.0	31.3	4.7	12	31	523 Btuh
3	2 NFRC	0.25, 0.36	No	No	N		1.5ft.	1.0ft.	15.0	0.0	15.0	12	12	181 Btuh
4	2 NFRC	0.25, 0.36	No	No	N		1.5ft.	1.0ft.	15.0	0.0	15.0	12	12	181 Btuh
5	2 NFRC	0.25, 0.36	No	No	E		1.5ft.	1.0ft.	15.0	0.7	14.3	12	31	450 Btuh
6	2 NFRC	0.25, 0.36	No	No	E		10.5f	1.0ft.	16.0	16.0	0.0	12	31	194 Btuh
7	2 NFRC	0.25, 0.36	No	No	E		10.5f	1.0ft.	30.0	30.0	0.0	12	31	363 Btuh
8	2 NFRC	0.25, 0.36	No	No	E		1.5ft.	1.0ft.	30.0	1.5	28.5	12	31	901 Btuh
9	2 NFRC	0.25, 0.36	No	No	W		1.5ft.	1.0ft.	20.0	1.0	19.0	12	31	600 Btuh
10	2 NFRC	0.25, 0.36	No	No	W		1.5ft.	1.0ft.	6.0	0.5	5.5	12	31	176 Btuh
11	2 NFRC	0.25, 0.36	No	No	W		1.5ft.	1.0ft.	4.0	1.0	3.0	12	31	105 Btuh
12	2 NFRC	0.25, 0.36	No	No	E		10.5f	1.0ft.	48.0	46.3	1.7	12	31	613 Btuh
	Excursion													277 Btuh
	Window Total								251 (sqft)					5060 Btuh
Walls	Type	U-Value		R-Value		Area(sqft)		HTM		Load				
1	Frame - Wood - Ext		0.09		13.0/0.0		126.5		2.3		286 Btuh			
2	Frame - Wood - Ext		0.09		13.0/0.0		42.7		2.3		97 Btuh			
3	Frame - Wood - Ext		0.09		13.0/0.0		67.3		2.3		152 Btuh			
4	Frame - Wood - Adj		0.09		13.0/0.0		205.0		1.7		346 Btuh			
5	Frame - Wood - Ext		0.09		13.0/0.0		357.0		2.3		808 Btuh			
6	Frame - Wood - Ext		0.09		13.0/0.0		99.0		2.3		224 Btuh			
7	Frame - Wood - Ext		0.09		13.0/0.0		136.7		2.3		309 Btuh			
8	Frame - Wood - Ext		0.09		13.0/0.0		100.7		2.3		228 Btuh			
9	Frame - Wood - Ext		0.09		13.0/0.0		97.0		2.3		220 Btuh			
10	Frame - Wood - Ext		0.09		13.0/0.0		81.0		2.3		183 Btuh			
11	Frame - Wood - Ext		0.09		13.0/0.0		115.5		2.3		261 Btuh			
12	Frame - Wood - Ext		0.09		13.0/0.0		316.5		2.3		716 Btuh			
	Wall Total							1745 (sqft)				3831 Btuh		
Doors	Type	Area (sqft)		HTM		Load								
1	Insulated - Exterior		24.0		13.8	331 Btuh								
2	Insulated - Garage		20.0		13.8	276 Btuh								
	Door Total		44 (sqft)			607 Btuh								
Ceilings	Type/Color/Surface	U-Value	R-Value	Area(sqft)	HTM	Load								
1	Vented AtticLight/Shingle/RB	0.025	38.0/0.0	2175.0	0.86	1877 Btuh								
	Ceiling Total				2175 (sqft)	1877 Btuh								
Floors	Type	R-Value		Size	HTM	Load								
1	Slab On Grade	0.0		2071 (ft-perimeter)	0.0	0 Btuh								
	Floor Total				2071.0 (sqft)	0 Btuh								
	Envelope Subtotal:					11375 Btuh								

Manual J Summer Calculations

Residential Load - Component Details (continued)

Scott & Michelle Hagan
1780 SW Bethlehem Ave
Ft White, FL

Project Title:
Hagan Residence

Climate:FL_GAINESVILLE_REGIONAL_A

10/18/2022

Infiltration	Type Natural	Average ACH 0.12	Volume(cuft) 18639	Wall Ratio 1	CFM= 38.3	Load 796 Btuh
Internal gain		Occupants 6	Btuh/occupant X 230	Appliance +	1200	Load 2580 Btuh
					Sensible Envelope Load:	14752 Btuh
Duct load	Average sealed,Supply(R6.0-Attic), Return(R6.0-Attic)				(DGM of 0.367)	5416 Btuh
					Sensible Load All Zones	20168 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Scott & Michelle Hagan
1780 SW Bethlehem Ave
Ft White, FL

Project Title:
Hagan Residence

Climate: FL_GAINESVILLE_REGIONAL_A

10/18/2022

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	14752 Btuh
	Sensible Duct Load	5416 Btuh
	Total Sensible Zone Loads	20168 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	20168 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	1321 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1602 Btuh
	Latent occupant gain (6.0 people @ 200 Btuh per person)	1200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	4123 Btuh
	TOTAL GAIN	24291 Btuh

EQUIPMENT

1. Central Unit	#	24014 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