Residential System Sizing Calculation

Summary

Isaac & Marlene Hart
159 SW Governors Glen
Lake City, FL 32024

Project Title:
Hart Residence

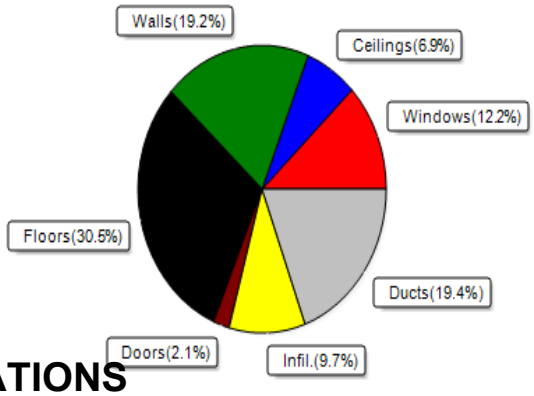
6/6/2023

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	**42025**	**Btuh**	**Total cooling load calculation**	**33655**	**Btuh**
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	100.0	42025	Sensible (SHR = 0.70)	85.3	23559
Heat Pump + Auxiliary(0.0kW)	100.0	42025	Latent	167.6	10097
			Total (Electric Heat Pump)	100.0	33655

WINTER CALCULATIONS

Winter Heating Load (for 2701 sqft)

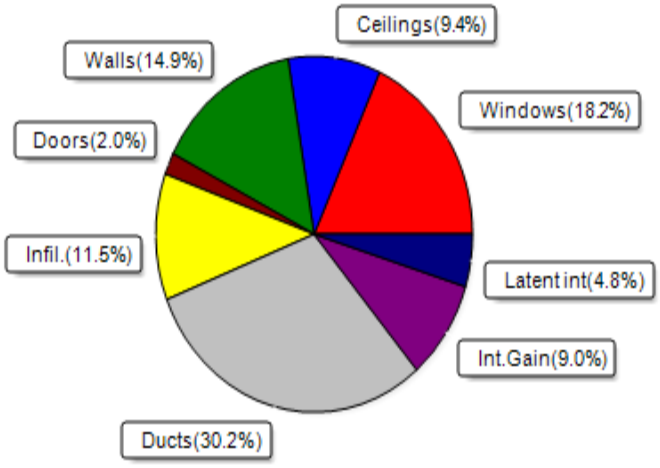
Load component			Load	
Window total	355	sqft	5112	Btuh
Wall total	2274	sqft	8072	Btuh
Door total	48	sqft	883	Btuh
Ceiling total	2836	sqft	2879	Btuh
Floor total	2701	sqft	12838	Btuh
Infiltration	93	cfm	4081	Btuh
Duct loss			8159	Btuh
Subtotal			**42025**	**Btuh**
Ventilation	Ex:0 cfm; Sup:0 cfm		0	Btuh
TOTAL HEAT LOSS			**42025**	**Btuh**



SUMMER CALCULATIONS

Summer Cooling Load (for 2701 sqft)

Load component			Load	
Window total	355	sqft	6134	Btuh
Wall total	2274	sqft	5012	Btuh
Door total	48	sqft	662	Btuh
Ceiling total	2836	sqft	3167	Btuh
Floor total			0	Btuh
Infiltration	70	cfm	1454	Btuh
Internal gain			3040	Btuh
Duct gain			8163	Btuh
Sens.Ventilation	Ex:0 cfm; Sup:0 cfm		0	Btuh
Blower Load			0	Btuh
Total sensible gain			**27633**	**Btuh**
Latent gain(ducts)			2010	Btuh
Latent gain(infiltration)			2413	Btuh
Latent gain(ventilation)			0	Btuh
Latent gain(internal/occupants/other)			1600	Btuh
Total latent gain			**6023**	**Btuh**
TOTAL HEAT GAIN			**33655**	**Btuh**



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EnergyGauge® System Sizing
PREPARED BY: _____
DATE: 6 / 6 / 2023

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Isaac & Marlene Hart
159 SW Governors Glen
Lake City, FL 32024

Project Title:
Hart Residence
Building Type: User

6/6/2023

Reference City: Gainesville, FL (Defaults) Winter Temperature Difference: 40.0 °F (TMY3 99%)
Winter Setpoint: 70 °F (Required Manual J default)

Component Loads for Whole House

Window	Panes/Type	Frame	U	Orientation	Area(sqft) X	HTM=	Load
1	2, NFRC 0.25	Vinyl	0.36	S	18.0	14.4	259 Btuh
2	2, NFRC 0.25	Vinyl	0.36	S	33.0	14.4	475 Btuh
3	2, NFRC 0.25	Vinyl	0.36	E	4.0	14.4	58 Btuh
4	2, NFRC 0.25	Vinyl	0.36	E	4.0	14.4	58 Btuh
5	2, NFRC 0.25	Vinyl	0.36	N	18.0	14.4	259 Btuh
6	2, NFRC 0.25	Vinyl	0.36	N	72.0	14.4	1037 Btuh
7	2, NFRC 0.25	TIM	0.36	E	48.0	14.4	691 Btuh
8	2, NFRC 0.25	Vinyl	0.36	N	54.0	14.4	778 Btuh
9	2, NFRC 0.25	Vinyl	0.36	N	36.0	14.4	518 Btuh
10	2, NFRC 0.25	Vinyl	0.36	W	20.0	14.4	288 Btuh
11	2, NFRC 0.25	Vinyl	0.36	W	12.0	14.4	173 Btuh
12	2, NFRC 0.25	Vinyl	0.36	W	20.0	14.4	288 Btuh
13	2, NFRC 0.25	Vinyl	0.36	W	16.0	14.4	230 Btuh
	Window Total				355.0(sqft)		5112 Btuh

Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	181	3.55	644 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	100	3.55	355 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	107	3.55	380 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	120	3.55	426 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	60	3.55	213 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	232	3.55	824 Btuh
7	Frame - Wood	- Ext	(0.089)	13.0/0.0	60	3.55	213 Btuh
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	147	3.55	521 Btuh
9	Frame - Wood	- Ext	(0.089)	13.0/0.0	122	3.55	433 Btuh
10	Frame - Wood	- Ext	(0.089)	13.0/0.0	100	3.55	355 Btuh
11	Frame - Wood	- Ext	(0.089)	13.0/0.0	108	3.55	383 Btuh
12	Frame - Wood	- Ext	(0.089)	13.0/0.0	52	3.55	185 Btuh
13	Frame - Wood	- Ext	(0.089)	13.0/0.0	66	3.55	234 Btuh
14	Frame - Wood	- Ext	(0.089)	13.0/0.0	30	3.55	107 Btuh
15	Frame - Wood	- Ext	(0.089)	13.0/0.0	117	3.55	417 Btuh
16	Frame - Wood	- Ext	(0.089)	13.0/0.0	143	3.55	509 Btuh
17	Frame - Wood	- Ext	(0.089)	13.0/0.0	47	3.55	166 Btuh
18	Frame - Wood	- Ext	(0.089)	13.0/0.0	249	3.55	883 Btuh
19	Frame - Wood	- Adj	(0.089)	13.0/0.0	233	3.55	826 Btuh
	Wall Total				2274(sqft)		8072 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)	24	18.4	442 Btuh
	Door Total			48(sqft)		883Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

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Hart Residence
Building Type: User

6/6/2023

Ceilings	Type/Color/Surface	Ueff.	R-Value	Area X	HTM=	Load
1	Flat ceil/M/Shing	(0.025)	38.0/0.0	2836	1.0	2879 Btuh
	Ceiling Total			2836(sqft)		2879Btuh
Floors	Type	Ueff.	R-Value	Size X	HTM=	Load
1	Slab On Grade	(1.180)	0.0	272.0 ft(perim.)	47.2	12838 Btuh
	Floor Total			2701 sqft		12838 Btuh
				Envelope Subtotal:		29785 Btuh

Infiltration	Type	Wholehouse ACH	Volume(cuft)	Wall Ratio	CFM=	
	Natural	0.23	24309	1.00	93.2	4081 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att)			(DLM of 0.241)		8159 Btuh
All Zones	**Sensible Subtotal All Zones**					**42025 Btuh**

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss	42025 Btuh
	Ventilation Sens. Heat Loss (Ex:0 cfm; Sup:0 cfm)	0 Btuh
	Total Heat Loss	42025 Btuh

EQUIPMENT

1. Electric Heat Pump	#	42025 Btuh

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)

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System Sizing Calculations - Summer

Residential Load - Whole House Component Details

Isaac & Marlene Hart
159 SW Governors Glen
Lake City, FL 32024

Project Title:
Hart Residence

6/6/2023

Reference City: Gainesville, FL (Defaults)
Humidity difference: 51gr.

Temperature Difference: 19.0F(TMY3 99%)
Summer Setpoint: 75 °F (Required Manual J default)

Component Loads for Whole House

	Type*					Overhang		Window Area(sqft)			HTM		Load
Window	Panes	SHGC	U	InSh	IS	Ornt	Len	Hgt	Gross	Shaded	Unshaded	Shaded	Unshaded	
1	2 NFRC	0.25,	0.36	No	No	S	8.5ft.	1.0ft.	18.0	18.0	0.0	12	14	218 Btuh
2	2 NFRC	0.25,	0.36	No	No	S	1.0ft.	0.5ft.	33.0	31.1	1.9	12	14	403 Btuh
3	2 NFRC	0.25,	0.36	No	No	E	1.5ft.	1.0ft.	4.0	0.5	3.5	12	31	115 Btuh
4	2 NFRC	0.25,	0.36	No	No	E	1.5ft.	1.0ft.	4.0	1.0	3.0	12	31	105 Btuh
5	2 NFRC	0.25,	0.36	No	No	N	1.0ft.	2.0ft.	18.0	0.0	18.0	12	12	218 Btuh
6	2 NFRC	0.25,	0.36	No	No	N	16.5f	1.0ft.	72.0	0.0	72.0	12	12	871 Btuh
7	2 NFRC	0.25,	0.36	No	No	E	8.5ft.	1.0ft.	48.0	36.3	11.7	12	31	801 Btuh
8	2 NFRC	0.25,	0.36	No	No	N	1.5ft.	1.0ft.	54.0	0.0	54.0	12	12	653 Btuh
9	2 NFRC	0.25,	0.36	No	No	N	1.0ft.	2.0ft.	36.0	0.0	36.0	12	12	436 Btuh
10	2 NFRC	0.25,	0.36	No	No	W	1.5ft.	1.0ft.	20.0	1.0	19.0	12	31	600 Btuh
11	2 NFRC	0.25,	0.36	No	No	W	1.5ft.	1.0ft.	12.0	2.0	10.0	12	31	334 Btuh
12	2 NFRC	0.25,	0.36	No	No	W	1.5ft.	1.0ft.	20.0	1.0	19.0	12	31	600 Btuh
13	2 NFRC	0.25,	0.36	No	No	W	1.5ft.	1.0ft.	16.0	1.0	15.0	12	31	477 Btuh
	Excursion													303 Btuh
	Window Total								355 (sqft)					6134 Btuh

Walls	Type	U-Value	R-Value Cav/Sheath	Area(sqft)	HTM	Load
1	Frame - Wood - Ext	0.09	13.0/0.0	181.3	2.3	410 Btuh
2	Frame - Wood - Ext	0.09	13.0/0.0	100.0	2.3	226 Btuh
3	Frame - Wood - Ext	0.09	13.0/0.0	107.0	2.3	242 Btuh
4	Frame - Wood - Ext	0.09	13.0/0.0	120.0	2.3	272 Btuh
5	Frame - Wood - Ext	0.09	13.0/0.0	60.0	2.3	136 Btuh
6	Frame - Wood - Ext	0.09	13.0/0.0	232.0	2.3	525 Btuh
7	Frame - Wood - Ext	0.09	13.0/0.0	60.0	2.3	136 Btuh
8	Frame - Wood - Ext	0.09	13.0/0.0	146.7	2.3	332 Btuh
9	Frame - Wood - Ext	0.09	13.0/0.0	122.0	2.3	276 Btuh
10	Frame - Wood - Ext	0.09	13.0/0.0	100.0	2.3	226 Btuh
11	Frame - Wood - Ext	0.09	13.0/0.0	108.0	2.3	244 Btuh
12	Frame - Wood - Ext	0.09	13.0/0.0	52.0	2.3	118 Btuh
13	Frame - Wood - Ext	0.09	13.0/0.0	66.0	2.3	149 Btuh
14	Frame - Wood - Ext	0.09	13.0/0.0	30.0	2.3	68 Btuh
15	Frame - Wood - Ext	0.09	13.0/0.0	117.3	2.3	266 Btuh
16	Frame - Wood - Ext	0.09	13.0/0.0	143.3	2.3	324 Btuh
17	Frame - Wood - Ext	0.09	13.0/0.0	46.7	2.3	106 Btuh
18	Frame - Wood - Ext	0.09	13.0/0.0	248.7	2.3	563 Btuh
19	Frame - Wood - Adj	0.09	13.0/0.0	232.7	1.7	392 Btuh
	Wall Total			2274 (sqft)		5012 Btuh

Doors	Type	Area (sqft)	HTM	Load
1	Insulated - Exterior	24.0	13.8	331 Btuh
2	Insulated - Garage	24.0	13.8	331 Btuh
	Door Total	48 (sqft)		662 Btuh

Ceilings	Type/Color/Surface	U-Value	R-Value	Area(sqft)	HTM	Load
1	Vented Attic/Med/Shingle/RB	0.025	38.0/0.0	2836.0	1.12	3167 Btuh
	Ceiling Total			2836 (sqft)		3167 Btuh

Floors	Type	R-Value	Size	HTM	Load
1	Slab On Grade	0.0	2701 (ft-perimeter)	0.0	0 Btuh
	Floor Total		2701.0 (sqft)		0 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

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159 SW Governors Glen
Lake City, FL 32024

Project Title: Hart Residence

Climate:FL_GAINESVILLE_REGIONAL_A

6/6/2023

					Envelope Subtotal:			14975 Btuh
Infiltration	Type	Average ACH	Volume(cuft)		Wall Ratio	CFM=	Load	
	Natural	0.17	24309		1	69.9	1454	Btuh
Internal gain		Occupants	Btuh/occupant			Appliance	Load	
		8	X	230	+	1200	3040	Btuh
					Sensible Envelope Load:		19469	Btuh
Duct load	Average sealed,Supply(R6.0-Attic), Return(R6.0-Attic)				(DGM of 0.419)		8163	Btuh
					Sensible Load All Zones		**27633**	**Btuh**

Manual J Summer Calculations

Residential Load - Component Details (continued)

Isaac & Marlene Hart
159 SW Governors Glen
Lake City, FL 32024

Project Title: Hart Residence
Climate:FL_GAINESVILLE_REGIONAL_A

6/6/2023

WHOLE HOUSE TOTALS

	Sensible Envelope Load All Zones	**19469 Btuh**
	Sensible Duct Load	8163 Btuh
	Total Sensible Zone Loads	**27633 Btuh**
	Sensible ventilation (Ex:0 cfm; Sup:0 cfm)	0 Btuh
	Blower	0 Btuh
Whole House	**Total sensible gain**	**27633 Btuh**
Totals for Cooling	Latent infiltration gain (for 51 gr. humidity difference)	2413 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	2010 Btuh
	Latent occupant gain (8.0 people @ 200 Btuh per person)	1600 Btuh
	Latent other gain	0 Btuh
	Latent total gain	**6023 Btuh**
	TOTAL GAIN	**33655 Btuh**

EQUIPMENT

1. Central Unit	#	33655 Btuh

*Key: Window types (Panes - 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)

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