Residential System Sizing Calculation

Summary

Project Title:
Martin Residence

, FL

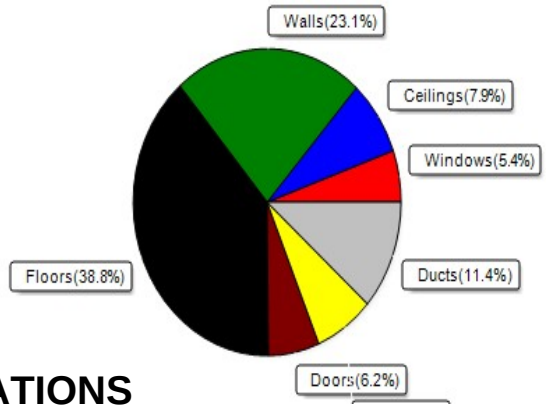
6/4/2024

Location for weather data: Gainesville, FL - Defaults: Latitude(29.7) Altitude(100 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	**23595**	**Btuh**	**Total cooling load calculation**	**19291**	**Btuh**
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	127.1	30000	Sensible (SHR = 0.75)	134.4	22500
Heat Pump + Auxiliary(0.0kW)	127.1	30000	Latent	294.2	7500
			Total (Electric Heat Pump)	155.5	30000

WINTER CALCULATIONS

Winter Heating Load (for 1466 sqft)

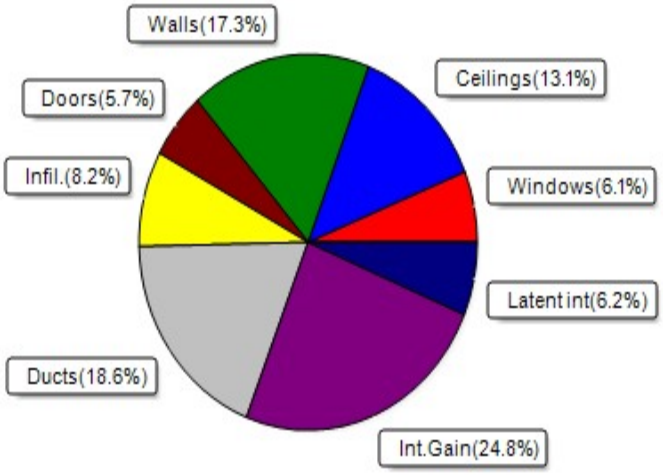
Load component			Load	
Window total	123	sqft	1279	Btuh
Wall total	1537	sqft	5457	Btuh
Door total	80	sqft	1472	Btuh
Ceiling total	1466	sqft	1868	Btuh
Floor total	1466	sqft	9157	Btuh
Infiltration	38	cfm	1661	Btuh
Duct loss			2702	Btuh
Subtotal			**23595**	**Btuh**
Ventilation	Ex:0 cfm; Sup:0 cfm		0	Btuh
TOTAL HEAT LOSS			**23595**	**Btuh**



SUMMER CALCULATIONS

Summer Cooling Load (for 1466 sqft)

Load component			Load	
Window total	123	sqft	1170	Btuh
Wall total	1537	sqft	3345	Btuh
Door total	80	sqft	1104	Btuh
Ceiling total	1466	sqft	2521	Btuh
Floor total			0	Btuh
Infiltration	28	cfm	592	Btuh
Internal gain			4780	Btuh
Duct gain			3229	Btuh
Sens.Ventilation	Ex:0 cfm; Sup:0 cfm		0	Btuh
Blower Load			0	Btuh
Total sensible gain			**16742**	**Btuh**
Latent gain(ducts)			367	Btuh
Latent gain(infiltration)			982	Btuh
Latent gain(ventilation)			0	Btuh
Latent gain(internal/occupants/other)			1200	Btuh
Total latent gain			**2549**	**Btuh**
TOTAL HEAT GAIN			**19291**	**Btuh**



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EnergyGauge® System Sizing
PREPARED BY: _____
DATE: 5-30-24

System Sizing Calculations - Summer

Residential Load - Whole House Component Details

Project Title:
Martin Residence

, FL

6/4/2024

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

Window	Type* Panes	SHGC	U	InSh	IS	Ornt	Overhang Len	Hgt	Window Area(sqft) Gross	Shaded	Unshaded	HTM Shaded	Unshaded	Load
1	2 NFRC	0.20, 0.26		No	No	N	1.5ft	1.3ft	15.0	0.0	15.0	9	9	137 Btuh
2	2 NFRC	0.20, 0.26		No	No	N	1.5ft	1.3ft	30.0	0.0	30.0	9	9	274 Btuh
3	2 NFRC	0.20, 0.26		No	No	N	1.5ft	1.3ft	30.0	0.0	30.0	9	9	274 Btuh
4	2 NFRC	0.20, 0.26		No	No	S	1.5ft	1.3ft	30.0	30.0	0.0	9	11	274 Btuh
5	2 NFRC	0.20, 0.26		No	No	S	1.5ft	1.3ft	15.0	15.0	0.0	9	11	137 Btuh
6	2 NFRC	0.20, 0.26		No	No	W	1.5ft	1.3ft	3.0	0.0	3.0	9	24	73 Btuh
	Window Total								123 (sqft)					1170 Btuh

Walls	Type	U-Value	R-Value Cav/Sheath	Area(sqft)	HTM	Load
1	Frame - Wood - Ext	0.09	13.0/0.0	93.0	2.3	210 Btuh
2	Frame - Wood - Ext	0.09	13.0/0.0	117.0	2.3	265 Btuh
3	Frame - Wood - Ext	0.09	13.0/0.0	123.0	2.3	278 Btuh
4	Frame - Wood - Ext	0.09	13.0/0.0	77.0	2.3	174 Btuh
5	Frame - Wood - Ext	0.09	13.0/0.0	183.0	2.3	414 Btuh
6	Frame - Wood - Ext	0.09	13.0/0.0	171.0	2.3	387 Btuh
7	Frame - Wood - Adj	0.09	13.0/0.0	232.0	1.7	391 Btuh
8	Frame - Wood - Ext	0.09	13.0/0.0	103.0	2.3	233 Btuh
9	Frame - Wood - Ext	0.09	13.0/0.0	63.0	2.3	143 Btuh
10	Frame - Wood - Ext	0.09	13.0/0.0	96.0	2.3	217 Btuh
11	Frame - Wood - Ext	0.09	13.0/0.0	279.0	2.3	631 Btuh
	Wall Total			1537 (sqft)		3345 Btuh

Doors	Type	Area (sqft)	HTM	Load
1	Insulated - Exterior	40.0	13.8	552 Btuh
2	Insulated - Garage	20.0	13.8	276 Btuh
3	Insulated - Exterior	20.0	13.8	276 Btuh
	Door Total	80 (sqft)		1104 Btuh

Ceilings	Type/Color/Surface	U-Value	R-Value	Area(sqft)	HTM	Load
1	Vented Attic/DarkShingle	0.032	30.0/0.0	1466.0	1.72	2521 Btuh
	Ceiling Total			1466 (sqft)		2521 Btuh

Floors	Type	R-Value	Size	HTM	Load
1	Slab On Grade	0.0	1466 (ft-perimeter)	0.0	0 Btuh
	Floor Total		1466.0 (sqft)		0 Btuh

	Envelope Subtotal:	8140 Btuh

Infiltration	Type	Average ACH	Volume(cuft)	Wall Ratio	CFM=	Load
	Natural	0.13	13194	1	28.4	592 Btuh

Internal gain	Occupants	Btuh/occupant		Appliance	Load
	6	X 230	+	3400	4780 Btuh

	Sensible Envelope Load:	13512 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title: Martin Residence
Climate:FL_GAINESVILLE_REGIONAL_A

, FL

6/4/2024

Duct load	Extremely sealed, Supply(R6.0-Attic), Return(R6.0-Attic)	(DGM of 0.239)	3229 Btuh
		Sensible Load All Zones	**16742 Btuh**

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title: Martin Residence
Climate:FL_GAINESVILLE_REGIONAL_A

, FL

6/4/2024

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	**Sensible Envelope Load All Zones**	**13512 Btuh**
	Sensible Duct Load	3229 Btuh
	Total Sensible Zone Loads	**16742 Btuh**
	Sensible ventilation (Ex:0 cfm; Sup:0 cfm)	0 Btuh
	Blower	0 Btuh
	Total sensible gain	**16742 Btuh**
	Latent infiltration gain (for 51 gr. humidity difference)	982 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	367 Btuh
	Latent occupant gain (6.0 people @ 200 Btuh per person)	1200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	**2549 Btuh**
	TOTAL GAIN	**19291 Btuh**

EQUIPMENT

1. Central Unit	#	30000 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)

Version 8

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Project Title:
Martin Residence
, FL Building Type: User

6/4/2024

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 0.20	Vinyl	0.26	N	15.0	10.4	156 Btuh
2	2, NFRC 0.20	Vinyl	0.26	N	30.0	10.4	312 Btuh
3	2, NFRC 0.20	Vinyl	0.26	N	30.0	10.4	312 Btuh
4	2, NFRC 0.20	Vinyl	0.26	S	30.0	10.4	312 Btuh
5	2, NFRC 0.20	Vinyl	0.26	S	15.0	10.4	156 Btuh
6	2, NFRC 0.20	Vinyl	0.26	W	3.0	10.4	31 Btuh
	Window Total				123.0(sqft)		1279 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	93	3.55	330 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	117	3.55	415 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	123	3.55	437 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	77	3.55	273 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	183	3.55	650 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	171	3.55	607 Btuh
7	Frame - Wood	- Adj	(0.089)	13.0/0.0	232	3.55	824 Btuh
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	103	3.55	366 Btuh
9	Frame - Wood	- Ext	(0.089)	13.0/0.0	63	3.55	224 Btuh
10	Frame - Wood	- Ext	(0.089)	13.0/0.0	96	3.55	341 Btuh
11	Frame - Wood	- Ext	(0.089)	13.0/0.0	279	3.55	991 Btuh
	Wall Total				1537(sqft)		5457 Btuh
Doors	Type	Storm	Ueff.		Area X	HTM=	Load
1	Insulated - Exterior,	n	(0.460)		40	18.4	736 Btuh
2	Insulated - Garage,	n	(0.460)		20	18.4	368 Btuh
3	Insulated - Exterior,	n	(0.460)		20	18.4	368 Btuh
	Door Total				80(sqft)		1472Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area X	HTM=	Load
1	Flat ceil/D/Shing		(0.032)	30.0/0.0	1466	1.3	1868 Btuh
	Ceiling Total				1466(sqft)		1868Btuh
Floors	Type		Ueff.	R-Value	Size X	HTM=	Load
1	Slab On Grade		(1.180)	0.0	194.0 ft(perim.)	47.2	9157 Btuh
	Floor Total				1466 sqft		9157 Btuh
					Envelope Subtotal:		19232 Btuh
Infiltration	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio	CFM=	
	Natural		0.17	13194	1.00	37.9	1661 Btuh
Duct load	Extremely sealed, R6.0, Supply(Att), Return(Att)				(DLM of 0.129)		2702 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Project Title:
Martin Residence
, FL Building Type: User

6/4/2024

All Zones	**Sensible Subtotal All Zones**	**23595 Btuh**

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sens. Heat Loss Total Heat Loss	(Ex:0 cfm; Sup:0 cfm)	23595 Btuh 0 Btuh 23595 Btuh

EQUIPMENT

1. Electric Heat Pump	#	30000 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)

Version 8