Residential System Sizing Calculation

Summary

Project Title:
Rich & Noelle Royster

, FL

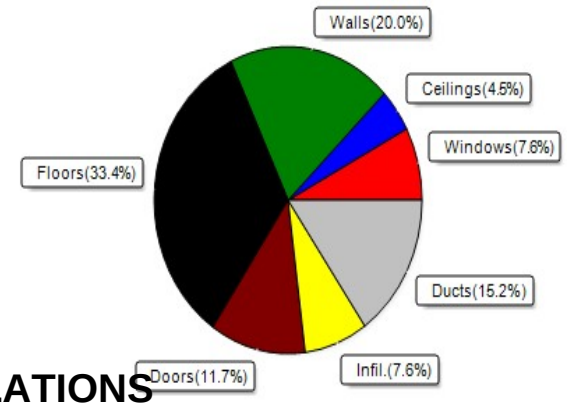
8/1/2023

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	**24884**	**Btuh**	**Total cooling load calculation**	**20999**	**Btuh**
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	144.7	36000	Sensible (SHR = 0.85)	173.0	30600
Heat Pump + Auxiliary(0.0kW)	144.7	36000	Latent	162.9	5400
			Total (Electric Heat Pump)	171.4	36000

WINTER CALCULATIONS

Winter Heating Load (for 1596 sqft)

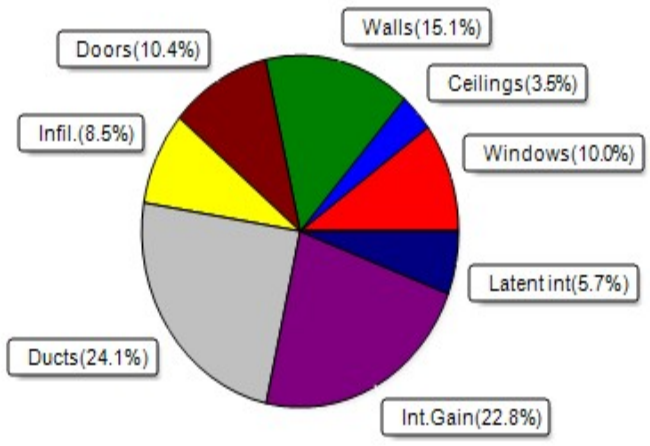
Load component			Load	
Window total	183	sqft	1903	Btuh
Wall total	1399	sqft	4967	Btuh
Door total	181	sqft	2901	Btuh
Ceiling total	1596	sqft	1130	Btuh
Floor total	1596	sqft	8307	Btuh
Infiltration	43	cfm	1886	Btuh
Duct loss			3789	Btuh
Subtotal			**24884**	**Btuh**
Ventilation	Ex:0 cfm; Sup:0 cfm		0	Btuh
TOTAL HEAT LOSS			**24884**	**Btuh**



SUMMER CALCULATIONS

Summer Cooling Load (for 1596 sqft)

Load component			Load	
Window total	183	sqft	2096	Btuh
Wall total	1399	sqft	3166	Btuh
Door total	181	sqft	2176	Btuh
Ceiling total	1596	sqft	734	Btuh
Floor total			0	Btuh
Infiltration	32	cfm	672	Btuh
Internal gain			4780	Btuh
Duct gain			4059	Btuh
Sens.Ventilation	Ex:0 cfm; Sup:0 cfm		0	Btuh
Blower Load			0	Btuh
Total sensible gain			**17684**	**Btuh**
Latent gain(ducts)			1000	Btuh
Latent gain(infiltration)			1115	Btuh
Latent gain(ventilation)			0	Btuh
Latent gain(internal/occupants/other)			1200	Btuh
Total latent gain			**3315**	**Btuh**
TOTAL HEAT GAIN			**20999**	**Btuh**



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EnergyGauge® System Sizing
PREPARED BY: _____
DATE: 8-1-23

System Sizing Calculations - Summer

Residential Load - Whole House Component Details

Project Title:
Rich & Noelle Royster

, FL

8/1/2023

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

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	2.3ft	15.0	0.0	15.0	9	9	137 Btuh
2	2 NFRC	0.20, 0.26		No	No	N	1.5ft	2.3ft	20.0	0.0	20.0	9	9	183 Btuh
3	2 NFRC	0.20, 0.26		No	No	N	1.5ft	2.3ft	30.0	0.0	30.0	9	9	274 Btuh
4	2 NFRC	0.20, 0.26		No	No	E	1.5ft	2.3ft	6.0	0.0	6.0	9	24	145 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	60.0	60.0	0.0	9	11	549 Btuh
8	2 NFRC	0.20, 0.26		No	No	W	1.5ft	2.3ft	15.0	0.0	15.0	9	24	363 Btuh
9	2 NFRC	0.20, 0.26		No	No	W	1.5ft	2.3ft	3.0	0.0	3.0	9	24	73 Btuh
	Window Total								183 (sqft)					2096 Btuh

Walls	Type	U-Value	R-Value Cav/Sheath	Area(sqft)	HTM	Load
1	Frame - Wood - Ext	0.09	13.0/0.0	265.0	2.3	600 Btuh
2	Frame - Wood - Ext	0.09	13.0/0.0	36.3	2.3	82 Btuh
3	Frame - Wood - Ext	0.09	13.0/0.0	144.0	2.3	326 Btuh
4	Frame - Wood - Ext	0.09	13.0/0.0	220.0	2.3	498 Btuh
5	Frame - Wood - Ext	0.09	13.0/0.0	413.3	2.3	936 Btuh
6	Frame - Wood - Ext	0.09	13.0/0.0	320.3	2.3	725 Btuh
	Wall Total			1399 (sqft)		3166 Btuh

Doors	Type	Area (sqft)	HTM	Load
1	Insulated - Exterior	72.0	12.0	864 Btuh
2	Insulated - Exterior	21.3	12.0	256 Btuh
3	Insulated - Exterior	48.0	12.0	576 Btuh
4	Insulated - Exterior	40.0	12.0	480 Btuh
	Door Total	181 (sqft)		2176 Btuh

Ceilings	Type/Color/Surface	U-Value	R-Value	Area(sqft)	HTM	Load
1	SnglAsmb w airsp/DarkShingle	0.018	30.0/30.0	1596.0	0.46	734 Btuh
	Ceiling Total			1596 (sqft)		734 Btuh

Floors	Type	R-Value	Size	HTM	Load
1	Slab On Grade	0.0	1596 (ft-perimeter)	0.0	0 Btuh
	Floor Total		1596.0 (sqft)		0 Btuh

	Envelope Subtotal:	8173 Btuh

Infiltration	Type	Average ACH	Volume(cuft)	Wall Ratio	CFM=	Load
	Natural	0.12	15960	1	32.3	672 Btuh
Internal gain		Occupants	Btuh/occupant		Appliance	Load
		6	X 230	+	3400	4780 Btuh
				Sensible Envelope Load:		13625 Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic)			(DGM of 0.298)		4059 Btuh
				Sensible Load All Zones		**17684 Btuh**

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
Rich & Noelle Royster

, FL

8/1/2023

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	**Sensible Envelope Load All Zones**	**13625**	**Btuh**
	Sensible Duct Load	4059	Btuh
	Total Sensible Zone Loads	**17684**	**Btuh**
	Sensible ventilation (Ex:0 cfm; Sup:0 cfm)	0	Btuh
	Blower	0	Btuh
	Total sensible gain	**17684**	**Btuh**
	Latent infiltration gain (for 51 gr. humidity difference)	1115	Btuh
	Latent ventilation gain	0	Btuh
	Latent duct gain	1000	Btuh
	Latent occupant gain (6.0 people @ 200 Btuh per person)	1200	Btuh
	Latent other gain	0	Btuh
	Latent total gain	**3315**	**Btuh**
	TOTAL GAIN	**20999**	**Btuh**

EQUIPMENT

1. Central Unit	#	36000 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:
Rich & Noelle Royster
, FL Building Type: User

8/1/2023

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 0.20	Vinyl	0.26	N	15.0	10.4	156 Btuh
2	2, NFRC 0.20	Vinyl	0.26	N	20.0	10.4	208 Btuh
3	2, NFRC 0.20	Vinyl	0.26	N	30.0	10.4	312 Btuh
4	2, NFRC 0.20	Vinyl	0.26	E	6.0	10.4	62 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	60.0	10.4	624 Btuh
8	2, NFRC 0.20	Vinyl	0.26	W	15.0	10.4	156 Btuh
9	2, NFRC 0.20	Vinyl	0.26	W	3.0	10.4	31 Btuh
	Window Total				183.0(sqft)		1903 Btuh

Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	265	3.55	941 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	36	3.55	129 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	144	3.55	511 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	220	3.55	781 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	413	3.55	1467 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	320	3.55	1137 Btuh
	Wall Total				1399(sqft)		4967 Btuh

Doors	Type	Storm	Ueff.		Area X	HTM=	Load
1	Insulated - Exterior,	n	(0.400)		72	16.0	1152 Btuh
2	Insulated - Exterior,	n	(0.400)		21	16.0	341 Btuh
3	Insulated - Exterior,	n	(0.400)		48	16.0	768 Btuh
4	Insulated - Exterior,	n	(0.400)		40	16.0	640 Btuh
	Door Total				181(sqft)		2901Btuh

Ceilings	Type/Color/Surface	Ueff.	R-Value	Area X	HTM=	Load
1	Single as/D/Shing	(0.018)	30.0/30.0	1596	0.71	1130 Btuh
	Ceiling Total			1596(sqft)		1130Btuh

Floors	Type	Ueff.	R-Value	Size X	HTM=	Load
1	Slab On Grade	(1.180)	0.0	176.0 ft(perim.)	47.2	8307 Btuh
	Floor Total			1596 sqft		8307 Btuh

	Envelope Subtotal:	19209 Btuh

Infiltration	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio	CFM=	
	Natural		0.16	15960	1.00	43.0	1886 Btuh

Duct load	Average sealed, R6.0, Supply(Att), Return(Att)	(DLM of 0.180)	3789 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Project Title:
Rich & Noelle Royster
Building Type: User

, FL

8/1/2023

All Zones	**Sensible Subtotal All Zones**	**24884 Btuh**

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sens. Heat Loss Total Heat Loss	(Ex:0 cfm; Sup:0 cfm)	24884 Btuh 0 Btuh 24884 Btuh

EQUIPMENT

1. Electric Heat Pump	#	36000 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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