Residential System Sizing Calculation

Summary

Project Title:
Mancilla Residence

, FL

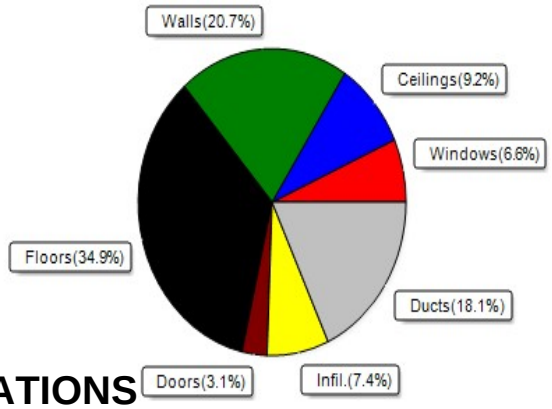
3/29/2023

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	**27965**	**Btuh**	**Total cooling load calculation**	**26607**	**Btuh**
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	150.2	42000	Sensible (SHR = 0.85)	161.1	35700
Heat Pump + Auxiliary(0.0kW)	150.2	42000	Latent	141.5	6300
			Total (Electric Heat Pump)	157.9	42000

WINTER CALCULATIONS

Winter Heating Load (for 2019 sqft)

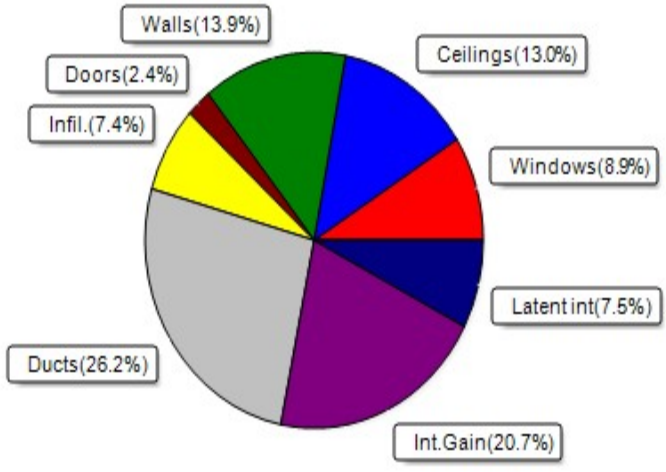
Load component			Load	
Window total	178	sqft	1851	Btuh
Wall total	1632	sqft	5793	Btuh
Door total	53	sqft	853	Btuh
Ceiling total	2019	sqft	2572	Btuh
Floor total	2019	sqft	9770	Btuh
Infiltration	47	cfm	2065	Btuh
Duct loss			5060	Btuh
Subtotal			**27965**	**Btuh**
Ventilation	Ex:0 cfm; Sup:0 cfm		0	Btuh
TOTAL HEAT LOSS			**27965**	**Btuh**



SUMMER CALCULATIONS

Summer Cooling Load (for 2019 sqft)

Load component			Load	
Window total	178	sqft	2379	Btuh
Wall total	1632	sqft	3693	Btuh
Door total	53	sqft	640	Btuh
Ceiling total	2019	sqft	3472	Btuh
Floor total			0	Btuh
Infiltration	35	cfm	736	Btuh
Internal gain			5500	Btuh
Duct gain			5734	Btuh
Sens.Ventilation	Ex:0 cfm; Sup:0 cfm		0	Btuh
Blower Load			0	Btuh
Total sensible gain			**22154**	**Btuh**
Latent gain(ducts)			1233	Btuh
Latent gain(infiltration)			1221	Btuh
Latent gain(ventilation)			0	Btuh
Latent gain(internal/occupants/other)			2000	Btuh
Total latent gain			**4453**	**Btuh**
TOTAL HEAT GAIN			**26607**	**Btuh**



Powered by ACCA MANUAL J 8th Edition

EnergyGauge® System Sizing
PREPARED BY: _____
DATE: 5-4-23

System Sizing Calculations - Summer

Residential Load - Whole House Component Details

Project Title:
Mancilla Residence

, FL

3/29/2023

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	0.20, 0.26		No	No	N	1.5ft	2.3ft	30.0	0.0	30.0	9	9	274	Btuh
2	2 NFRC	0.20, 0.26		No	No	N	1.5ft	2.3ft	6.0	0.0	6.0	9	9	55	Btuh
3	2 NFRC	0.20, 0.26		No	No	S	1.5ft	2.3ft	3.0	3.0	0.0	9	11	27	Btuh
4	2 NFRC	0.20, 0.26		No	No	E	10.2f	2.3ft	25.0	25.0	0.0	9	24	229	Btuh
5	2 NFRC	0.20, 0.26		No	No	S	1.5ft	2.3ft	75.0	75.0	0.0	9	11	686	Btuh
6	2 NFRC	0.20, 0.26		No	No	W	1.5ft	2.3ft	9.0	0.0	9.0	9	24	218	Btuh
7	2 NFRC	0.20, 0.26		No	No	W	1.5ft	2.3ft	30.0	0.0	30.0	9	24	727	Btuh
	Excursion													163	Btuh
	Window Total								178 (sqft)					2379	Btuh

Walls	Type	U-Value	R-Value Cav/Sheath	Area(sqft)	HTM	Load	
1	Frame - Wood - Ext	0.09	13.0/0.0	331.5	2.3	750	Btuh
2	Frame - Wood - Ext	0.09	13.0/0.0	120.0	2.3	272	Btuh
3	Frame - Wood - Ext	0.09	13.0/0.0	75.0	2.3	170	Btuh
4	Frame - Wood - Ext	0.09	13.0/0.0	135.2	2.3	306	Btuh
5	Frame - Wood - Ext	0.09	13.0/0.0	78.0	2.3	177	Btuh
6	Frame - Wood - Ext	0.09	13.0/0.0	172.5	2.3	390	Btuh
7	Frame - Wood - Ext	0.09	13.0/0.0	272.5	2.3	617	Btuh
8	Frame - Wood - Ext	0.09	13.0/0.0	447.0	2.3	1012	Btuh
	Wall Total			1632 (sqft)		3693	Btuh

Doors	Type	Area (sqft)	HTM	Load	
1	Insulated - Exterior	33.3	12.0	400	Btuh
2	Insulated - Exterior	20.0	12.0	240	Btuh
	Door Total	53 (sqft)		640	Btuh

Ceilings	Type/Color/Surface	U-Value	R-Value	Area(sqft)	HTM	Load	
1	Vented Attic/DarkShingle	0.032	30.0/0.0	2019.0	1.72	3472	Btuh
	Ceiling Total			2019 (sqft)		3472	Btuh

Floors	Type	R-Value	Size	HTM	Load	
1	Slab On Grade	0.0	2019 (ft-perimeter)	0.0	0	Btuh
	Floor Total		2019.0 (sqft)		0	Btuh
			Envelope Subtotal:		10184	Btuh

Infiltration	Type	Average ACH	Volume(cuft)	Wall Ratio	CFM=	Load	
	Natural	0.12	18171	1	35.3	736	Btuh
Internal gain		Occupants	Btuh/occupant		Appliance	Load	
		10	X 230	+	3200	5500	Btuh
				Sensible Envelope Load:		16420	Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic)			(DGM of 0.349)		5734	Btuh
				Sensible Load All Zones		**22154**	**Btuh**

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
Mancilla Residence

, FL

3/29/2023

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	**Sensible Envelope Load All Zones**	**16420**	**Btuh**
	Sensible Duct Load	5734	Btuh
	Total Sensible Zone Loads	**22154**	**Btuh**
	Sensible ventilation (Ex:0 cfm; Sup:0 cfm)	0	Btuh
	Blower	0	Btuh
	Total sensible gain	**22154**	**Btuh**
	Latent infiltration gain (for 51 gr. humidity difference)	1221	Btuh
	Latent ventilation gain	0	Btuh
	Latent duct gain	1233	Btuh
	Latent occupant gain (10.0 people @ 200 Btuh per person)	2000	Btuh
	Latent other gain	0	Btuh
	Latent total gain	**4453**	**Btuh**
	TOTAL GAIN	**26607**	**Btuh**

EQUIPMENT

1. Central Unit	#	42000 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:
Mancilla Residence
, FL Building Type: User

3/29/2023

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	30.0	10.4	312 Btuh
2	2, NFRC 0.20	Vinyl	0.26	N	6.0	10.4	62 Btuh
3	2, NFRC 0.20	Vinyl	0.26	S	3.0	10.4	31 Btuh
4	2, NFRC 0.20	Vinyl	0.26	E	25.0	10.4	260 Btuh
5	2, NFRC 0.20	Vinyl	0.26	S	75.0	10.4	780 Btuh
6	2, NFRC 0.20	Vinyl	0.26	W	9.0	10.4	94 Btuh
7	2, NFRC 0.20	Vinyl	0.26	W	30.0	10.4	312 Btuh
	Window Total				178.0(sqft)		1851 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	332	3.55	1177 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	120	3.55	426 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	75	3.55	266 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	135	3.55	480 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	78	3.55	277 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	173	3.55	612 Btuh
7	Frame - Wood	- Ext	(0.089)	13.0/0.0	273	3.55	967 Btuh
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	447	3.55	1587 Btuh
	Wall Total				1632(sqft)		5793 Btuh
Doors	Type	Storm	Ueff.		Area X	HTM=	Load
1	Insulated - Exterior,	n	(0.400)		33	16.0	533 Btuh
2	Insulated - Exterior,	n	(0.400)		20	16.0	320 Btuh
	Door Total				53(sqft)		853Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area X	HTM=	Load
1	Flat ceil/D/Shing		(0.032)	30.0/0.0	2019	1.3	2572 Btuh
	Ceiling Total				2019(sqft)		2572Btuh
Floors	Type		Ueff.	R-Value	Size X	HTM=	Load
1	Slab On Grade		(1.180)	0.0	207.0 ft(perim.)	47.2	9770 Btuh
	Floor Total				2019 sqft		9770 Btuh
					Envelope Subtotal:		20840 Btuh

Infiltration	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio	CFM=	
	Natural		0.16	18171	1.00	47.1	2065 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att)				(DLM of 0.221)		5060 Btuh
All Zones	**Sensible Subtotal All Zones**						**27965 Btuh**

Manual J Winter Calculations

Residential Load - Component Details (continued)

Project Title:
Mancilla Residence
Building Type: User

, FL

3/29/2023

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss		27965 Btuh
	Ventilation Sens. Heat Loss	(Ex:0 cfm; Sup:0 cfm)	0 Btuh
	Total Heat Loss		27965 Btuh

EQUIPMENT

1. Electric Heat Pump	#	42000 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