Residential System Sizing Calculation

Summary

Mary Johnson

Lake City, FL 32055

Project Title:
Mary Johnson Res

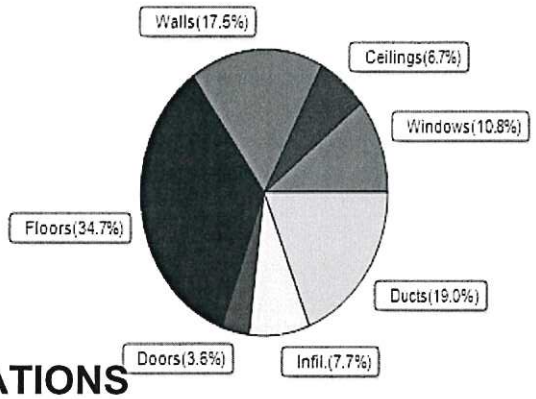
8/1/2024

Location for weather data: Gainesville, FL - Defaults: Latitude(29.7) Altitude(152 ft.) Temp Range(M)					
Humidity data: Interior RH (50%) Outdoor wet bulb (79F) Humidity difference(54gr.)					
Winter design temperature(MJ8 99%/Cu)	33	F	Summer design temperature(MJ8 99%/Cu)	99	F
Winter setpoint	70	F	Summer setpoint	75	F
Winter temperature difference	37	F	Summer temperature difference	24	F
Total heating load calculation	**17633**	**Btuh**	**Total cooling load calculation**	**16793**	**Btuh**
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	106.7	18809	Sensible (SHR = 0.75)	81.2	11533
Heat Pump + Auxiliary(0.0kW)	106.7	18809	Latent	148.2	3844
			Total (Electric Heat Pump)	91.6	15377

WINTER CALCULATIONS

Winter Heating Load (for 1144 sqft)

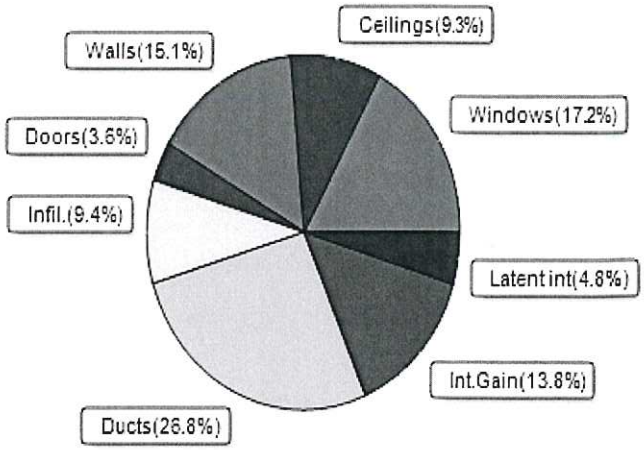
Load component			Load	
Window total	143	sqft	1898	Btuh
Wall total	940	sqft	3086	Btuh
Door total	38	sqft	643	Btuh
Ceiling total	1258	sqft	1182	Btuh
Floor total	1144	sqft	6112	Btuh
Infiltration	33	cfm	1356	Btuh
Duct loss			3356	Btuh
Subtotal			**17633**	**Btuh**
Ventilation	Ex:0 cfm; Sup:0 cfm		0	Btuh
TOTAL HEAT LOSS			**17633**	**Btuh**



SUMMER CALCULATIONS

Summer Cooling Load (for 1144 sqft)

Load component			Load	
Window total	143	sqft	2886	Btuh
Wall total	940	sqft	2544	Btuh
Door total	38	sqft	608	Btuh
Ceiling total	1258	sqft	1565	Btuh
Floor total			0	Btuh
Infiltration	25	cfm	660	Btuh
Internal gain			2320	Btuh
Duct gain			3617	Btuh
Sens.Ventilation	Ex:0 cfm; Sup:0 cfm		0	Btuh
Blower Load			0	Btuh
Total sensible gain			**14200**	**Btuh**
Latent gain(ducts)			876	Btuh
Latent gain(infiltration)			918	Btuh
Latent gain(ventilation)			0	Btuh
Latent gain(internal/occupants/other)			800	Btuh
Total latent gain			**2594**	**Btuh**
TOTAL HEAT GAIN			**16793**	**Btuh**



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Columbia County Building Department — Plans Reviewed for Code Compliance — State of Florida

EnergyGauge® System Sizing
PREPARED BY: Will C Ty
DATE: 8 / 1 / 2024

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Mary Johnson

Lake City, FL 32055

Project Title:
Mary Johnson Res
Building Type: User

8/1/2024

Reference City: Gainesville, FL (Defaults) Winter Temperature Difference: 37.0 °F (MJ8 99%/Cu)
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	1, NFRC 0.25	Vinyl	0.36	S	62.0	13.3	826 Btuh
2	1, NFRC 0.25	Vinyl	0.36	E	15.5	13.3	206 Btuh
3	1, NFRC 0.25	Vinyl	0.36	N	18.0	13.3	240 Btuh
4	1, NFRC 0.25	Vinyl	0.36	N	16.0	13.3	213 Btuh
5	1, NFRC 0.25	Vinyl	0.36	E	31.0	13.3	413 Btuh
	Window Total				142.5(sqft)		1898 Btuh

Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	270	3.28	887 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	193	3.28	632 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	300	3.28	986 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	177	3.28	581 Btuh
	Wall Total				940(sqft)		3086 Btuh

Doors	Type	Storm	Ueff.	Area X	HTM=	Load
1	Insulated - Exterior,	n	(0.460)	20	17.0	340 Btuh
2	Insulated - Exterior,	n	(0.460)	18	17.0	303 Btuh
	Door Total			38(sqft)		643Btuh

Ceilings	Type/Color/Surface	Ueff.	R-Value	Area X	HTM=	Load
1	Flat ceil/D/Shing	(0.025)	38.0/0.0	1258	0.94	1182 Btuh
	Ceiling Total			1258(sqft)		1182Btuh

Floors	Type	Ueff.	R-Value	Size X	HTM=	Load
1	Slab On Grade	(1.180)	0.0	140.0 ft(perim.)	43.7	6112 Btuh
	Floor Total			1144 sqft		6112 Btuh

	Envelope Subtotal:	12921 Btuh

Infiltration	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio	CFM=	
	Natural		0.22	9152	1.00	33.5	1356 Btuh

Duct load	Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.235)	3356 Btuh
All Zones	**Sensible Subtotal All Zones**	**17633 Btuh**

Manual J Winter Calculations

Residential Load - Component Details (continued)

Mary Johnson

Lake City, FL 32055

Project Title:
Mary Johnson Res
Building Type: User

8/1/2024

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sens. Heat Loss (Ex:0 cfm; Sup:0 cfm) Total Heat Loss	17633 Btuh 0 Btuh 17633 Btuh

EQUIPMENT

1. Electric Heat Pump	#	18809 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

Mary Johnson

Lake City, FL 32055

Project Title:
Mary Johnson Res

8/1/2024

Reference City: Gainesville, FL (Defaults)
Humidity difference: 54gr.

Temperature Difference: 24.0F(MJ8 99%/Cu)
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	1 NFRC	0.25, 0.36	No	No	S	1.5ft.	0.5ft.	62.0	62.0	0.0	14	16	862 Btuh
2	1 NFRC	0.25, 0.36	No	No	E	1.0ft.	0.5ft.	15.5	1.0	14.5	14	33	489 Btuh
3	1 NFRC	0.25, 0.36	No	No	N	1.5ft.	0.5ft.	18.0	0.0	18.0	14	14	250 Btuh
4	1 NFRC	0.25, 0.36	No	No	N	1.5ft.	0.5ft.	16.0	0.0	16.0	14	14	222 Btuh
5	1 NFRC	0.25, 0.36	No	No	E	1.0ft.	0.5ft.	31.0	2.0	29.0	14	33	978 Btuh
	Excursion												85 Btuh
	Window Total							143 (sqft)					2886 Btuh

Walls	Type	U-Value	R-Value Cav/Sheath	Area(sqft)	HTM	Load
1	Frame - Wood - Ext	0.09	13.0/0.0	270.0	2.7	731 Btuh
2	Frame - Wood - Ext	0.09	13.0/0.0	192.5	2.7	521 Btuh
3	Frame - Wood - Ext	0.09	13.0/0.0	300.2	2.7	813 Btuh
4	Frame - Wood - Ext	0.09	13.0/0.0	177.0	2.7	479 Btuh
	Wall Total			940 (sqft)		2544 Btuh

Doors	Type	Area (sqft)	HTM	Load
1	Insulated - Exterior	20.0	16.1	322 Btuh
2	Insulated - Exterior	17.8	16.1	286 Btuh
	Door Total	38 (sqft)		608 Btuh

Ceilings	Type/Color/Surface	U-Value	R-Value	Area(sqft)	HTM	Load
1	Vented Attic/DarkShingle/RB	0.025	38.0/0.0	1258.4	1.24	1565 Btuh
	Ceiling Total			1258 (sqft)		1565 Btuh

Floors	Type	R-Value	Size	HTM	Load
1	Slab On Grade	0.0	1144 (ft-perimeter)	0.0	0 Btuh
	Floor Total		1144.0 (sqft)		0 Btuh
			Envelope Subtotal:		7603 Btuh

Infiltration	Type	Average ACH	Volume(cuft)	Wall Ratio	CFM=	Load
	Natural	0.16	9152	1	25.1	660 Btuh

Internal gain	Occupants	Btuh/occupant		Appliance	Load
	4	X 230	+	1400	2320 Btuh
			Sensible Envelope Load:		10582 Btuh
Duct load	Average sealed,Supply(R6.0-Attic), Return(R6.0-Attic)		(DGM of 0.342)		3617 Btuh
			Sensible Load All Zones		**14200 Btuh**

Manual J Summer Calculations

Residential Load - Component Details (continued)

Mary Johnson

Lake City, FL 32055

Project Title: Mary Johnson Res

Climate:FL_GAINESVILLE_REGIONAL_A

8/1/2024

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	**Sensible Envelope Load All Zones**	**10582 Btuh**
	Sensible Duct Load	3617 Btuh
	Total Sensible Zone Loads	**14200 Btuh**
	Sensible ventilation (Ex:0 cfm; Sup:0 cfm)	0 Btuh
	Blower	0 Btuh
	Total sensible gain	**14200 Btuh**
	Latent infiltration gain (for 54 gr. humidity difference)	918 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	876 Btuh
	Latent occupant gain (4.0 people @ 200 Btuh per person)	800 Btuh
	Latent other gain	0 Btuh
	Latent total gain	**2594 Btuh**
	TOTAL GAIN	**16793 Btuh**

EQUIPMENT

1. Central Unit	#	15377 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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