Residential System Sizing Calculation

Summary

Jackson, Daniel
SW Tustenuggee Ave
Lake City, FL

Project Title:
231049 Jackson

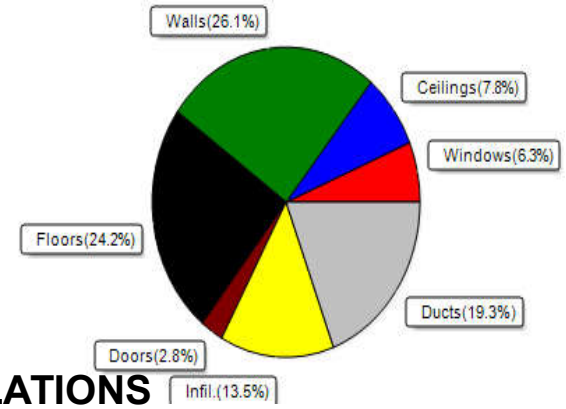
2023-08-23

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	**46781**	**Btuh**	**Total cooling load calculation**	**36183**	**Btuh**
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	109.0	51000	Sensible (SHR = 0.75)	128.9	38250
Heat Pump + Auxiliary(0.0kW)	109.0	51000	Latent	196.2	12750
			Total (Electric Heat Pump)	141.0	51000

WINTER CALCULATIONS

Winter Heating Load (for 3600 sqft)

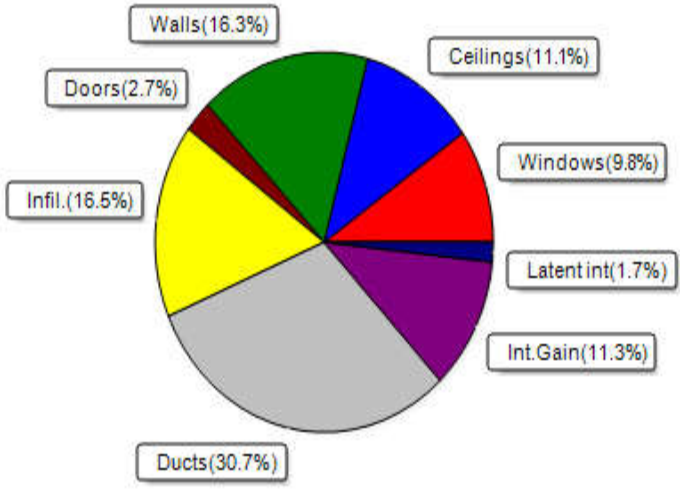
Load component			Load	
Window total	242	sqft	2952	Btuh
Wall total	2077	sqft	12210	Btuh
Door total	81	sqft	1296	Btuh
Ceiling total	3600	sqft	3655	Btuh
Floor total	3600	sqft	11328	Btuh
Infiltration	144	cfm	6315	Btuh
Duct loss			9025	Btuh
Subtotal			**46781**	**Btuh**
Ventilation	Ex:0 cfm; Sup:0 cfm		0	Btuh
TOTAL HEAT LOSS			**46781**	**Btuh**



SUMMER CALCULATIONS

Summer Cooling Load (for 3600 sqft)

Load component			Load	
Window total	242	sqft	3529	Btuh
Wall total	2077	sqft	5891	Btuh
Door total	81	sqft	972	Btuh
Ceiling total	3600	sqft	4020	Btuh
Floor total			0	Btuh
Infiltration	108	cfm	2250	Btuh
Internal gain			4090	Btuh
Duct gain			8932	Btuh
Sens.Ventilation	Ex:0 cfm; Sup:0 cfm		0	Btuh
Blower Load			0	Btuh
Total sensible gain			**29684**	**Btuh**
Latent gain(ducts)			2165	Btuh
Latent gain(infiltration)			3733	Btuh
Latent gain(ventilation)			0	Btuh
Latent gain(internal/occupants/other)			600	Btuh
Total latent gain			**6498**	**Btuh**
TOTAL HEAT GAIN			**36183**	**Btuh**



Powered by ACCA MANUAL J8 8th Edition

EnergyGauge® System Sizing
PREPARED BY: Evan Beamsley
DATE: 2023-08-23

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Jackson, Daniel
SW Tustenuggee Ave
Lake City, FL

Project Title:
231049 Jackson
Building Type: User

2023-08-23

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	0.30	N	36.0	12.0	432 Btuh
2	2, NFRC 0.20	Metal	0.30	N	6.7	12.0	80 Btuh
3	2, NFRC 0.20	Vinyl	0.30	E	42.0	12.0	504 Btuh
4	2, NFRC 0.20	Metal	0.30	E	6.7	12.0	80 Btuh
5	2, NFRC 0.20	Vinyl	0.30	E	24.0	12.0	288 Btuh
6	2, NFRC 0.20	Vinyl	0.30	S	48.0	12.0	576 Btuh
7	2, NFRC 0.20	Metal	0.30	S	6.7	12.0	80 Btuh
8	2, NFRC 0.20	Vinyl	0.30	W	48.0	12.0	576 Btuh
9	2, NFRC 0.25	Metal	0.35	S	24.0	14.0	336 Btuh
	Window Total				242.0(sqft)		2952 Btuh

Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area X	HTM=	Load
1	Conc Blk,Hollow	- Ext	(0.151)	4.0/0.0	537	6.06	3256 Btuh
2	Conc Blk,Hollow	- Ext	(0.133)	4.0/0.0	507	5.32	2698 Btuh
3	Conc Blk,Hollow	- Ext	(0.151)	4.0/0.0	501	6.06	3038 Btuh
4	Conc Blk,Hollow	- Ext	(0.151)	4.0/0.0	531	6.06	3218 Btuh
	Wall Total				2077(sqft)		12210 Btuh

Doors	Type	Storm	Ueff.	Area X	HTM=	Load
1	Insulated - Exterior,	n	(0.400)	20	16.0	320 Btuh
2	Insulated - Exterior,	n	(0.400)	20	16.0	320 Btuh
3	Insulated - Exterior,	n	(0.400)	20	16.0	320 Btuh
4	Insulated - Exterior,	n	(0.400)	21	16.0	336 Btuh
	Door Total			81(sqft)		1296Btuh

Ceilings	Type/Color/Surface	Ueff.	R-Value	Area X	HTM=	Load
1	Flat ceil/M/Metal	(0.025)	38.0/0.0	3600	1.0	3655 Btuh
	Ceiling Total			3600(sqft)		3655Btuh

Floors	Type	Ueff.	R-Value	Size X	HTM=	Load
1	Slab On Grade	(1.180)	0.0	240.0 ft(perim.)	47.2	11328 Btuh
	Floor Total			3600 sqft		11328 Btuh

	Envelope Subtotal:	31441 Btuh

Infiltration	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio	CFM=	
	Natural		0.24	36000	1.00	144.0	6315 Btuh

Duct load	Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.239)	9025 Btuh
All Zones	**Sensible Subtotal All Zones**	**46781 Btuh**

Manual J Winter Calculations

Residential Load - Component Details (continued)

Jackson, Daniel
SW Tustenuggee Ave
Lake City, FL

Project Title:
231049 Jackson
Building Type: User

2023-08-23

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss		46781 Btuh
	Ventilation Sens. Heat Loss	(Ex:0 cfm; Sup:0 cfm)	0 Btuh
	Total Heat Loss		46781 Btuh

EQUIPMENT

1. Electric Heat Pump	#	51000 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

System Sizing Calculations - Summer

Residential Load - Room by Room Component Details

Jackson, Daniel
SW Tustenuggee Ave
Lake City, FL

Project Title:
231049 Jackson

2023-08-23

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 Room #1: Main

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, 0.30	No	No	N	3.0ft	1.5ft	36.0	23.8	12.2	10	25	541 Btuh
2	2 NFRC	0.20, 0.30	No	No	N	3.0ft	2.5ft	6.7	0.0	6.7	10	25	167 Btuh
3	2 NFRC	0.20, 0.30	No	No	E	3.0ft	1.5ft	42.0	0.0	42.0	10	10	416 Btuh
4	2 NFRC	0.20, 0.30	No	No	E	3.0ft	2.5ft	6.7	0.0	6.7	10	10	66 Btuh
5	2 NFRC	0.20, 0.30	No	No	E	3.0ft	3.0ft	24.0	0.0	24.0	10	10	238 Btuh
6	2 NFRC	0.20, 0.30	No	No	S	3.0ft	1.5ft	48.0	31.7	16.3	10	25	722 Btuh
7	2 NFRC	0.20, 0.30	No	No	S	3.0ft	2.5ft	6.7	0.0	6.7	10	25	167 Btuh
8	2 NFRC	0.20, 0.30	No	No	W	3.0ft	1.5ft	48.0	48.0	0.0	10	11	476 Btuh
9	2 NFRC	0.25, 0.35	No	No	S	3.0ft	3.0ft	24.0	0.0	24.0	12	31	738 Btuh
	Window Total								242 (sqft)					3529 Btuh

Walls	Type	U-Value	R-Value Cav/Sheath	Area(sqft)	HTM	Load
1	Concrete Blk,Hollow - Ext	0.15	4.0/0.0	537.3	2.9	1571 Btuh
2	Concrete Blk,Hollow - Ext	0.13	4.0/0.0	507.3	2.6	1302 Btuh
3	Concrete Blk,Hollow - Ext	0.15	4.0/0.0	501.3	2.9	1466 Btuh
4	Concrete Blk,Hollow - Ext	0.15	4.0/0.0	531.0	2.9	1553 Btuh
	Wall Total			2077 (sqft)		5891 Btuh

Doors	Type	Area (sqft)	HTM	Load
1	Insulated - Exterior	20.0	12.0	240 Btuh
2	Insulated - Exterior	20.0	12.0	240 Btuh
3	Insulated - Exterior	20.0	12.0	240 Btuh
4	Insulated - Exterior	21.0	12.0	252 Btuh
	Door Total	81 (sqft)		972 Btuh

Ceilings	Type/Color/Surface	U-Value	R-Value	Area(sqft)	HTM	Load
1	Vented Attic/Med/Metal	0.025	38.0/0.0	3600.0	1.12	4020 Btuh
	Ceiling Total			3600 (sqft)		4020 Btuh

Floors	Type	R-Value	Size	HTM	Load
1	Slab On Grade	0.0	3600 (ft-perimeter)	0.0	0 Btuh
	Floor Total		3600.0 (sqft)		0 Btuh
			Zone Envelope Subtotal:		14413 Btuh

Infiltration	Type	Wholehouse ACH	Volume(cuft)	Wall Ratio	CFM=	Load
	Natural	0.18	36000	1.00	108.0	2250 Btuh
Internal gain		Occupants	Btuh/occupant		Appliance	Load
		3	X 230	+	3400	4090 Btuh
				Sensible Envelope Load:		20753 Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic)				(DGM of 0.430)	8932 Btuh
					Sensible Zone Load	**29684 Btuh**

Manual J Summer Calculations

Residential Load - Component Details (continued)

Jackson, Daniel
SW Tustenuggee Ave
Lake City, FL

Project Title: 231049 Jackson

Climate:FL_GAINESVILLE_REGIONAL_A

2023-08-23

Manual J Summer Calculations

Residential Load - Component Details (continued)

Jackson, Daniel
SW Tustenuggee Ave
Lake City, FL

Project Title: 231049 Jackson

Climate:FL_GAINESVILLE_REGIONAL_A

2023-08-23

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	**Sensible Envelope Load All Zones**	**20753**	**Btuh**
	Sensible Duct Load	8932	Btuh
	Total Sensible Zone Loads	**29684**	**Btuh**
	Sensible ventilation (Ex:0 cfm; Sup:0 cfm)	0	Btuh
	Blower	0	Btuh
	Total sensible gain	**29684**	**Btuh**
	Latent infiltration gain (for 51 gr. humidity difference)	3733	Btuh
	Latent ventilation gain	0	Btuh
	Latent duct gain	2165	Btuh
	Latent occupant gain (3.0 people @ 200 Btuh per person)	600	Btuh
	Latent other gain	0	Btuh
	Latent total gain	**6498**	**Btuh**
	TOTAL GAIN	**36183**	**Btuh**

EQUIPMENT

1. Central Unit	#	51000 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