Residential System Sizing Calculation

Summary

Mitchell Res
807 SW Mandiba
Lake City, FL

Project Title:
220007 Mitchell Res

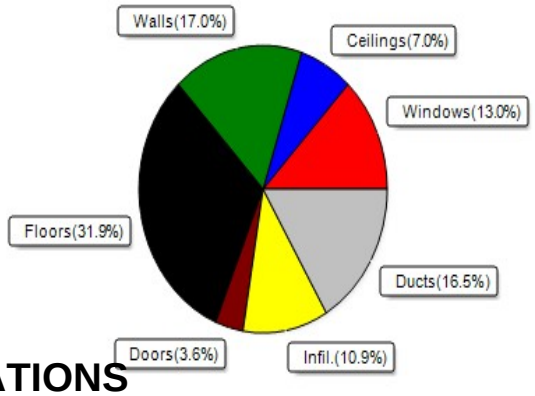
2022-01-05

Location for weather data: Gainesville, FL - Defaults: Latitude(29.7) Altitude(152 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	**29923**	**Btuh**		**Total cooling load calculation**	**29150**	**Btuh**
Submitted heating capacity	% of calc	Btuh		Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	110.3	33000		Sensible (SHR = 0.75)	100.0	24750
Heat Pump + Auxiliary(0.0kW)	110.3	33000		Latent	187.5	8250
				Total (Electric Heat Pump)	113.2	33000

WINTER CALCULATIONS

Winter Heating Load (for 2061 sqft)

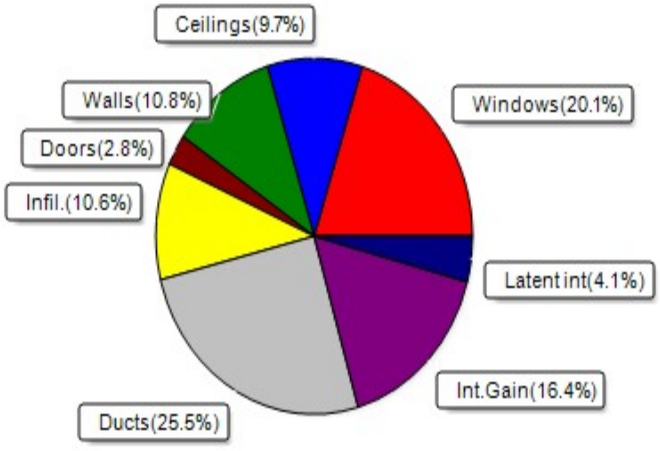
Load component			Load	
Window total	305	sqft	3904	Btuh
Wall total	1436	sqft	5098	Btuh
Door total	68	sqft	1088	Btuh
Ceiling total	2061	sqft	2092	Btuh
Floor total	2061	sqft	9534	Btuh
Infiltration	74	cfm	3261	Btuh
Duct loss			4945	Btuh
Subtotal			**29923**	**Btuh**
Ventilation	0	cfm	0	Btuh
TOTAL HEAT LOSS			**29923**	**Btuh**



SUMMER CALCULATIONS

Summer Cooling Load (for 2061 sqft)

Load component			Load	
Window total	305	sqft	5856	Btuh
Wall total	1436	sqft	3137	Btuh
Door total	68	sqft	816	Btuh
Ceiling total	2061	sqft	2825	Btuh
Floor total			0	Btuh
Infiltration	56	cfm	1162	Btuh
Internal gain			4780	Btuh
Duct gain			6174	Btuh
Sens. Ventilation	0	cfm	0	Btuh
Blower Load			0	Btuh
Total sensible gain			**24749**	**Btuh**
Latent gain(ducts)			1273	Btuh
Latent gain(infiltration)			1927	Btuh
Latent gain(ventilation)			0	Btuh
Latent gain(internal/occupants/other)			1200	Btuh
Total latent gain			**4400**	**Btuh**
TOTAL HEAT GAIN			**29150**	**Btuh**



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EnergyGauge® System Sizing
PREPARED BY: Evan Beamsley
DATE: 2021-01-05

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Mitchell Res
807 SW Mandiba
Lake City, FL

Project Title:
220007 Mitchell Res
Building Type: User

2022-01-05

Reference City: Gainesville, FL (Defaults) Winter Temperature Difference: 40.0 F (TMY3 99%)

Component Loads for Whole House

Window	Panes/Type	Frame	U	Orientation	Area(sqft) X	HTM=	Load
1	2, NFRC 0.22	Vinyl	0.32	N	15.0	12.8	192 Btuh
2	2, NFRC 0.22	Vinyl	0.32	N	36.0	12.8	461 Btuh
3	2, NFRC 0.22	Vinyl	0.32	E	36.0	12.8	461 Btuh
4	2, NFRC 0.22	Vinyl	0.32	N	72.0	12.8	922 Btuh
5	2, NFRC 0.22	Vinyl	0.32	N	32.0	12.8	410 Btuh
6	2, NFRC 0.22	Vinyl	0.32	E	12.5	12.8	160 Btuh
7	2, NFRC 0.22	Vinyl	0.32	E	6.0	12.8	77 Btuh
8	2, NFRC 0.22	Vinyl	0.32	S	4.0	12.8	51 Btuh
9	2, NFRC 0.22	Vinyl	0.32	S	18.0	12.8	230 Btuh
10	2, NFRC 0.22	Vinyl	0.32	S	24.0	12.8	307 Btuh
11	2, NFRC 0.22	Vinyl	0.32	S	18.0	12.8	230 Btuh
12	2, NFRC 0.22	Vinyl	0.32	W	12.5	12.8	160 Btuh
13	2, NFRC 0.22	Vinyl	0.32	W	15.0	12.8	192 Btuh
14	2, NFRC 0.22	Vinyl	0.32	W	4.0	12.8	51 Btuh
	Window Total				305.0(sqft)		3904 Btuh

Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	201	3.55	714 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	48	3.55	170 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	115	3.55	408 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	291	3.55	1031 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	110	3.55	391 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	18	3.55	64 Btuh
7	Frame - Wood	- Ext	(0.089)	13.0/0.0	21	3.55	75 Btuh
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	18	3.55	64 Btuh
9	Frame - Wood	- Ext	(0.089)	13.0/0.0	93	3.55	330 Btuh
10	Frame - Wood	- Adj	(0.089)	13.0/0.0	33	3.55	117 Btuh
11	Frame - Wood	- Adj	(0.089)	13.0/0.0	163	3.55	579 Btuh
12	Frame - Wood	- Ext	(0.089)	13.0/0.0	326	3.55	1156 Btuh
	Wall Total				1436(sqft)		5098 Btuh

Doors	Type	Storm	Ueff.	Area X	HTM=	Load
1	Insulated - Exterior,	n	(0.400)	24	16.0	384 Btuh
2	Insulated - Exterior,	n	(0.400)	24	16.0	384 Btuh
3	Insulated - Garage,	n	(0.400)	20	16.0	320 Btuh
	Door Total			68(sqft)		1088Btuh

Ceilings	Type/Color/Surface	Ueff.	R-Value	Area X	HTM=	Load
1	Vented Attic/D/Shing	(0.025)	38.0/0.0	2061	1.0	2092 Btuh
	Ceiling Total			2061(sqft)		2092Btuh

Floors	Type	Ueff.	R-Value	Size X	HTM=	Load
1	Slab On Grade	(1.180)	0.0	202.0 ft(perim.)	47.2	9534 Btuh
	Floor Total			2061 sqft		9534 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Mitchell Res
807 SW Mandiba
Lake City, FL

Project Title:
220007 Mitchell Res
Building Type: User

2022-01-05

	Envelope Subtotal:	21717 Btuh
Infiltration	Type Wholehouse ACH Volume(cuft) Wall Ratio CFM= Natural 0.23 19167 1.00 74.5	3261 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.198)	4945 Btuh
All Zones	**Sensible Subtotal All Zones**	**29923 Btuh**

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	29923 Btuh 0 Btuh 29923 Btuh

EQUIPMENT

1. Electric Heat Pump	#	33000 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 - Whole House Component Details

Mitchell Res
807 SW Mandiba
Lake City, FL

Project Title:
220007 Mitchell Res

2022-01-05

Reference City: Gainesville, FL Temperature Difference: 19.0F(TMY3 99%) Humidity difference: 51gr.

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	0.22, 0.32		No	No	N	1.5ft	1.0ft	15.0	0.0	15.0	11	21	313 Btuh
2	2 NFRC	0.22, 0.32		No	No	N	1.5ft	1.0ft	36.0	0.0	36.0	11	21	751 Btuh
3	2 NFRC	0.22, 0.32		No	No	E	27.0f	0.5ft	36.0	36.0	0.0	11	22	385 Btuh
4	2 NFRC	0.22, 0.32		No	No	N	9.3ft	0.0ft	72.0	0.0	72.0	11	21	1502 Btuh
5	2 NFRC	0.22, 0.32		No	No	N	9.3ft	0.5ft	32.0	0.0	32.0	11	21	668 Btuh
6	2 NFRC	0.22, 0.32		No	No	E	1.5ft	10.0f	12.5	0.0	12.5	11	22	273 Btuh
7	2 NFRC	0.22, 0.32		No	No	E	1.5ft	8.0ft	6.0	0.0	6.0	11	22	131 Btuh
8	2 NFRC	0.22, 0.32		No	No	S	1.5ft	1.0ft	4.0	2.9	1.1	11	22	55 Btuh
9	2 NFRC	0.22, 0.32		No	No	S	1.5ft	1.0ft	18.0	4.4	13.6	11	22	344 Btuh
10	2 NFRC	0.22, 0.32		No	No	S	8.0ft	2.0ft	24.0	24.0	0.0	11	22	257 Btuh
11	2 NFRC	0.22, 0.32		No	No	S	6.0ft	2.0ft	18.0	18.0	0.0	11	22	193 Btuh
12	2 NFRC	0.22, 0.32		No	No	W	1.5ft	6.0ft	12.5	0.0	12.5	11	21	261 Btuh
13	2 NFRC	0.22, 0.32		No	No	W	1.5ft	10.0f	15.0	0.0	15.0	11	21	313 Btuh
14	2 NFRC	0.22, 0.32		No	No	W	1.5ft	6.0ft	4.0	0.0	4.0	11	21	83 Btuh
	Excursion													327 Btuh
	Window Total								305 (sqft)					5856 Btuh

Walls	Type	U-Value	R-Value Cav/Sheath	Area(sqft)	HTM	Load
1	Frame - Wood - Ext	0.09	13.0/0.0	201.0	2.3	455 Btuh
2	Frame - Wood - Ext	0.09	13.0/0.0	48.0	2.3	109 Btuh
3	Frame - Wood - Ext	0.09	13.0/0.0	115.0	2.3	260 Btuh
4	Frame - Wood - Ext	0.09	13.0/0.0	290.5	2.3	657 Btuh
5	Frame - Wood - Ext	0.09	13.0/0.0	110.0	2.3	249 Btuh
6	Frame - Wood - Ext	0.09	13.0/0.0	18.0	2.3	41 Btuh
7	Frame - Wood - Ext	0.09	13.0/0.0	21.0	2.3	48 Btuh
8	Frame - Wood - Ext	0.09	13.0/0.0	18.0	2.3	41 Btuh
9	Frame - Wood - Ext	0.09	13.0/0.0	93.0	2.3	210 Btuh
10	Frame - Wood - Adj	0.09	13.0/0.0	33.0	1.7	56 Btuh
11	Frame - Wood - Adj	0.09	13.0/0.0	163.0	1.7	275 Btuh
12	Frame - Wood - Ext	0.09	13.0/0.0	325.5	2.3	737 Btuh
	Wall Total			1436 (sqft)		3137 Btuh

Doors	Type	Area (sqft)	HTM	Load
1	Insulated - Exterior	24.0	12.0	288 Btuh
2	Insulated - Exterior	24.0	12.0	288 Btuh
3	Insulated - Garage	20.0	12.0	240 Btuh
	Door Total	68 (sqft)		816 Btuh

Ceilings	Type/Color/Surface	U-Value	R-Value	Area(sqft)	HTM	Load
1	Vented Attic/DarkShingle	0.025	38.0/0.0	2061.0	1.37	2825 Btuh
	Ceiling Total			2061 (sqft)		2825 Btuh

Floors	Type	R-Value	Size	HTM	Load
1	Slab On Grade	0.0	2061 (ft-perimeter)	0.0	0 Btuh
	Floor Total		2061.0 (sqft)		0 Btuh

		Envelope Subtotal:	12634 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Mitchell Res
807 SW Mandiba
Lake City, FL

Project Title: 220007 Mitchell Res

Climate:FL_GAINESVILLE_REGIONAL_A

2022-01-05

Infiltration	Type	Average ACH	Volume(cuft)	Wall Ratio	CFM=	Load	
	Natural	0.17	19167	1	55.8	1162	Btuh
Internal gain	Occupants	Btuh/occupant	Appliance	Load	
	6	X 230	+ 3400	4780	Btuh
	Sensible Envelope Load:			18576	Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic)	(DGM of 0.332)		6174	Btuh
	Sensible Load All Zones			**24749**	**Btuh**

Manual J Summer Calculations

Residential Load - Component Details (continued)

Mitchell Res
807 SW Mandiba
Lake City, FL

Project Title: 220007 Mitchell Res

Climate:FL_GAINESVILLE_REGIONAL_A

2022-01-05

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	**Sensible Envelope Load All Zones**	**18576**	**Btuh**
	Sensible Duct Load	6174	Btuh
	Total Sensible Zone Loads	**24749**	**Btuh**
	Sensible ventilation	0	Btuh
	Blower	0	Btuh
	Total sensible gain	**24749**	**Btuh**
	Latent infiltration gain (for 51 gr. humidity difference)	1927	Btuh
	Latent ventilation gain	0	Btuh
	Latent duct gain	1273	Btuh
	Latent occupant gain (6.0 people @ 200 Btuh per person)	1200	Btuh
	Latent other gain	0	Btuh
	Latent total gain	**4400**	**Btuh**
	TOTAL GAIN	**29150**	**Btuh**

EQUIPMENT

1. Central Unit	#	33000 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