Residential System Sizing Calculation

Summary

Schnieders Res

Project Title:
221308 Schnieders

Lake City, FL

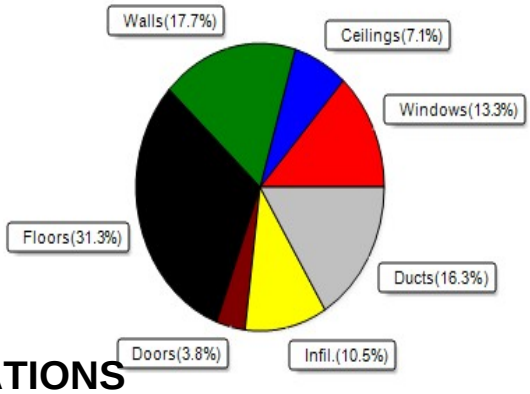
2022-11-10

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	**35758**	**Btuh**		**Total cooling load calculation**	**33343**	**Btuh**
Submitted heating capacity	% of calc	Btuh		Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	109.1	39000		Sensible (SHR = 0.75)	101.2	29250
Heat Pump + Auxiliary(0.0kW)	109.1	39000		Latent	219.9	9750
				Total (Electric Heat Pump)	117.0	39000

WINTER CALCULATIONS

Winter Heating Load (for 2405 sqft)

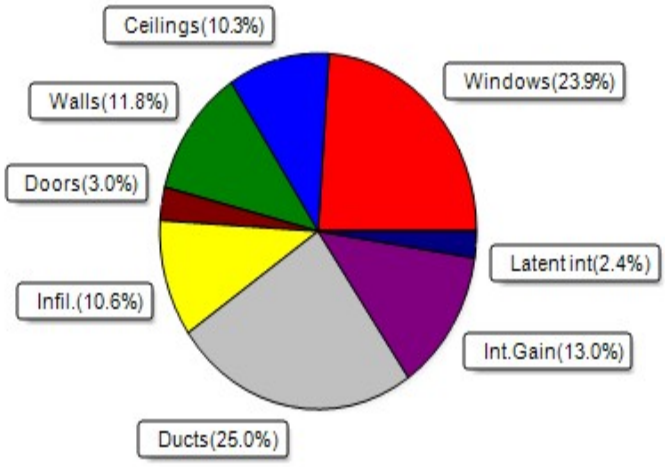
Load component			Load	
Window total	397	sqft	4768	Btuh
Wall total	1785	sqft	6338	Btuh
Door total	84	sqft	1344	Btuh
Ceiling total	2517	sqft	2555	Btuh
Floor total	2405	sqft	11186	Btuh
Infiltration	86	cfm	3748	Btuh
Duct loss			5818	Btuh
Subtotal			**35758**	**Btuh**
Ventilation	0	cfm	0	Btuh
TOTAL HEAT LOSS			**35758**	**Btuh**



SUMMER CALCULATIONS

Summer Cooling Load (for 2405 sqft)

Load component			Load	
Window total	397	sqft	7973	Btuh
Wall total	1785	sqft	3919	Btuh
Door total	84	sqft	1008	Btuh
Ceiling total	2517	sqft	3450	Btuh
Floor total			0	Btuh
Infiltration	64	cfm	1335	Btuh
Internal gain			4320	Btuh
Duct gain			6904	Btuh
Sens. Ventilation	0	cfm	0	Btuh
Blower Load			0	Btuh
Total sensible gain			**28908**	**Btuh**
Latent gain(ducts)			1419	Btuh
Latent gain(infiltration)			2215	Btuh
Latent gain(ventilation)			0	Btuh
Latent gain(internal/occupants/other)			800	Btuh
Total latent gain			**4435**	**Btuh**
TOTAL HEAT GAIN			**33343**	**Btuh**



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EnergyGauge® System Sizing
PREPARED BY: Evan Beamsley
DATE: 2022-11-10

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Schnieders Res
Lake City, FL

Project Title:
221308 Schnieders
Building Type: User

2022-11-10

Reference City: Gainesville, FL (Defaults) Winter Temperature Difference: 40.0 F (TMY3 99%)
This calculation is for Worst Case. The house has been rotated 315 degrees.

Component Loads for Whole House

Window	Panes/Type	Frame	U	Orientation	Area(sqft) X	HTM=	Load
1	2, NFRC 0.22	Metal	0.30	NW	36.0	12.0	432 Btuh
2	2, NFRC 0.22	Metal	0.30	N	13.3	12.0	160 Btuh
3	2, NFRC 0.22	Metal	0.30	NW	54.0	12.0	648 Btuh
4	2, NFRC 0.22	Metal	0.30	NE	48.0	12.0	576 Btuh
5	2, NFRC 0.22	Metal	0.30	NW	72.0	12.0	864 Btuh
6	2, NFRC 0.22	Metal	0.30	NW	36.0	12.0	432 Btuh
7	2, NFRC 0.22	Metal	0.30	NE	15.0	12.0	180 Btuh
8	2, NFRC 0.22	Metal	0.30	NE	8.0	12.0	96 Btuh
9	2, NFRC 0.22	Metal	0.30	SE	30.0	12.0	360 Btuh
10	2, NFRC 0.22	Metal	0.30	SE	32.0	12.0	384 Btuh
11	2, NFRC 0.22	Metal	0.30	SE	15.0	12.0	180 Btuh
12	2, NFRC 0.22	Metal	0.30	SW	30.0	12.0	360 Btuh
13	2, NFRC 0.22	Metal	0.30	SW	8.0	12.0	96 Btuh
	Window Total				397.3(sqft)		4768 Btuh

Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	104	3.55	367 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	127	3.55	450 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	15	3.55	52 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	62	3.55	221 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	20	3.55	71 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	24	3.55	85 Btuh
7	Frame - Wood	- Ext	(0.089)	13.0/0.0	24	3.55	85 Btuh
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	99	3.55	351 Btuh
9	Frame - Wood	- Ext	(0.089)	13.0/0.0	313	3.55	1111 Btuh
10	Frame - Wood	- Ext	(0.089)	13.0/0.0	122	3.55	431 Btuh
11	Frame - Wood	- Ext	(0.089)	13.0/0.0	53	3.55	186 Btuh
12	Frame - Wood	- Ext	(0.089)	13.0/0.0	107	3.55	378 Btuh
13	Frame - Wood	- Adj	(0.089)	13.0/0.0	34	3.55	121 Btuh
14	Frame - Wood	- Adj	(0.089)	13.0/0.0	33	3.55	117 Btuh
15	Frame - Wood	- Adj	(0.089)	13.0/0.0	144	3.55	511 Btuh
16	Frame - Wood	- Ext	(0.089)	13.0/0.0	304	3.55	1079 Btuh
17	Frame - Wood	- Ext	(0.089)	13.0/0.0	17	3.55	59 Btuh
18	Frame - Wood	- Ext	(0.089)	13.0/0.0	186	3.55	660 Btuh
	Wall Total				1785(sqft)		6338 Btuh

Doors	Type	Storm	Ueff.	Area X	HTM=	Load
1	Insulated - Exterior,	n	(0.400)	8	16.0	128 Btuh
2	Insulated - Exterior,	n	(0.400)	16	16.0	256 Btuh
3	Insulated - Exterior,	n	(0.400)	24	16.0	384 Btuh
4	Insulated - Exterior,	n	(0.400)	16	16.0	256 Btuh
5	Insulated - Garage,	n	(0.400)	20	16.0	320 Btuh
	Door Total			84(sqft)		1344Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Schnieders Res
Lake City, FL

Project Title:
221308 Schnieders
Building Type: User

2022-11-10

Ceilings	Type/Color/Surface	Ueff.	R-Value	Area X	HTM=	Load
1	Vented Attic/D/Shing	(0.025)	38.0/0.0	2405	1.0	2442 Btuh
2	Knee Wall/D/Shing	(0.025)	38.0/0.0	112	1.0	114 Btuh
	Ceiling Total			2517(sqft)		2555Btuh
Floors	Type	Ueff.	R-Value	Size X	HTM=	Load
1	Slab On Grade	(1.180)	0.0	237.0 ft(perim.)	47.2	11186 Btuh
	Floor Total			2405 sqft		11186 Btuh
				Envelope Subtotal:		26192 Btuh
Infiltration	Type	Wholehouse ACH	Volume(cuft)	Wall Ratio	CFM=	
	Natural	0.23	22126	1.00	85.6	3748 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att)			(DLM of 0.194)		5818 Btuh
All Zones	**Sensible Subtotal All Zones**					**35758 Btuh**

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss	35758 Btuh
	Ventilation Sensible Heat Loss	0 Btuh
	Total Heat Loss	35758 Btuh

EQUIPMENT

1. Electric Heat Pump	#	39000 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

Schnieders Res

Project Title:
221308 Schnieders

Lake City, FL

2022-11-10

Reference City: Gainesville, FL Temperature Difference: 19.0F(TMY3 99%) Humidity difference: 51gr.
This calculation is for Worst Case. The house has been rotated 315 degrees.

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	0.22, 0.30		No	No	NW	1.5ft	0.5ft	36.0	0.0	36.0	10	20	737	Btuh
2	2 NFRC	0.22, 0.30		No	No	N	15.0f	0.0ft	13.3	0.0	13.3	10	10	138	Btuh
3	2 NFRC	0.22, 0.30		No	No	NW	14.3f	0.5ft	54.0	0.0	54.0	10	20	1106	Btuh
4	2 NFRC	0.22, 0.30		No	No	NE	15.5f	0.0ft	48.0	0.0	48.0	10	20	983	Btuh
5	2 NFRC	0.22, 0.30		No	No	NW	15.2f	0.0ft	72.0	0.0	72.0	10	20	1475	Btuh
6	2 NFRC	0.22, 0.30		No	No	NW	1.5ft	0.5ft	36.0	0.0	36.0	10	20	737	Btuh
7	2 NFRC	0.22, 0.30		No	No	NE	1.5ft	9.0ft	15.0	0.0	15.0	10	20	307	Btuh
8	2 NFRC	0.22, 0.30		No	No	NE	1.5ft	5.0ft	8.0	0.0	8.0	10	20	164	Btuh
9	2 NFRC	0.22, 0.30		No	No	SE	1.5ft	0.5ft	30.0	9.8	20.2	10	21	534	Btuh
10	2 NFRC	0.22, 0.30		No	No	SE	10.5f	0.0ft	32.0	32.0	0.0	10	21	330	Btuh
11	2 NFRC	0.22, 0.30		No	No	SE	10.5f	0.5ft	15.0	15.0	0.0	10	21	155	Btuh
12	2 NFRC	0.22, 0.30		No	No	SW	1.5ft	11.0f	30.0	0.0	30.0	10	21	644	Btuh
13	2 NFRC	0.22, 0.30		No	No	SW	1.5ft	9.0ft	8.0	0.0	8.0	10	21	172	Btuh
	Excursion													490	Btuh
	Window Total								397 (sqft)					7973	Btuh

Walls	Type	U-Value	R-Value Cav/Sheath	Area(sqft)	HTM	Load	
1	Frame - Wood - Ext	0.09	13.0/0.0	103.5	2.3	234	Btuh
2	Frame - Wood - Ext	0.09	13.0/0.0	126.8	2.3	287	Btuh
3	Frame - Wood - Ext	0.09	13.0/0.0	14.7	2.3	33	Btuh
4	Frame - Wood - Ext	0.09	13.0/0.0	62.3	2.3	141	Btuh
5	Frame - Wood - Ext	0.09	13.0/0.0	20.0	2.3	45	Btuh
6	Frame - Wood - Ext	0.09	13.0/0.0	24.0	2.3	54	Btuh
7	Frame - Wood - Ext	0.09	13.0/0.0	24.0	2.3	54	Btuh
8	Frame - Wood - Ext	0.09	13.0/0.0	99.0	2.3	224	Btuh
9	Frame - Wood - Ext	0.09	13.0/0.0	313.0	2.3	708	Btuh
10	Frame - Wood - Ext	0.09	13.0/0.0	121.5	2.3	275	Btuh
11	Frame - Wood - Ext	0.09	13.0/0.0	52.5	2.3	119	Btuh
12	Frame - Wood - Ext	0.09	13.0/0.0	106.5	2.3	241	Btuh
13	Frame - Wood - Adj	0.09	13.0/0.0	34.0	1.7	57	Btuh
14	Frame - Wood - Adj	0.09	13.0/0.0	33.0	1.7	56	Btuh
15	Frame - Wood - Adj	0.09	13.0/0.0	144.0	1.7	243	Btuh
16	Frame - Wood - Ext	0.09	13.0/0.0	304.0	2.3	688	Btuh
17	Frame - Wood - Ext	0.09	13.0/0.0	16.5	2.3	37	Btuh
18	Frame - Wood - Ext	0.09	13.0/0.0	186.0	2.3	421	Btuh
	Wall Total			1785 (sqft)		3919	Btuh

Doors	Type	Area (sqft)	HTM	Load	
1	Insulated - Exterior	8.0	12.0	96	Btuh
2	Insulated - Exterior	16.0	12.0	192	Btuh
3	Insulated - Exterior	24.0	12.0	288	Btuh
4	Insulated - Exterior	16.0	12.0	192	Btuh
5	Insulated - Garage	20.0	12.0	240	Btuh
	Door Total	84 (sqft)		1008	Btuh

Ceilings	Type/Color/Surface	U-Value	R-Value	Area(sqft)	HTM	Load	
1	Vented Attic/DarkShingle	0.025	38.0/0.0	2405.0	1.37	3296	Btuh
2	Knee Wall/DarkShingle	0.025	38.0/0.0	112.0	1.37	154	Btuh
	Ceiling Total			2517 (sqft)		3450	Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Schnieders Res | Project Title: 221308 Schnieders | Climate:FL_GAINESVILLE_REGIONAL_A

Lake City, FL

2022-11-10

Floors	Type	R-Value	Size	HTM	Load
1	Slab On Grade	0.0	2405 (ft-perimeter)	0.0	0 Btuh
	Floor Total		2405.0 (sqft)		0 Btuh
				Envelope Subtotal:	16349 Btuh

Infiltration	Type	Average ACH	Volume(cuft)	Wall Ratio	CFM=	Load
	Natural	0.17	22126	1	64.2	1335 Btuh
Internal gain		Occupants	Btuh/occupant		Appliance	Load
		4	X 230	+	3400	4320 Btuh
					Sensible Envelope Load:	22004 Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic)			(DGM of 0.314)		6904 Btuh
					Sensible Load All Zones	**28908 Btuh**

Manual J Summer Calculations

Residential Load - Component Details (continued)

Schnieders Res | Project Title: 221308 Schnieders | Climate:FL_GAINESVILLE_REGIONAL_A

Lake City, FL

2022-11-10

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	**Sensible Envelope Load All Zones**	**22004**	**Btuh**
	Sensible Duct Load	6904	Btuh
	Total Sensible Zone Loads	**28908**	**Btuh**
	Sensible ventilation	0	Btuh
	Blower	0	Btuh
	Total sensible gain	**28908**	**Btuh**
	Latent infiltration gain (for 51 gr. humidity difference)	2215	Btuh
	Latent ventilation gain	0	Btuh
	Latent duct gain	1419	Btuh
	Latent occupant gain (4.0 people @ 200 Btuh per person)	800	Btuh
	Latent other gain	0	Btuh
	Latent total gain	**4435**	**Btuh**
	TOTAL GAIN	**33343**	**Btuh**

EQUIPMENT

1. Central Unit	#	39000 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