

Residential System Sizing Calculation

Summary

Van Voorhis

Project Title:
220014 Van Voorhis

Lake City, FL

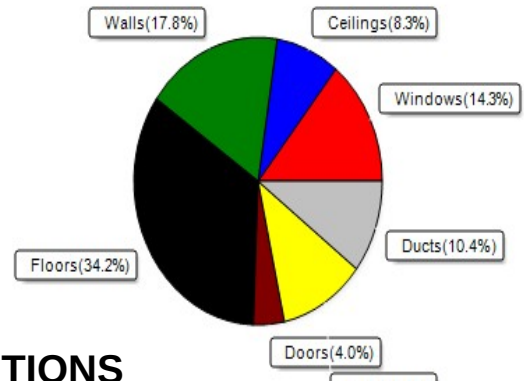
2022-01-05

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	33417 Btuh	Total cooling load calculation	25072 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	107.7 36000	Sensible (SHR = 0.75)	132.8 27000
Heat Pump + Auxiliary(0.0kW)	107.7 36000	Latent	190.0 9000
		Total (Electric Heat Pump)	143.6 36000

WINTER CALCULATIONS

Winter Heating Load (for 2312 sqft)

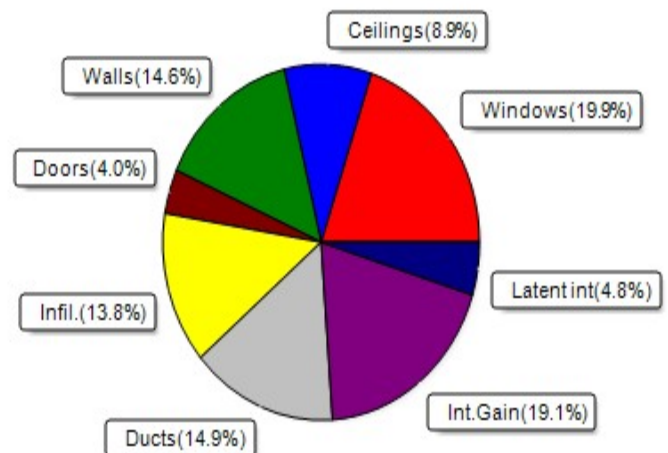
Load component		Load	
Window total	397 sqft	4768	Btuh
Wall total	1675 sqft	5947	Btuh
Door total	84 sqft	1344	Btuh
Ceiling total	2312 sqft	2786	Btuh
Floor total	2312 sqft	11422	Btuh
Infiltration	84 cfm	3658	Btuh
Duct loss		3492	Btuh
Subtotal		33417	Btuh
Ventilation	0 cfm	0	Btuh
TOTAL HEAT LOSS		33417	Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 2312 sqft)

Load component		Load	
Window total	397 sqft	4979	Btuh
Wall total	1675 sqft	3669	Btuh
Door total	84 sqft	1008	Btuh
Ceiling total	2312 sqft	2229	Btuh
Floor total		0	Btuh
Infiltration	63 cfm	1303	Btuh
Internal gain		4780	Btuh
Duct gain		2366	Btuh
Sens. Ventilation	0 cfm	0	Btuh
Blower Load		0	Btuh
Total sensible gain		20334	Btuh
Latent gain(ducts)		1375	Btuh
Latent gain(infiltration)		2162	Btuh
Latent gain(ventilation)		0	Btuh
Latent gain(internal/occupants/other)		1200	Btuh
Total latent gain		4738	Btuh
TOTAL HEAT GAIN		25072	Btuh



8th Edition

EnergyGauge® System Sizing
PREPARED BY: Evan Beamsley
DATE: 2022-01-05

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Van Voorhis
Lake City, FL

Project Title:
220014 Van Voorhis
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 0.20	Metal	0.30	N	36.0		12.0	432 Btuh
2	2, NFRC 0.20	Metal	0.30	NE	13.3		12.0	160 Btuh
3	2, NFRC 0.20	Metal	0.30	N	54.0		12.0	648 Btuh
4	2, NFRC 0.20	Metal	0.30	E	48.0		12.0	576 Btuh
5	2, NFRC 0.20	Metal	0.30	N	72.0		12.0	864 Btuh
6	2, NFRC 0.20	Metal	0.30	N	36.0		12.0	432 Btuh
7	2, NFRC 0.20	Metal	0.30	E	15.0		12.0	180 Btuh
8	2, NFRC 0.20	Metal	0.30	E	8.0		12.0	96 Btuh
9	2, NFRC 0.20	Metal	0.30	S	30.0		12.0	360 Btuh
10	2, NFRC 0.20	Metal	0.30	S	32.0		12.0	384 Btuh
11	2, NFRC 0.20	Metal	0.30	S	15.0		12.0	180 Btuh
12	2, NFRC 0.20	Metal	0.30	W	30.0		12.0	360 Btuh
13	2, NFRC 0.20	Metal	0.30	W	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	87		3.55	309 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	91		3.55	322 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	13		3.55	47 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	114		3.55	405 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	458		3.55	1625 Btuh
Wall Total					1675(sqft)			5947 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	Wood - 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)

Van Voorhis
Lake City, FL

Project Title:
220014 Van Voorhis
Building Type: User

2022-01-05

Ceilings 1	Type/Color/Surface Unvent Attic/L/Shing Ceiling Total	Ueff. (0.241)	R-Value 0.0/22.0	Area X 2312 2312(sqft)	HTM= 1.2	Load 2786 Btuh 2786Btuh
Floors 1	Type Slab On Grade Floor Total	Ueff. (1.180)	R-Value 0.0	Size X 242.0 ft(perim.) 2312 sqft	HTM= 47.2	Load 11422 Btuh 11422 Btuh
Envelope Subtotal:						26267 Btuh
Infiltration	Type Natural	Wholehouse ACH 0.23	Volume(cuft) 21502	Wall Ratio 1.00	CFM= 83.5	3658 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.117)					3492 Btuh
All Zones	Sensible Subtotal All Zones					33417 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	33417 Btuh 0 Btuh 33417 Btuh
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EQUIPMENT

1. Electric Heat Pump	#	36000 Btuh
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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

Van Voorhis

Project Title:
220014 Van Voorhis

Lake City, FL

2022-01-05

Reference City: Gainesville, FL

Temperature Difference: 19.0F(TMY3 99%)

Humidity difference: 51gr.

Component Loads for Whole House

Window	Type*						Overhang		Window Area(sqft)			HTM		Load	
	Panes	SHGC	U	InSh	IS	Ornt	Len	Hgt	Gross	Shaded	Unshaded	Shaded	Unshaded		
1	2 NFRC	0.20, 0.30	No	No	N		1.5ft	1.0ft	36.0	0.0	36.0	10	10	357	Btuh
2	2 NFRC	0.20, 0.30	No	No	NE		15.0f	0.0ft	13.3	0.0	13.3	10	19	255	Btuh
3	2 NFRC	0.20, 0.30	No	No	N		12.8f	0.0ft	54.0	0.0	54.0	10	10	535	Btuh
4	2 NFRC	0.20, 0.30	No	No	E		14.0f	0.0ft	48.0	48.0	0.0	10	25	476	Btuh
5	2 NFRC	0.20, 0.30	No	No	N		13.7f	0.0ft	72.0	0.0	72.0	10	10	713	Btuh
6	2 NFRC	0.20, 0.30	No	No	N		1.5ft	1.0ft	36.0	0.0	36.0	10	10	357	Btuh
7	2 NFRC	0.20, 0.30	No	No	E		1.5ft	9.0ft	15.0	0.0	15.0	10	25	375	Btuh
8	2 NFRC	0.20, 0.30	No	No	E		1.5ft	6.0ft	8.0	0.0	8.0	10	25	200	Btuh
9	2 NFRC	0.20, 0.30	No	No	S		1.5ft	1.0ft	30.0	30.0	0.0	10	11	297	Btuh
10	2 NFRC	0.20, 0.30	No	No	S		9.0ft	0.0ft	32.0	32.0	0.0	10	11	317	Btuh
11	2 NFRC	0.20, 0.30	No	No	S		9.0ft	0.5ft	15.0	15.0	0.0	10	11	149	Btuh
12	2 NFRC	0.20, 0.30	No	No	W		1.5ft	8.0ft	30.0	0.0	30.0	10	25	749	Btuh
13	2 NFRC	0.20, 0.30	No	No	W		1.5ft	5.0ft	8.0	0.0	8.0	10	25	200	Btuh
	Window Total								397 (sqft)					4979 Btuh	
Walls	Type	U-Value		R-Value		Area(sqft)		HTM		Load					
					Cav/Sheath										
1	Frame - Wood - Ext		0.09		13.0/0.0		87.0		2.3		197 Btuh				
2	Frame - Wood - Ext		0.09		13.0/0.0		90.8		2.3		205 Btuh				
3	Frame - Wood - Ext		0.09		13.0/0.0		13.2		2.3		30 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		114.0		2.3		258 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		457.8		2.3		1036 Btuh				
	Wall Total								1675 (sqft)			3669 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	Wood - 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	Unvented Attic/Light/Shingle		0.241		0.0/22.0		2312.0		0.96		2229 Btuh				
	Ceiling Total								2312 (sqft)			2229 Btuh			
Floors	Type	R-Value		Size		HTM		Load							
1	Slab On Grade		0.0		2312 (ft-perimeter)		0.0		0 Btuh						
	Floor Total								2312.0 (sqft)			0 Btuh			

Manual J Summer Calculations

Residential Load - Component Details (continued)

Van Voorhis
Lake City, FL

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
220014 Van Voorhis

2022-01-05

	Envelope Subtotal:					11885 Btuh
Infiltration	Type	Average ACH	Volume(cuft)	Wall Ratio	CFM=	Load
	Natural	0.17	21502	1	62.6	1303 Btuh
Internal gain		Occupants	Btuh/occupant		Appliance	Load
		6	X 230	+	3400	4780 Btuh
	Sensible Envelope Load:					17968 Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic) (DGM of 0.132)					2366 Btuh
	Sensible Load All Zones					20334 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Van Voorhis
Lake City, FL

Project Title:
220014 Van Voorhis

Climate:FL_GAINESVILLE_REGIONAL_A

2022-01-05

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	17968 Btuh
	Sensible Duct Load	2366 Btuh
	Total Sensible Zone Loads	20334 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	20334 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	2162 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1375 Btuh
	Latent occupant gain (6.0 people @ 200 Btuh per person)	1200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	4738 Btuh
	TOTAL GAIN	25072 Btuh

EQUIPMENT

1. Central Unit	#	36000 Btuh
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*Key: Window types (Panels - 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