

Residential System Sizing Calculation

Summary

Jerri & Paula Payne

Project Title:
200499 Payne Res

Lake City, FL

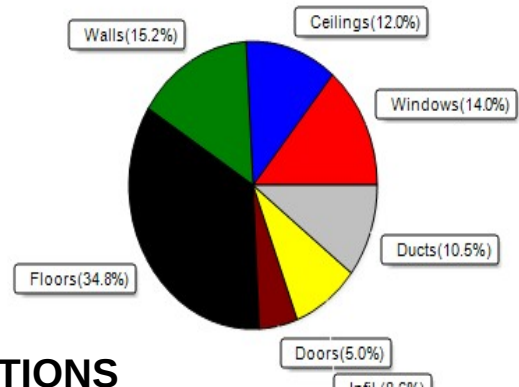
2020-05-08

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	28601 Btuh	Total cooling load calculation	22578 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	111.9 32000	Sensible (SHR = 0.75)	127.9 24000
Heat Pump + Auxiliary(0.0kW)	111.9 32000	Latent	210.0 8000
		Total (Electric Heat Pump)	141.7 32000

WINTER CALCULATIONS

Winter Heating Load (for 1961 sqft)

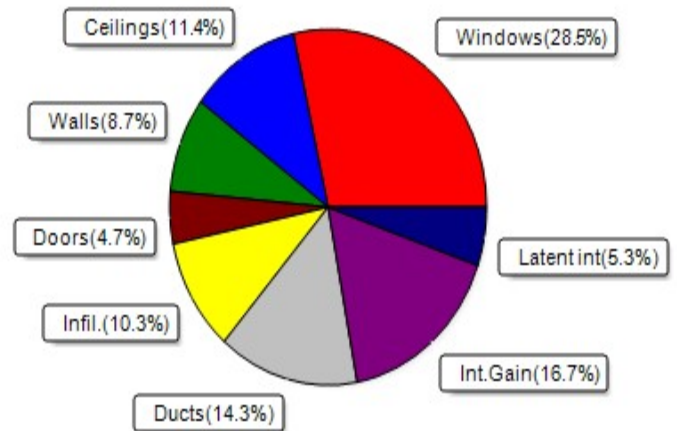
Load component		Load	
Window total	333 sqft	4000	Btuh
Wall total	1468 sqft	4338	Btuh
Door total	89 sqft	1429	Btuh
Ceiling total	1961 sqft	3425	Btuh
Floor total	1961 sqft	9959	Btuh
Infiltration	56 cfm	2452	Btuh
Duct loss		2997	Btuh
Subtotal		28601	Btuh
Ventilation	0 cfm	0	Btuh
TOTAL HEAT LOSS		28601	Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 1961 sqft)

Load component		Load	
Window total	333 sqft	6441	Btuh
Wall total	1468 sqft	1955	Btuh
Door total	89 sqft	1072	Btuh
Ceiling total	1961 sqft	2569	Btuh
Floor total		0	Btuh
Infiltration	42 cfm	874	Btuh
Internal gain		3780	Btuh
Duct gain		2078	Btuh
Sens. Ventilation	0 cfm	0	Btuh
Blower Load		0	Btuh
Total sensible gain		18769	Btuh
Latent gain(ducts)		1160	Btuh
Latent gain(infiltration)		1450	Btuh
Latent gain(ventilation)		0	Btuh
Latent gain(internal/occupants/other)		1200	Btuh
Total latent gain		3809	Btuh
TOTAL HEAT GAIN		22578	Btuh



8th Edition

EnergyGauge® System Sizing
PREPARED BY: Evan Beamsley
DATE: 2020-05-08

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Jerri & Paula Payne

Project Title:
200499 Payne Res
Building Type: User

Lake City, FL

2020-05-08

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 0.20	Metal	0.30	NW	72.0		12.0	864 Btuh
2	2, NFRC 0.20	Metal	0.30	NW	36.0		12.0	432 Btuh
3	2, NFRC 0.20	Metal	0.30	NE	32.0		12.0	384 Btuh
4	2, NFRC 0.20	Metal	0.30	NW	36.0		12.0	432 Btuh
5	2, NFRC 0.20	Metal	0.30	NE	7.5		12.0	90 Btuh
6	2, NFRC 0.20	Metal	0.30	SE	30.0		12.0	360 Btuh
7	2, NFRC 0.20	Metal	0.30	SE	13.3		12.0	160 Btuh
8	2, NFRC 0.20	Metal	0.30	SE	30.0		12.0	360 Btuh
9	2, NFRC 0.20	Metal	0.30	SW	7.5		12.0	90 Btuh
10	2, NFRC 0.20	Metal	0.30	SW	45.0		12.0	540 Btuh
11	2, NFRC 0.20	Metal	0.30	SW	24.0		12.0	288 Btuh
Window Total					333.3(sqft)			4000 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.077)	19.0/0.0	155		3.09	480 Btuh
2	Frame - Wood	- Ext	(0.077)	19.0/0.0	33		3.09	102 Btuh
3	Frame - Wood	- Ext	(0.077)	19.0/0.0	155		3.09	480 Btuh
4	Face Br - Wood	- Ext	(0.067)	19.0/0.0	191		2.66	509 Btuh
5	Frame - Wood	- Adj	(0.089)	13.0/0.0	44		3.55	154 Btuh
6	Frame - Wood	- Adj	(0.089)	13.0/0.0	43		3.55	152 Btuh
7	Frame - Wood	- Adj	(0.089)	13.0/0.0	95		3.55	338 Btuh
8	Frame - Wood	- Adj	(0.089)	13.0/0.0	99		3.55	351 Btuh
9	Frame - Wood	- Ext	(0.077)	19.0/0.0	78		3.09	240 Btuh
10	Face Br - Wood	- Ext	(0.067)	19.0/0.0	72		2.66	192 Btuh
11	Face Br - Wood	- Ext	(0.067)	19.0/0.0	86		2.66	230 Btuh
12	Face Br - Wood	- Ext	(0.067)	19.0/0.0	417		2.66	1110 Btuh
Wall Total					1468(sqft)			4338 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior, n		(0.400)		16		16.0	256 Btuh
2	Insulated - Garage, n		(0.400)		33		16.0	533 Btuh
3	Insulated - Garage, n		(0.400)		20		16.0	320 Btuh
4	Insulated - Exterior, n		(0.400)		20		16.0	320 Btuh
Door Total					89(sqft)			1429Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load
1	Unvent Attic/D/Shing		(0.044)	0.0/22.0	1961		1.7	3425 Btuh
Ceiling Total					1961(sqft)			3425Btuh
Floors	Type		Ueff.	R-Value	Size	X	HTM=	Load
1	Slab On Grade		(1.180)	0.0	211.0 ft(perim.)		47.2	9959 Btuh
Floor Total					1961 sqft			9959 Btuh
Envelope Subtotal:								23151 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Jerri & Paula Payne

Project Title:
200499 Payne Res
Building Type: User

Lake City, FL

2020-05-08

Infiltration	Type Natural	Wholehouse ACH 0.21	Volume(cuft) 15688	Wall Ratio 1.00	CFM= 56.0	2452 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.117)					2997 Btuh
All Zones	Sensible Subtotal All Zones					28601 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	28601 Btuh 0 Btuh 28601 Btuh
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EQUIPMENT

1. Electric Heat Pump	#	32000 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

Jerri & Paula Payne

Project Title:
200499 Payne Res

Lake City, FL

2020-05-08

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

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	NW	1.5ft	0.5ft	72.0	0.0	72.0	10	19	1378	Btuh	
2	2 NFRC	0.20, 0.30	No	No	NW	1.5ft	0.5ft	36.0	0.0	36.0	10	19	689	Btuh	
3	2 NFRC	0.20, 0.30	No	No	NE	22.7f	0.0ft	32.0	0.0	32.0	10	19	612	Btuh	
4	2 NFRC	0.20, 0.30	No	No	NW	10.5f	0.5ft	36.0	0.0	36.0	10	19	689	Btuh	
5	2 NFRC	0.20, 0.30	No	No	NE	1.5ft	1.0ft	7.5	0.0	7.5	10	19	144	Btuh	
6	2 NFRC	0.20, 0.30	No	No	SE	6.5ft	2.0ft	30.0	30.0	0.0	10	20	297	Btuh	
7	2 NFRC	0.20, 0.30	No	No	SE	6.5ft	2.0ft	13.3	13.3	0.0	10	20	132	Btuh	
8	2 NFRC	0.20, 0.30	No	No	SE	1.5ft	3.0ft	30.0	0.0	30.0	10	20	601	Btuh	
9	2 NFRC	0.20, 0.30	No	No	SW	1.5ft	1.0ft	7.5	3.7	3.8	10	20	113	Btuh	
10	2 NFRC	0.20, 0.30	No	No	SW	1.5ft	1.0ft	45.0	13.2	31.8	10	20	768	Btuh	
11	2 NFRC	0.20, 0.30	No	No	SW	1.5ft	1.0ft	24.0	5.9	18.1	10	20	421	Btuh	
	Excursion												597	Btuh	
	Window Total							333 (sqft)						6441	Btuh
Walls	Type	U-Value		R-Value		Area(sqft)		HTM		Load					
					Cav/Sheath										
1	Frame - Wood - Ext		0.08		19.0/0.0		155.3		1.7		257	Btuh			
2	Frame - Wood - Ext		0.08		19.0/0.0		33.0		1.7		55	Btuh			
3	Frame - Wood - Ext		0.08		19.0/0.0		155.3		1.7		257	Btuh			
4	Face Brick - Wood - Ext		0.07		19.0/0.0		191.3		1.0		196	Btuh			
5	Frame - Wood - Adj		0.09		13.0/0.0		43.5		1.7		73	Btuh			
6	Frame - Wood - Adj		0.09		13.0/0.0		42.8		1.7		72	Btuh			
7	Frame - Wood - Adj		0.09		13.0/0.0		95.2		1.7		160	Btuh			
8	Frame - Wood - Adj		0.09		13.0/0.0		99.0		1.7		167	Btuh			
9	Frame - Wood - Ext		0.08		19.0/0.0		77.7		1.7		128	Btuh			
10	Face Brick - Wood - Ext		0.07		19.0/0.0		72.0		1.0		74	Btuh			
11	Face Brick - Wood - Ext		0.07		19.0/0.0		86.3		1.0		88	Btuh			
12	Face Brick - Wood - Ext		0.07		19.0/0.0		417.0		1.0		427	Btuh			
	Wall Total							1468 (sqft)					1955	Btuh	
Doors	Type	U-Value		R-Value		Area (sqft)		HTM		Load					
1	Insulated - Exterior						16.0		12.0		192	Btuh			
2	Insulated - Garage						33.3		12.0		400	Btuh			
3	Insulated - Garage						20.0		12.0		240	Btuh			
4	Insulated - Exterior						20.0		12.0		240	Btuh			
	Door Total							89 (sqft)					1072	Btuh	
Ceilings	Type/Color/Surface	U-Value		R-Value		Area(sqft)		HTM		Load					
1	Unvented Attic/DarkShingle		0.044		0.0/22.0		1961.0		1.31		2569	Btuh			
	Ceiling Total						1961 (sqft)				2569	Btuh			
Floors	Type	U-Value		R-Value		Size		HTM		Load					
1	Slab On Grade				0.0		1961 (ft-perimeter)		0.0		0	Btuh			
	Floor Total							1961.0 (sqft)					0	Btuh	
	Envelope Subtotal:											12037	Btuh		

Manual J Summer Calculations

Residential Load - Component Details (continued)

Jerri & Paula Payne

Project Title:
200499 Payne Res

Climate:FL_GAINESVILLE_REGIONAL_A

Lake City, FL

2020-05-08

Infiltration	Type Natural	Average ACH 0.16	Volume(cuft) 15688	Wall Ratio 1	CFM= 42.0	Load 874 Btuh
Internal gain		Occupants 6	Btuh/occupant X 230	Appliance +	2400	Load 3780 Btuh
					Sensible Envelope Load:	16691 Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic)				(DGM of 0.125)	2078 Btuh
					Sensible Load All Zones	18769 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Jerri & Paula Payne

Project Title:
200499 Payne Res

Climate:FL_GAINESVILLE_REGIONAL_A

Lake City, FL

2020-05-08

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	16691 Btuh
	Sensible Duct Load	2078 Btuh
	Total Sensible Zone Loads	18769 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	18769 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	1450 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1160 Btuh
	Latent occupant gain (6.0 people @ 200 Btuh per person)	1200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	3809 Btuh
	TOTAL GAIN	22578 Btuh

EQUIPMENT

1. Central Unit	#	32000 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