

Residential System Sizing Calculation

Summary

Project Title:
Bootle Residence

, FL

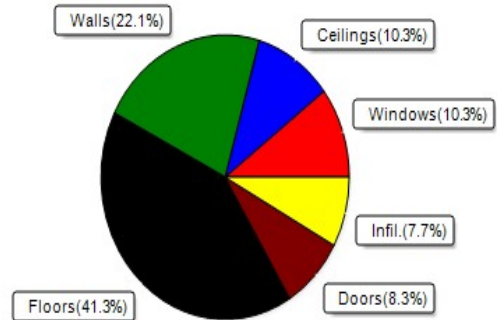
6/21/2024

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	30760	Btuh	Total cooling load calculation	20966	Btuh
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	136.5	42000	Sensible (SHR = 0.85)	198.7	35700
Heat Pump + Auxiliary(0.0kW)	136.5	42000	Latent	209.8	6300
			Total (Electric Heat Pump)	200.3	42000

WINTER CALCULATIONS

Winter Heating Load (for 2328 sqft)

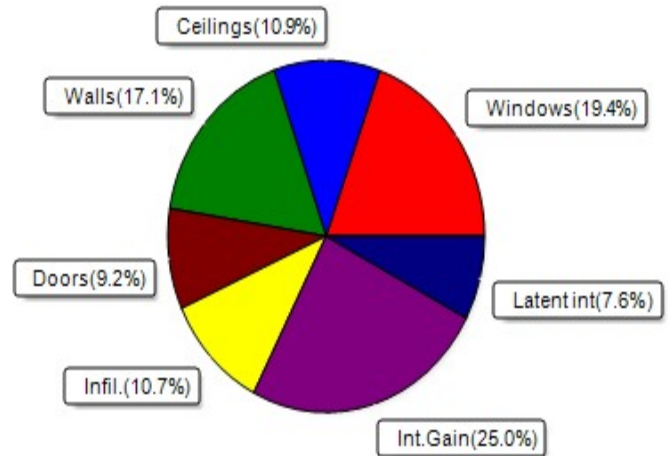
Load component	Load
Window total 304 sqft	3162 Btuh
Wall total 2163 sqft	6801 Btuh
Door total 160 sqft	2560 Btuh
Ceiling total 2328 sqft	3166 Btuh
Floor total 2328 sqft	12697 Btuh
Infiltration 54 cfm	2374 Btuh
Duct loss	0 Btuh
Subtotal	30760 Btuh
Ventilation Ex:0 cfm; Sup:0 cfm	0 Btuh
TOTAL HEAT LOSS	30760 Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 2328 sqft)

Load component	Load
Window total 304 sqft	4077 Btuh
Wall total 2163 sqft	3585 Btuh
Door total 160 sqft	1920 Btuh
Ceiling total 2328 sqft	2296 Btuh
Floor total	0 Btuh
Infiltration 41 cfm	846 Btuh
Internal gain	5240 Btuh
Duct gain	0 Btuh
Sens.Ventilation Ex:0 cfm; Sup:0 cfm	0 Btuh
Blower Load	0 Btuh
Total sensible gain	17963 Btuh
Latent gain(ducts)	0 Btuh
Latent gain(infiltration)	1403 Btuh
Latent gain(ventilation)	0 Btuh
Latent gain(internal/occupants/other)	1600 Btuh
Total latent gain	3003 Btuh
TOTAL HEAT GAIN	20966 Btuh



8th Edition

EnergyGauge® System Sizing

PREPARED BY: _____

DATE: 6-21-24

System Sizing Calculations - Summer

Residential Load - Whole House Component Details

Project Title:
Bootle Residence

, FL

6/21/2024

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 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, 0.26	No	No	N	1.5ft	2.3ft	12.0	0.0	12.0	9	9	110	Btuh
2	2 NFRC	0.20, 0.26	No	No	N	1.5ft	2.3ft	8.0	0.0	8.0	9	9	73	Btuh
3	2 NFRC	0.20, 0.26	No	No	E	1.5ft	2.3ft	20.0	0.0	20.0	9	24	484	Btuh
4	2 NFRC	0.20, 0.26	No	No	E	1.5ft	2.3ft	30.0	0.0	30.0	9	24	727	Btuh
5	2 NFRC	0.20, 0.26	No	No	S	1.5ft	2.3ft	36.0	36.0	0.0	9	11	329	Btuh
6	2 NFRC	0.20, 0.26	No	No	S	1.5ft	2.3ft	8.0	8.0	0.0	9	11	73	Btuh
7	2 NFRC	0.20, 0.26	No	No	S	1.5ft	2.3ft	90.0	90.0	0.0	9	11	823	Btuh
8	2 NFRC	0.20, 0.26	No	No	S	1.5ft	2.3ft	8.0	8.0	0.0	9	11	73	Btuh
9	2 NFRC	0.20, 0.26	No	No	S	1.5ft	2.3ft	36.0	36.0	0.0	9	11	329	Btuh
10	2 NFRC	0.20, 0.26	No	No	W	1.5ft	2.3ft	36.0	0.0	36.0	9	24	872	Btuh
11	2 NFRC	0.20, 0.26	No	No	N	1.5ft	1.3ft	20.0	0.0	20.0	9	9	183	Btuh
Window Total								304 (sqft)					4077 Btuh	
Walls	Type	U-Value		R-Value		Area(sqft)		HTM		Load				
1	Frame - Wood - Ext		0.08		19.0/0.0		136.7		1.7		226	Btuh		
2	Frame - Wood - Ext		0.08		19.0/0.0		130.0		1.7		215	Btuh		
3	Frame - Wood - Ext		0.08		19.0/0.0		180.7		1.7		299	Btuh		
4	Frame - Wood - Adj		0.09		13.0/0.0		252.7		1.7		426	Btuh		
5	Frame - Wood - Ext		0.08		19.0/0.0		241.7		1.7		400	Btuh		
6	Frame - Wood - Ext		0.08		19.0/0.0		112.3		1.7		186	Btuh		
7	Frame - Wood - Ext		0.08		19.0/0.0		20.0		1.7		33	Btuh		
8	Frame - Wood - Ext		0.08		19.0/0.0		75.3		1.7		125	Btuh		
9	Frame - Wood - Ext		0.08		19.0/0.0		70.0		1.7		116	Btuh		
10	Frame - Wood - Ext		0.08		19.0/0.0		180.0		1.7		298	Btuh		
11	Frame - Wood - Ext		0.08		19.0/0.0		30.0		1.7		50	Btuh		
12	Frame - Wood - Ext		0.08		19.0/0.0		80.3		1.7		133	Btuh		
13	Frame - Wood - Ext		0.08		19.0/0.0		78.3		1.7		130	Btuh		
14	Frame - Wood - Ext		0.08		19.0/0.0		87.3		1.7		144	Btuh		
15	Frame - Wood - Ext		0.08		19.0/0.0		146.7		1.7		243	Btuh		
16	Frame - Wood - Ext		0.08		19.0/0.0		60.0		1.7		99	Btuh		
17	Frame - Wood - Ext		0.08		19.0/0.0		280.7		1.7		464	Btuh		
Wall Total								2163 (sqft)					3585 Btuh	
Doors	Type	Area (sqft)		HTM		Load								
1	Insulated - Exterior		96.0		12.0		1152	Btuh						
2	Wood - Garage		24.0		12.0		288	Btuh						
3	Insulated - Exterior		40.0		12.0		480	Btuh						
Door Total								160 (sqft)					1920 Btuh	
Ceilings	Type/Color/Surface	U-Value		R-Value		Area(sqft)		HTM		Load				
1	SnglAsmb no airsp/DarkShingle		0.034		30.0/0.0		2328.0		0.99		2296	Btuh		
Ceiling Total								2328 (sqft)					2296 Btuh	
Floors	Type	R-Value		Size		HTM		Load						
1	Slab On Grade		0.0		2328 (ft-perimeter)		0.0		0		Btuh			
Floor Total								2328.0 (sqft)					0 Btuh	
Envelope Subtotal:												11877 Btuh		

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
 Bootle Residence

, FL

6/21/2024

Infiltration	Type Natural	Average ACH 0.12	Volume(cuft) 20952	Wall Ratio 1	CFM= 40.6	Load 846 Btuh
Internal gain		Occupants 8	Btuh/occupant X 230	Appliance +	3400	Load 5240 Btuh
	Sensible Envelope Load:					17963 Btuh
Duct load	Extremely sealed, Supply(R6.0-Condi), Return(R6.0-Condi) (DGM of 0.000)					0 Btuh
	Sensible Load All Zones					17963 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
Bootle Residence

, FL

6/21/2024

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	17963 Btuh
	Sensible Duct Load	0 Btuh
	Total Sensible Zone Loads	17963 Btuh
	Sensible ventilation (Ex:0 cfm; Sup:0 cfm)	0 Btuh
	Blower	0 Btuh
	Total sensible gain	17963 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	1403 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	0 Btuh
	Latent occupant gain (8.0 people @ 200 Btuh per person)	1600 Btuh
	Latent other gain	0 Btuh
	Latent total gain	3003 Btuh
	TOTAL GAIN	20966 Btuh

EQUIPMENT

1. Central Unit	#	42000 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

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Project Title:
Bootle Residence
Building Type: User

, FL

6/21/2024

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	0.26	N	12.0		10.4	125 Btuh
2	2, NFRC 0.20	Vinyl	0.26	N	8.0		10.4	83 Btuh
3	2, NFRC 0.20	Vinyl	0.26	E	20.0		10.4	208 Btuh
4	2, NFRC 0.20	Vinyl	0.26	E	30.0		10.4	312 Btuh
5	2, NFRC 0.20	Vinyl	0.26	S	36.0		10.4	374 Btuh
6	2, NFRC 0.20	Vinyl	0.26	S	8.0		10.4	83 Btuh
7	2, NFRC 0.20	Vinyl	0.26	S	90.0		10.4	936 Btuh
8	2, NFRC 0.20	Vinyl	0.26	S	8.0		10.4	83 Btuh
9	2, NFRC 0.20	Vinyl	0.26	S	36.0		10.4	374 Btuh
10	2, NFRC 0.20	Vinyl	0.26	W	36.0		10.4	374 Btuh
11	2, NFRC 0.20	Vinyl	0.26	N	20.0		10.4	208 Btuh
	Window Total				304.0(sqft)			3162 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.077)	19.0/0.0	137		3.09	422 Btuh
2	Frame - Wood	- Ext	(0.077)	19.0/0.0	130		3.09	402 Btuh
3	Frame - Wood	- Ext	(0.077)	19.0/0.0	181		3.09	558 Btuh
4	Frame - Wood	- Adj	(0.089)	13.0/0.0	253		3.55	897 Btuh
5	Frame - Wood	- Ext	(0.077)	19.0/0.0	242		3.09	747 Btuh
6	Frame - Wood	- Ext	(0.077)	19.0/0.0	112		3.09	347 Btuh
7	Frame - Wood	- Ext	(0.077)	19.0/0.0	20		3.09	62 Btuh
8	Frame - Wood	- Ext	(0.077)	19.0/0.0	75		3.09	233 Btuh
9	Frame - Wood	- Ext	(0.077)	19.0/0.0	70		3.09	216 Btuh
10	Frame - Wood	- Ext	(0.077)	19.0/0.0	180		3.09	556 Btuh
11	Frame - Wood	- Ext	(0.077)	19.0/0.0	30		3.09	93 Btuh
12	Frame - Wood	- Ext	(0.077)	19.0/0.0	80		3.09	248 Btuh
13	Frame - Wood	- Ext	(0.077)	19.0/0.0	78		3.09	242 Btuh
14	Frame - Wood	- Ext	(0.077)	19.0/0.0	87		3.09	270 Btuh
15	Frame - Wood	- Ext	(0.077)	19.0/0.0	147		3.09	453 Btuh
16	Frame - Wood	- Ext	(0.077)	19.0/0.0	60		3.09	185 Btuh
17	Frame - Wood	- Ext	(0.077)	19.0/0.0	281		3.09	868 Btuh
	Wall Total				2163(sqft)			6801 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior,	n	(0.400)		96		16.0	1536 Btuh
2	Wood - Garage,	n	(0.400)		24		16.0	384 Btuh
3	Insulated - Exterior,	n	(0.400)		40		16.0	640 Btuh
	Door Total				160(sqft)			2560Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load
1	Single as/D/Shing		(0.034)	30.0/0.0	2328		1.4	3166 Btuh
	Ceiling Total				2328(sqft)			3166Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

, FL

Project Title:
Bootle Residence
Building Type: User

6/21/2024

Floors 1	Type Slab On Grade Floor Total	Ueff. (1.180)	R-Value 0.0	Size X 269.0 ft(perim.) 2328 sqft	HTM= 47.2	Load 12697 Btuh 12697 Btuh
	Envelope Subtotal:					28385 Btuh
Infiltration	Type Natural	Wholehouse ACH 0.16	Volume(cuft) 20952	Wall Ratio 1.00	CFM= 54.1	2374 Btuh
Duct load	Extremely sealed, R6.0, Supply(Con), Return(Con) (DLM of 0.000)					0 Btuh
All Zones	Sensible Subtotal All Zones					30760 Btuh

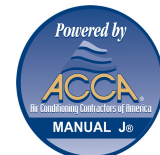
WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sens. Heat Loss Total Heat Loss	(Ex:0 cfm; Sup:0 cfm)	30760 Btuh 0 Btuh 30760 Btuh
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EQUIPMENT

1. Electric Heat Pump	#	42000 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