

Residential System Sizing Calculation

Summary

Spec House

Project Title:
Bristol Model

Lake City, FL 32024

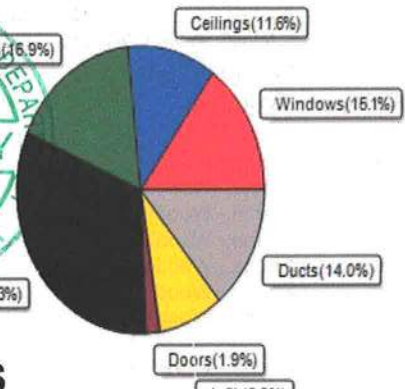
5/5/2021

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	34331 Btuh	Total cooling load calculation	28708 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	174.8 60000	Sensible (SHR = 0.80)	192.1 48000
Heat Pump + Auxiliary(0.0kW)	174.8 60000	Latent	322.8 12000
		Total (Electric Heat Pump)	209.0 60000

WINTER CALCULATIONS

Winter Heating Load (for 3119 sqft)

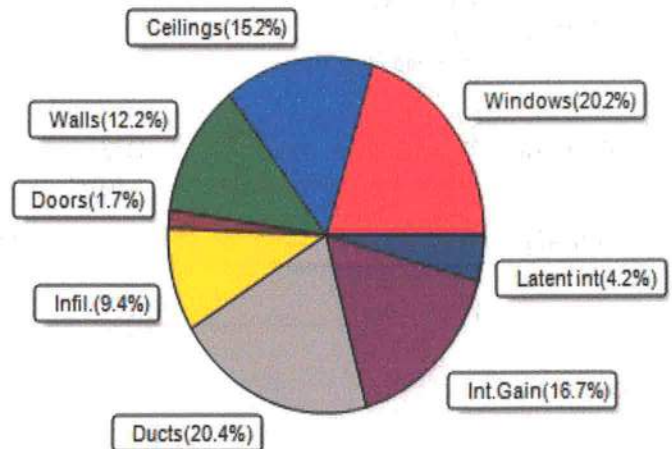
Load component		Load	
Window total	393 sqft	5192	Btuh
Wall total	1670 sqft	5790	Btuh
Door total	40 sqft	640	Btuh
Ceiling total	3119 sqft	3973	Btuh
Floor total	3119 sqft	11092	Btuh
Infiltration	65 cfm	2855	Btuh
Duct loss		4790	Btuh
Subtotal		34331	Btuh
Ventilation	0 cfm	0	Btuh
TOTAL HEAT LOSS		34331	Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 3119 sqft)

Load component		Load	
Window total	393 sqft	5812	Btuh
Wall total	1670 sqft	3510	Btuh
Door total	40 sqft	480	Btuh
Ceiling total	3119 sqft	4371	Btuh
Floor total		0	Btuh
Infiltration	49 cfm	1017	Btuh
Internal gain		4780	Btuh
Duct gain		5021	Btuh
Sens. Ventilation	0 cfm	0	Btuh
Blower Load		0	Btuh
Total sensible gain		24991	Btuh
Latent gain(ducts)		830	Btuh
Latent gain(infiltration)		1688	Btuh
Latent gain(ventilation)		0	Btuh
Latent gain(internal/occupants/other)		1200	Btuh
Total latent gain		3718	Btuh
TOTAL HEAT GAIN		28708	Btuh



8th Edition

EnergyGauge® System Sizing

PREPARED BY: _____

DATE: _____

5-5-21

System Sizing Calculations - Summer

Residential Load - Whole House Component Details

Spec House

Project Title:
Bristol Model

Lake City, FL 32024

5/5/2021

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	0.22, 0.33	No	No	N		17.8f	1.3ft	18.0	0.0	18.0	11	11	196	Btuh
2	2 NFRC	0.22, 0.33	No	No	N		9.5ft	1.3ft	144.0	0.0	144.0	11	11	1569	Btuh
3	2 NFRC	0.22, 0.33	No	No	N		1.5ft	1.3ft	54.0	0.0	54.0	11	11	588	Btuh
4	2 NFRC	0.22, 0.33	No	No	E		1.5ft	1.3ft	36.0	0.0	36.0	11	27	989	Btuh
5	2 NFRC	0.22, 0.33	No	No	E		1.5ft	1.3ft	16.0	0.0	16.0	11	27	440	Btuh
6	2 NFRC	0.22, 0.33	No	No	E		1.5ft	1.3ft	4.0	0.0	4.0	11	27	110	Btuh
7	2 NFRC	0.22, 0.33	No	No	S		12.2f	1.3ft	13.3	13.3	0.0	11	13	145	Btuh
8	2 NFRC	0.22, 0.33	No	No	S		7.5ft	1.3ft	36.0	36.0	0.0	11	13	392	Btuh
9	2 NFRC	0.22, 0.33	No	No	S		1.5ft	1.3ft	36.0	36.0	0.0	11	13	392	Btuh
10	2 NFRC	0.22, 0.33	No	No	E		1.5ft	1.3ft	36.0	0.0	36.0	11	27	989	Btuh
	Window Total								393 (sqft)					5812 Btuh	
Walls	Type	U-Value		R-Value		Area(sqft)		HTM		Load					
				Cav/Sheath											
1	Frame - Wood - Ext		0.09	13.0/0.6		105.0		2.2		231 Btuh					
2	Frame - Wood - Ext		0.09	13.0/0.6		75.0		2.2		165 Btuh					
3	Frame - Wood - Ext		0.09	13.0/0.6		120.0		2.2		264 Btuh					
4	Frame - Wood - Ext		0.09	13.0/0.6		147.0		2.2		323 Btuh					
5	Frame - Wood - Ext		0.09	13.0/0.6		78.0		2.2		171 Btuh					
6	Frame - Wood - Ext		0.09	13.0/0.6		298.0		2.2		655 Btuh					
7	Frame - Wood - Ext		0.09	13.0/0.6		41.7		2.2		92 Btuh					
8	Frame - Wood - Ext		0.09	13.0/0.6		42.0		2.2		92 Btuh					
9	Frame - Wood - Ext		0.09	13.0/0.6		87.0		2.2		191 Btuh					
10	Frame - Wood - Ext		0.09	13.0/0.6		9.0		2.2		20 Btuh					
11	Frame - Wood - Ext		0.09	13.0/0.6		87.0		2.2		191 Btuh					
12	Frame - Wood - Ext		0.09	13.0/0.6		267.0		2.2		587 Btuh					
13	Frame - Wood - Adj		0.09	13.0/0.0		313.0		1.7		528 Btuh					
	Wall Total						1670 (sqft)			3510 Btuh					
Doors	Type	Area (sqft)		HTM		Load									
1	Insulated - Exterior	20.0		12.0		240 Btuh									
2	Insulated - Garage	20.0		12.0		240 Btuh									
	Door Total						40 (sqft)			480 Btuh					
Ceilings	Type/Color/Surface	U-Value		R-Value		Area(sqft)		HTM		Load					
1	Vented Attic/Light/Shingle	0.032		30.0/0.0		3119.0		1.40		4371 Btuh					
	Ceiling Total						3119 (sqft)			4371 Btuh					
Floors	Type	R-Value		Size		HTM		Load							
1	Slab On Grade	0.0		3119 (ft-perimeter)		0.0		0 Btuh							
	Floor Total						3119.0 (sqft)			0 Btuh					
	Envelope Subtotal:											14173 Btuh			

Manual J Summer Calculations

Residential Load - Component Details (continued)

Spec House

Project Title:
Bristol Model

Climate:FL_GAINESVILLE_REGIONAL_A

Lake City, FL 32024

5/5/2021

Infiltration	Type Natural	Average ACH 0.12	Volume(cuft) 24952	Wall Ratio 1	CFM= 48.9	Load 1017 Btuh
Internal gain		Occupants 6	Btuh/occupant X 230	Appliance +	3400	Load 4780 Btuh
					Sensible Envelope Load:	19970 Btuh
Duct load	Extremely sealed, Supply(R8.0-Attic), Return(R8.0-Attic)				(DGM of 0.251)	5021 Btuh
					Sensible Load All Zones	24991 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Spec House

Project Title:
Bristol Model

Climate:FL_GAINESVILLE_REGIONAL_A

Lake City, FL 32024

5/5/2021

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	19970 Btuh
	Sensible Duct Load	5021 Btuh
	Total Sensible Zone Loads	24991 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	24991 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	1688 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	830 Btuh
	Latent occupant gain (6.0 people @ 200 Btuh per person)	1200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	3718 Btuh
	TOTAL GAIN	28708 Btuh

EQUIPMENT

1. Central Unit	#	60000 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

Spec House

Lake City, FL 32024

Project Title:
Bristol Model
Building Type: User

5/5/2021

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	0.33	N	18.0		13.2	238 Btuh
2	2, NFRC 0.22	Vinyl	0.33	N	144.0		13.2	1901 Btuh
3	2, NFRC 0.22	Vinyl	0.33	N	54.0		13.2	713 Btuh
4	2, NFRC 0.22	Vinyl	0.33	E	36.0		13.2	475 Btuh
5	2, NFRC 0.22	Vinyl	0.33	E	16.0		13.2	211 Btuh
6	2, NFRC 0.22	Vinyl	0.33	E	4.0		13.2	53 Btuh
7	2, NFRC 0.22	Vinyl	0.33	S	13.3		13.2	176 Btuh
8	2, NFRC 0.22	Vinyl	0.33	S	36.0		13.2	475 Btuh
9	2, NFRC 0.22	Vinyl	0.33	S	36.0		13.2	475 Btuh
10	2, NFRC 0.22	Vinyl	0.33	E	36.0		13.2	475 Btuh
	Window Total				393.3(sqft)			5192 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.086)	13.0/0.6	105		3.45	362 Btuh
2	Frame - Wood	- Ext	(0.086)	13.0/0.6	75		3.45	259 Btuh
3	Frame - Wood	- Ext	(0.086)	13.0/0.6	120		3.45	414 Btuh
4	Frame - Wood	- Ext	(0.086)	13.0/0.6	147		3.45	507 Btuh
5	Frame - Wood	- Ext	(0.086)	13.0/0.6	78		3.45	269 Btuh
6	Frame - Wood	- Ext	(0.086)	13.0/0.6	298		3.45	1028 Btuh
7	Frame - Wood	- Ext	(0.086)	13.0/0.6	42		3.45	144 Btuh
8	Frame - Wood	- Ext	(0.086)	13.0/0.6	42		3.45	145 Btuh
9	Frame - Wood	- Ext	(0.086)	13.0/0.6	87		3.45	300 Btuh
10	Frame - Wood	- Ext	(0.086)	13.0/0.6	9		3.45	31 Btuh
11	Frame - Wood	- Ext	(0.086)	13.0/0.6	87		3.45	300 Btuh
12	Frame - Wood	- Ext	(0.086)	13.0/0.6	267		3.45	921 Btuh
13	Frame - Wood	- Adj	(0.089)	13.0/0.0	313		3.55	1111 Btuh
	Wall Total				1670(sqft)			5790 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior, n		(0.400)		20		16.0	320 Btuh
2	Insulated - Garage, n		(0.400)		20		16.0	320 Btuh
	Door Total				40(sqft)			640Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load
1	Vented Attic/L/Shing		(0.032)	30.0/0.0	3119		1.3	3973 Btuh
	Ceiling Total				3119(sqft)			3973Btuh
Floors	Type		Ueff.	R-Value	Size	X	HTM=	Load
1	Slab On Grade		(1.180)	0.0	235.0 ft(perim.)		47.2	11092 Btuh
	Floor Total				3119 sqft			11092 Btuh
	Envelope Subtotal:							26687 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Spec House

Lake City, FL 32024

Project Title:
Bristol Model
Building Type: User

5/5/2021

Infiltration	Type Natural	Wholehouse ACH 0.16	Volume(cuft) 24952	Wall Ratio 1.00	CFM= 65.2	2855 Btuh
Duct load	Extremely sealed, R8.0, Supply(Att), Return(Att) (DLM of 0.162)					4790 Btuh
All Zones	Sensible Subtotal All Zones					34331 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	34331 Btuh 0 Btuh 34331 Btuh
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EQUIPMENT

1. Electric Heat Pump	#	60000 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