

Residential System Sizing Calculation

Summary

Bryan & Robin Smithey
Brown Road
Lake City, FL

Project Title:
241153 Smithey Res

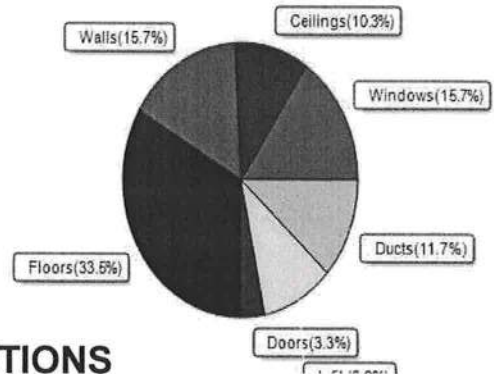
2024-11-04

Location for weather data: Gainesville, FL - Defaults: Latitude(30) Altitude(164 ft.) Temp Range(M)					
Humidity data: Interior RH (50%) Outdoor wet bulb (78F) Humidity difference(47gr.)					
Winter design temperature(MJ8 99%/Cu) 30 F			Summer design temperature(MJ8 99%/Cu) 100 F		
Winter setpoint 70 F			Summer setpoint 75 F		
Winter temperature difference 40 F			Summer temperature difference 25 F		
Total heating load calculation 26072 Btuh			Total cooling load calculation 21782 Btuh		
Submitted heating capacity % of calc Btuh			Submitted cooling capacity % of calc Btuh		
Total (Electric Heat Pump) 107.4 28000			Sensible (SHR = 0.75) 112.7 21000		
Heat Pump + Auxiliary(0.0kW) 107.4 28000			Latent 222.5 7000		
			Total (Electric Heat Pump) 128.5 28000		

WINTER CALCULATIONS

Winter Heating Load (for 1913 sqft)

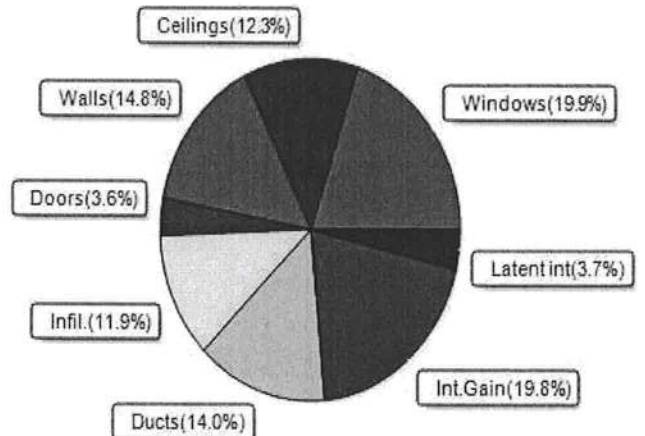
Load component		Load
Window total	291 sqft	4080 Btuh
Wall total	1153 sqft	4093 Btuh
Door total	54 sqft	871 Btuh
Ceiling total	2224 sqft	2680 Btuh
Floor total	1913 sqft	8732 Btuh
Infiltration	58 cfm	2554 Btuh
Duct loss		3061 Btuh
Subtotal		26072 Btuh
Ventilation	Ex:0 cfm; Sup:0 cfm	0 Btuh
TOTAL HEAT LOSS		26072 Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 1913 sqft)

Load component		Load
Window total	291 sqft	4343 Btuh
Wall total	1153 sqft	3223 Btuh
Door total	54 sqft	784 Btuh
Ceiling total	2224 sqft	2680 Btuh
Floor total		0 Btuh
Infiltration	44 cfm	1197 Btuh
Internal gain		4320 Btuh
Duct gain		2089 Btuh
Sens. Ventilation	Ex:0 cfm; Sup:0 cfm	0 Btuh
Blower Load		0 Btuh
Total sensible gain		18636 Btuh
Latent gain(ducts)		955 Btuh
Latent gain(infiltration)		1391 Btuh
Latent gain(ventilation)		0 Btuh
Latent gain(internal/occupants/other)		800 Btuh
Total latent gain		3147 Btuh
TOTAL HEAT GAIN		21782 Btuh



8th Edition

EnergyGauge® System Sizing
PREPARED BY: Evan Beamsley
DATE: 2024-11-04

EnergyGauge® / USRCZB v8.1.00

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Bryan & Robin Smithey
Brown Road
Lake City, FL

Project Title:
241153 Smithey Res
Building Type: User

2024-11-04

Reference City: Gainesville, FL (Defaults) Winter Temperature Difference: 40.0 °F (MJ8 99%/Cu)
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 0.25	Metal	0.35	N	22.2		14.0	311 Btuh
2	2, NFRC 0.25	Metal	0.35	N	60.0		14.0	840 Btuh
3	2, NFRC 0.25	Metal	0.35	N	24.4		14.0	342 Btuh
4	2, NFRC 0.25	Metal	0.35	N	30.0		14.0	420 Btuh
5	2, NFRC 0.25	Metal	0.35	E	45.0		14.0	630 Btuh
6	2, NFRC 0.25	Metal	0.35	S	15.0		14.0	210 Btuh
7	2, NFRC 0.25	Metal	0.35	S	10.0		14.0	140 Btuh
8	2, NFRC 0.25	Metal	0.35	S	18.0		14.0	252 Btuh
9	2, NFRC 0.25	Metal	0.35	S	17.8		14.0	249 Btuh
10	2, NFRC 0.25	Metal	0.35	S	9.0		14.0	126 Btuh
11	2, NFRC 0.25	Metal	0.35	S	8.0		14.0	112 Btuh
12	2, NFRC 0.25	Metal	0.35	W	8.0		14.0	112 Btuh
13	2, NFRC 0.25	Metal	0.35	W	24.0		14.0	336 Btuh
Window Total					291.4(sqft)			4080 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	313		3.55	1110 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	51		3.55	182 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	24		3.55	85 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	140		3.55	496 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	72		3.55	257 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	25		3.55	90 Btuh
7	Frame - Wood	- Ext	(0.089)	13.0/0.0	298		3.55	1058 Btuh
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	229		3.55	814 Btuh
Wall Total					1153(sqft)			4093 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior,	n	(0.400)		13		16.0	213 Btuh
2	Insulated - Exterior,	n	(0.400)		13		16.0	213 Btuh
3	Insulated - Exterior,	n	(0.400)		10		16.0	160 Btuh
4	Insulated - Exterior,	n	(0.400)		18		16.0	284 Btuh
Door Total					54(sqft)			871Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load
1	Flat ceil/D/Metal		(0.241)	0.0/22.0	1197		1.2	1442 Btuh
2	Sloped ce/D/Metal		(0.241)	0.0/22.0	776		1.2	935 Btuh
3	Knee wall/D/Metal		(0.241)	0.0/22.0	251		1.2	302 Btuh
Ceiling Total					2224(sqft)			2680Btuh
Floors	Type		Ueff.	R-Value	Size	X	HTM=	Load
1	Slab On Grade		(1.180)	0.0	185.0 ft(perim.)		47.2	8732 Btuh
Floor Total					1913 sqft			8732 Btuh
Envelope Subtotal:								20456 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Bryan & Robin Smithey
Brown Road
Lake City, FL

Project Title:
241153 Smithey Res
Building Type: User

2024-11-04

Infiltration	Type Natural	Wholehouse ACH 0.20	Volume(cuft) 17600	Wall Ratio 1.00	CFM= 58.3	2554 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att)				(DLM of 0.133)	3061 Btuh
All Zones	Sensible Subtotal All Zones					26072 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss	26072 Btuh
	Ventilation Sens. Heat Loss (Ex:0 cfm; Sup:0 cfm)	0 Btuh
	Total Heat Loss	26072 Btuh

EQUIPMENT

1. Electric Heat Pump	#	28000 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

Bryan & Robin Smithey
Brown Road
Lake City, FL

Project Title:
241153 Smithey Res

2024-11-04

Reference City: Gainesville, FL (Defaults)
Humidity difference: 47gr.

Temperature Difference: 25.0F(MJ8 99%/Cu)
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	0.25, 0.35	No	No	N	13.5f	0.3ft	22.2	22.2	0.0	14	16	311	Btuh
2	2 NFRC	0.25, 0.35	No	No	N	13.5f	0.3ft	60.0	60.0	0.0	14	16	840	Btuh
3	2 NFRC	0.25, 0.35	No	No	N	13.5f	0.3ft	24.4	24.4	0.0	14	16	342	Btuh
4	2 NFRC	0.25, 0.35	No	No	N	13.5f	0.3ft	30.0	30.0	0.0	14	16	420	Btuh
5	2 NFRC	0.25, 0.35	No	No	E	5.5ft	0.3ft	45.0	38.1	6.9	14	33	760	Btuh
6	2 NFRC	0.25, 0.35	No	No	S	12.7f	0.3ft	15.0	0.0	15.0	14	14	210	Btuh
7	2 NFRC	0.25, 0.35	No	No	S	9.5ft	0.3ft	10.0	0.0	10.0	14	14	140	Btuh
8	2 NFRC	0.25, 0.35	No	No	S	9.5ft	4.0ft	18.0	0.0	18.0	14	14	252	Btuh
9	2 NFRC	0.25, 0.35	No	No	S	9.5ft	4.0ft	17.8	0.0	17.8	14	14	249	Btuh
10	2 NFRC	0.25, 0.35	No	No	S	9.5ft	0.3ft	9.0	0.0	9.0	14	14	126	Btuh
11	2 NFRC	0.25, 0.35	No	No	S	9.5ft	0.3ft	8.0	0.0	8.0	14	14	112	Btuh
12	2 NFRC	0.25, 0.35	No	No	W	5.5ft	0.3ft	8.0	8.0	0.0	14	33	112	Btuh
13	2 NFRC	0.25, 0.35	No	No	W	5.5ft	0.3ft	24.0	16.9	7.1	14	33	469	Btuh
	Window Total							291 (sqft)					4343 Btuh	
Walls	Type		U-Value		R-Value		Area(sqft)		HTM		Load			
					Cav/Sheath									
1	Frame - Wood - Ext		0.09		13.0/0.0		312.7		2.8		874 Btuh			
2	Frame - Wood - Ext		0.09		13.0/0.0		51.3		2.8		144 Btuh			
3	Frame - Wood - Ext		0.09		13.0/0.0		24.0		2.8		67 Btuh			
4	Frame - Wood - Ext		0.09		13.0/0.0		139.7		2.8		390 Btuh			
5	Frame - Wood - Ext		0.09		13.0/0.0		72.3		2.8		202 Btuh			
6	Frame - Wood - Ext		0.09		13.0/0.0		25.3		2.8		71 Btuh			
7	Frame - Wood - Ext		0.09		13.0/0.0		298.1		2.8		833 Btuh			
8	Frame - Wood - Ext		0.09		13.0/0.0		229.3		2.8		641 Btuh			
	Wall Total							1153 (sqft)			3223 Btuh			
Doors	Type		Area (sqft)		HTM		Load							
1	Insulated - Exterior		13.3		14.4		192 Btuh							
2	Insulated - Exterior		13.3		14.4		192 Btuh							
3	Insulated - Exterior		10.0		14.4		144 Btuh							
4	Insulated - Exterior		17.8		14.4		256 Btuh							
	Door Total							54 (sqft)			784 Btuh			
Ceilings	Type/Color/Surface		U-Value		R-Value		Area(sqft)		HTM		Load			
1	Unvented Attic/DarkMetal		0.241		0.0/22.0		1197.0		1.20		1442 Btuh			
2	Unvented Attic/DarkMetal		0.241		0.0/22.0		776.0		1.20		935 Btuh			
3	Knee wall to attic/DarkMetal		0.241		0.0/22.0		251.0		1.20		302 Btuh			
	Ceiling Total							2224 (sqft)			2680 Btuh			
Floors	Type		R-Value		Size		HTM		Load					
1	Slab On Grade		0.0		1913 (ft-perimeter)		0.0		0 Btuh					
	Floor Total							1913.0 (sqft)			0 Btuh			
	Envelope Subtotal:											11030 Btuh		

Manual J Summer Calculations

Residential Load - Component Details (continued)

Bryan & Robin Smithey
Brown Road
Lake City, FL

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
241153 Smithey Res

2024-11-04

Infiltration	Type Natural	Average ACH 0.15	Volume(cuft) 17600	Wall Ratio 1	CFM= 43.8	Load 1197 Btuh
Internal gain		Occupants 4	Btuh/occupant X 230	Appliance +	3400	Load 4320 Btuh
	Sensible Envelope Load:					16547 Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic)				(DGM of 0.126)	2089 Btuh
	Sensible Load All Zones					18636 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Bryan & Robin Smithey
Brown Road
Lake City, FL

Project Title:
241153 Smithey Res

Climate:FL_GAINESVILLE_REGIONAL_A

2024-11-04

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	16547 Btuh
	Sensible Duct Load	2089 Btuh
	Total Sensible Zone Loads	18636 Btuh
	Sensible ventilation (Ex:0 cfm; Sup:0 cfm)	0 Btuh
	Blower	0 Btuh
	Total sensible gain	18636 Btuh
	Latent infiltration gain (for 47 gr. humidity difference)	1391 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	955 Btuh
	Latent occupant gain (4.0 people @ 200 Btuh per person)	800 Btuh
	Latent other gain	0 Btuh
	Latent total gain	3147 Btuh
	TOTAL GAIN	21782 Btuh

EQUIPMENT

1. Central Unit	#	28000 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