

Residential System Sizing Calculation

Summary

Mother-in-law Suite
Lot 9 Southern Approches
Lake City, FL

Project Title:
200713 Abbate - Suite

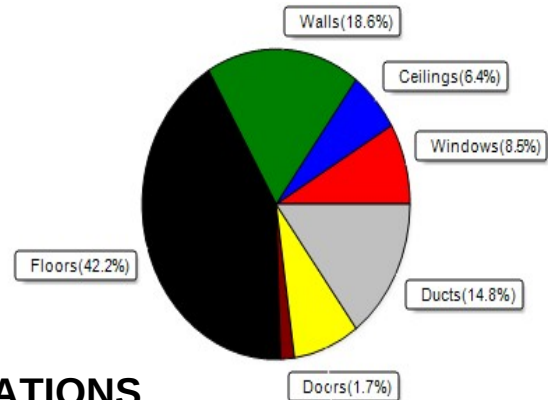
2020-07-15

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	12756 Btuh	Total cooling load calculation	11191 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	109.7 14000	Sensible (SHR = 0.75)	112.8 10500
Heat Pump + Auxiliary(0.0kW)	109.7 14000	Latent	186.0 3500
		Total (Electric Heat Pump)	125.1 14000

WINTER CALCULATIONS

Winter Heating Load (for 800 sqft)

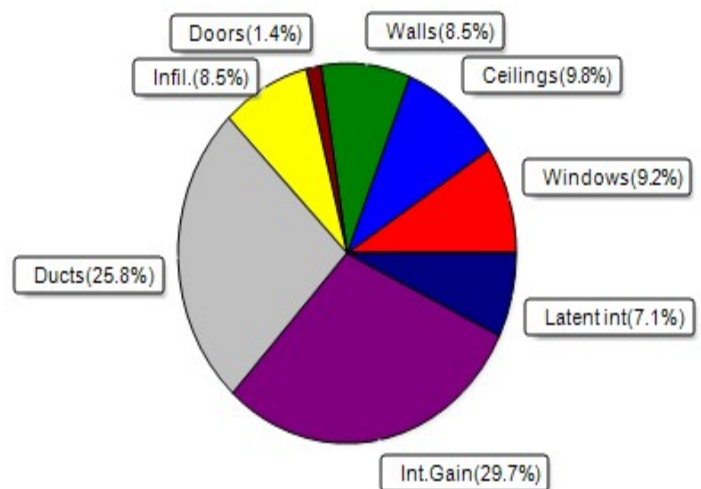
Load component		Load	
Window total	85 sqft	1084	Btuh
Wall total	745 sqft	2376	Btuh
Door total	13 sqft	213	Btuh
Ceiling total	800 sqft	812	Btuh
Floor total	800 sqft	5381	Btuh
Infiltration	23 cfm	1001	Btuh
Duct loss		1890	Btuh
Subtotal		12756	Btuh
Ventilation	0 cfm	0	Btuh
TOTAL HEAT LOSS		12756	Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 800 sqft)

Load component		Load	
Window total	85 sqft	1028	Btuh
Wall total	745 sqft	950	Btuh
Door total	13 sqft	160	Btuh
Ceiling total	800 sqft	1096	Btuh
Floor total		0	Btuh
Infiltration	17 cfm	356	Btuh
Internal gain		3320	Btuh
Duct gain		2399	Btuh
Sens. Ventilation	0 cfm	0	Btuh
Blower Load		0	Btuh
Total sensible gain		9310	Btuh
Latent gain(ducts)		490	Btuh
Latent gain(infiltration)		591	Btuh
Latent gain(ventilation)		0	Btuh
Latent gain(internal/occupants/other)		800	Btuh
Total latent gain		1881	Btuh
TOTAL HEAT GAIN		11191	Btuh



8th Edition

EnergyGauge® System Sizing
PREPARED BY: **Evan Beamsley**
DATE: **2020-07-15**

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Mother-in-law Suite
Lot 9 Southern Approches
Lake City, FL

Project Title:
200713 Abbate - Suite
Building Type: User

2020-07-15

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	Metal	0.32	S	30.0		12.8	384 Btuh
2	2, NFRC 0.22	Metal	0.32	S	6.7		12.8	85 Btuh
3	2, NFRC 0.22	Metal	0.32	W	15.0		12.8	192 Btuh
4	2, NFRC 0.22	Metal	0.32	N	30.0		12.8	384 Btuh
5	2, NFRC 0.22	Metal	0.32	N	3.0		12.8	38 Btuh
	Window Total					84.7(sqft)		1084 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Face Br - Wood	- Ext	(0.080)	13.0/0.0	200		3.19	638 Btuh
2	Face Br - Wood	- Ext	(0.080)	13.0/0.0	209		3.19	666 Btuh
3	Face Br - Wood	- Ext	(0.080)	13.0/0.0	113		3.19	360 Btuh
4	Face Br - Wood	- Ext	(0.080)	13.0/0.0	223		3.19	711 Btuh
	Wall Total					745(sqft)		2376 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior, n		(0.400)		13		16.0	213 Btuh
	Door Total					13(sqft)		213Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load
1	Vented Attic/D/Shing		(0.025)	38.0/0.0	800		1.0	812 Btuh
	Ceiling Total					800(sqft)		812Btuh
Floors	Type		Ueff.	R-Value	Size	X	HTM=	Load
1	Slab On Grade		(1.180)	0.0	114.0 ft(perim.)		47.2	5381 Btuh
	Floor Total					800 sqft		5381 Btuh
	Envelope Subtotal:							9866 Btuh
Infiltration	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio	CFM=		
	Natural		0.21	6400	1.00	22.8		1001 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att)						(DLM of 0.174)	1890 Btuh
All Zones	Sensible Subtotal All Zones							12756 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Mother-in-law Suite
Lot 9 Southern Approches
Lake City, FL

Project Title:
200713 Abbate - Suite
Building Type: User

2020-07-15

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss	12756 Btuh
	Ventilation Sensible Heat Loss	0 Btuh
	Total Heat Loss	12756 Btuh

EQUIPMENT

1. Electric Heat Pump	#	14000 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

Mother-in-law Suite
Lot 9 Southern Approches
Lake City, FL

Project Title:
200713 Abbate - Suite

2020-07-15

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, 0.32	No	No	S		1.5ft	0.7ft	30.0	30.0	0.0	11	12	321	Btuh	
2	2 NFRC	0.22, 0.32	No	No	S		1.5ft	0.7ft	6.7	6.7	0.0	11	12	71	Btuh	
3	2 NFRC	0.22, 0.32	No	No	W		16.0f	0.7ft	15.0	15.0	0.0	11	27	161	Btuh	
4	2 NFRC	0.22, 0.32	No	No	N		1.5ft	0.7ft	30.0	0.0	30.0	11	11	321	Btuh	
5	2 NFRC	0.22, 0.32	No	No	N		1.5ft	0.7ft	3.0	0.0	3.0	11	11	32	Btuh	
	Excursion													121	Btuh	
	Window Total								85 (sqft)					1028 Btuh		
Walls	Type						U-Value		R-Value		Area(sqft)		HTM		Load	
							Cav/Sheath									
1	Face Brick - Wood - Ext						0.08		13.0/0.0		200.0		1.3		255 Btuh	
2	Face Brick - Wood - Ext						0.08		13.0/0.0		208.7		1.3		266 Btuh	
3	Face Brick - Wood - Ext						0.08		13.0/0.0		113.0		1.3		144 Btuh	
4	Face Brick - Wood - Ext						0.08		13.0/0.0		223.0		1.3		285 Btuh	
	Wall Total										745 (sqft)				950 Btuh	
Doors	Type								Area (sqft)		HTM		Load			
	Insulated - Exterior								13.3		12.0		160 Btuh			
	Door Total								13 (sqft)				160 Btuh			
Ceilings	Type/Color/Surface						U-Value		R-Value		Area(sqft)		HTM		Load	
	Vented Attic/DarkShingle						0.025		38.0/0.0		800.0		1.37		1096 Btuh	
	Ceiling Total										800 (sqft)				1096 Btuh	
Floors	Type								R-Value		Size		HTM		Load	
	Slab On Grade								0.0		800 (ft-perimeter)		0.0		0 Btuh	
	Floor Total										800.0 (sqft)				0 Btuh	
	Envelope Subtotal:													3234 Btuh		
Infiltration	Type						Average ACH		Volume(cuft)		Wall Ratio		CFM=		Load	
	Natural						0.16		6400		1		17.1		356 Btuh	
Internal gain							Occupants		Btuh/occupant		Appliance		Load			
							4		X 230		+		2400		3320 Btuh	
	Sensible Envelope Load:													6911 Btuh		
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic) (DGM of 0.347)													2399 Btuh		
	Sensible Load All Zones													9310 Btuh		

Manual J Summer Calculations

Residential Load - Component Details (continued)

Mother-in-law Suite
Lot 9 Southern Approches
Lake City, FL

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
200713 Abbate - Suite

2020-07-15

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	6911 Btuh
	Sensible Duct Load	2399 Btuh
	Total Sensible Zone Loads	9310 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	9310 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	591 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	490 Btuh
	Latent occupant gain (4.0 people @ 200 Btuh per person)	800 Btuh
	Latent other gain	0 Btuh
	Latent total gain	1881 Btuh
	TOTAL GAIN	11191 Btuh

EQUIPMENT

1. Central Unit	#	14000 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