

Residential System Sizing Calculation

Summary

Project Title:
Benson Residence

Ft White, FL

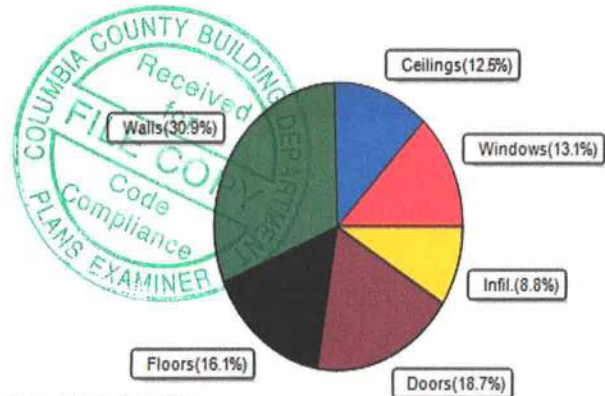
9/8/2020

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			6853	Btuh	
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	262.7	18000	Sensible (SHR = 0.85)	230.9	15300
Heat Pump + Auxiliary(0.0kW)	262.7	18000	Latent	486.6	2700
			Total (Electric Heat Pump)	250.7	18000

WINTER CALCULATIONS

Winter Heating Load (for 672 sqft)

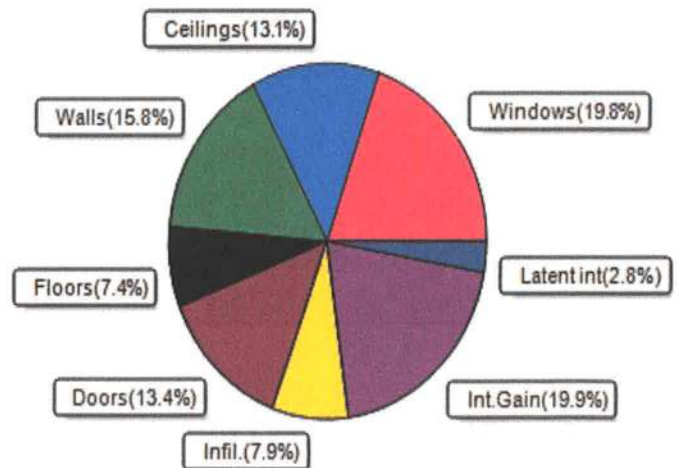
Load component		Load	
Window total	68 sqft	898	Btuh
Wall total	684 sqft	2114	Btuh
Door total	80 sqft	1280	Btuh
Ceiling total	672 sqft	856	Btuh
Floor total	672 sqft	1104	Btuh
Infiltration	14 cfm	600	Btuh
Duct loss		0	Btuh
Subtotal		6853	Btuh
Ventilation	0 cfm	0	Btuh
TOTAL HEAT LOSS		6853	Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 672 sqft)

Load component		Load	
Window total	68 sqft	1421	Btuh
Wall total	684 sqft	1131	Btuh
Door total	80 sqft	960	Btuh
Ceiling total	672 sqft	942	Btuh
Floor total		528	Btuh
Infiltration	10 cfm	214	Btuh
Internal gain		1430	Btuh
Duct gain		0	Btuh
Sens. Ventilation	0 cfm	0	Btuh
Blower Load		0	Btuh
Total sensible gain		6625	Btuh
Latent gain(ducts)		0	Btuh
Latent gain(infiltration)		355	Btuh
Latent gain(ventilation)		0	Btuh
Latent gain(internal/occupants/other)		200	Btuh
Total latent gain		555	Btuh
TOTAL HEAT GAIN		7180	Btuh



8th Edition

EnergyGauge® System Sizing

PREPARED BY: _____

DATE: _____

9-8-20

System Sizing Calculations - Summer

Residential Load - Whole House Component Details

Project Title:
Benson Residence

Ft White, FL

9/8/2020

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	E		1.5ft	1.3ft	15.0	0.0	15.0	11	27	412	Btuh
2	2 NFRC	0.22, 0.33	No	No	S		1.5ft	1.3ft	12.0	12.0	0.0	11	13	131	Btuh
3	2 NFRC	0.22, 0.33	No	No	S		1.5ft	1.3ft	15.0	15.0	0.0	11	13	163	Btuh
4	2 NFRC	0.22, 0.33	No	No	W		1.5ft	1.3ft	20.0	0.0	20.0	11	27	550	Btuh
5	2 NFRC	0.22, 0.33	No	No	W		1.5ft	1.3ft	6.0	0.0	6.0	11	27	165	Btuh
	Window Total								68 (sqft)					1421 Btuh	
Walls	Type					U-Value	R-Value		Area(sqft)		HTM		Load		
							Cav/Sheath								
1	Frame - Wood - Ext					0.08	19.0/0.0		184.0		1.7		304 Btuh		
2	Frame - Wood - Ext					0.08	19.0/0.0		157.0		1.7		260 Btuh		
3	Frame - Wood - Ext					0.08	19.0/0.0		177.0		1.7		293 Btuh		
4	Frame - Wood - Ext					0.08	19.0/0.0		166.0		1.7		275 Btuh		
	Wall Total								684 (sqft)					1131 Btuh	
Doors	Type								Area (sqft)		HTM		Load		
1	Insulated - Exterior								40.0		12.0		480 Btuh		
2	Insulated - Exterior								20.0		12.0		240 Btuh		
3	Insulated - Exterior								20.0		12.0		240 Btuh		
	Door Total								80 (sqft)					960 Btuh	
Ceilings	Type/Color/Surface					U-Value	R-Value		Area(sqft)		HTM		Load		
1	Vented Attic/Light/Metal					0.032	30.0/0.0		672.0		1.40		942 Btuh		
	Ceiling Total								672 (sqft)					942 Btuh	
Floors	Type						R-Value		Size		HTM		Load		
1	Stem/Crawlsp(v)						19.0		672 (sqft)		0.8		528 Btuh		
	Floor Total								672.0 (sqft)					528 Btuh	
	Envelope Subtotal:													4982 Btuh	
Infiltration	Type					Average ACH		Volume(cuft)		Wall Ratio		CFM=		Load	
	Natural					0.11		5376		1		10.3		214 Btuh	
Internal gain						Occupants		Btuh/occupant		Appliance		Load			
						1		X 230		+		1200		1430 Btuh	
	Sensible Envelope Load:													6625 Btuh	
Duct load	Extremely sealed, Supply(R6.0-Condi), Return(R6.0-Condi) (DGM of 0.000)													0 Btuh	
	Sensible Load All Zones													6625 Btuh	

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title: Benson Residence Climate: FL_GAINESVILLE_REGIONAL_A

Ft White, FL

9/8/2020

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	6625 Btuh
	Sensible Duct Load	0 Btuh
	Total Sensible Zone Loads	6625 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	6625 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	355 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	0 Btuh
	Latent occupant gain (1.0 people @ 200 Btuh per person)	200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	555 Btuh
	TOTAL GAIN	7180 Btuh

EQUIPMENT

1. Central Unit	#	18000 Btuh
-----------------	---	------------

*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

Ft White, FL

Project Title:
Benson Residence
Building Type: User

9/8/2020

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	E	15.0		13.2	198 Btuh
2	2, NFRC 0.22	Vinyl	0.33	S	12.0		13.2	158 Btuh
3	2, NFRC 0.22	Vinyl	0.33	S	15.0		13.2	198 Btuh
4	2, NFRC 0.22	Vinyl	0.33	W	20.0		13.2	264 Btuh
5	2, NFRC 0.22	Vinyl	0.33	W	6.0		13.2	79 Btuh
	Window Total				68.0(sqft)			898 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.077)	19.0/0.0	184		3.09	569 Btuh
2	Frame - Wood	- Ext	(0.077)	19.0/0.0	157		3.09	485 Btuh
3	Frame - Wood	- Ext	(0.077)	19.0/0.0	177		3.09	547 Btuh
4	Frame - Wood	- Ext	(0.077)	19.0/0.0	166		3.09	513 Btuh
	Wall Total				684(sqft)			2114 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior, n		(0.400)		40		16.0	640 Btuh
2	Insulated - Exterior, n		(0.400)		20		16.0	320 Btuh
3	Insulated - Exterior, n		(0.400)		20		16.0	320 Btuh
	Door Total				80(sqft)			1280Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load
1	Vented Attic/L/Metal		(0.032)	30.0/0.0	672		1.3	856 Btuh
	Ceiling Total				672(sqft)			856Btuh
Floors	Type		Ueff.	R-Value	Size	X	HTM=	Load
1	Stem/Crawlsp(Wood)(v)		(0.052)	19.0/0.0	672.0	sqft	1.6	1104 Btuh
	Floor Total				672		sqft	1104 Btuh
	Envelope Subtotal:							6252 Btuh
Infiltration	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio	CFM=		
	Natural		0.15	5376	1.00	13.7		600 Btuh
Duct load	Extremely sealed, R6.0, Supply(Con), Return(Con)						(DLM of 0.000)	0 Btuh
All Zones	Sensible Subtotal All Zones							6853 Btuh