

Residential System Sizing Calculation

Summary

Project Title:
Cruce Residence

, FL

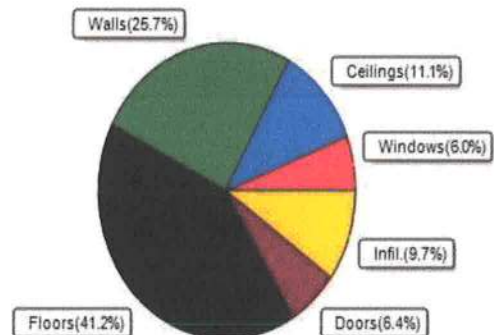
6/2/2023

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	18334 Btuh	Total cooling load calculation	12050 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	196.4 36000	Sensible (SHR = 0.85)	288.6 30600
Heat Pump + Auxiliary(0.0kW)	196.4 36000	Latent	372.9 5400
		Total (Electric Heat Pump)	298.7 36000

WINTER CALCULATIONS

Winter Heating Load (for 1500 sqft)

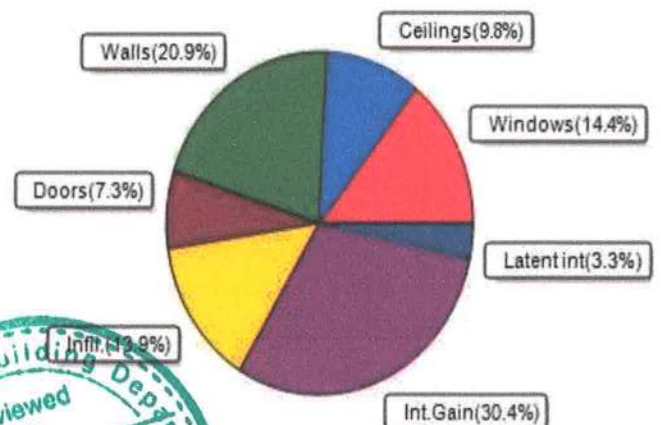
Load component	Load
Window total 105 sqft	1092 Btuh
Wall total 1522 sqft	4703 Btuh
Door total 73 sqft	1173 Btuh
Ceiling total 1500 sqft	2040 Btuh
Floor total 1500 sqft	7552 Btuh
Infiltration 40 cfm	1773 Btuh
Duct loss	0 Btuh
Subtotal	18334 Btuh
Ventilation Ex:0 cfm; Sup:0 cfm	0 Btuh
TOTAL HEAT LOSS	18334 Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 1500 sqft)

Load component	Load
Window total 105 sqft	1729 Btuh
Wall total 1522 sqft	2516 Btuh
Door total 73 sqft	880 Btuh
Ceiling total 1500 sqft	1185 Btuh
Floor total	0 Btuh
Infiltration 30 cfm	632 Btuh
Internal gain	3660 Btuh
Duct gain	0 Btuh
Sens. Ventilation Ex:0 cfm; Sup:0 cfm	0 Btuh
Blower Load	0 Btuh
Total sensible gain	10602 Btuh
Latent gain(ducts)	0 Btuh
Latent gain(infiltration)	1048 Btuh
Latent gain(ventilation)	0 Btuh
Latent gain(internal/occupants/other)	400 Btuh
Total latent gain	1448 Btuh
TOTAL HEAT GAIN	12050 Btuh



8th Edition

EnergyGauge® / USRCZB v7.5.01



EnergyGauge® System Sizing

PREPARED BY:

DATE:

6-2-23

System Sizing Calculations - Summer

Residential Load - Whole House Component Details

Project Title:
Cruce Residence

, FL

6/2/2023

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	6.0	0.0	6.0	9	9	55 Btuh
2	2 NFRC	0.20, 0.26	No	No	N		1.5ft	2.3ft	9.0	0.0	9.0	9	9	82 Btuh
3	2 NFRC	0.20, 0.26	No	No	E		1.5ft	2.3ft	6.0	0.0	6.0	9	24	145 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	30.0	30.0	0.0	9	11	274 Btuh
6	2 NFRC	0.20, 0.26	No	No	S		1.5ft	2.3ft	9.0	9.0	0.0	9	11	82 Btuh
7	2 NFRC	0.20, 0.26	No	No	W		1.5ft	2.3ft	15.0	0.0	15.0	9	24	363 Btuh
Window Total									105 (sqft)					1729 Btuh
Walls	Type		U-Value		R-Value		Area(sqft)		HTM		Load			
					Cav/Sheath									
1	Frame - Wood - Ext		0.08		19.0/0.0		265.0		1.7		438 Btuh			
2	Frame - Wood - Ext		0.08		19.0/0.0		564.0		1.7		933 Btuh			
3	Frame - Wood - Ext		0.08		19.0/0.0		227.7		1.7		376 Btuh			
4	Frame - Wood - Ext		0.08		19.0/0.0		465.0		1.7		769 Btuh			
Wall Total							1522 (sqft)					2516 Btuh		
Doors	Type		Area (sqft)		HTM		Load							
1	Insulated - Exterior		20.0		12.0		240 Btuh							
2	Insulated - Exterior		33.3		12.0		400 Btuh							
3	Insulated - Exterior		20.0		12.0		240 Btuh							
Door Total							73 (sqft)					880 Btuh		
Ceilings	Type/Color/Surface		U-Value		R-Value		Area(sqft)		HTM		Load			
1	SnglAsmb no airsp/Light/Metal		0.034		30.0/0.0		1500.0		0.79		1185 Btuh			
Ceiling Total							1500 (sqft)					1185 Btuh		
Floors	Type		R-Value		Size		HTM		Load					
1	Slab On Grade		0.0		1500 (ft-perimeter)		0.0		0 Btuh					
Floor Total							1500.0 (sqft)					0 Btuh		
	Envelope Subtotal:											6311 Btuh		
Infiltration	Type		Average ACH		Volume(cuft)		Wall Ratio		CFM=		Load			
	Natural		0.12		15000		1		30.3		632 Btuh			
Internal gain	Occupants		Btuh/occupant		Appliance		Load							
	2		X 230		+		3200		3660 Btuh					
	Sensible Envelope Load:											10602 Btuh		
Duct load	NA, Supply(R0.0-None), Return(R0.0-None) (DGM of 0.000)											0 Btuh		
	Sensible Load All Zones											10602 Btuh		

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
Cruce Residence

, FL

6/2/2023

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	10602 Btuh
	Sensible Duct Load	0 Btuh
	Total Sensible Zone Loads	10602 Btuh
	Sensible ventilation (Ex:0 cfm; Sup:0 cfm)	0 Btuh
	Blower	0 Btuh
	Total sensible gain	10602 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	1048 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	0 Btuh
	Latent occupant gain (2.0 people @ 200 Btuh per person)	400 Btuh
	Latent other gain	0 Btuh
	Latent total gain	1448 Btuh
	TOTAL GAIN	12050 Btuh

EQUIPMENT

1. PTAC and Room Unit	#	36000 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:
Cruce Residence
Building Type: User

, FL

6/2/2023

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	6.0		10.4	62 Btuh
2	2, NFRC 0.20	Vinyl	0.26	N	9.0		10.4	94 Btuh
3	2, NFRC 0.20	Vinyl	0.26	E	6.0		10.4	62 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	30.0		10.4	312 Btuh
6	2, NFRC 0.20	Vinyl	0.26	S	9.0		10.4	94 Btuh
7	2, NFRC 0.20	Vinyl	0.26	W	15.0		10.4	156 Btuh
	Window Total					105.0(sqft)		1092 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.077)	19.0/0.0	265		3.09	819 Btuh
2	Frame - Wood	- Ext	(0.077)	19.0/0.0	564		3.09	1743 Btuh
3	Frame - Wood	- Ext	(0.077)	19.0/0.0	228		3.09	704 Btuh
4	Frame - Wood	- Ext	(0.077)	19.0/0.0	465		3.09	1437 Btuh
	Wall Total					1522(sqft)		4703 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior,	n	(0.400)		20		16.0	320 Btuh
2	Insulated - Exterior,	n	(0.400)		33		16.0	533 Btuh
3	Insulated - Exterior,	n	(0.400)		20		16.0	320 Btuh
	Door Total					73(sqft)		1173Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load
1	Single as/L/Metal		(0.034)	30.0/0.0	1500		1.4	2040 Btuh
	Ceiling Total					1500(sqft)		2040Btuh
Floors	Type		Ueff.	R-Value	Size	X	HTM=	Load
1	Slab On Grade		(1.180)	0.0	160.0 ft(perim.)		47.2	7552 Btuh
	Floor Total					1500 sqft		7552 Btuh
	Envelope Subtotal:							16561 Btuh
Infiltration	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio	CFM=		
	Natural		0.16	15000	1.00	40.4		1773 Btuh
Duct load	NA, R0.0, Supply(), Return()						(DLM of 0.000)	0 Btuh
All Zones	Sensible Subtotal All Zones							18334 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Project Title:
Cruce Residence
Building Type: User

, FL

6/2/2023

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss	18334 Btuh
	Ventilation Sens. Heat Loss (Ex:0 cfm; Sup:0 cfm)	0 Btuh
	Total Heat Loss	18334 Btuh

EQUIPMENT

1. Electric Heat Pump	#	36000 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