

# Residential System Sizing Calculation

## Summary

Project Title:  
Tuell Residence

, FL

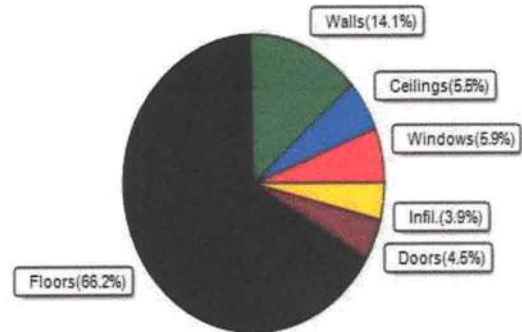
7/21/2023

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		
<b>Total heating load calculation</b>	<b>14342 Btuh</b>	<b>Total cooling load calculation</b>	<b>10318 Btuh</b>		
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh		
Total (Electric Heat Pump)	83.7 12000	Sensible (SHR = 0.85)	106.4 10200		
Heat Pump + Auxiliary(0.0kW)	83.7 12000	Latent	247.6 1800		
			<b>Total (Electric Heat Pump)</b>	<b>116.3</b>	<b>12000</b>

## WINTER CALCULATIONS

Winter Heating Load (for 617 sqft)

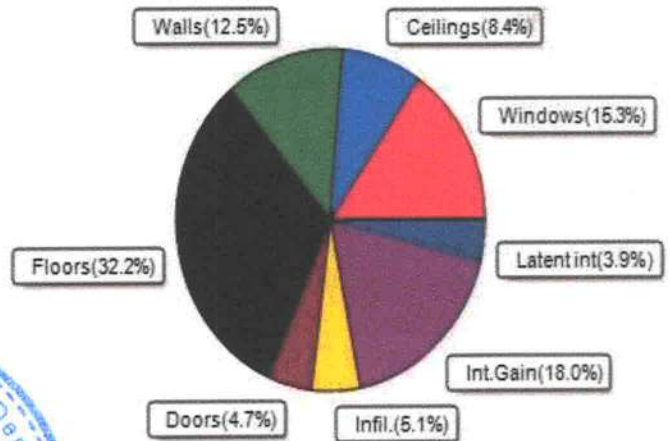
Load component		Load	
Window total	82 sqft	849	Btuh
Wall total	569 sqft	2020	Btuh
Door total	40 sqft	640	Btuh
Ceiling total	617 sqft	786	Btuh
Floor total	617 sqft	9493	Btuh
Infiltration	13 cfm	553	Btuh
Duct loss		0	Btuh
<b>Subtotal</b>		<b>14342</b>	<b>Btuh</b>
Ventilation	Ex:0 cfm; Sup:0 cfm	0	Btuh
<b>TOTAL HEAT LOSS</b>		<b>14342</b>	<b>Btuh</b>



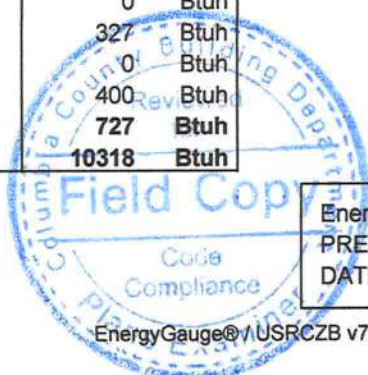
## SUMMER CALCULATIONS

Summer Cooling Load (for 617 sqft)

Load component		Load	
Window total	82 sqft	1579	Btuh
Wall total	569 sqft	1288	Btuh
Door total	40 sqft	480	Btuh
Ceiling total	617 sqft	865	Btuh
Floor total		3323	Btuh
Infiltration	9 cfm	197	Btuh
Internal gain		1860	Btuh
Duct gain		0	Btuh
Sens.Ventilation	Ex:0 cfm; Sup:0 cfm	0	Btuh
Blower Load		0	Btuh
<b>Total sensible gain</b>		<b>9591</b>	<b>Btuh</b>
Latent gain(ducts)		0	Btuh
Latent gain(infiltration)		327	Btuh
Latent gain(ventilation)		0	Btuh
Latent gain(internal/occupants/other)		400	Btuh
<b>Total latent gain</b>		<b>727</b>	<b>Btuh</b>
<b>TOTAL HEAT GAIN</b>		<b>10318</b>	<b>Btuh</b>



8th Edition



EnergyGauge® System Sizing

PREPARED BY: \_\_\_\_\_

DATE: \_\_\_\_\_

*[Signature]*  
7-21-23

# System Sizing Calculations - Summer

## Residential Load - Whole House Component Details

Project Title:  
Tuell Residence

, FL

7/21/2023

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	W	1.5ft	2.3ft	15.0	0.0	15.0	9	24	363 Btuh	
2	2 NFRC	0.20, 0.26	No	No	N	1.5ft	2.3ft	15.0	0.0	15.0	9	9	137 Btuh	
3	2 NFRC	0.20, 0.26	No	No	N	1.5ft	2.3ft	6.7	0.0	6.7	9	9	61 Btuh	
4	2 NFRC	0.20, 0.26	No	No	W	1.5ft	2.3ft	6.0	0.0	6.0	9	24	145 Btuh	
5	2 NFRC	0.20, 0.26	No	No	N	1.5ft	2.3ft	6.0	0.0	6.0	9	9	55 Btuh	
6	2 NFRC	0.20, 0.26	No	No	E	1.5ft	2.3ft	3.0	0.0	3.0	9	24	73 Btuh	
7	2 NFRC	0.20, 0.26	No	No	E	1.5ft	2.3ft	30.0	0.0	30.0	9	24	727 Btuh	
	Excursion													18 Btuh
	Window Total								82 (sqft)					1579 Btuh
Walls	Type	U-Value	R-Value	Area(sqft)		HTM		Load						
				Cav/Sheath										
1	Frame - Wood - Ext	0.09	13.0/0.0	65.0		2.3		147 Btuh						
2	Frame - Wood - Ext	0.09	13.0/0.0	173.0		2.3		392 Btuh						
3	Frame - Wood - Ext	0.09	13.0/0.0	58.0		2.3		131 Btuh						
4	Frame - Wood - Ext	0.09	13.0/0.0	63.3		2.3		143 Btuh						
5	Frame - Wood - Ext	0.09	13.0/0.0	209.7		2.3		475 Btuh						
	Wall Total			569 (sqft)				1288 Btuh						
Doors	Type	U-Value	R-Value	Area (sqft)	HTM	Load								
1	Insulated - Exterior			20.0	12.0	240 Btuh								
2	Insulated - Exterior			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/Med/Metal	0.032	30.0/0.0	617.0	1.40	865 Btuh								
	Ceiling Total			617 (sqft)		865 Btuh								
Floors	Type	U-Value	R-Value	Size	HTM	Load								
1	Raised - Open		0.0	617 (sqft)	5.4	3323 Btuh								
	Floor Total			617.0 (sqft)		3323 Btuh								
Envelope Subtotal:						7534 Btuh								
Infiltration	Type	Average ACH	Volume(cuft)	Wall Ratio	CFM=	Load								
	Natural	0.11	4936	1	9.5	197 Btuh								
Internal gain	Occupants	Btuh/occupant	Appliance	Load										
	2	X 230	+	1400	1860 Btuh									
Sensible Envelope Load:						9591 Btuh								
Duct load	NA, Supply(R0.0-None), Return(R0.0-None) (DGM of 0.000)					0 Btuh								
<b>Sensible Load All Zones</b>						<b>9591 Btuh</b>								

# Manual J Summer Calculations

## Residential Load - Component Details (continued)

Project Title: Climate:FL\_GAINESVILLE\_REGIONAL\_A  
 Tuell Residence

, FL

7/21/2023

### WHOLE HOUSE TOTALS

<b>Whole House Totals for Cooling</b>	<b>Sensible Envelope Load All Zones</b>	<b>9591 Btuh</b>
	Sensible Duct Load	0 Btuh
	<b>Total Sensible Zone Loads</b>	<b>9591 Btuh</b>
	Sensible ventilation (Ex:0 cfm; Sup:0 cfm)	0 Btuh
	Blower	0 Btuh
	<b>Total sensible gain</b>	<b>9591 Btuh</b>
	Latent infiltration gain (for 51 gr. humidity difference)	327 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
	<b>Latent total gain</b>	<b>727 Btuh</b>
	<b>TOTAL GAIN</b>	<b>10318 Btuh</b>

### EQUIPMENT

1. Central Unit	#	12000 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:  
Tuell Residence  
Building Type: User

, FL

7/21/2023

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	W	15.0		10.4 156 Btuh	
2	2, NFRC 0.20	Vinyl	0.26	N	15.0		10.4 156 Btuh	
3	2, NFRC 0.20	Vinyl	0.26	N	6.7		10.4 69 Btuh	
4	2, NFRC 0.20	Vinyl	0.26	W	6.0		10.4 62 Btuh	
5	2, NFRC 0.20	Vinyl	0.26	N	6.0		10.4 62 Btuh	
6	2, NFRC 0.20	Vinyl	0.26	E	3.0		10.4 31 Btuh	
7	2, NFRC 0.20	Vinyl	0.26	E	30.0		10.4 312 Btuh	
	Window Total					81.7(sqft)		849 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM= Load	
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	65		3.55 231 Btuh	
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	173		3.55 614 Btuh	
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	58		3.55 206 Btuh	
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	63		3.55 225 Btuh	
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	210		3.55 744 Btuh	
	Wall Total					569(sqft)		2020 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)		20		16.0 320 Btuh	
	Door Total					40(sqft)		640Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM= Load	
1	Flat ceil/M/Metal		(0.032)	30.0/0.0	617		1.3 786 Btuh	
	Ceiling Total					617(sqft)		786Btuh
Floors	Type		Ueff.	R-Value	Size	X	HTM= Load	
1	Raised - Open		(0.385)	0.0	617.0	sqft	15.4 9493 Btuh	
	Floor Total					617 sqft		9493 Btuh
Envelope Subtotal:							13788 Btuh	
Infiltration	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio	CFM= Load		
	Natural		0.15	4936	1.00	12.6 553 Btuh		
Duct load	NA, R0.0, Supply(), Return() (DLM of 0.000)						0 Btuh	
All Zones	<b>Sensible Subtotal All Zones</b>						<b>14342 Btuh</b>	

# Manual J Winter Calculations

## Residential Load - Component Details (continued)

Project Title:  
Tuell Residence  
Building Type: User

, FL

7/21/2023

### WHOLE HOUSE TOTALS

<b>Totals for Heating</b>	Subtotal Sensible Heat Loss Ventilation Sens. Heat Loss (Ex:0 cfm; Sup:0 cfm) Total Heat Loss	14342 Btuh 0 Btuh 14342 Btuh
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### EQUIPMENT

1. Electric Heat Pump	#	12000 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