

# Residential System Sizing Calculation

## Summary

Laura Sloane

Project Title:  
200351 Sloane

, FL

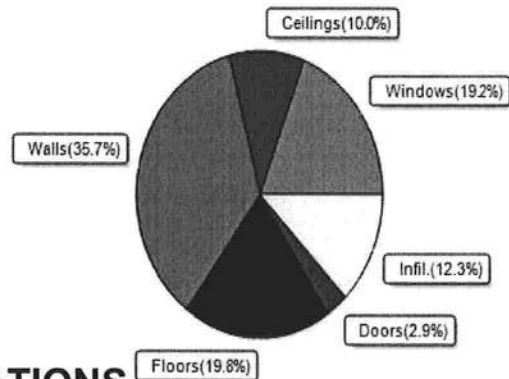
2020-05-14

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
<b>Total heating load calculation</b>	<b>7295</b>	<b>Btuh</b>	<b>Total cooling load calculation</b>	<b>10672</b>	<b>Btuh</b>
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Window/Wall Heat Pump)	164.5	12000	Sensible (SHR = 0.75)	96.4	9000
Heat Pump + Auxiliary(0.0kW)	164.5	12000	Latent	225.2	3000
			Total (Window/Wall Heat Pump)	112.4	12000

## WINTER CALCULATIONS

Winter Heating Load (for 720 sqft)

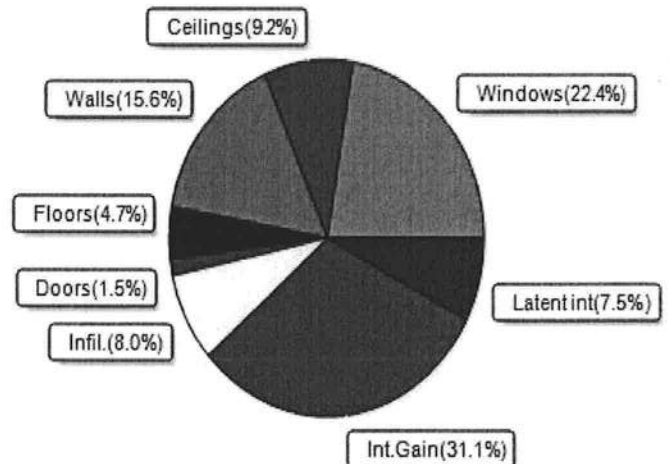
Load component			Load	
Window total	117	sqft	1400	Btuh
Wall total	734	sqft	2606	Btuh
Door total	13	sqft	213	Btuh
Ceiling total	720	sqft	731	Btuh
Floor total	720	sqft	1444	Btuh
Infiltration	21	cfm	900	Btuh
Duct loss			0	Btuh
<b>Subtotal</b>			<b>7295</b>	<b>Btuh</b>
Ventilation	0	cfm	0	Btuh
<b>TOTAL HEAT LOSS</b>			<b>7295</b>	<b>Btuh</b>



## SUMMER CALCULATIONS

Summer Cooling Load (for 720 sqft)

Load component			Load	
Window total	117	sqft	2386	Btuh
Wall total	734	sqft	1661	Btuh
Door total	13	sqft	160	Btuh
Ceiling total	720	sqft	987	Btuh
Floor total			505	Btuh
Infiltration	15	cfm	321	Btuh
Internal gain			3320	Btuh
Duct gain			0	Btuh
Sens. Ventilation	0	cfm	0	Btuh
Blower Load			0	Btuh
<b>Total sensible gain</b>			<b>9340</b>	<b>Btuh</b>
Latent gain(ducts)			0	Btuh
Latent gain(infiltration)			532	Btuh
Latent gain(ventilation)			0	Btuh
Latent gain(internal/occupants/other)			800	Btuh
<b>Total latent gain</b>			<b>1332</b>	<b>Btuh</b>
<b>TOTAL HEAT GAIN</b>			<b>10672</b>	<b>Btuh</b>



8th Edition

EnergyGauge® System Sizing  
PREPARED BY: Evan Beamsley  
DATE: 2020-05-14

# System Sizing Calculations - Winter

## Residential Load - Whole House Component Details

Laura Sloane

, FL

Project Title:  
200351 Sloane  
Building Type: User

2020-05-14

Reference City: Gainesville, FL (Defaults) Winter Temperature Difference: 40.0 F (TMY3 99%)  
This calculation is for Worst Case. The house has been rotated 135 degrees.

Component Loads for Whole House							
<b>Window</b>	Panes/Type	Frame	U	Orientation	Area(sqft)	X	HTM= Load
1	2, NFRC 0.20	Metal	0.30	SW	30.0	12.0	360 Btuh
2	2, NFRC 0.20	Metal	0.30	NW	30.0	12.0	360 Btuh
3	2, NFRC 0.20	Metal	0.30	NW	26.7	12.0	320 Btuh
4	2, NFRC 0.20	Metal	0.30	NE	30.0	12.0	360 Btuh
	Window Total				116.7(sqft)		1400 Btuh
<b>Walls</b>	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM= Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	240	3.55	852 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	162	3.55	575 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	170	3.55	604 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	162	3.55	575 Btuh
	Wall Total				734(sqft)		2606 Btuh
<b>Doors</b>	Type	Storm	Ueff.		Area	X	HTM= Load
1	Insulated - Exterior, n		(0.400)		7	16.0	107 Btuh
2	Insulated - Exterior, n		(0.400)		7	16.0	107 Btuh
	Door Total				13(sqft)		213Btuh
<b>Ceilings</b>	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM= Load
1	Vented Attic/D/Shing		(0.025)	38.0/0.0	720	1.0	731 Btuh
	Ceiling Total				720(sqft)		731Btuh
<b>Floors</b>	Type		Ueff.	R-Value	Size	X	HTM= Load
1	Raised - Open		(0.050)	19.0	720.0 sqft	2.0	1444 Btuh
	Floor Total				720 sqft		1444 Btuh
					Envelope Subtotal:		6394 Btuh
<b>Infiltration</b>	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio	CFM=	Load
	Natural		0.21	5760	1.00	20.6	900 Btuh
<b>Duct load</b>	NA, R0.0, Supply(), Return() (DLM of 0.000)						0 Btuh
<b>All Zones</b>	Sensible Subtotal All Zones						7295 Btuh

# Manual J Winter Calculations

## Residential Load - Component Details (continued)

Laura Sloane  
 , FL

Project Title:  
 200351 Sloane  
 Building Type: User

2020-05-14

**WHOLE HOUSE TOTALS**

<b>Totals for Heating</b>	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	7295 Btuh 0 Btuh 7295 Btuh
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**EQUIPMENT**

1. Window/Wall 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

# System Sizing Calculations - Summer

## Residential Load - Whole House Component Details

Laura Sloane

Project Title:  
200351 Sloane

, FL

2020-05-14

Reference City: Gainesville, FL Temperature Difference: 19.0F(TMY3 99%) Humidity difference: 51gr.  
This calculation is for Worst Case. The house has been rotated 135 degrees.

### 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, 0.30	No	No	SW	1.5ft.	5.0ft.	30.0	0.0	30.0	10	20	601	Btuh	
2	2 NFRC	0.20, 0.30	No	No	NW	7.5ft.	0.5ft.	30.0	0.0	30.0	10	19	574	Btuh	
3	2 NFRC	0.20, 0.30	No	No	NW	7.5ft.	0.5ft.	26.7	0.0	26.7	10	19	510	Btuh	
4	2 NFRC	0.20, 0.30	No	No	NE	1.5ft.	3.0ft.	30.0	0.0	30.0	10	19	574	Btuh	
	Excursion													126	Btuh
	Window Total								117 (sqft)					2386 Btuh	
Walls	Type	U-Value		R-Value		Area(sqft)		HTM		Load					
				Cav/Sheath											
1	Frame - Wood - Ext	0.09	13.0/0.0			240.0	2.3			543	Btuh				
2	Frame - Wood - Ext	0.09	13.0/0.0			162.0	2.3			367	Btuh				
3	Frame - Wood - Ext	0.09	13.0/0.0			170.0	2.3			385	Btuh				
4	Frame - Wood - Ext	0.09	13.0/0.0			162.0	2.3			367	Btuh				
	Wall Total						734 (sqft)				1661 Btuh				
Doors	Type	Area (sqft)		HTM		Load									
1	Insulated - Exterior	6.7		12.0		80 Btuh									
2	Insulated - Exterior	6.7		12.0		80 Btuh									
	Door Total						13 (sqft)				160 Btuh				
Ceilings	Type/Color/Surface	U-Value	R-Value	Area(sqft)		HTM		Load							
1	Vented Attic/DarkShingle	0.025	38.0/0.0	720.0		1.37		987 Btuh							
	Ceiling Total						720 (sqft)				987 Btuh				
Floors	Type	R-Value		Size		HTM		Load							
1	Raised - Open	19.0		720 (sqft)		0.7		505 Btuh							
	Floor Total						720.0 (sqft)				505 Btuh				
Envelope Subtotal:											5699 Btuh				
Infiltration	Type	Average ACH		Volume(cuft)		Wall Ratio		CFM=		Load					
	Natural	0.16		5760		1		15.4		321 Btuh					
Internal gain	Occupants	Btuh/occupant		Appliance		Load									
	4	X 230 +		2400		3320 Btuh									
Sensible Envelope Load:											9340 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>9340 Btuh</b>				

# Manual J Summer Calculations

## Residential Load - Component Details (continued)

Laura Sloane  
 , FL

Project Title: Climate:FL\_GAINESVILLE\_REGIONAL\_A  
 200351 Sloane

2020-05-14

### WHOLE HOUSE TOTALS

<b>Whole House Totals for Cooling</b>	<b>Sensible Envelope Load All Zones</b>	<b>9340 Btuh</b>
	Sensible Duct Load	0 Btuh
	<b>Total Sensible Zone Loads</b>	<b>9340 Btuh</b>
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	<b>Total sensible gain</b>	<b>9340 Btuh</b>
	Latent infiltration gain (for 51 gr. humidity difference)	532 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	0 Btuh
	Latent occupant gain (4.0 people @ 200 Btuh per person)	800 Btuh
	Latent other gain	0 Btuh
	<b>Latent total gain</b>	<b>1332 Btuh</b>
	<b>TOTAL GAIN</b>	<b>10672 Btuh</b>

### EQUIPMENT

1. PTAC and Room 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