

Residential System Sizing Calculation

Summary

Project Title:
Harrell Residence

, FL

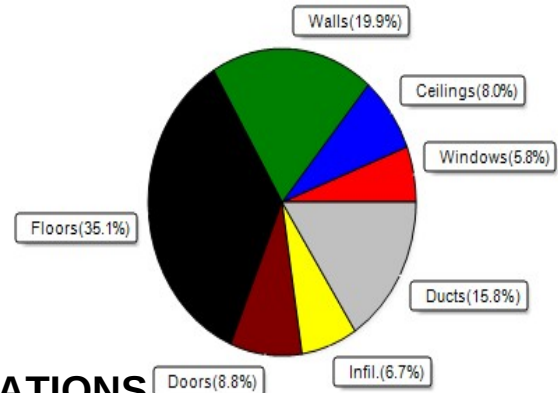
9/12/2023

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	20307 Btuh	Total cooling load calculation	17136 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	147.7 30000	Sensible (SHR = 0.85)	173.0 25500
Heat Pump + Auxiliary(0.0kW)	147.7 30000	Latent	187.5 4500
		Total (Electric Heat Pump)	175.1 30000

WINTER CALCULATIONS

Winter Heating Load (for 1270 sqft)

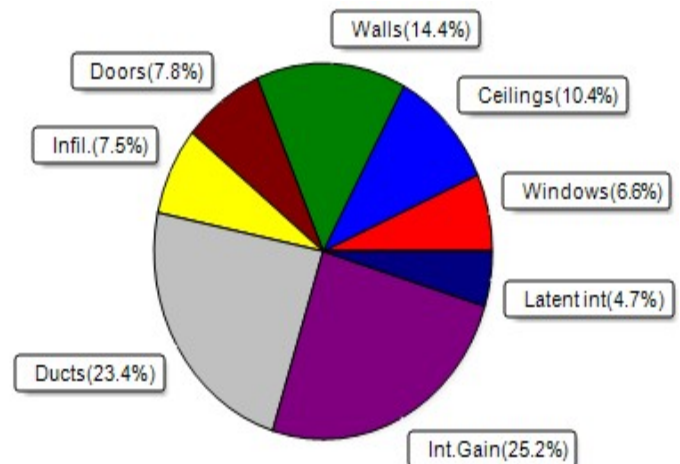
Load component	Load
Window total 114 sqft	1186 Btuh
Wall total 1137 sqft	4036 Btuh
Door total 111 sqft	1778 Btuh
Ceiling total 1270 sqft	1618 Btuh
Floor total 1270 sqft	7127 Btuh
Infiltration 31 cfm	1359 Btuh
Duct loss	3203 Btuh
Subtotal	20307 Btuh
Ventilation Ex:0 cfm; Sup:0 cfm	0 Btuh
TOTAL HEAT LOSS	20307 Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 1270 sqft)

Load component	Load
Window total 114 sqft	1133 Btuh
Wall total 1137 sqft	2476 Btuh
Door total 111 sqft	1333 Btuh
Ceiling total 1270 sqft	1780 Btuh
Floor total	0 Btuh
Infiltration 23 cfm	484 Btuh
Internal gain	4320 Btuh
Duct gain	3211 Btuh
Sens.Ventilation Ex:0 cfm; Sup:0 cfm	0 Btuh
Blower Load	0 Btuh
Total sensible gain	14737 Btuh
Latent gain(ducts)	796 Btuh
Latent gain(infiltration)	804 Btuh
Latent gain(ventilation)	0 Btuh
Latent gain(internal/occupants/other)	800 Btuh
Total latent gain	2400 Btuh
TOTAL HEAT GAIN	17136 Btuh



8th Edition

EnergyGauge® System Sizing

PREPARED BY: _____

DATE: _____

9-12-23

System Sizing Calculations - Summer

Residential Load - Whole House Component Details

Project Title:
Harrell Residence

, FL

9/12/2023

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	30.0	0.0	30.0	9	9	274	Btuh
2	2 NFRC	0.20, 0.26	No	No	N	1.5ft	2.3ft	30.0	0.0	30.0	9	9	274	Btuh
3	2 NFRC	0.20, 0.26	No	No	S	1.5ft	2.3ft	12.0	12.0	0.0	9	11	110	Btuh
4	2 NFRC	0.20, 0.26	No	No	S	1.5ft	2.3ft	36.0	36.0	0.0	9	11	329	Btuh
5	2 NFRC	0.20, 0.26	No	No	W	1.5ft	2.3ft	6.0	0.0	6.0	9	24	145	Btuh
	Window Total							114 (sqft)					1133 Btuh	
Walls	Type	U-Value		R-Value		Area(sqft)		HTM		Load				
1	Frame - Wood - Ext		0.09		13.0/0.0		111.0		2.3		251	Btuh		
2	Frame - Wood - Ext		0.09		13.0/0.0		54.2		2.3		123	Btuh		
3	Frame - Wood - Ext		0.09		13.0/0.0		98.0		2.3		222	Btuh		
4	Frame - Wood - Ext		0.09		13.0/0.0		54.0		2.3		122	Btuh		
5	Frame - Wood - Adj		0.09		13.0/0.0		169.0		1.7		285	Btuh		
6	Frame - Wood - Ext		0.09		13.0/0.0		57.0		2.3		129	Btuh		
7	Frame - Wood - Ext		0.09		13.0/0.0		227.7		2.3		515	Btuh		
8	Frame - Wood - Ext		0.09		13.0/0.0		366.0		2.3		828	Btuh		
	Wall Total							1137 (sqft)					2476 Btuh	
Doors	Type	Area (sqft)		HTM		Load								
1	Insulated - Exterior		17.8		12.0		213	Btuh						
2	Insulated - Exterior		40.0		12.0		480	Btuh						
3	Insulated - Garage		20.0		12.0		240	Btuh						
4	Insulated - Exterior		33.3		12.0		400	Btuh						
	Door Total							111 (sqft)					1333 Btuh	
Ceilings	Type/Color/Surface	U-Value		R-Value		Area(sqft)		HTM		Load				
1	Vented Attic/Med/Shingle		0.032		30.0/0.0		1270.0		1.40		1780	Btuh		
	Ceiling Total							1270 (sqft)					1780 Btuh	
Floors	Type	R-Value		Size		HTM		Load						
1	Slab On Grade		0.0		1270 (ft-perimeter)		0.0		0	Btuh				
	Floor Total							1270.0 (sqft)					0 Btuh	
	Envelope Subtotal:											6722 Btuh		
Infiltration	Type	Average ACH		Volume(cuft)		Wall Ratio		CFM=		Load				
	Natural													
1			0.12		11430		1		23.2		484	Btuh		
Internal gain	Occupants		Btuh/occupant		Appliance		Load							
			4	X	230	+	3400		4320	Btuh				
	Sensible Envelope Load:											11526 Btuh		
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic) (DGM of 0.279)											3211 Btuh		
	Sensible Load All Zones											14737 Btuh		

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
Harrell Residence

, FL

9/12/2023

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	11526 Btuh
	Sensible Duct Load	3211 Btuh
	Total Sensible Zone Loads	14737 Btuh
	Sensible ventilation (Ex:0 cfm; Sup:0 cfm)	0 Btuh
	Blower	0 Btuh
	Total sensible gain	14737 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	804 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	796 Btuh
	Latent occupant gain (4.0 people @ 200 Btuh per person)	800 Btuh
	Latent other gain	0 Btuh
	Latent total gain	2400 Btuh
	TOTAL GAIN	17136 Btuh

EQUIPMENT

1. Central Unit	#	30000 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:
Harrell Residence
Building Type: User

, FL

9/12/2023

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	30.0		10.4	312 Btuh
2	2, NFRC 0.20	Vinyl	0.26	N	30.0		10.4	312 Btuh
3	2, NFRC 0.20	Vinyl	0.26	S	12.0		10.4	125 Btuh
4	2, NFRC 0.20	Vinyl	0.26	S	36.0		10.4	374 Btuh
5	2, NFRC 0.20	Vinyl	0.26	W	6.0		10.4	62 Btuh
	Window Total				114.0(sqft)			1186 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	111		3.55	394 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	54		3.55	193 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	98		3.55	348 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	54		3.55	192 Btuh
5	Frame - Wood	- Adj	(0.089)	13.0/0.0	169		3.55	600 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	57		3.55	202 Btuh
7	Frame - Wood	- Ext	(0.089)	13.0/0.0	228		3.55	808 Btuh
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	366		3.55	1299 Btuh
	Wall Total				1137(sqft)			4036 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior,	n	(0.400)		18		16.0	284 Btuh
2	Insulated - Exterior,	n	(0.400)		40		16.0	640 Btuh
3	Insulated - Garage,	n	(0.400)		20		16.0	320 Btuh
4	Insulated - Exterior,	n	(0.400)		33		16.0	533 Btuh
	Door Total				111(sqft)			1778Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load
1	Flat ceil/M/Shing		(0.032)	30.0/0.0	1270		1.3	1618 Btuh
	Ceiling Total				1270(sqft)			1618Btuh
Floors	Type		Ueff.	R-Value	Size	X	HTM=	Load
1	Slab On Grade		(1.180)	0.0	151.0 ft(perim.)		47.2	7127 Btuh
	Floor Total				1270 sqft			7127 Btuh
	Envelope Subtotal:							15745 Btuh
Infiltration	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio	CFM=		
	Natural		0.16	11430	1.00	31.0		1359 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.187)							3203 Btuh
All Zones	Sensible Subtotal All Zones							20307 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

, FL

Project Title:
Harrell Residence
Building Type: User

9/12/2023

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss	20307 Btuh
	Ventilation Sens. Heat Loss (Ex:0 cfm; Sup:0 cfm)	0 Btuh
	Total Heat Loss	20307 Btuh

EQUIPMENT

1. Electric Heat Pump	#	30000 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