

Residential System Sizing Calculation

Summary

Caleb Harris

Project Title:
Caleb Harris Residence

, FL

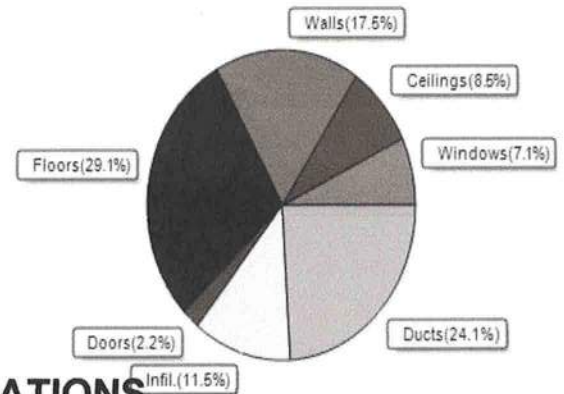
3/18/2024

Location for weather data: Gainesville, FL - Defaults: Latitude(29.7) Altitude(152 ft.) Temp Range(M)			
Humidity data: Interior RH (50%) Outdoor wet bulb (79F) Humidity difference(54gr.)			
Winter design temperature(MJ8 99%/Cu)	33 F	Summer design temperature(MJ8 99%/Cu)	99 F
Winter setpoint	70 F	Summer setpoint	75 F
Winter temperature difference	37 F	Summer temperature difference	24 F
Total heating load calculation	31535 Btuh	Total cooling load calculation	31914 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	106.3 33517	Sensible (SHR = 0.75)	102.0 26325
Heat Pump + Auxiliary(0.0kW)	106.3 33517	Latent	143.9 8775
		Total (Electric Heat Pump)	110.0 35100

WINTER CALCULATIONS

Winter Heating Load (for 2600 sqft)

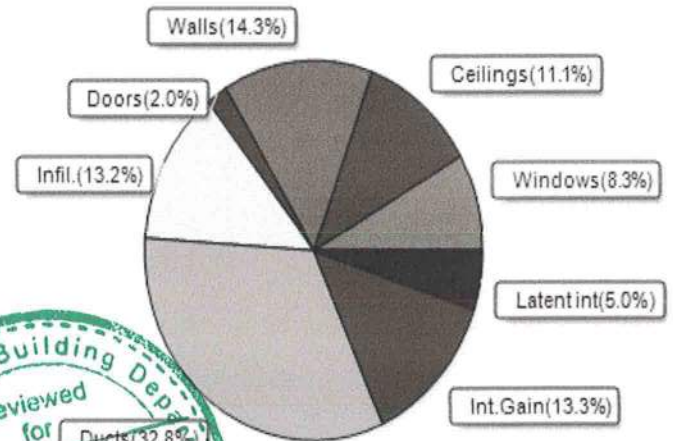
Load component		Load	
Window total	168 sqft	2238	Btuh
Wall total	1682 sqft	5524	Btuh
Door total	40 sqft	681	Btuh
Ceiling total	2860 sqft	2686	Btuh
Floor total	2600 sqft	9169	Btuh
Infiltration	90 cfm	3634	Btuh
Duct loss		7604	Btuh
Subtotal		31535	Btuh
Ventilation	Ex:0 cfm; Sup:0 cfm	0	Btuh
TOTAL HEAT LOSS		31535	Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 2600 sqft)

Load component		Load	
Window total	168 sqft	2636	Btuh
Wall total	1682 sqft	4553	Btuh
Door total	40 sqft	644	Btuh
Ceiling total	2860 sqft	3557	Btuh
Floor total		0	Btuh
Infiltration	67 cfm	1768	Btuh
Internal gain		4240	Btuh
Duct gain		8418	Btuh
Sens.Ventilation	Ex:0 cfm; Sup:0 cfm	0	Btuh
Blower Load		0	Btuh
Total sensible gain		25817	Btuh
Latent gain(ducts)		2039	Btuh
Latent gain(infiltration)		2459	Btuh
Latent gain(ventilation)		0	Btuh
Latent gain(internal/occupants/other)		1600	Btuh
Total latent gain		6098	Btuh
TOTAL HEAT GAIN		31914	Btuh



8th Edition

EnergyGauge® / USRCZB v8.1.02

EnergyGauge® System Sizing

PREPARED BY:

DATE:

3/18/2024

W. C. Harris

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Caleb Harris

, FL

Project Title:
Caleb Harris Residence
Building Type: User

3/18/2024

Reference City: Gainesville, FL (Defaults) Winter Temperature Difference: 37.0 °F (MJ8 99%/Cu)
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 0.25	Vinyl	0.36	S	15.0		13.3	200 Btuh
2	2, NFRC 0.25	Vinyl	0.36	S	60.0		13.3	799 Btuh
3	2, NFRC 0.25	Vinyl	0.36	S	15.0		13.3	200 Btuh
4	2, NFRC 0.25	Vinyl	0.36	E	6.0		13.3	80 Btuh
5	2, NFRC 0.25	Vinyl	0.36	E	10.0		13.3	133 Btuh
6	2, NFRC 0.25	Vinyl	0.36	N	27.0		13.3	360 Btuh
7	2, NFRC 0.25	TIM	0.36	N	20.0		13.3	266 Btuh
8	2, NFRC 0.25	Vinyl	0.36	N	15.0		13.3	200 Btuh
Window Total					168.0(sqft)			2238 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	102		3.28	335 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	271		3.28	890 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	102		3.28	335 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	344		3.28	1130 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	503		3.28	1652 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	360		3.28	1182 Btuh
Wall Total					1682(sqft)			5524 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior, n		(0.460)		20		17.0	340 Btuh
2	Insulated - Exterior, n		(0.460)		20		17.0	340 Btuh
Door Total					40(sqft)			681Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load
1	Flat ceil/D/Shing		(0.025)	38.0/0.0	2860		0.94	2686 Btuh
Ceiling Total					2860(sqft)			2686Btuh
Floors	Type		Ueff.	R-Value	Size	X	HTM=	Load
1	Slab On Grade		(1.180)	0.0	210.0 ft(perim.)		43.7	9169 Btuh
Floor Total					2600 sqft			9169 Btuh
Envelope Subtotal:								20297 Btuh
Infiltration	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio	CFM=		Load
	Natural		0.23	23400	1.00	89.7		3634 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att)					(DLM of 0.318)		7604 Btuh
All Zones	Sensible Subtotal All Zones							31535 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Caleb Harris

, FL

Project Title:
Caleb Harris Residence
Building Type: User

3/18/2024

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss	31535 Btuh
	Ventilation Sens. Heat Loss (Ex:0 cfm; Sup:0 cfm)	0 Btuh
	Total Heat Loss	31535 Btuh

EQUIPMENT

1. Electric Heat Pump	#	33517 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

Caleb Harris

Project Title:
Caleb Harris Residence

, FL

3/18/2024

Reference City: Gainesville, FL (Defaults)
Humidity difference: 54gr.

Temperature Difference: 24.0F(MJ8 99%/Cu)
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	0.25, 0.36	No	No	S		1.5ft.	1.0ft.	15.0	15.0	0.0	14	16	208	Btuh
2	2 NFRC	0.25, 0.36	No	No	S		9.5ft.	1.0ft.	60.0	60.0	0.0	14	16	834	Btuh
3	2 NFRC	0.25, 0.36	No	No	S		1.5ft.	1.0ft.	15.0	15.0	0.0	14	16	208	Btuh
4	2 NFRC	0.25, 0.36	No	No	E		1.0ft.	5.0ft.	6.0	0.0	6.0	14	33	196	Btuh
5	2 NFRC	0.25, 0.36	No	No	E		1.0ft.	5.0ft.	10.0	0.0	10.0	14	33	327	Btuh
6	2 NFRC	0.25, 0.36	No	No	N		13.5f	1.0ft.	27.0	0.0	27.0	14	14	375	Btuh
7	2 NFRC	0.25, 0.36	No	No	N		13.5f	1.0ft.	20.0	0.0	20.0	14	14	278	Btuh
8	2 NFRC	0.25, 0.36	No	No	N		13.5f	1.0ft.	15.0	0.0	15.0	14	14	208	Btuh
	Window Total								168 (sqft)					2636 Btuh	
Walls	Type					U-Value	R-Value	Area(sqft)		HTM		Load			
							Cav/Sheath								
1	Frame - Wood - Ext						0.09	13.0/0.0	102.0		2.7		276 Btuh		
2	Frame - Wood - Ext						0.09	13.0/0.0	271.0		2.7		734 Btuh		
3	Frame - Wood - Ext						0.09	13.0/0.0	102.0		2.7		276 Btuh		
4	Frame - Wood - Ext						0.09	13.0/0.0	344.0		2.7		931 Btuh		
5	Frame - Wood - Ext						0.09	13.0/0.0	503.0		2.7		1362 Btuh		
6	Frame - Wood - Ext						0.09	13.0/0.0	360.0		2.7		975 Btuh		
	Wall Total								1682 (sqft)					4553 Btuh	
Doors	Type							Area (sqft)		HTM		Load			
	1 Insulated - Exterior								20.0		16.1		322 Btuh		
	2 Insulated - Exterior								20.0		16.1		322 Btuh		
	Door Total								40 (sqft)					644 Btuh	
Ceilings	Type/Color/Surface					U-Value	R-Value	Area(sqft)		HTM		Load			
	1 Vented Attic/DarkShingle/RB						0.025	38.0/0.0	2860.0		1.24		3557 Btuh		
	Ceiling Total								2860 (sqft)					3557 Btuh	
Floors	Type					R-Value		Size		HTM		Load			
	1 Slab On Grade						0.0		2600 (ft-perimeter)		0.0		0 Btuh		
	Floor Total								2600.0 (sqft)					0 Btuh	
	Envelope Subtotal:													11391 Btuh	
Infiltration	Type					Average ACH		Volume(cuft)		Wall Ratio		CFM=		Load	
	Natural						0.17		23400		1		67.3		1768 Btuh
Internal gain					Occupants		Btuh/occupant		Appliance		Load				
					8		X 230		+		2400		4240 Btuh		
	Sensible Envelope Load:													17399 Btuh	
Duct load	Average sealed,Supply(R6.0-Attic), Return(R6.0-Attic)										(DGM of 0.484)		8418 Btuh		
	Sensible Load All Zones													25817 Btuh	

Manual J Summer Calculations

Residential Load - Component Details (continued)

Caleb Harris
 , FL

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
 Caleb Harris Residence

3/18/2024

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	17399 Btuh
	Sensible Duct Load	8418 Btuh
	Total Sensible Zone Loads	25817 Btuh
	Sensible ventilation (Ex:0 cfm; Sup:0 cfm)	0 Btuh
	Blower	0 Btuh
	Total sensible gain	25817 Btuh
	Latent infiltration gain (for 54 gr. humidity difference)	2459 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	2039 Btuh
	Latent occupant gain (8.0 people @ 200 Btuh per person)	1600 Btuh
	Latent other gain	0 Btuh
	Latent total gain	6098 Btuh
	TOTAL GAIN	31914 Btuh

EQUIPMENT

1. Central Unit	#	35100 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