

Residential System Sizing Calculation

Summary

Project Title:
Brooks Residence

, FL

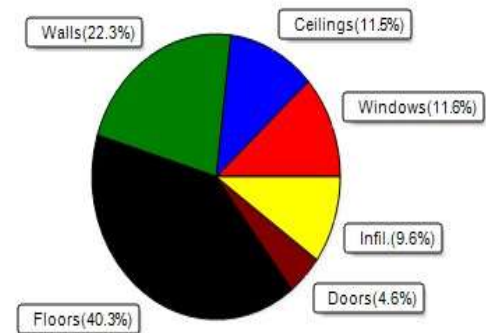
10/10/2022

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
Total heating load calculation	30340 Btuh	Total cooling load calculation	20244 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	118.7 36000	Sensible (SHR = 0.85)	176.7 30600
Heat Pump + Auxiliary(0.0kW)	118.7 36000	Latent	184.7 5400
		Total (Electric Heat Pump)	177.8 36000

WINTER CALCULATIONS

Winter Heating Load (for 2702 sqft)

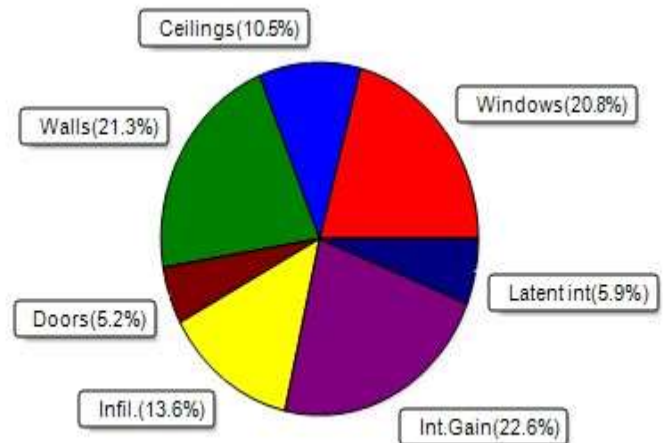
Load component		Load	
Window total	339 sqft	3520	Btuh
Wall total	1908 sqft	6772	Btuh
Door total	88 sqft	1408	Btuh
Ceiling total	2702 sqft	3498	Btuh
Floor total	2702 sqft	12225	Btuh
Infiltration	67 cfm	2916	Btuh
Duct loss		0	Btuh
Subtotal		30340	Btuh
Ventilation	0 cfm	0	Btuh
TOTAL HEAT LOSS		30340	Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 2702 sqft)

Load component		Load	
Window total	339 sqft	4212	Btuh
Wall total	1908 sqft	4317	Btuh
Door total	88 sqft	1056	Btuh
Ceiling total	2702 sqft	2116	Btuh
Floor total		0	Btuh
Infiltration	50 cfm	1039	Btuh
Internal gain		4580	Btuh
Duct gain		0	Btuh
Sens. Ventilation	0 cfm	0	Btuh
Blower Load		0	Btuh
Total sensible gain		17320	Btuh
Latent gain(ducts)		0	Btuh
Latent gain(infiltration)		1724	Btuh
Latent gain(ventilation)		0	Btuh
Latent gain(internal/occupants/other)		1200	Btuh
Total latent gain		2924	Btuh
TOTAL HEAT GAIN		20244	Btuh



8th Edition

EnergyGauge® System Sizing

PREPARED BY: _____

DATE: _____

11-21-22

System Sizing Calculations - Summer

Residential Load - Whole House Component Details

Project Title:
Brooks Residence

, FL

10/10/2022

Reference City: Gainesville, FL

Temperature Difference: 19.0F(TMY3 99%)

Humidity difference: 51gr.

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		11.5f	2.3ft.	15.0	0.0	15.0	9	9	137	Btuh	
2	2 NFRC	0.20, 0.26	No	No	N		11.5f	2.3ft.	96.0	0.0	96.0	9	9	878	Btuh	
3	2 NFRC	0.20, 0.26	No	No	N		1.5ft.	2.3ft.	3.5	0.0	3.5	9	9	32	Btuh	
4	2 NFRC	0.20, 0.26	No	No	N		1.5ft.	2.3ft.	36.0	0.0	36.0	9	9	329	Btuh	
5	2 NFRC	0.20, 0.26	No	No	E		1.5ft.	2.3ft.	36.0	0.0	36.0	9	24	872	Btuh	
6	2 NFRC	0.20, 0.26	No	No	E		1.5ft.	2.3ft.	10.0	0.0	10.0	9	24	242	Btuh	
7	2 NFRC	0.20, 0.26	No	No	S		11.5f	2.3ft.	72.0	72.0	0.0	9	11	659	Btuh	
8	2 NFRC	0.20, 0.26	No	No	S		1.5ft.	2.3ft.	30.0	30.0	0.0	9	11	274	Btuh	
9	2 NFRC	0.20, 0.26	No	No	S		1.5ft.	2.3ft.	12.0	12.0	0.0	9	11	110	Btuh	
10	2 NFRC	0.20, 0.26	No	No	W		1.5ft.	2.3ft.	20.0	0.0	20.0	9	24	484	Btuh	
11	2 NFRC	0.20, 0.26	No	No	W		1.5ft.	2.3ft.	8.0	0.0	8.0	9	24	194	Btuh	
	Window Total									339 (sqft)					4212 Btuh	
Walls	Type					U-Value	R-Value		Area(sqft)			HTM		Load		
							Cav/Sheath									
1	Frame - Wood - Ext					0.09	13.0/0.0		336.0			2.3		760 Btuh		
2	Frame - Wood - Ext					0.09	13.0/0.0		129.0			2.3		292 Btuh		
3	Frame - Wood - Ext					0.09	13.0/0.0		166.0			2.3		376 Btuh		
4	Frame - Wood - Ext					0.09	13.0/0.0		380.0			2.3		860 Btuh		
5	Frame - Wood - Ext					0.09	13.0/0.0		46.5			2.3		105 Btuh		
6	Frame - Wood - Ext					0.09	13.0/0.0		18.0			2.3		41 Btuh		
7	Frame - Wood - Ext					0.09	13.0/0.0		228.5			2.3		517 Btuh		
8	Frame - Wood - Ext					0.09	13.0/0.0		18.0			2.3		41 Btuh		
9	Frame - Wood - Ext					0.09	13.0/0.0		72.0			2.3		163 Btuh		
10	Frame - Wood - Ext					0.09	13.0/0.0		46.5			2.3		105 Btuh		
11	Frame - Wood - Ext					0.09	13.0/0.0		102.0			2.3		231 Btuh		
12	Frame - Wood - Ext					0.09	13.0/0.0		18.0			2.3		41 Btuh		
13	Frame - Wood - Ext					0.09	13.0/0.0		73.5			2.3		166 Btuh		
14	Frame - Wood - Ext					0.09	13.0/0.0		273.5			2.3		619 Btuh		
	Wall Total									1908 (sqft)					4317 Btuh	
Doors	Type						Area (sqft)			HTM		Load				
1	Insulated - Exterior						24.0			12.0		288 Btuh				
2	Insulated - Exterior						24.0			12.0		288 Btuh				
3	Insulated - Exterior						40.0			12.0		480 Btuh				
	Door Total									88 (sqft)					1056 Btuh	
Ceilings	Type/Color/Surface					U-Value	R-Value		Area(sqft)			HTM		Load		
1	Cath/Sngl Assem/Light/Metal					0.032	30.0/0.0		2702.0			0.78		2116 Btuh		
	Ceiling Total									2702 (sqft)					2116 Btuh	
Floors	Type						R-Value		Size			HTM		Load		
1	Slab On Grade						0.0		2702 (ft-perimeter)			0.0		0 Btuh		
	Floor Total									2702.0 (sqft)					0 Btuh	
	Envelope Subtotal:													11701 Btuh		

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
Brooks Residence

, FL

10/10/2022

Infiltration	Type Natural	Average ACH 0.12	Volume(cuft) 24318	Wall Ratio 1	CFM= 49.9	Load 1039 Btuh
Internal gain		Occupants 6	Btuh/occupant X 230	Appliance +	3200	Load 4580 Btuh
	Sensible Envelope Load:					17320 Btuh
Duct load	Average sealed, Supply(R6.0-Condi), Return(R6.0-Condi) (DGM of 0.000)					0 Btuh
	Sensible Load All Zones					17320 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
Brooks Residence

, FL

10/10/2022

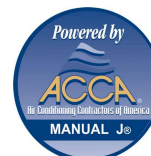
WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	17320 Btuh
	Sensible Duct Load	0 Btuh
	Total Sensible Zone Loads	17320 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	17320 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	1724 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	0 Btuh
	Latent occupant gain (6.0 people @ 200 Btuh per person)	1200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	2924 Btuh
	TOTAL GAIN	20244 Btuh

EQUIPMENT

1. Central 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:
Brooks Residence
Building Type: User

, FL

10/10/2022

Reference City: Gainesville, FL (Defaults) Winter Temperature Difference: 40.0 F (TMY3 99%)

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	15.0		10.4	156 Btuh
2	2, NFRC 0.20	Vinyl	0.26	N	96.0		10.4	998 Btuh
3	2, NFRC 0.20	Vinyl	0.26	N	3.5		10.4	36 Btuh
4	2, NFRC 0.20	Vinyl	0.26	N	36.0		10.4	374 Btuh
5	2, NFRC 0.20	Vinyl	0.26	E	36.0		10.4	374 Btuh
6	2, NFRC 0.20	Vinyl	0.26	E	10.0		10.4	104 Btuh
7	2, NFRC 0.20	Vinyl	0.26	S	72.0		10.4	749 Btuh
8	2, NFRC 0.20	Vinyl	0.26	S	30.0		10.4	312 Btuh
9	2, NFRC 0.20	Vinyl	0.26	S	12.0		10.4	125 Btuh
10	2, NFRC 0.20	Vinyl	0.26	W	20.0		10.4	208 Btuh
11	2, NFRC 0.20	Vinyl	0.26	W	8.0		10.4	83 Btuh
Window Total					338.5(sqft)			3520 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	336		3.55	1193 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	129		3.55	458 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	166		3.55	589 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	380		3.55	1349 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	47		3.55	165 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	18		3.55	64 Btuh
7	Frame - Wood	- Ext	(0.089)	13.0/0.0	229		3.55	811 Btuh
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	18		3.55	64 Btuh
9	Frame - Wood	- Ext	(0.089)	13.0/0.0	72		3.55	256 Btuh
10	Frame - Wood	- Ext	(0.089)	13.0/0.0	47		3.55	165 Btuh
11	Frame - Wood	- Ext	(0.089)	13.0/0.0	102		3.55	362 Btuh
12	Frame - Wood	- Ext	(0.089)	13.0/0.0	18		3.55	64 Btuh
13	Frame - Wood	- Ext	(0.089)	13.0/0.0	74		3.55	261 Btuh
14	Frame - Wood	- Ext	(0.089)	13.0/0.0	274		3.55	971 Btuh
Wall Total					1908(sqft)			6772 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior, n		(0.400)		24		16.0	384 Btuh
2	Insulated - Exterior, n		(0.400)		24		16.0	384 Btuh
3	Insulated - Exterior, n		(0.400)		40		16.0	640 Btuh
Door Total					88(sqft)			1408Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load
1	Cathedral/L/Metal		(0.032)	30.0/0.0	2702		1.3	3498 Btuh
Ceiling Total					2702(sqft)			3498Btuh
Floors	Type		Ueff.	R-Value	Size	X	HTM=	Load
1	Slab On Grade		(1.180)	0.0	259.0 ft(perim.)		47.2	12225 Btuh
Floor Total					2702 sqft			12225 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

, FL

Project Title:
Brooks Residence
Building Type: User

10/10/2022

	Envelope Subtotal:						27423 Btuh
Infiltration	Type Natural	Wholehouse	ACH 0.16	Volume(cuft) 24318	Wall Ratio 1.00	CFM= 66.6	2916 Btuh
Duct load	Average sealed, R6.0, Supply(Con), Return(Con) (DLM of 0.000)						0 Btuh
All Zones	Sensible Subtotal All Zones						30340 Btuh

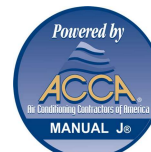
WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss	30340 Btuh
	Ventilation Sensible Heat Loss	0 Btuh
	Total Heat Loss	30340 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