

Residential System Sizing Calculation



Barber, Austin & Kelsey
Racetrack Lane
Lake City, FL

Summary

Project Title:
240742 Barber

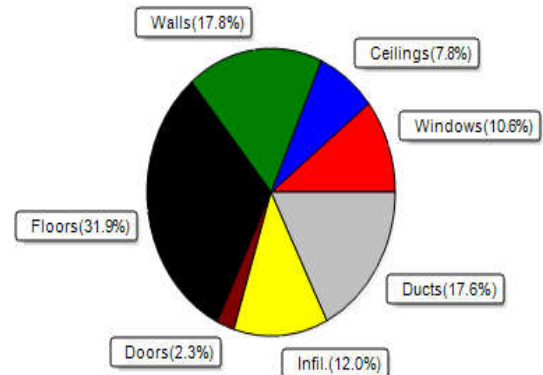
2024-06-29

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	33475	Btuh	Total cooling load calculation	28513	Btuh
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	110.5	37000	Sensible (SHR = 0.75)	116.1	27750
Heat Pump + Auxiliary(0.0kW)	110.5	37000	Latent	200.6	9250
			Total (Electric Heat Pump)	129.8	37000

WINTER CALCULATIONS

Winter Heating Load (for 2466 sqft)

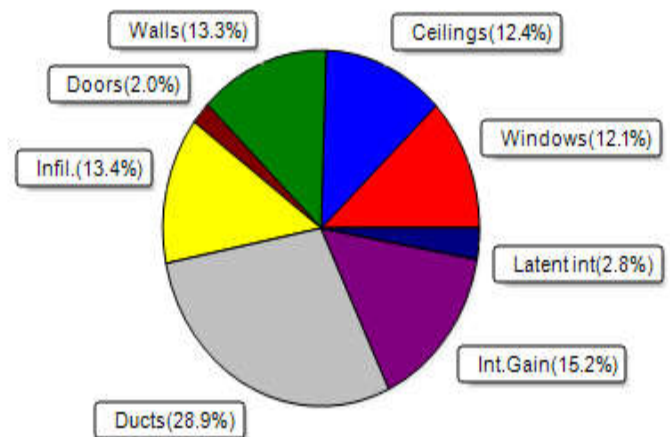
Load component			Load	
Window total	296	sqft	3554	Btuh
Wall total	1674	sqft	5943	Btuh
Door total	64	sqft	768	Btuh
Ceiling total	2578	sqft	2617	Btuh
Floor total	2466	sqft	10667	Btuh
Infiltration	92	cfm	4026	Btuh
Duct loss			5900	Btuh
Subtotal			33475	Btuh
Ventilation	Ex:0 cfm; Sup:0 cfm		0	Btuh
TOTAL HEAT LOSS			33475	Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 2466 sqft)

Load component			Load	
Window total	296	sqft	3448	Btuh
Wall total	1674	sqft	3788	Btuh
Door total	64	sqft	576	Btuh
Ceiling total	2578	sqft	3533	Btuh
Floor total			0	Btuh
Infiltration	69	cfm	1434	Btuh
Internal gain			4320	Btuh
Duct gain			6801	Btuh
Sens.Ventilation	Ex:0 cfm; Sup:0 cfm		0	Btuh
Blower Load			0	Btuh
Total sensible gain			23902	Btuh
Latent gain(ducts)			1431	Btuh
Latent gain(infiltration)			2380	Btuh
Latent gain(ventilation)			0	Btuh
Latent gain(internal/occupants/other)			800	Btuh
Total latent gain			4611	Btuh
TOTAL HEAT GAIN			28513	Btuh



8th Edition

EnergyGauge® System Sizing
PREPARED BY: Evan Beamsley
DATE: 2024-06-29

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Barber, Austin & Kelsey
Racetrack Lane
Lake City, FL

Project Title:
240742 Barber
Building Type: User

2024-06-29

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 0.22	Vinyl	0.30	N	15.0		12.0	180 Btuh
2	2, NFRC 0.22	Vinyl	0.30	N	66.7		12.0	800 Btuh
3	2, NFRC 0.22	Vinyl	0.30	N	16.0		12.0	192 Btuh
4	2, NFRC 0.22	Vinyl	0.30	N	16.0		12.0	192 Btuh
5	2, NFRC 0.22	Vinyl	0.30	N	9.0		12.0	108 Btuh
6	2, NFRC 0.22	Vinyl	0.30	E	12.0		12.0	144 Btuh
7	2, NFRC 0.22	Vinyl	0.30	E	4.0		12.0	48 Btuh
8	2, NFRC 0.22	Vinyl	0.30	S	126.0		12.0	1512 Btuh
9	2, NFRC 0.22	Vinyl	0.30	S	8.0		12.0	96 Btuh
10	2, NFRC 0.22	Vinyl	0.30	S	16.0		12.0	192 Btuh
11	2, NFRC 0.22	Vinyl	0.30	W	7.5		12.0	90 Btuh
Window Total					296.2(sqft)			3554 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	102		3.55	362 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	108		3.55	383 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	313		3.55	1112 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	299		3.55	1062 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	436		3.55	1548 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	416		3.55	1475 Btuh
Wall Total					1674(sqft)			5943 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior,	n	(0.300)		24		12.0	288 Btuh
2	Insulated - Exterior,	n	(0.300)		8		12.0	96 Btuh
3	Insulated - Exterior,	n	(0.300)		24		12.0	288 Btuh
4	Insulated - Exterior,	n	(0.300)		8		12.0	96 Btuh
Door Total					64(sqft)			768Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load
1	Flat ceil/D/Shing		(0.025)	38.0/0.0	1806		1.0	1834 Btuh
2	Sloped ce/D/Shing		(0.025)	38.0/0.0	680		1.0	690 Btuh
3	Knee wall/D/Shing		(0.025)	38.0/0.0	92		1.0	93 Btuh
Ceiling Total					2578(sqft)			2617Btuh
Floors	Type		Ueff.	R-Value	Size	X	HTM=	Load
1	Slab On Grade		(1.180)	0.0	226.0 ft(perim.)		47.2	10667 Btuh
Floor Total					2466 sqft			10667 Btuh
Envelope Subtotal:								23549 Btuh
Infiltration	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio	CFM=		
	Natural		0.24	23427	1.00	91.8		4026 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Barber, Austin & Kelsey
Racetrack Lane
Lake City, FL

Project Title:
240742 Barber
Building Type: User

2024-06-29

Duct load	Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.214)	5900 Btuh
All Zones	Sensible Subtotal All Zones	33475 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sens. Heat Loss (Ex:0 cfm; Sup:0 cfm) Total Heat Loss	33475 Btuh 0 Btuh 33475 Btuh
---------------------------	---	------------------------------------

EQUIPMENT

1. Electric Heat Pump	#	37000 Btuh
-----------------------	---	------------

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

Barber, Austin & Kelsey
Racetrack Lane
Lake City, FL

Project Title:
240742 Barber

2024-06-29

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	0.22, 0.30	No	No	N		1.5ft	1.0ft	15.0	0.0	15.0	10	10	155	Btuh
2	2 NFRC	0.22, 0.30	No	No	N		13.5f	0.5ft	66.7	0.0	66.7	10	10	689	Btuh
3	2 NFRC	0.22, 0.30	No	No	N		13.5f	0.5ft	16.0	0.0	16.0	10	10	165	Btuh
4	2 NFRC	0.22, 0.30	No	No	N		13.5f	0.5ft	16.0	0.0	16.0	10	10	165	Btuh
5	2 NFRC	0.22, 0.30	No	No	N		13.5f	0.5ft	9.0	0.0	9.0	10	10	93	Btuh
6	2 NFRC	0.22, 0.30	No	No	E		1.5ft	9.0ft	12.0	0.0	12.0	10	27	323	Btuh
7	2 NFRC	0.22, 0.30	No	No	E		1.5ft	4.0ft	4.0	0.0	4.0	10	27	108	Btuh
8	2 NFRC	0.22, 0.30	No	No	S		7.5ft	0.5ft	126.0	126.0	0.0	10	12	1301	Btuh
9	2 NFRC	0.22, 0.30	No	No	S		7.5ft	0.5ft	8.0	8.0	0.0	10	12	83	Btuh
10	2 NFRC	0.22, 0.30	No	No	S		7.5ft	0.5ft	16.0	16.0	0.0	10	12	165	Btuh
11	2 NFRC	0.22, 0.30	No	No	W		1.5ft	13.0f	7.5	0.0	7.5	10	27	202	Btuh
Window Total									296 (sqft)					3448 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			2.3		231	Btuh
2	Frame - Wood - Ext					0.09	13.0/0.0		108.0			2.3		244	Btuh
3	Frame - Wood - Ext					0.09	13.0/0.0		313.3			2.3		709	Btuh
4	Frame - Wood - Ext					0.09	13.0/0.0		299.0			2.3		677	Btuh
5	Frame - Wood - Ext					0.09	13.0/0.0		436.0			2.3		987	Btuh
6	Frame - Wood - Ext					0.09	13.0/0.0		415.5			2.3		940	Btuh
Wall Total									1674 (sqft)					3788 Btuh	
Doors	Type							Area (sqft)			HTM		Load		
1	Insulated - Exterior								24.0			9.0		216	Btuh
2	Insulated - Exterior								8.0			9.0		72	Btuh
3	Insulated - Exterior								24.0			9.0		216	Btuh
4	Insulated - Exterior								8.0			9.0		72	Btuh
Door Total									64 (sqft)					576 Btuh	
Ceilings	Type/Color/Surface	U-Value				R-Value		Area(sqft)			HTM		Load		
1	Vented Attic/DarkShingle					0.025	38.0/0.0		1806.0			1.37		2475	Btuh
2	Vented Attic/DarkShingle					0.025	38.0/0.0		680.0			1.37		932	Btuh
3	Knee wall to attic/DarkShingle					0.025	38.0/0.0		92.0			1.37		126	Btuh
Ceiling Total									2578 (sqft)					3533 Btuh	
Floors	Type					R-Value		Size			HTM		Load		
1	Slab On Grade						0.0		2466 (ft-perimeter)			0.0		0	Btuh
Floor Total									2466.0 (sqft)					0 Btuh	
Envelope Subtotal:														11346 Btuh	

Manual J Summer Calculations

Residential Load - Component Details (continued)

Barber, Austin & Kelsey
Racetrack Lane
Lake City, FL

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
240742 Barber

2024-06-29

Infiltration	Type Natural	Average ACH 0.18	Volume(cuft) 23427	Wall Ratio 1	CFM= 68.8	Load 1434 Btuh
Internal gain		Occupants 4	Btuh/occupant X 230	Appliance +	3400	Load 4320 Btuh
					Sensible Envelope Load:	17100 Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic) (DGM of 0.398)					6801 Btuh
					Sensible Load All Zones	23902 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Barber, Austin & Kelsey
Racetrack Lane
Lake City, FL

Project Title:
240742 Barber

Climate:FL_GAINESVILLE_REGIONAL_A

2024-06-29

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	17100 Btuh
	Sensible Duct Load	6801 Btuh
	Total Sensible Zone Loads	23902 Btuh
	Sensible ventilation (Ex:0 cfm; Sup:0 cfm)	0 Btuh
	Blower	0 Btuh
	Total sensible gain	23902 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	2380 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1431 Btuh
	Latent occupant gain (4.0 people @ 200 Btuh per person)	800 Btuh
	Latent other gain	0 Btuh
	Latent total gain	4611 Btuh
	TOTAL GAIN	28513 Btuh

EQUIPMENT

1. Central Unit	#	37000 Btuh
-----------------	---	------------

*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