

Residential System Sizing Calculation

Summary

Sykes Res

Project Title:
240152 Sykes

Lake City, FL

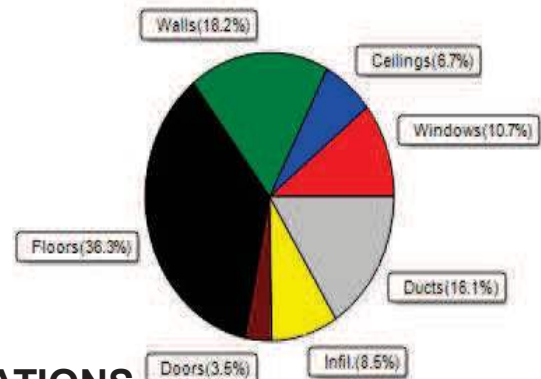
2024-02-07

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		18192 Btuh	Total cooling load calculation		16376 Btuh
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	109.9	20000	Sensible (SHR = 0.75)	106.0	15000
Heat Pump + Auxiliary(0.0kW)	109.9	20000	Latent	224.5	5000
			Total (Electric Heat Pump)	122.1	20000

WINTER CALCULATIONS

Winter Heating Load (for 1200 sqft)

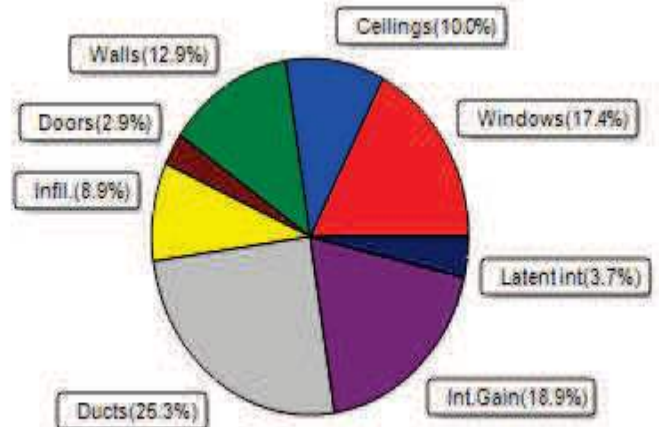
Load component		Load	
Window total	148 sqft	1947	Btuh
Wall total	933 sqft	3311	Btuh
Door total	40 sqft	640	Btuh
Ceiling total	1200 sqft	1218	Btuh
Floor total	1200 sqft	6608	Btuh
Infiltration	35 cfm	1540	Btuh
Duct loss		2928	Btuh
Subtotal		18192	Btuh
Ventilation	Ex:0 cfm; Sup:0 cfm	0	Btuh
TOTAL HEAT LOSS		18192	Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 1200 sqft)

Load component		Load	
Window total	148 sqft	2854	Btuh
Wall total	933 sqft	2111	Btuh
Door total	40 sqft	480	Btuh
Ceiling total	1200 sqft	1645	Btuh
Floor total		0	Btuh
Infiltration	26 cfm	549	Btuh
Internal gain		3090	Btuh
Duct gain		3421	Btuh
Sens.Ventilation	Ex:0 cfm; Sup:0 cfm	0	Btuh
Blower Load		0	Btuh
Total sensible gain		14149	Btuh
Latent gain(ducts)		717	Btuh
Latent gain(infiltration)		910	Btuh
Latent gain(ventilation)		0	Btuh
Latent gain(internal/occupants/other)		600	Btuh
Total latent gain		2227	Btuh
TOTAL HEAT GAIN		16376	Btuh



8th Edition



EnergyGauge® System Sizing

PREPARED BY: Evan Beamsley

DATE: 2024-02-07

EnergyGauge® / USRCZB v8.1.00

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Sykes Res

Lake City, FL

Project Title:
240152 Sykes
Building Type: User

2024-02-07

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 0.23	Vinyl	0.33	N	30.0		13.2	396 Btuh
2	2, NFRC 0.23	Vinyl	0.33	N	25.0		13.2	330 Btuh
3	2, NFRC 0.23	Vinyl	0.33	E	30.0		13.2	396 Btuh
4	2, NFRC 0.23	Vinyl	0.33	S	25.0		13.2	330 Btuh
5	2, NFRC 0.23	Vinyl	0.33	S	12.5		13.2	165 Btuh
6	2, NFRC 0.23	Vinyl	0.33	W	15.0		13.2	198 Btuh
7	2, NFRC 0.23	Vinyl	0.33	W	10.0		13.2	132 Btuh
	Window Total				147.5(sqft)			1947 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	165		3.55	586 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	290		3.55	1030 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	183		3.55	648 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	295		3.55	1047 Btuh
	Wall Total				933(sqft)			3311 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior, n		(0.400)		20		16.0	320 Btuh
2	Insulated - Exterior, n		(0.400)		20		16.0	320 Btuh
	Door Total				40(sqft)			640Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load
1	Flat ceil/D/Shing		(0.025)	38.0/0.0	1200		1.0	1218 Btuh
	Ceiling Total				1200(sqft)			1218Btuh
Floors	Type		Ueff.	R-Value	Size	X	HTM=	Load
1	Slab On Grade		(1.180)	0.0	140.0 ft(perim.)		47.2	6608 Btuh
	Floor Total				1200 sqft			6608 Btuh
	Envelope Subtotal:							13724 Btuh
Infiltration	Type	Wholehouse	ACH	Volume(cuft)	Wall Ratio	CFM=		Load
	Natural		0.22	9600	1.00	35.1		1540 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.192)							2928 Btuh
All Zones	Sensible Subtotal All Zones							18192 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Sykes Res
Lake City, FL

Project Title:
240152 Sykes
Building Type: User

2024-02-07

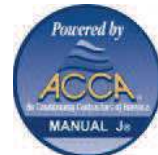
WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss	18192 Btuh
	Ventilation Sens. Heat Loss (Ex:0 cfm; Sup:0 cfm)	0 Btuh
	Total Heat Loss	18192 Btuh

EQUIPMENT

1. Electric Heat Pump	#	20000 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

Sykes Res

Project Title:
240152 Sykes

Lake City, FL

2024-02-07

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	0.23, 0.33	No	No	N		1.5ft	6.0ft	30.0	0.0	30.0	11	22	652	Btuh	
2	2 NFRC	0.23, 0.33	No	No	N		1.5ft	4.5ft	25.0	0.0	25.0	11	22	543	Btuh	
3	2 NFRC	0.23, 0.33	No	No	E		1.5ft	0.5ft	30.0	11.8	18.2	11	23	545	Btuh	
4	2 NFRC	0.23, 0.33	No	No	S		6.0ft	0.5ft	25.0	25.0	0.0	11	23	278	Btuh	
5	2 NFRC	0.23, 0.33	No	No	S		6.0ft	0.5ft	12.5	12.5	0.0	11	23	139	Btuh	
6	2 NFRC	0.23, 0.33	No	No	W		1.5ft	0.5ft	15.0	0.0	15.0	11	22	326	Btuh	
7	2 NFRC	0.23, 0.33	No	No	W		1.5ft	0.5ft	10.0	0.0	10.0	11	22	217	Btuh	
	Excursion													154	Btuh	
	Window Total								148 (sqft)					2854 Btuh		
Walls	Type						U-Value		R-Value		Area(sqft)		HTM		Load	
									Cav/Sheath							
1	Frame - Wood - Ext						0.09		13.0/0.0		165.0		2.3		373 Btuh	
2	Frame - Wood - Ext						0.09		13.0/0.0		290.0		2.3		656 Btuh	
3	Frame - Wood - Ext						0.09		13.0/0.0		182.5		2.3		413 Btuh	
4	Frame - Wood - Ext						0.09		13.0/0.0		295.0		2.3		668 Btuh	
	Wall Total										933 (sqft)				2111 Btuh	
Doors	Type								Area (sqft)		HTM		Load			
1	Insulated - Exterior								20.0		12.0		240 Btuh			
2	Insulated - Exterior								20.0		12.0		240 Btuh			
	Door Total								40 (sqft)				480 Btuh			
Ceilings	Type/Color/Surface						U-Value		R-Value		Area(sqft)		HTM		Load	
1	Vented Attic/DarkShingle						0.025		38.0/0.0		1200.0		1.37		1645 Btuh	
	Ceiling Total										1200 (sqft)				1645 Btuh	
Floors	Type								R-Value		Size		HTM		Load	
1	Slab On Grade								0.0		1200 (ft-perimeter)		0.0		0 Btuh	
	Floor Total										1200.0 (sqft)				0 Btuh	
	Envelope Subtotal:													7089 Btuh		
Infiltration	Type						Average ACH		Volume(cuft)		Wall Ratio		CFM=		Load	
	Natural						0.16		9600		1		26.3		549 Btuh	
Internal gain							Occupants		Btuh/occupant		Appliance		Load			
							3		X 230		+		2400		3090 Btuh	
	Sensible Envelope Load:													10728 Btuh		
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic) (DGM of 0.319)													3421 Btuh		
	Sensible Load All Zones													14149 Btuh		

Manual J Summer Calculations

Residential Load - Component Details (continued)

Sykes Res
Lake City, FL

Project Title:
240152 Sykes

Climate:FL_GAINESVILLE_REGIONAL_A

2024-02-07

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	10728 Btuh
	Sensible Duct Load	3421 Btuh
	Total Sensible Zone Loads	14149 Btuh
	Sensible ventilation (Ex:0 cfm; Sup:0 cfm)	0 Btuh
	Blower	0 Btuh
	Total sensible gain	14149 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	910 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	717 Btuh
	Latent occupant gain (3.0 people @ 200 Btuh per person)	600 Btuh
	Latent other gain	0 Btuh
	Latent total gain	2227 Btuh
	TOTAL GAIN	16376 Btuh

EQUIPMENT

1. Central Unit	#	20000 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