

Residential System Sizing Calculation

Summary

Mitchell & Jeanenne Adams

Project Title:
Adams Residence

Lake City, FL 32024

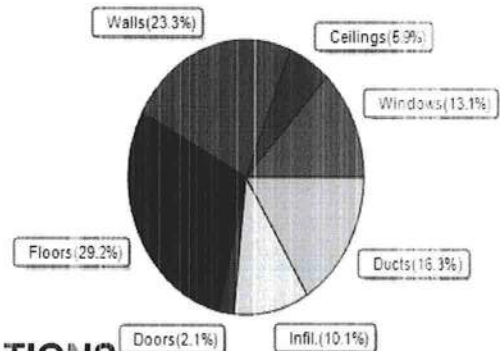
8/31/2020

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	42443 Btuh	Total cooling load calculation	34022 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	64.9 27546	Sensible (SHR = 0.70)	55.0 15282
Heat Pump + Auxiliary(0.0kW)	64.9 27546	Latent	104.9 6549
		Total (Electric Heat Pump)	64.2 21831

WINTER CALCULATIONS

Winter Heating Load (for 2350 sqft)

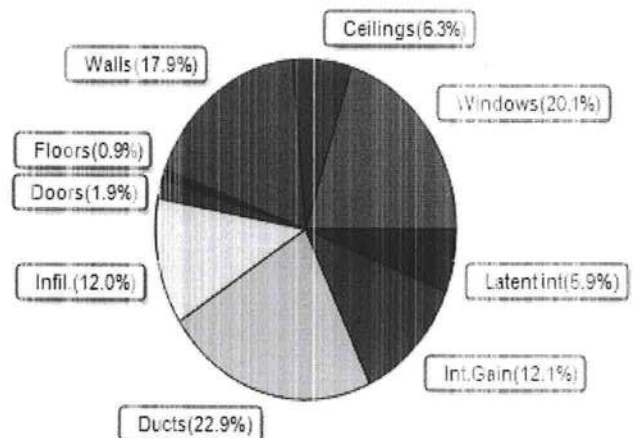
Load component		Load	
Window total	385 sqft	5544	Btuh
Wall total	2790 sqft	9904	Btuh
Door total	48 sqft	883	Btuh
Ceiling total	2468 sqft	2506	Btuh
Floor total	See detail report	12384	Btuh
Infiltration	98 cfm	4303	Btuh
Duct loss		6919	Btuh
Subtotal		42443	Btuh
Ventilation	0 cfm	0	Btuh
TOTAL HEAT LOSS		42443	Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 2350 sqft)

Load component		Load	
Window total	385 sqft	6848	Btuh
Wall total	2790 sqft	6078	Btuh
Door total	48 sqft	662	Btuh
Ceiling total	2468 sqft	2130	Btuh
Floor total		320	Btuh
Infiltration	74 cfm	1533	Btuh
Internal gain		4100	Btuh
Duct gain		6105	Btuh
Sens. Ventilation	0 cfm	0	Btuh
Blower Load		0	Btuh
Total sensible gain		27777	Btuh
Latent gain(ducts)		1701	Btuh
Latent gain(infiltration)		2544	Btuh
Latent gain(ventilation)		0	Btuh
Latent gain(internal/occupants/other)		2000	Btuh
Total latent gain		6245	Btuh
TOTAL HEAT GAIN		34022	Btuh



8th Edition

EnergyGauge® System Sizing

PREPARED BY: _____

DATE: _____

EnergyGauge® / USRCZB v6.1.04

47477

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Mitchell & Jeanenne Adams

Project Title:

Adams Residence

Lake City, FL 32024

Building Type: User

8/31/2020

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 0.25	Vinyl	0.36	S	40.0	14.4	576 Btuh
2	2, NFRC 0.25	Vinyl	0.36	S	20.0	14.4	288 Btuh
3	2, NFRC 0.25	Vinyl	0.36	E	50.0	14.4	720 Btuh
4	2, NFRC 0.25	TIM	0.36	N	100.0	14.4	1440 Btuh
5	2, NFRC 0.25	Vinyl	0.36	N	24.0	14.4	346 Btuh
6	2, NFRC 0.25	TIM	0.36	E	20.0	14.4	288 Btuh
7	2, NFRC 0.25	Vinyl	0.36	E	15.0	14.4	216 Btuh
8	2, NFRC 0.25	Vinyl	0.36	N	30.0	14.4	432 Btuh
9	2, NFRC 0.25	Vinyl	0.36	W	16.0	14.4	230 Btuh
10	2, NFRC 0.25	Vinyl	0.36	W	6.0	14.4	86 Btuh
11	2, NFRC 0.25	Vinyl	0.36	S	32.0	14.4	461 Btuh
12	2, NFRC 0.25	Vinyl	0.36	W	32.0	14.4	461 Btuh
Window Total					385.0(sqft)		5544 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	176	3.55	625 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	100	3.55	355 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	138	3.55	491 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	308	3.55	1092 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	274	3.55	974 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	80	3.55	284 Btuh
7	Frame - Wood	- Ext	(0.089)	13.0/0.0	85	3.55	302 Btuh
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	230	3.55	817 Btuh
9	Frame - Wood	- Ext	(0.089)	13.0/0.0	268	3.55	951 Btuh
10	Frame - Wood	- Adj	(0.089)	13.0/0.0	236	3.55	838 Btuh
11	Frame - Wood	- Adj	(0.089)	13.0/0.0	172	3.55	609 Btuh
12	Frame - Wood	- Ext	(0.089)	13.0/0.0	125	3.55	445 Btuh
13	Frame - Wood	- Ext	(0.089)	13.0/0.0	157	3.55	559 Btuh
14	Frame - Wood	- Ext	(0.089)	13.0/0.0	236	3.55	838 Btuh
15	Frame - Wood	- Ext	(0.089)	13.0/0.0	204	3.55	724 Btuh
Wall Total					2789(sqft)		9904 Btuh
Doors	Type	Storm	Ueff.		Area X	HTM=	Load
1	Insulated - Exterior, n		(0.460)		24	18.4	442 Btuh
2	Insulated - Garage, n		(0.460)		24	18.4	442 Btuh
Door Total					48(sqft)		883 Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area X	HTM=	Load
1	Vented Attic/L/Shing		(0.025)	38.0/0.0	1989	1.0	2019 Btuh
2	Vented Attic/L/Shing		(0.025)	38.0/0.0	479	1.0	486 Btuh
Ceiling Total					2468(sqft)		2506 Btuh
Floors	Type		Ueff.	R-Value	Size X	HTM=	Load
1	Slab On Grade		(1.180)	0.0	243.0 ft(perim.)	47.2	11470 Btuh
2	Raised Wood - Adj		(0.050)	19.0	456.0 sqft	2.0	915 Btuh
Floor Total					2350 sqft		12384 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Mitchell & Jeanenne Adams

Project Title:
Adams Residence
Building Type: User

Lake City, FL 32024

8/31/2020

	Envelope Subtotal:					31221 Btuh
Infiltration	Type Natural	Wholehouse ACH 0.26	Volume(cuft) 22588	Wall Ratio 1.00	CFM= 98.3	4303 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.195)					6919 Btuh
All Zones	Sensible Subtotal All Zones					42443 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	42443 Btuh 0 Btuh 42443 Btuh
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EQUIPMENT

1. Electric Heat Pump	#	27546 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

Mitchell & Jeanenne Adams

Project Title:
Adams Residence

Lake City, FL 32024

8/31/2020

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	0.25, 0.36	No	No	S		7.5ft.	1.0ft.	40.0	40.0	0.0	12	14	484	Btuh	
2	2 NFRC	0.25, 0.36	No	No	S		1.0ft.	4.0ft.	20.0	6.7	13.3	12	14	263	Btuh	
3	2 NFRC	0.25, 0.36	No	No	E		1.0ft.	4.0ft.	50.0	0.0	50.0	12	31	1547	Btuh	
4	2 NFRC	0.25, 0.36	No	No	N		11.5f	1.0ft.	100.0	0.0	100.0	12	12	1210	Btuh	
5	2 NFRC	0.25, 0.36	No	No	N		11.5f	1.0ft.	24.0	0.0	24.0	12	12	290	Btuh	
6	2 NFRC	0.25, 0.36	No	No	E		10.0f	1.0ft.	20.0	20.0	0.0	12	31	242	Btuh	
7	2 NFRC	0.25, 0.36	No	No	E		1.5ft.	1.0ft.	15.0	0.7	14.3	12	31	450	Btuh	
8	2 NFRC	0.25, 0.36	No	No	N		1.0ft.	4.0ft.	30.0	0.0	30.0	12	12	363	Btuh	
9	2 NFRC	0.25, 0.36	No	No	W		1.5ft.	1.0ft.	16.0	1.0	15.0	12	31	477	Btuh	
10	2 NFRC	0.25, 0.36	No	No	W		1.5ft.	1.0ft.	6.0	1.5	4.5	12	31	153	Btuh	
11	2 NFRC	0.25, 0.36	No	No	S		1.0ft.	2.0ft.	32.0	22.1	9.9	12	14	407	Btuh	
12	2 NFRC	0.25, 0.36	No	No	W		1.0ft.	0.5ft.	32.0	2.0	30.0	12	31	953	Btuh	
	Window Total								385 (sqft)					6848		Btuh
Walls	Type					U-Value	R-Value	Area(sqft)		HTM		Load				
							Cav/Sheath									
1	Frame - Wood - Ext					0.09	13.0/0.0	176.0		2.3		393		Btuh		
2	Frame - Wood - Ext					0.09	13.0/0.0	100.0		2.3		226		Btuh		
3	Frame - Wood - Ext					0.09	13.0/0.0	138.3		2.3		313		Btuh		
4	Frame - Wood - Ext					0.09	13.0/0.0	307.5		2.3		696		Btuh		
5	Frame - Wood - Ext					0.09	13.0/0.0	274.3		2.3		621		Btuh		
6	Frame - Wood - Ext					0.09	13.0/0.0	80.0		2.3		181		Btuh		
7	Frame - Wood - Ext					0.09	13.0/0.0	85.0		2.3		192		Btuh		
8	Frame - Wood - Ext					0.09	13.0/0.0	230.0		2.3		521		Btuh		
9	Frame - Wood - Ext					0.09	13.0/0.0	268.0		2.3		607		Btuh		
10	Frame - Wood - Adj					0.09	13.0/0.0	236.0		1.7		398		Btuh		
11	Frame - Wood - Adj					0.09	13.0/0.0	171.7		1.7		289		Btuh		
12	Frame - Wood - Ext					0.09	13.0/0.0	125.3		2.3		284		Btuh		
13	Frame - Wood - Ext					0.09	13.0/0.0	157.3		2.3		356		Btuh		
14	Frame - Wood - Ext					0.09	13.0/0.0	236.0		2.3		534		Btuh		
15	Frame - Wood - Ext					0.09	13.0/0.0	204.0		2.3		462		Btuh		
	Wall Total								2790 (sqft)					6078		Btuh
Doors	Type							Area (sqft)		HTM		Load				
1	Insulated - Exterior							24.0		13.8		331		Btuh		
2	Insulated - Garage							24.0		13.8		331		Btuh		
	Door Total								48 (sqft)					662		Btuh
Ceilings	Type/Color/Surface					U-Value	R-Value	Area(sqft)		HTM		Load				
1	Vented AtticLight/Shingle/RB					0.025	38.0/0.0	1989.0		0.86		1716		Btuh		
2	Vented AtticLight/Shingle/RB					0.025	38.0/0.0	479.0		0.86		413		Btuh		
	Ceiling Total								2468 (sqft)					2130		Btuh
Floors	Type						R-Value	Size		HTM		Load				
1	Slab On Grade						0.0	1894 (ft-perimeter)		0.0		0		Btuh		
2	Raised Wood - Adj						19.0	456 (sqft)		0.7		320		Btuh		
	Floor Total								2350.0 (sqft)					320		Btuh
	Envelope Subtotal:													16039		Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Mitchell & Jeanenne Adams

Project Title:
Adams Residence

Climate: FL_GAINESVILLE_REGIONAL_A

Lake City, FL 32024

8/31/2020

Infiltration	Type Natural	Average ACH 0.20	Volume(cuft) 22588	Wall Ratio 1	CFM= 73.7	Load 1533 Btuh
Internal gain		Occupants 10	Btuh/occupant X 230	Appliance +	1800	Load 4100 Btuh
					Sensible Envelope Load:	21672 Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic)				(DGM of 0.282)	6105 Btuh
					Sensible Load All Zones	27777 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Mitchell & Jeanenne Adams

Project Title:
Adams Residence

Climate: FL_GAINESVILLE_REGIONAL_A

Lake City, FL 32024

8/31/2020

WHOLE HOUSE TOTALS		
Whole House Totals for Cooling	Sensible Envelope Load All Zones	21672 Btuh
	Sensible Duct Load	6105 Btuh
	Total Sensible Zone Loads	27777 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	27777 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	2544 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1701 Btuh
	Latent occupant gain (10.0 people @ 200 Btuh per person)	2000 Btuh
	Latent other gain	0 Btuh
	Latent total gain	6245 Btuh
	TOTAL GAIN	34022 Btuh

EQUIPMENT		
1. Central Unit	#	21831 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