

Residential System Sizing Calculation

Summary

Johnson Res
CR 252
Lake City, FL

Project Title:
200740 Johnson Res

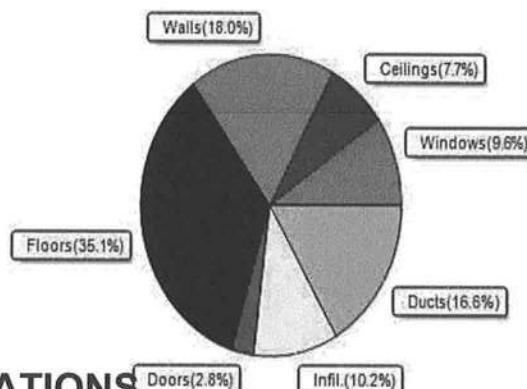
2021-07-19

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	26605 Btuh	Total cooling load calculation	20952 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	109.0 29000	Sensible (SHR = 0.75)	127.0 21750
Heat Pump + Auxiliary(0.0kW)	109.0 29000	Latent	189.6 7250
		Total (Electric Heat Pump)	138.4 29000

WINTER CALCULATIONS

Winter Heating Load (for 1821 sqft)

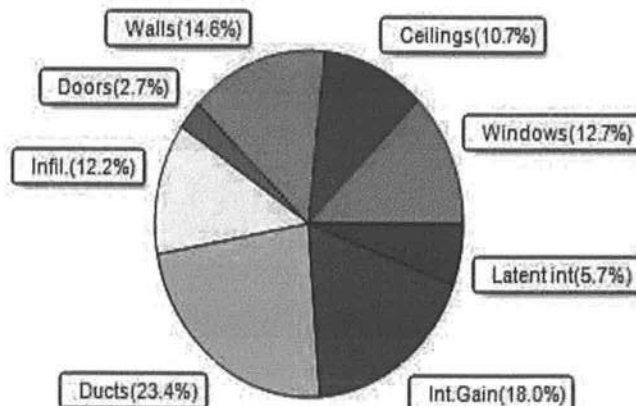
Load component		Load	
Window total	182 sqft	2553 Btuh	
Wall total	1348 sqft	4787 Btuh	
Door total	47 sqft	747 Btuh	
Ceiling total	2005 sqft	2036 Btuh	
Floor total	1821 sqft	9346 Btuh	
Infiltration	62 cfm	2709 Btuh	
Duct loss		4428 Btuh	
Subtotal		26605 Btuh	
Ventilation	0 cfm	0 Btuh	
TOTAL HEAT LOSS		26605 Btuh	



SUMMER CALCULATIONS

Summer Cooling Load (for 1821 sqft)

Load component		Load	
Window total	182 sqft	2657 Btuh	
Wall total	1348 sqft	3052 Btuh	
Door total	47 sqft	560 Btuh	
Ceiling total	2005 sqft	2239 Btuh	
Floor total		0 Btuh	
Infiltration	46 cfm	965 Btuh	
Internal gain		3780 Btuh	
Duct gain		3875 Btuh	
Sens. Ventilation	0 cfm	0 Btuh	
Blower Load		0 Btuh	
Total sensible gain		17128 Btuh	
Latent gain(ducts)		1023 Btuh	
Latent gain(infiltration)		1601 Btuh	
Latent gain(ventilation)		0 Btuh	
Latent gain(internal/occupants/other)		1200 Btuh	
Total latent gain		3824 Btuh	
TOTAL HEAT GAIN		20952 Btuh	



8th Edition

EnergyGauge® System Sizing
PREPARED BY: Evan Beamsley
DATE: 2021-07-19

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Johnson Res
CR 252
Lake City, FL

Project Title:
200740 Johnson Res
Building Type: User

2021-07-19

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 0.30	Metal	0.35	N	15.0		14.0	210 Btuh
2	2, NFRC 0.30	Metal	0.35	N	30.0		14.0	420 Btuh
3	2, NFRC 0.30	Metal	0.35	NW	13.3		14.0	187 Btuh
4	2, NFRC 0.30	Metal	0.35	N	20.0		14.0	280 Btuh
5	2, NFRC 0.30	Metal	0.35	N	15.0		14.0	210 Btuh
6	2, NFRC 0.30	Metal	0.35	N	16.0		14.0	224 Btuh
7	2, NFRC 0.30	Metal	0.35	E	9.0		14.0	126 Btuh
8	2, NFRC 0.30	Metal	0.35	S	15.0		14.0	210 Btuh
9	2, NFRC 0.30	Metal	0.35	E	6.0		14.0	84 Btuh
10	2, NFRC 0.30	Metal	0.35	S	9.0		14.0	126 Btuh
11	2, NFRC 0.30	Metal	0.35	S	30.0		14.0	420 Btuh
12	2, NFRC 0.30	Metal	0.35	W	4.0		14.0	56 Btuh
	Window Total					182.3(sqft)		2553 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	81		3.55	288 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	40		3.55	142 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	53		3.55	187 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	11		3.55	38 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	19		3.55	66 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	245		3.55	870 Btuh
7	Frame - Wood	- Ext	(0.089)	13.0/0.0	199		3.55	707 Btuh
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	140		3.55	496 Btuh
9	Frame - Wood	- Ext	(0.089)	13.0/0.0	25		3.55	88 Btuh
10	Frame - Wood	- Ext	(0.089)	13.0/0.0	282		3.55	1002 Btuh
11	Frame - Wood	- Ext	(0.089)	13.0/0.0	255		3.55	904 Btuh
	Wall Total					1348(sqft)		4787 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior, n		(0.400)		7		16.0	107 Btuh
2	Insulated - Exterior, n		(0.400)		20		16.0	320 Btuh
3	Insulated - Exterior, n		(0.400)		20		16.0	320 Btuh
	Door Total					47(sqft)		747Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load
1	Vented Attic/L/Metal		(0.025)	38.0/0.0	1821		1.0	1849 Btuh
2	Knee Wall/L/Metal		(0.025)	38.0/0.0	184		1.0	187 Btuh
	Ceiling Total					2005(sqft)		2036Btuh
Floors	Type		Ueff.	R-Value	Size	X	HTM=	Load
1	Slab On Grade		(1.180)	0.0	198.0 ft(perim.)		47.2	9346 Btuh
	Floor Total					1821 sqft		9346 Btuh
	Envelope Subtotal:							19467 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Johnson Res
CR 252
Lake City, FL

Project Title:
200740 Johnson Res
Building Type: User

2021-07-19

Infiltration	Type Natural	Wholehouse ACH 0.23	Volume(cuft) 16207	Wall Ratio 1.00	CFM= 61.9	2709 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Con) (DLM of 0.200)					4428 Btuh
All Zones	Sensible Subtotal All Zones					26605 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	26605 Btuh 0 Btuh 26605 Btuh
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EQUIPMENT

1. Electric Heat Pump	#	29000 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

Johnson Res
CR 252
Lake City, FL

Project Title:
200740 Johnson Res

2021-07-19

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	0.30, 0.35	No	No	N	1.5ft	0.5ft	15.0	15.0	0.0	13	15	194	Btuh
2	2 NFRC	0.30, 0.35	No	No	N	12.0f	0.5ft	30.0	30.0	0.0	13	15	389	Btuh
3	2 NFRC	0.30, 0.35	No	No	NW	17.0f	0.5ft	13.3	13.3	0.0	13	28	173	Btuh
4	2 NFRC	0.30, 0.35	No	No	N	1.5ft	0.5ft	20.0	20.0	0.0	13	15	259	Btuh
5	2 NFRC	0.30, 0.35	No	No	N	1.5ft	0.5ft	15.0	15.0	0.0	13	15	194	Btuh
6	2 NFRC	0.30, 0.35	No	No	N	1.5ft	0.5ft	16.0	16.0	0.0	13	15	207	Btuh
7	2 NFRC	0.30, 0.35	No	No	E	1.5ft	2.5ft	9.0	0.0	9.0	13	36	320	Btuh
8	2 NFRC	0.30, 0.35	No	No	S	1.5ft	0.5ft	15.0	0.0	15.0	13	13	194	Btuh
9	2 NFRC	0.30, 0.35	No	No	E	7.5ft	0.5ft	6.0	6.0	0.0	13	36	78	Btuh
10	2 NFRC	0.30, 0.35	No	No	S	7.5ft	0.5ft	9.0	0.0	9.0	13	13	117	Btuh
11	2 NFRC	0.30, 0.35	No	No	S	7.5ft	0.5ft	30.0	0.0	30.0	13	13	389	Btuh
12	2 NFRC	0.30, 0.35	No	No	W	1.5ft	9.0ft	4.0	0.0	4.0	13	36	142	Btuh
	Window Total							182 (sqft)					2657 Btuh	
Walls	Type	U-Value					R-Value		Area(sqft)		HTM		Load	
							Cav/Sheath							
1	Frame - Wood - Ext	0.09					13.0/0.0		81.0		2.3		183 Btuh	
2	Frame - Wood - Ext	0.09					13.0/0.0		40.0		2.3		91 Btuh	
3	Frame - Wood - Ext	0.09					13.0/0.0		52.7		2.3		119 Btuh	
4	Frame - Wood - Ext	0.09					13.0/0.0		10.7		2.3		24 Btuh	
5	Frame - Wood - Ext	0.09					13.0/0.0		18.7		2.3		42 Btuh	
6	Frame - Wood - Ext	0.09					13.0/0.0		245.0		2.3		555 Btuh	
7	Frame - Wood - Ext	0.09					13.0/0.0		199.0		2.3		450 Btuh	
8	Frame - Wood - Ext	0.09					13.0/0.0		139.7		2.3		316 Btuh	
9	Frame - Wood - Ext	0.09					13.0/0.0		24.7		2.3		56 Btuh	
10	Frame - Wood - Ext	0.09					13.0/0.0		282.3		2.3		639 Btuh	
11	Frame - Wood - Ext	0.09					13.0/0.0		254.7		2.3		576 Btuh	
	Wall Total							1348 (sqft)					3052 Btuh	
Doors	Type	U-Value					R-Value		Area (sqft)		HTM		Load	
1	Insulated - Exterior								6.7		12.0		80 Btuh	
2	Insulated - Exterior								20.0		12.0		240 Btuh	
3	Insulated - Exterior								20.0		12.0		240 Btuh	
	Door Total							47 (sqft)					560 Btuh	
Ceilings	Type/Color/Surface	U-Value					R-Value		Area(sqft)		HTM		Load	
1	Vented Attic/Light/Metal	0.025					38.0/0.0		1821.0		1.12		2034 Btuh	
2	Knee Wall/Light/Metal	0.025					38.0/0.0		184.0		1.12		205 Btuh	
	Ceiling Total							2005 (sqft)					2239 Btuh	
Floors	Type	U-Value					R-Value		Size		HTM		Load	
1	Slab On Grade						0.0		1821 (ft-perimeter)		0.0		0 Btuh	
	Floor Total							1821.0 (sqft)					0 Btuh	
	Envelope Subtotal:												8508 Btuh	

Manual J Summer Calculations

Residential Load - Component Details (continued)

Johnson Res
CR 252
Lake City, FL

Project Title: 200740 Johnson Res
Climate: FL_GAINESVILLE_REGIONAL_A

2021-07-19

Infiltration	Type Natural	Average ACH 0.17	Volume(cuft) 16207	Wall Ratio 1	CFM= 46.4	Load 965 Btuh
Internal gain		Occupants 6	Btuh/occupant X 230	Appliance +	2400	Load 3780 Btuh
	Sensible Envelope Load:					13253 Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Condi) (DGM of 0.292)					3875 Btuh
	Sensible Load All Zones					17128 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Johnson Res
CR 252
Lake City, FL

Project Title: 200740 Johnson Res
Climate: FL_GAINESVILLE_REGIONAL_A

2021-07-19

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	13253 Btuh
	Sensible Duct Load	3875 Btuh
	Total Sensible Zone Loads	17128 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	17128 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	1601 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1023 Btuh
	Latent occupant gain (6.0 people @ 200 Btuh per person)	1200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	3824 Btuh
	TOTAL GAIN	20952 Btuh

EQUIPMENT

1. Central Unit	#	29000 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