

Residential System Sizing Calculation

Summary

Project Title:
Johnson Residence

, FL

11/2/2021

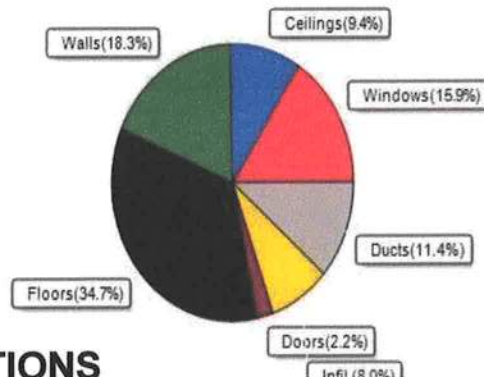


Location for weather data: Gainesville, FL - Defaults: Latitude(29.7) Altitude(152 ft.) Temp Range(M)					
Humidity data: Interior RH (50%) Outdoor wet bulb (77F) Humidity difference(51gr.)					
Winter design temperature(TMY3 99%)	30	F	Summer design temperature(TMY3 99%)	94	F
Winter setpoint	70	F	Summer setpoint	75	F
Winter temperature difference	40	F	Summer temperature difference	19	F
Total heating load calculation	29486	Btuh	Total cooling load calculation	22223	Btuh
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	122.1	36000	Sensible (SHR = 0.80)	150.9	28800
Heat Pump + Auxiliary(0.0kW)	122.1	36000	Latent	229.8	7200
			Total (Electric Heat Pump)	162.0	36000

WINTER CALCULATIONS

Winter Heating Load (for 2186 sqft)

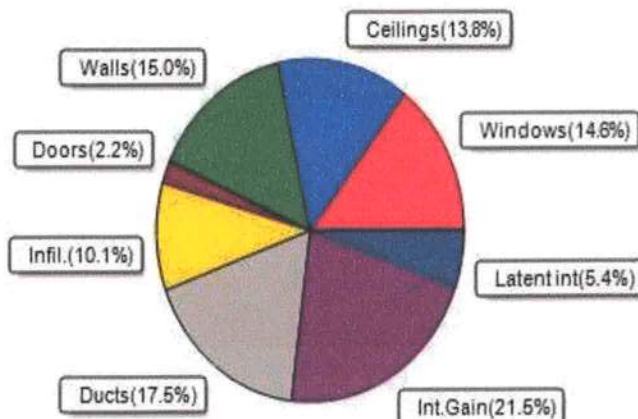
Load component		Load
Window total	355 sqft	4690 Btuh
Wall total	1569 sqft	5410 Btuh
Door total	40 sqft	640 Btuh
Ceiling total	2186 sqft	2785 Btuh
Floor total	2186 sqft	10242 Btuh
Infiltration	54 cfm	2359 Btuh
Duct loss		3359 Btuh
Subtotal		29486 Btuh
Ventilation	0 cfm	0 Btuh
TOTAL HEAT LOSS		29486 Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 2186 sqft)

Load component		Load
Window total	355 sqft	3243 Btuh
Wall total	1569 sqft	3324 Btuh
Door total	40 sqft	480 Btuh
Ceiling total	2186 sqft	3063 Btuh
Floor total		0 Btuh
Infiltration	40 cfm	841 Btuh
Internal gain		4780 Btuh
Duct gain		3359 Btuh
Sens. Ventilation	0 cfm	0 Btuh
Blower Load		0 Btuh
Total sensible gain		19090 Btuh
Latent gain(ducts)		539 Btuh
Latent gain(infiltration)		1395 Btuh
Latent gain(ventilation)		0 Btuh
Latent gain(internal/occupants/other)		1200 Btuh
Total latent gain		3133 Btuh
TOTAL HEAT GAIN		22223 Btuh



8th Edition

EnergyGauge® System Sizing

PREPARED BY: _____

DATE: _____

[Signature]
11-2-21

System Sizing Calculations - Summer

Residential Load - Whole House Component Details

Project Title:
Johnson Residence

, FL

11/2/2021

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	
1	2 NFRC	0.22, 0.33	I-A	No	N	12.5f	1.3ft	54.0	0.0	54.0	8	8	414 Btuh
2	2 NFRC	0.22, 0.33	I-A	No	N	12.5f	1.3ft	63.0	0.0	63.0	8	8	483 Btuh
3	2 NFRC	0.22, 0.33	I-A	No	W	29.5f	1.3ft	40.0	40.0	0.0	8	15	307 Btuh
4	2 NFRC	0.22, 0.33	I-A	No	N	1.5ft	1.3ft	63.0	0.0	63.0	8	8	483 Btuh
5	2 NFRC	0.22, 0.33	I-A	No	N	1.5ft	1.3ft	15.0	0.0	15.0	8	8	115 Btuh
6	2 NFRC	0.22, 0.33	I-A	No	E	1.5ft	1.3ft	3.0	0.0	3.0	8	15	46 Btuh
7	2 NFRC	0.22, 0.33	I-A	No	E	1.5ft	1.3ft	15.0	0.0	15.0	8	15	228 Btuh
8	2 NFRC	0.22, 0.33	I-A	No	E	1.5ft	1.3ft	12.0	0.0	12.0	8	15	182 Btuh
9	2 NFRC	0.22, 0.33	I-A	No	S	7.5ft	1.3ft	18.0	18.0	0.0	8	9	138 Btuh
10	2 NFRC	0.22, 0.33	I-A	No	S	13.5f	1.3ft	13.3	13.3	0.0	8	9	102 Btuh
11	2 NFRC	0.22, 0.33	I-A	No	S	13.5f	1.3ft	5.0	5.0	0.0	8	9	38 Btuh
12	2 NFRC	0.22, 0.33	I-A	No	S	7.5ft	1.3ft	18.0	18.0	0.0	8	9	138 Btuh
13	2 NFRC	0.22, 0.33	I-A	No	W	1.5ft	1.3ft	16.0	0.0	16.0	8	15	243 Btuh
14	2 NFRC	0.22, 0.33	I-A	No	W	1.5ft	1.3ft	20.0	0.0	20.0	8	15	304 Btuh
	Excursion												22 Btuh
	Window Total							355 (sqft)					3243 Btuh
Walls	Type	U-Value					R-Value		Area(sqft)		HTM		Load
							Cav/Sheath						
1	Frame - Wood - Ext	0.09					13.0/0.6		135.0		2.2		297 Btuh
2	Frame - Wood - Ext	0.09					13.0/0.6		70.0		2.2		154 Btuh
3	Frame - Wood - Ext	0.09					13.0/0.6		162.0		2.2		356 Btuh
4	Frame - Wood - Ext	0.09					13.0/0.6		348.0		2.2		765 Btuh
5	Frame - Wood - Adj	0.09					13.0/0.6		172.0		1.6		282 Btuh
6	Frame - Wood - Adj	0.09					13.0/0.6		51.0		1.6		84 Btuh
7	Frame - Wood - Ext	0.09					13.0/0.6		84.0		2.2		185 Btuh
8	Frame - Wood - Ext	0.09					13.0/0.6		54.0		2.2		119 Btuh
9	Frame - Wood - Ext	0.09					13.0/0.6		12.7		2.2		28 Btuh
10	Frame - Wood - Ext	0.09					13.0/0.6		54.0		2.2		119 Btuh
11	Frame - Wood - Ext	0.09					13.0/0.6		129.0		2.2		284 Btuh
12	Frame - Wood - Ext	0.09					13.0/0.6		297.0		2.2		653 Btuh
	Wall Total							1569 (sqft)					3324 Btuh
Doors	Type								Area (sqft)		HTM		Load
1	Insulated - Garage								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/DarkWood shing	0.032					30.0/0.0		2186.0		1.40		3063 Btuh
	Ceiling Total							2186 (sqft)					3063 Btuh
Floors	Type						R-Value		Size		HTM		Load
1	Slab On Grade						0.0		2186 (ft-perimeter)		0.0		0 Btuh
	Floor Total							2186.0 (sqft)					0 Btuh
	Envelope Subtotal:												10110 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
Johnson Residence

, FL

11/2/2021

Infiltration	Type Natural	Average ACH 0.12	Volume(cuft) 19674	Wall Ratio 1	CFM= 40.4	Load 841 Btuh
Internal gain		Occupants 6	Btuh/occupant X 230	Appliance +	3400	Load 4780 Btuh
					Sensible Envelope Load:	15731 Btuh
Duct load	Extremely sealed, Supply(R8.0-Attic), Return(R8.0-Attic)				(DGM of 0.214)	3359 Btuh
					Sensible Load All Zones	19090 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
Johnson Residence

, FL

11/2/2021

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	15731 Btuh
	Sensible Duct Load	3359 Btuh
	Total Sensible Zone Loads	19090 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	19090 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	1395 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	539 Btuh
	Latent occupant gain (6.0 people @ 200 Btuh per person)	1200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	3133 Btuh
	TOTAL GAIN	22223 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:
Johnson Residence
Building Type: User

, FL

11/2/2021

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 0.22	Vinyl	0.33	N	54.0	13.2	713 Btuh
2	2, NFRC 0.22	Vinyl	0.33	N	63.0	13.2	832 Btuh
3	2, NFRC 0.22	Vinyl	0.33	W	40.0	13.2	528 Btuh
4	2, NFRC 0.22	Vinyl	0.33	N	63.0	13.2	832 Btuh
5	2, NFRC 0.22	Vinyl	0.33	N	15.0	13.2	198 Btuh
6	2, NFRC 0.22	Vinyl	0.33	E	3.0	13.2	40 Btuh
7	2, NFRC 0.22	Vinyl	0.33	E	15.0	13.2	198 Btuh
8	2, NFRC 0.22	Vinyl	0.33	E	12.0	13.2	158 Btuh
9	2, NFRC 0.22	Vinyl	0.33	S	18.0	13.2	238 Btuh
10	2, NFRC 0.22	Vinyl	0.33	S	13.3	13.2	176 Btuh
11	2, NFRC 0.22	Vinyl	0.33	S	5.0	13.2	66 Btuh
12	2, NFRC 0.22	Vinyl	0.33	S	18.0	13.2	238 Btuh
13	2, NFRC 0.22	Vinyl	0.33	W	16.0	13.2	211 Btuh
14	2, NFRC 0.22	Vinyl	0.33	W	20.0	13.2	264 Btuh
Window Total					355.3(sqft)		4690 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area X	HTM=	Load
1	Frame - Wood	- Ext	(0.086)	13.0/0.6	135	3.45	466 Btuh
2	Frame - Wood	- Ext	(0.086)	13.0/0.6	70	3.45	241 Btuh
3	Frame - Wood	- Ext	(0.086)	13.0/0.6	162	3.45	559 Btuh
4	Frame - Wood	- Ext	(0.086)	13.0/0.6	348	3.45	1200 Btuh
5	Frame - Wood	- Adj	(0.086)	13.0/0.6	172	3.45	593 Btuh
6	Frame - Wood	- Adj	(0.086)	13.0/0.6	51	3.45	176 Btuh
7	Frame - Wood	- Ext	(0.086)	13.0/0.6	84	3.45	290 Btuh
8	Frame - Wood	- Ext	(0.086)	13.0/0.6	54	3.45	186 Btuh
9	Frame - Wood	- Ext	(0.086)	13.0/0.6	13	3.45	44 Btuh
10	Frame - Wood	- Ext	(0.086)	13.0/0.6	54	3.45	186 Btuh
11	Frame - Wood	- Ext	(0.086)	13.0/0.6	129	3.45	445 Btuh
12	Frame - Wood	- Ext	(0.086)	13.0/0.6	297	3.45	1024 Btuh
Wall Total					1569(sqft)		5410 Btuh
Doors	Type	Storm	Ueff.		Area X	HTM=	Load
1	Insulated - Garage,	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	Vented Attic/D/Wood		(0.032)	30.0/0.0	2186	1.3	2785 Btuh
Ceiling Total					2186(sqft)		2785Btuh
Floors	Type		Ueff.	R-Value	Size X	HTM=	Load
1	Slab On Grade		(1.180)	0.0	217.0 ft(perim.)	47.2	10242 Btuh
Floor Total					2186 sqft		10242 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Project Title:
Johnson Residence
Building Type: User

, FL

11/2/2021

	Envelope Subtotal:						23767 Btuh
Infiltration	Type Natural	Wholehouse ACH 0.16	Volume(cuft) 19674	Wall Ratio 1.00	CFM= 53.9		2359 Btuh
Duct load	Extremely sealed, R8.0, Supply(Att), Return(Att) (DLM of 0.129)						3359 Btuh
All Zones	Sensible Subtotal All Zones						29486 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	29486 Btuh 0 Btuh 29486 Btuh
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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