

Residential System Sizing Calculation

Summary

Keith Archbold
NW Frontier Drive
Lake City, FL 32055

Project Title:
Archbold Residence

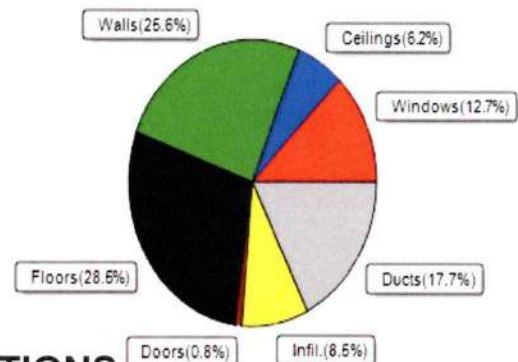
7/29/2022

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	43611 Btuh	Total cooling load calculation	31286 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	100.0 43611	Sensible (SHR = 0.70)	85.4 21892
Heat Pump + Auxiliary(0.0kW)	100.0 43611	Latent	166.2 9382
		Total (Electric Heat Pump)	100.0 31275

WINTER CALCULATIONS

Winter Heating Load (for 2552 sqft)

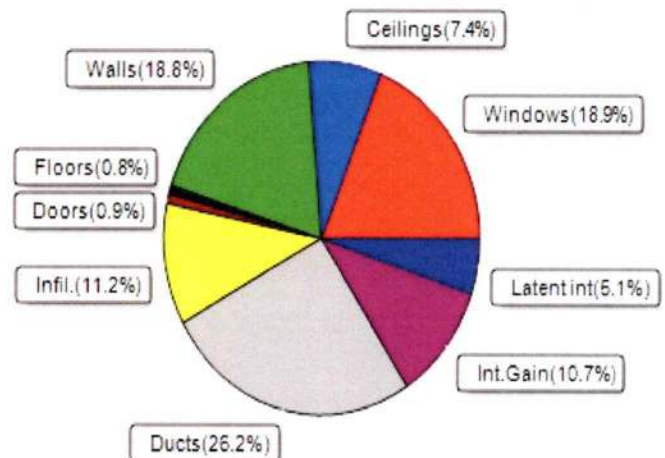
Load component		Load
Window total	384 sqft	5522 Btuh
Wall total	2542 sqft	11153 Btuh
Door total	20 sqft	368 Btuh
Ceiling total	2679 sqft	2720 Btuh
Floor total	See detail report	12430 Btuh
Infiltration	85 cfm	3715 Btuh
Duct loss		7704 Btuh
Subtotal		43611 Btuh
Ventilation	0 cfm	0 Btuh
TOTAL HEAT LOSS		43611 Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 2552 sqft)

Load component		Load
Window total	384 sqft	5927 Btuh
Wall total	2542 sqft	5877 Btuh
Door total	20 sqft	276 Btuh
Ceiling total	2679 sqft	2312 Btuh
Floor total		253 Btuh
Infiltration	64 cfm	1323 Btuh
Internal gain		3340 Btuh
Duct gain		6332 Btuh
Sens. Ventilation	0 cfm	0 Btuh
Blower Load		0 Btuh
Total sensible gain		25640 Btuh
Latent gain(ducts)		1850 Btuh
Latent gain(infiltration)		2196 Btuh
Latent gain(ventilation)		0 Btuh
Latent gain(internal/occupants/other)		1600 Btuh
Total latent gain		5646 Btuh
TOTAL HEAT GAIN		31286 Btuh



8th Edition

EnergyGauge® System Sizing

PREPARED BY: _____

DATE: 7/29/2022

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Keith Archbold
NW Frontier Drive
Lake City, FL 32055

Project Title:
Archbold Residence
Building Type: User

7/29/2022

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	70.0		14.4	1008 Btuh
2	2, NFRC 0.25	TIM	0.36	S	42.7		14.4	614 Btuh
3	2, NFRC 0.25	Vinyl	0.36	S	6.0		14.4	86 Btuh
4	2, NFRC 0.25	Vinyl	0.36	E	20.0		14.4	288 Btuh
5	2, NFRC 0.25	Vinyl	0.36	N	12.5		14.4	180 Btuh
6	2, NFRC 0.25	Vinyl	0.36	N	30.0		14.4	432 Btuh
7	2, NFRC 0.25	Vinyl	0.36	W	30.0		14.4	432 Btuh
8	2, NFRC 0.25	TIM	0.36	W	20.0		14.4	288 Btuh
9	2, NFRC 0.25	Vinyl	0.36	N	15.0		14.4	216 Btuh
10	2, NFRC 0.25	TIM	0.36	N	85.3		14.4	1229 Btuh
11	2, NFRC 0.25	Vinyl	0.36	N	16.0		14.4	230 Btuh
12	2, NFRC 0.25	Vinyl	0.36	W	6.0		14.4	86 Btuh
13	2, NFRC 0.25	Vinyl	0.36	N	15.0		14.4	216 Btuh
14	2, NFRC 0.25	Vinyl	0.36	E	15.0		14.4	216 Btuh
Window Total					383.5(sqft)			5522 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Conc Blk,Hollow - Ext		(0.132)	5.0/0.0	205		5.26	1077 Btuh
2	Conc Blk,Hollow - Ext		(0.132)	5.0/0.0	44		5.26	229 Btuh
3	Frame - Wood - Adj		(0.089)	13.0/0.0	166		3.55	591 Btuh
4	Frame - Wood - Adj		(0.089)	13.0/0.0	214		3.55	760 Btuh
5	Conc Blk,Hollow - Ext		(0.132)	5.0/0.0	258		5.26	1360 Btuh
6	Conc Blk,Hollow - Ext		(0.132)	5.0/0.0	231		5.26	1217 Btuh
7	Conc Blk,Hollow - Ext		(0.132)	5.0/0.0	70		5.26	366 Btuh
8	Conc Blk,Hollow - Ext		(0.132)	5.0/0.0	73		5.26	386 Btuh
9	Frame - Wood - Ext		(0.089)	13.0/0.0	268		3.55	950 Btuh
10	Conc Blk,Hollow - Ext		(0.132)	5.0/0.0	286		5.26	1507 Btuh
11	Frame - Wood - Ext		(0.089)	13.0/0.0	78		3.55	278 Btuh
12	Frame - Wood - Ext		(0.089)	13.0/0.0	64		3.55	227 Btuh
13	Frame - Wood - Ext		(0.089)	13.0/0.0	57		3.55	204 Btuh
14	Frame - Wood - Ext		(0.089)	13.0/0.0	65		3.55	231 Btuh
15	Frame - Wood - Ext		(0.089)	13.0/0.0	79		3.55	282 Btuh
16	Frame - Wood - Ext		(0.089)	13.0/0.0	80		3.55	284 Btuh
17	Frame - Wood - Ext		(0.089)	13.0/0.0	228		3.55	809 Btuh
18	Conc Blk,Hollow - Ext		(0.132)	5.0/0.0	75		5.26	394 Btuh
Wall Total					2542(sqft)			11153 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Garage, n		(0.460)		20		18.4	368 Btuh
Door Total					20(sqft)			368Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load
1	Vented Attic/L/Shing		(0.025)	38.0/0.0	2300		1.0	2335 Btuh
2	Vented Attic/L/Shing		(0.025)	38.0/0.0	379		1.0	385 Btuh
Ceiling Total					2679(sqft)			2720Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Keith Archbold
NW Frontier Drive
Lake City, FL 32055

Project Title:
Archbold Residence
Building Type: User

7/29/2022

Floors	Type	Ueff.	R-Value	Size X	HTM=	Load
1	Slab On Grade	(1.180)	0.0	248.0 ft(perim.)	47.2	11706 Btuh
2	Raised Wood - Adj	(0.050)	19.0	361.0 sqft	2.0	724 Btuh
	Floor Total			2552 sqft		12430 Btuh
	Envelope Subtotal:					32193 Btuh
Infiltration	Type	Wholehouse ACH	Volume(cuft)	Wall Ratio	CFM=	
	Natural	0.22	23330	1.00	84.8	3715 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att)				(DLM of 0.215)	7704 Btuh
All Zones	Sensible Subtotal All Zones					43611 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	43611 Btuh 0 Btuh 43611 Btuh
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EQUIPMENT

1. Electric Heat Pump	#	43611 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

Keith Archbold
NW Frontier Drive
Lake City, FL 32055

Project Title:
Archbold Residence

7/29/2022

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		9.5ft.	1.0ft.	70.0	70.0	0.0	12	14	847	Btuh
2	2 NFRC	0.25, 0.36	No	No	S		9.5ft.	1.0ft.	42.7	42.7	0.0	12	14	516	Btuh
3	2 NFRC	0.25, 0.36	No	No	S		1.5ft.	1.0ft.	6.0	6.0	0.0	12	14	73	Btuh
4	2 NFRC	0.25, 0.36	No	No	E		1.5ft.	1.0ft.	20.0	1.0	19.0	12	31	600	Btuh
5	2 NFRC	0.25, 0.36	No	No	N		1.0ft.	2.0ft.	12.5	0.0	12.5	12	12	151	Btuh
6	2 NFRC	0.25, 0.36	No	No	N		1.0ft.	2.0ft.	30.0	0.0	30.0	12	12	363	Btuh
7	2 NFRC	0.25, 0.36	No	No	W		1.5ft.	1.0ft.	30.0	1.5	28.5	12	31	901	Btuh
8	2 NFRC	0.25, 0.36	No	No	W		9.0ft.	1.0ft.	20.0	19.4	0.6	12	31	253	Btuh
9	2 NFRC	0.25, 0.36	No	No	N		11.5f	1.0ft.	15.0	0.0	15.0	12	12	181	Btuh
10	2 NFRC	0.25, 0.36	No	No	N		11.5f	1.0ft.	85.3	0.0	85.3	12	12	1032	Btuh
11	2 NFRC	0.25, 0.36	No	No	N		11.5f	1.0ft.	16.0	0.0	16.0	12	12	194	Btuh
12	2 NFRC	0.25, 0.36	No	No	W		1.5ft.	1.0ft.	6.0	0.5	5.5	12	31	176	Btuh
13	2 NFRC	0.25, 0.36	No	No	N		1.0ft.	2.0ft.	15.0	0.0	15.0	12	12	181	Btuh
14	2 NFRC	0.25, 0.36	No	No	E		1.0ft.	0.5ft.	15.0	1.0	14.0	12	31	445	Btuh
Excursion													12 Btuh		
Window Total										384 (sqft)			5927 Btuh		
Walls	Type						U-Value	R-Value	Area(sqft)		HTM		Load		
								Cav/Sheath							
1	Concrete Blk,Hollow- Ext						0.13	5.0/0.0	204.7		2.5		520 Btuh		
2	Concrete Blk,Hollow- Ext						0.13	5.0/0.0	43.6		2.5		111 Btuh		
3	Frame - Wood - Adj						0.09	13.0/0.0	166.4		1.7		281 Btuh		
4	Frame - Wood - Adj						0.09	13.0/0.0	214.0		1.7		361 Btuh		
5	Concrete Blk,Hollow- Ext						0.13	5.0/0.0	258.4		2.5		656 Btuh		
6	Concrete Blk,Hollow- Ext						0.13	5.0/0.0	231.3		2.5		587 Btuh		
7	Concrete Blk,Hollow- Ext						0.13	5.0/0.0	69.6		2.5		177 Btuh		
8	Concrete Blk,Hollow- Ext						0.13	5.0/0.0	73.3		2.5		186 Btuh		
9	Frame - Wood - Ext						0.09	13.0/0.0	267.7		2.3		606 Btuh		
10	Concrete Blk,Hollow- Ext						0.13	5.0/0.0	286.4		2.5		727 Btuh		
11	Frame - Wood - Ext						0.09	13.0/0.0	78.3		2.3		177 Btuh		
12	Frame - Wood - Ext						0.09	13.0/0.0	64.0		2.3		145 Btuh		
13	Frame - Wood - Ext						0.09	13.0/0.0	57.3		2.3		130 Btuh		
14	Frame - Wood - Ext						0.09	13.0/0.0	65.0		2.3		147 Btuh		
15	Frame - Wood - Ext						0.09	13.0/0.0	79.3		2.3		180 Btuh		
16	Frame - Wood - Ext						0.09	13.0/0.0	80.0		2.3		181 Btuh		
17	Frame - Wood - Ext						0.09	13.0/0.0	228.0		2.3		516 Btuh		
18	Concrete Blk,Hollow- Ext						0.13	5.0/0.0	74.9		2.5		190 Btuh		
Wall Total								2542 (sqft)						5877 Btuh	
Doors	Type						Area (sqft)			HTM		Load			
1	Insulated - Garage						20.0			13.8		276 Btuh			
Door Total							20 (sqft)					276 Btuh			
Ceilings	Type/Color/Surface						U-Value	R-Value	Area(sqft)		HTM		Load		
1	Vented Attic/Light/Shingle/RB						0.025	38.0/0.0	2300.0		0.86		1985 Btuh		
2	Vented Attic/Light/Shingle/RB						0.025	38.0/0.0	379.0		0.86		327 Btuh		
Ceiling Total								2679 (sqft)						2312 Btuh	
Floors	Type						R-Value		Size		HTM		Load		
1	Slab On Grade						0.0		2191 (ft-perimeter)		0.0		0 Btuh		
2	Raised Wood - Adj						19.0		361 (sqft)		0.7		253 Btuh		
Floor Total								2552.0 (sqft)						253 Btuh	

Manual J Summer Calculations

Residential Load - Component Details (continued)

Keith Archbold
NW Frontier Drive
Lake City, FL 32055

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
Archbold Residence

7/29/2022

	Envelope Subtotal:					14645 Btuh
Infiltration	Type	Average ACH	Volume(cuft)	Wall Ratio	CFM=	Load
	Natural	0.16	23330	1	63.6	1323 Btuh
Internal gain		Occupants	Btuh/occupant	Appliance		Load
		8	X 230	+	1500	3340 Btuh
	Sensible Envelope Load:					19308 Btuh
Duct load	Average sealed,Supply(R6.0-Attic), Return(R6.0-Attic)				(DGM of 0.328)	6332 Btuh
	Sensible Load All Zones					25640 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Keith Archbold
NW Frontier Drive
Lake City, FL 32055

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
Archbold Residence

7/29/2022

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	19308 Btuh
	Sensible Duct Load	6332 Btuh
	Total Sensible Zone Loads	25640 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	25640 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	2196 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1850 Btuh
	Latent occupant gain (8.0 people @ 200 Btuh per person)	1600 Btuh
	Latent other gain	0 Btuh
	Latent total gain	5646 Btuh
	TOTAL GAIN	31286 Btuh

EQUIPMENT

1. Central Unit	#	31275 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