(31)

Residential System Sizing Calculation

Summary

Erkinger Personal House

Ft White, FL

Project Title:
200747 Erkinger Res

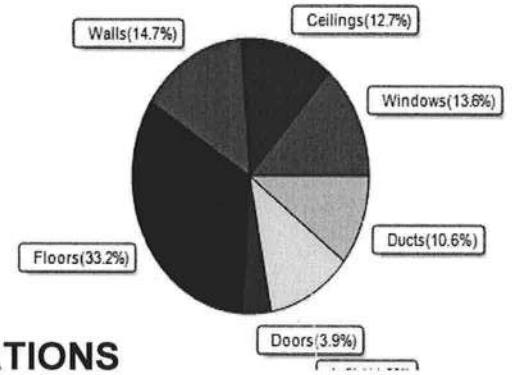
2020-07-13

Location for weather data: Gainesville, FL - Defaults: Latitude(29.7) Altitude(152 ft.) Temp Range(M) Humidity data: Interior RH (50%) Outdoor wet bulb (79F) Humidity difference(54gr.)					
Winter design temperature(MJ8 99%)	32	F	Summer design temperature(MJ8 99%)	99	F
Winter setpoint	70	F	Summer setpoint	75	F
Winter temperature difference	38	F	Summer temperature difference	24	F
Total heating load calculation	**25223**	**Btuh**	**Total cooling load calculation**	**23502**	**Btuh**
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	115.0	29000	Sensible (SHR = 0.75)	112.5	21750
Heat Pump + Auxiliary(0.0kW)	115.0	29000	Latent	174.1	7250
			Total (Electric Heat Pump)	123.4	29000

WINTER CALCULATIONS

Winter Heating Load (for 1801 sqft)

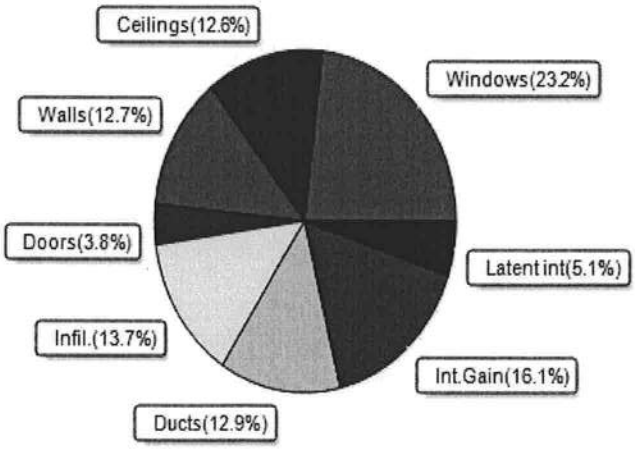
Load component			Load	
Window total	282	sqft	3428	Btuh
Wall total	1101	sqft	3713	Btuh
Door total	64	sqft	980	Btuh
Ceiling total	1931	sqft	3204	Btuh
Floor total	1801	sqft	8385	Btuh
Infiltration	68	cfm	2839	Btuh
Duct loss			2674	Btuh
Subtotal			**25223**	**Btuh**
Ventilation	0	cfm	0	Btuh
TOTAL HEAT LOSS			**25223**	**Btuh**



SUMMER CALCULATIONS

Summer Cooling Load (for 1801 sqft)

Load component			Load	
Window total	282	sqft	5444	Btuh
Wall total	1101	sqft	2981	Btuh
Door total	64	sqft	902	Btuh
Ceiling total	1931	sqft	2951	Btuh
Floor total			0	Btuh
Infiltration	51	cfm	1345	Btuh
Internal gain			3780	Btuh
Duct gain			1935	Btuh
Sens. Ventilation	0	cfm	0	Btuh
Blower Load			0	Btuh
Total sensible gain			**19337**	**Btuh**
Latent gain(ducts)			1094	Btuh
Latent gain(infiltration)			1870	Btuh
Latent gain(ventilation)			0	Btuh
Latent gain(internal/occupants/other)			1200	Btuh
Total latent gain			**4165**	**Btuh**
TOTAL HEAT GAIN			**23502**	**Btuh**



8th Edition

EnergyGauge® System Sizing
PREPARED BY: Evan Beamsley
DATE: 2020-07-13

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Erkinger Personal House
Project Title:
200747 Erkinger Res
Ft White, FL
Building Type: User

2020-07-13

Reference City: Gainesville, FL (Defaults) Winter Temperature Difference: 38.0 F (MJ8 99%)
This calculation is for Worst Case. The house has been rotated 225 degrees.

Component Loads for Whole House

Window	Panes/Type	Frame	U	Orientation	Area(sqft) X	HTM=	Load
1	2, NFRC 0.22	Metal	0.32	SW	8.0	12.2	97 Btuh
2	2, NFRC 0.22	Metal	0.32	SW	6.0	12.2	73 Btuh
3	2, NFRC 0.22	Metal	0.32	S	18.0	12.2	219 Btuh
4	2, NFRC 0.22	Metal	0.32	SW	24.0	12.2	292 Btuh
5	2, NFRC 0.22	Metal	0.32	W	11.1	12.2	135 Btuh
6	2, NFRC 0.22	Metal	0.32	SW	18.0	12.2	219 Btuh
7	2, NFRC 0.22	Metal	0.32	NW	45.0	12.2	547 Btuh
8	2, NFRC 0.22	Metal	0.32	NE	72.0	12.2	876 Btuh
9	2, NFRC 0.22	Metal	0.32	NE	17.8	12.2	216 Btuh
10	2, NFRC 0.22	Metal	0.32	SE	30.0	12.2	365 Btuh
11	2, NFRC 0.22	Metal	0.32	E	8.0	12.2	97 Btuh
12	2, NFRC 0.22	Metal	0.32	SE	16.0	12.2	195 Btuh
13	2, NFRC 0.22	Metal	0.32	W	8.0	12.2	97 Btuh
	Window Total				281.9(sqft)		3428 Btuh

Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	87	3.37	295 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	15	3.37	52 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	24	3.37	81 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	16	3.37	52 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	175	3.37	590 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	44	3.37	148 Btuh
7	Frame - Wood	- Ext	(0.089)	13.0/0.0	24	3.37	81 Btuh
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	119	3.37	401 Btuh
9	Frame - Wood	- Ext	(0.089)	13.0/0.0	24	3.37	81 Btuh
10	Frame - Wood	- Ext	(0.089)	13.0/0.0	40	3.37	135 Btuh
11	Frame - Wood	- Ext	(0.089)	13.0/0.0	318	3.37	1073 Btuh
12	Frame - Wood	- Ext	(0.089)	13.0/0.0	101	3.37	340 Btuh
13	Frame - Wood	- Ext	(0.089)	13.0/0.0	8	3.37	27 Btuh
14	Frame - Wood	- Ext	(0.089)	13.0/0.0	15	3.37	49 Btuh
15	Frame - Wood	- Ext	(0.089)	13.0/0.0	39	3.37	130 Btuh
16	Frame - Wood	- Ext	(0.089)	13.0/0.0	14	3.37	47 Btuh
17	Frame - Wood	- Ext	(0.089)	13.0/0.0	8	3.37	27 Btuh
18	Frame - Wood	- Ext	(0.089)	13.0/0.0	31	3.37	103 Btuh
	Wall Total				1101(sqft)		3713 Btuh

Doors	Type	Storm	Ueff.	Area X	HTM=	Load
1	Insulated - Exterior,	n	(0.400)	20	15.2	304 Btuh
2	Insulated - Exterior,	n	(0.400)	18	15.2	270 Btuh
3	Insulated - Exterior,	n	(0.400)	20	15.2	304 Btuh
4	Insulated - Exterior,	n	(0.400)	7	15.2	101 Btuh
	Door Total			64(sqft)		980Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Erkinger Personal House
Ft White, FL

Project Title:
200747 Erkinger Res
Building Type: User

2020-07-13

Ceilings	Type/Color/Surface	Ueff.	R-Value	Area X	HTM=	Load
1	Unvent Attic/D/Shing	(0.044)	0.0/22.0	1931	1.7	3204 Btuh
	Ceiling Total			1931(sqft)		3204Btuh
Floors	Type	Ueff.	R-Value	Size X	HTM=	Load
1	Slab On Grade	(1.180)	0.0	187.0 ft(perim.)	44.8	8385 Btuh
	Floor Total			1801 sqft		8385 Btuh
				Envelope Subtotal:		19710 Btuh
Infiltration	Type	Wholehouse ACH	Volume(cuft)	Wall Ratio	CFM=	
	Natural	0.25	16209	1.00	68.2	2839 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att)			(DLM of 0.119)		2674 Btuh
All Zones			**Sensible Subtotal All Zones**			**25223 Btuh**

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss	25223 Btuh
	Ventilation Sensible Heat Loss	0 Btuh
	Total Heat Loss	25223 Btuh

EQUIPMENT

1. Electric Heat Pump	#	29000 Btuh

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

Erkinger Personal House

Project Title:
200747 Erkinger Res

Ft White, FL

2020-07-13

Reference City: Gainesville, FL Temperature Difference: 24.0F(MJ8 99%) Humidity difference: 54gr.
This calculation is for Worst Case. The house has been rotated 225 degrees.

Component Loads for Whole House

Window	Type* Panes	SHGC	U	InSh	IS	Ornt	Overhang Len	Hgt	Window Area(sqft) Gross	Shaded	Unshaded	HTM Shaded	Unshaded	Load
1	2 NFRC	0.22	0.32	No	No	SW	11.5f	1.0ft	8.0	8.0	0.0	12	23	98 Btuh
2	2 NFRC	0.22	0.32	No	No	SW	11.5f	1.0ft	6.0	6.0	0.0	12	23	74 Btuh
3	2 NFRC	0.22	0.32	No	No	S	13.0f	1.0ft	18.0	18.0	0.0	12	14	222 Btuh
4	2 NFRC	0.22	0.32	No	No	SW	8.5ft	1.0ft	24.0	24.0	0.0	12	23	295 Btuh
5	2 NFRC	0.22	0.32	No	No	W	13.0f	1.0ft	11.1	11.1	0.0	12	29	137 Btuh
6	2 NFRC	0.22	0.32	No	No	SW	11.5f	1.0ft	18.0	18.0	0.0	12	23	222 Btuh
7	2 NFRC	0.22	0.32	No	No	NW	5.5ft	1.0ft	45.0	0.0	45.0	12	22	1011 Btuh
8	2 NFRC	0.22	0.32	No	No	NE	9.5ft	1.0ft	72.0	0.0	72.0	12	22	1617 Btuh
9	2 NFRC	0.22	0.32	No	No	NE	9.5ft	1.0ft	17.8	0.0	17.8	12	22	399 Btuh
10	2 NFRC	0.22	0.32	No	No	SE	8.5ft	1.0ft	30.0	30.0	0.0	12	23	369 Btuh
11	2 NFRC	0.22	0.32	No	No	E	8.0ft	1.0ft	8.0	8.0	0.0	12	29	98 Btuh
12	2 NFRC	0.22	0.32	No	No	SE	5.5ft	1.0ft	16.0	16.0	0.0	12	23	197 Btuh
13	2 NFRC	0.22	0.32	No	No	W	8.0ft	1.0ft	8.0	8.0	0.0	12	29	98 Btuh
	Excursion													605 Btuh
	Window Total								282 (sqft)					5444 Btuh

Walls	Type	U-Value	R-Value Cav/Sheath	Area(sqft)	HTM	Load
1	Frame - Wood - Ext	0.09	13.0/0.0	87.3	2.7	236 Btuh
2	Frame - Wood - Ext	0.09	13.0/0.0	15.3	2.7	42 Btuh
3	Frame - Wood - Ext	0.09	13.0/0.0	24.0	2.7	65 Btuh
4	Frame - Wood - Ext	0.09	13.0/0.0	15.6	2.7	42 Btuh
5	Frame - Wood - Ext	0.09	13.0/0.0	174.9	2.7	473 Btuh
6	Frame - Wood - Ext	0.09	13.0/0.0	44.0	2.7	119 Btuh
7	Frame - Wood - Ext	0.09	13.0/0.0	24.0	2.7	65 Btuh
8	Frame - Wood - Ext	0.09	13.0/0.0	119.0	2.7	322 Btuh
9	Frame - Wood - Ext	0.09	13.0/0.0	24.0	2.7	65 Btuh
10	Frame - Wood - Ext	0.09	13.0/0.0	40.0	2.7	108 Btuh
11	Frame - Wood - Ext	0.09	13.0/0.0	318.2	2.7	861 Btuh
12	Frame - Wood - Ext	0.09	13.0/0.0	100.7	2.7	273 Btuh
13	Frame - Wood - Ext	0.09	13.0/0.0	8.0	2.7	22 Btuh
14	Frame - Wood - Ext	0.09	13.0/0.0	14.7	2.7	40 Btuh
15	Frame - Wood - Ext	0.09	13.0/0.0	38.7	2.7	105 Btuh
16	Frame - Wood - Ext	0.09	13.0/0.0	14.0	2.7	38 Btuh
17	Frame - Wood - Ext	0.09	13.0/0.0	8.0	2.7	22 Btuh
18	Frame - Wood - Ext	0.09	13.0/0.0	30.7	2.7	83 Btuh
	Wall Total			1101 (sqft)		2981 Btuh

Doors	Type	Area (sqft)	HTM	Load
1	Insulated - Exterior	20.0	14.0	280 Btuh
2	Insulated - Exterior	17.8	14.0	249 Btuh
3	Insulated - Exterior	20.0	14.0	280 Btuh
4	Insulated - Exterior	6.7	14.0	93 Btuh
	Door Total	64 (sqft)		902 Btuh

Ceilings	Type/Color/Surface	U-Value	R-Value	Area(sqft)	HTM	Load
1	Unvented Attic/DarkShingle	0.044	0.0/22.0	1931.0	1.53	2951 Btuh
	Ceiling Total			1931 (sqft)		2951 Btuh

Floors	Type	R-Value	Size	HTM	Load
1	Slab On Grade	0.0	1801 (ft-perimeter)	0.0	0 Btuh
	Floor Total		1801.0 (sqft)		0 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Erkinger Personal House | Project Title: 200747 Erkinger Res | Climate:FL_GAINESVILLE_REGIONAL_A

Ft White, FL

2020-07-13

				Envelope Subtotal:			12278 Btuh
Infiltration	Type	Average ACH	Volume(cuft)	Wall Ratio		CFM=	Load
	Natural	0.19	16209	1		51.2	1345 Btuh
Internal gain		Occupants	Btuh/occupant			Appliance	Load
		6	X 230	+		2400	3780 Btuh
				Sensible Envelope Load:			17402 Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic)			(DGM of 0.111)			1935 Btuh
				Sensible Load All Zones			**19337 Btuh**

Manual J Summer Calculations

Residential Load - Component Details (continued)

Erkinger Personal House
Project Title: 200747 Erkinger Res
Climate:FL_GAINESVILLE_REGIONAL_A

Ft White, FL

2020-07-13

WHOLE HOUSE TOTALS

	Sensible Envelope Load All Zones	**17402 Btuh**
	Sensible Duct Load	1935 Btuh
	Total Sensible Zone Loads	**19337 Btuh**
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
Whole House	**Total sensible gain**	**19337 Btuh**
Totals for Cooling	Latent infiltration gain (for 54 gr. humidity difference)	1870 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1094 Btuh
	Latent occupant gain (6.0 people @ 200 Btuh per person)	1200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	**4165 Btuh**
	TOTAL GAIN	**23502 Btuh**

EQUIPMENT

1. Central Unit	#	29000 Btuh

*Key: Window types (Panes - 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