

Residential System Sizing Calculation

Summary

David & Deirdre Kutner

Project Title:
Kutner Residence

, FL 32024

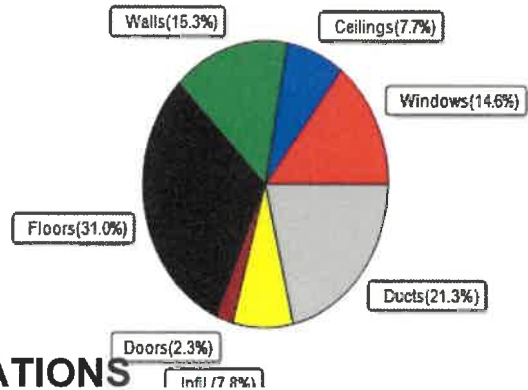
8/11/2021

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	35527	Btuh	Total cooling load calculation	27026	Btuh
Submitted heating capacity	% of calc	Btuh	Submitted cooling capacity	% of calc	Btuh
Total (Electric Heat Pump)	100.0	35527	Sensible (SHR = 0.70)	86.7	18918
Heat Pump + Auxiliary(0.0kW)	100.0	35527	Latent	155.4	8108
			Total (Electric Heat Pump)	100.0	27026

WINTER CALCULATIONS

Winter Heating Load (for 2552 sqft)

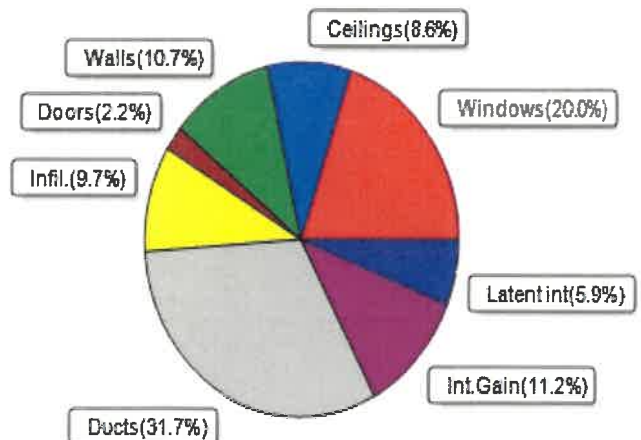
Load component		Load	
Window total	361 sqft	5198	Btuh
Wall total	1762 sqft	5447	Btuh
Door total	44 sqft	810	Btuh
Ceiling total	2680 sqft	2721	Btuh
Floor total	2552 sqft	11029	Btuh
Infiltration	63 cfm	2754	Btuh
Duct loss		7568	Btuh
Subtotal		35527	Btuh
Ventilation	0 cfm	0	Btuh
TOTAL HEAT LOSS		35527	Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 2552 sqft)

Load component		Load	
Window total	361 sqft	5406	Btuh
Wall total	1762 sqft	2879	Btuh
Door total	44 sqft	607	Btuh
Ceiling total	2680 sqft	2313	Btuh
Floor total		0	Btuh
Infiltration	47 cfm	981	Btuh
Internal gain		3040	Btuh
Duct gain		6581	Btuh
Sens. Ventilation	0 cfm	0	Btuh
Blower Load		0	Btuh
Total sensible gain		21808	Btuh
Latent gain(ducts)		1990	Btuh
Latent gain(infiltration)		1628	Btuh
Latent gain(ventilation)		0	Btuh
Latent gain(internal/occupants/other)		1600	Btuh
Total latent gain		5218	Btuh
TOTAL HEAT GAIN		27026	Btuh



8th Edition

EnergyGauge® System Sizing

PREPARED BY: *[Signature]*

DATE: *8/11/2021*

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

David & Deirdre Kutner

Project Title:
Kutner Residence
Building Type: User

, FL 32024

8/11/2021

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 0.25	Vinyl	0.36	S	8.0		14.4	115 Btuh
2	2, NFRC 0.25	Vinyl	0.36	S	72.0		14.4	1037 Btuh
3	2, NFRC 0.25	TIM	0.36	S	16.0		14.4	230 Btuh
4	2, NFRC 0.25	Vinyl	0.36	E	30.0		14.4	432 Btuh
5	2, NFRC 0.25	Vinyl	0.36	E	4.0		14.4	58 Btuh
6	2, NFRC 0.25	Vinyl	0.36	N	15.0		14.4	216 Btuh
7	2, NFRC 0.25	Vinyl	0.36	N	45.0		14.4	648 Btuh
8	2, NFRC 0.25	Vinyl	0.36	N	60.0		14.4	864 Btuh
9	2, NFRC 0.25	TIM	0.36	N	40.0		14.4	576 Btuh
10	2, NFRC 0.25	Vinyl	0.36	N	45.0		14.4	648 Btuh
11	2, NFRC 0.25	Vinyl	0.36	W	20.0		14.4	288 Btuh
12	2, NFRC 0.25	Vinyl	0.36	W	6.0		14.4	86 Btuh
Window Total					361.0(sqft)			5198 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.077)	19.0/0.0	68		3.09	210 Btuh
2	Frame - Wood	- Ext	(0.077)	19.0/0.0	203		3.09	627 Btuh
3	Frame - Wood	- Ext	(0.077)	19.0/0.0	37		3.09	114 Btuh
4	Frame - Wood	- Ext	(0.077)	19.0/0.0	50		3.09	153 Btuh
5	Frame - Wood	- Adj	(0.077)	19.0/0.0	187		3.09	578 Btuh
6	Frame - Wood	- Ext	(0.077)	19.0/0.0	307		3.09	947 Btuh
7	Frame - Wood	- Ext	(0.077)	19.0/0.0	80		3.09	246 Btuh
8	Frame - Wood	- Ext	(0.077)	19.0/0.0	72		3.09	223 Btuh
9	Frame - Wood	- Ext	(0.077)	19.0/0.0	108		3.09	334 Btuh
10	Frame - Wood	- Ext	(0.077)	19.0/0.0	36		3.09	111 Btuh
11	Frame - Wood	- Ext	(0.077)	19.0/0.0	151		3.09	467 Btuh
12	Frame - Wood	- Ext	(0.077)	19.0/0.0	36		3.09	111 Btuh
13	Frame - Wood	- Ext	(0.077)	19.0/0.0	83		3.09	255 Btuh
14	Frame - Wood	- Ext	(0.077)	19.0/0.0	346		3.09	1069 Btuh
Wall Total					1762(sqft)			5447 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)		20		18.4	368 Btuh
Door Total					44(sqft)			810Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load
1	Vented Attic/L/Shing		(0.025)	38.0/0.0	2680		1.0	2721 Btuh
Ceiling Total					2680(sqft)			2721Btuh
Floors	Type		Ueff.	R-Value	Size	X	HTM=	Load
1	Slab On Grade		(1.180)	0.0	233.7 ft(perim.)		47.2	11029 Btuh
Floor Total					2552 sqft			11029 Btuh
Envelope Subtotal:								25205 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

David & Deirdre Kutner

Project Title:
Kutner Residence
Building Type: User

, FL 32024

8/11/2021

Infiltration	Type Natural	Wholehouse ACH 0.16	Volume(cuft) 22968	Wall Ratio 1.00	CFM= 62.9	2754 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.271)					7568 Btuh
All Zones	Sensible Subtotal All Zones					35527 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	35527 Btuh 0 Btuh 35527 Btuh
---------------------------	--	------------------------------------

EQUIPMENT

1. Electric Heat Pump	#	35527 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

David & Deirdre Kutner

Project Title:
Kutner Residence

, FL 32024

8/11/2021

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	Unshaded		
1	2 NFRC	0.25, 0.36	No	No	S		1.5ft.	1.0ft.	8.0	8.0	0.0	12	14	97	Btuh
2	2 NFRC	0.25, 0.36	No	No	S		8.5ft.	1.0ft.	72.0	72.0	0.0	12	14	871	Btuh
3	2 NFRC	0.25, 0.36	No	No	S		10.5f	1.0ft.	16.0	16.0	0.0	12	14	194	Btuh
4	2 NFRC	0.25, 0.36	No	No	E		1.5ft.	1.0ft.	30.0	1.5	28.5	12	31	901	Btuh
5	2 NFRC	0.25, 0.36	No	No	E		1.5ft.	1.0ft.	4.0	1.0	3.0	12	31	105	Btuh
6	2 NFRC	0.25, 0.36	No	No	N		14.0f	1.0ft.	15.0	0.0	15.0	12	12	181	Btuh
7	2 NFRC	0.25, 0.36	No	No	N		7.5ft.	1.0ft.	45.0	0.0	45.0	12	12	544	Btuh
8	2 NFRC	0.25, 0.36	No	No	N		11.5f	1.0ft.	60.0	0.0	60.0	12	12	726	Btuh
9	2 NFRC	0.25, 0.36	No	No	N		11.5f	1.0ft.	40.0	0.0	40.0	12	12	484	Btuh
10	2 NFRC	0.25, 0.36	No	No	N		7.5ft.	1.0ft.	45.0	0.0	45.0	12	12	544	Btuh
11	2 NFRC	0.25, 0.36	No	No	W		1.5ft.	1.0ft.	20.0	1.0	19.0	12	31	600	Btuh
12	2 NFRC	0.25, 0.36	No	No	W		1.5ft.	1.0ft.	6.0	1.5	4.5	12	31	158	Btuh
	Window Total								361 (sqft)					5406 Btuh	
Walls	Type	U-Value		R-Value		Area(sqft)		HTM		Load					
1	Frame - Wood - Ext		0.08		19.0/0.0		68.0		1.7		112 Btuh				
2	Frame - Wood - Ext		0.08		19.0/0.0		203.0		1.7		336 Btuh				
3	Frame - Wood - Ext		0.08		19.0/0.0		37.0		1.7		61 Btuh				
4	Frame - Wood - Ext		0.08		19.0/0.0		49.5		1.7		82 Btuh				
5	Frame - Wood - Adj		0.08		19.0/0.0		187.0		1.5		275 Btuh				
6	Frame - Wood - Ext		0.08		19.0/0.0		306.5		1.7		507 Btuh				
7	Frame - Wood - Ext		0.08		19.0/0.0		79.5		1.7		131 Btuh				
8	Frame - Wood - Ext		0.08		19.0/0.0		72.0		1.7		119 Btuh				
9	Frame - Wood - Ext		0.08		19.0/0.0		108.0		1.7		179 Btuh				
10	Frame - Wood - Ext		0.08		19.0/0.0		36.0		1.7		60 Btuh				
11	Frame - Wood - Ext		0.08		19.0/0.0		151.2		1.7		250 Btuh				
12	Frame - Wood - Ext		0.08		19.0/0.0		36.0		1.7		60 Btuh				
13	Frame - Wood - Ext		0.08		19.0/0.0		82.5		1.7		136 Btuh				
14	Frame - Wood - Ext		0.08		19.0/0.0		346.0		1.7		572 Btuh				
	Wall Total						1762 (sqft)					2879 Btuh			
Doors	Type	Area (sqft)		HTM		Load									
1	Insulated - Exterior		24.0		13.8	331 Btuh									
2	Insulated - Garage		20.0		13.8	276 Btuh									
	Door Total		44 (sqft)		607 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		2680.0		0.86		2313 Btuh				
	Ceiling Total						2680 (sqft)			2313 Btuh					
Floors	Type	R-Value		Size		HTM		Load							
1	Slab On Grade		0.0		2552 (ft-perimeter)		0.0		0 Btuh						
	Floor Total						2552.0 (sqft)			0 Btuh					
	Envelope Subtotal:										11205 Btuh				

Manual J Summer Calculations

Residential Load - Component Details (continued)

David & Deirdre Kutner

Project Title:
Kutner Residence

Climate:FL_GAINESVILLE_REGIONAL_A

, FL 32024

8/11/2021

Infiltration	Type Natural	Average ACH 0.12	Volume(cuft) 22968	Wall Ratio 1	CFM= 47.2	Load 981 Btuh
Internal gain		Occupants 8	Btuh/occupant X 230	Appliance +	1200	Load 3040 Btuh
					Sensible Envelope Load:	15226 Btuh
Duct load	Average sealed,Supply(R6.0-Attic), Return(R6.0-Attic) (DGM of 0.432)					6581 Btuh
					Sensible Load All Zones	21808 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

David & Deirdre Kutner

Project Title:
Kutner Residence

Climate:FL_GAINESVILLE_REGIONAL_A

, FL 32024

8/11/2021

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	15226 Btuh
	Sensible Duct Load	6581 Btuh
	Total Sensible Zone Loads	21808 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	21808 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	1628 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1990 Btuh
	Latent occupant gain (8.0 people @ 200 Btuh per person)	1600 Btuh
	Latent other gain	0 Btuh
	Latent total gain	5218 Btuh
	TOTAL GAIN	27026 Btuh

EQUIPMENT

1. Central Unit	#	27026 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