

Residential System Sizing Calculation

Summary

Reed & Susan Kellner
SW Montague Lane
Lake City, FL

Project Title:
241248 Kellner Res

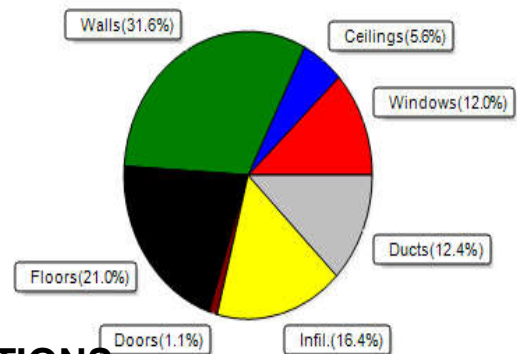
2024-12-03

Location for weather data: Gainesville, FL - Defaults: Latitude(29.7) Altitude(100 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	39402 Btuh	Total cooling load calculation	35564 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	114.2 45000	Sensible (SHR = 0.75)	114.1 33750
Heat Pump + Auxiliary(0.0kW)	114.2 45000	Latent	187.8 11250
		Total (Electric Heat Pump)	126.5 45000

WINTER CALCULATIONS

Winter Heating Load (for 3337 sqft)

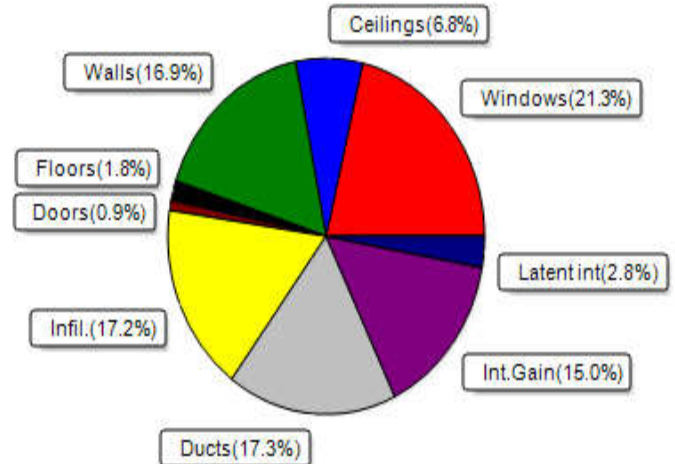
Load component	Load
Window total 394 sqft	4724 Btuh
Wall total 2550 sqft	12463 Btuh
Door total 53 sqft	427 Btuh
Ceiling total 2160 sqft	2193 Btuh
Floor total See detail report	8269 Btuh
Infiltration 147 cfm	6445 Btuh
Duct loss	4881 Btuh
Subtotal	39402 Btuh
Ventilation Ex:0 cfm; Sup:0 cfm	0 Btuh
TOTAL HEAT LOSS	39402 Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 3337 sqft)

Load component	Load
Window total 394 sqft	7575 Btuh
Wall total 2550 sqft	6001 Btuh
Door total 53 sqft	320 Btuh
Ceiling total 2160 sqft	2412 Btuh
Floor total	647 Btuh
Infiltration 110 cfm	2296 Btuh
Internal gain	5350 Btuh
Duct gain	4972 Btuh
Sens.Ventilation Ex:0 cfm; Sup:0 cfm	0 Btuh
Blower Load	0 Btuh
Total sensible gain	29574 Btuh
Latent gain(ducts)	1180 Btuh
Latent gain(infiltration)	3810 Btuh
Latent gain(ventilation)	0 Btuh
Latent gain(internal/occupants/other)	1000 Btuh
Total latent gain	5990 Btuh
TOTAL HEAT GAIN	35564 Btuh



8th Edition

EnergyGauge® System Sizing
PREPARED BY: Evan Beamsley
DATE: 2024-12-03

System Sizing Calculations - Winter

Residential Load - Room by Room Component Details

Reed & Susan Kellner
SW Montague Lane
Lake City, FL

Project Title:
241248 Kellner Res
Building Type: User

2024-12-03

Reference City: Gainesville, FL (Defaults) Winter Temperature Difference: 40.0 °F (TMY3 99%)
Winter Setpoint: 70 °F (Required Manual J default)

Component Loads for Room #1: 1st floor

Window	Panes/Type	Frame	U	Orientation	Area(sqft)	X	HTM=	Load
1	2, NFRC 0.22	Vinyl	0.30	N	26.7		12.0	320 Btuh
2	2, NFRC 0.22	Vinyl	0.30	N	45.0		12.0	540 Btuh
3	2, NFRC 0.22	Vinyl	0.30	E	30.0		12.0	360 Btuh
4	2, NFRC 0.22	Vinyl	0.30	E	6.7		12.0	80 Btuh
Window Total					108.3(sqft)			1300 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Conc Blk,Hollow	- Ext	(0.130)	5.1/0.0	116		5.19	603 Btuh
2	Conc Blk,Hollow	- Ext	(0.130)	5.1/0.0	76		5.19	395 Btuh
3	Conc Blk,Hollow	- Ext	(0.130)	5.1/0.0	226		5.19	1172 Btuh
4	Conc Blk,Hollow	- Ext	(0.130)	5.1/0.0	250		5.19	1299 Btuh
5	Frame - Wood	- Adj	(0.089)	13.0/0.0	321		3.55	1139 Btuh
6	Frame - Wood	- Adj	(0.089)	13.0/0.0	109		3.55	387 Btuh
7	Frame - Wood	- Adj	(0.089)	13.0/0.0	46		3.55	163 Btuh
Wall Total					1143(sqft)			5157 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior,	n	(0.200)		13		8.0	107 Btuh
2	Insulated - Garage,	n	(0.200)		20		8.0	160 Btuh
3	Insulated - Garage,	n	(0.200)		20		8.0	160 Btuh
Door Total					53(sqft)			427Btuh
Floors	Type		Ueff.	R-Value	Size	X	HTM=	Load
1	Slab On Grade		(1.180)	0.0	136.0 ft(perim.)		47.2	6419 Btuh
Floor Total					1254 sqft			6419 Btuh
Room Envelope Subtotal:								13303 Btuh
Infiltration	Type	Wholehouse	ACH	Room Volume	Wall Ratio	CFM=		
	Natural		0.27	10032	0.45	65.9		2890 Btuh
Duct load	Average sealed, Supply(R6.0-Cond.), Return(R6.0-Cond.) (DLM of 0.000)							0 Btuh
Room #1	Sensible Room Subtotal							16193 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Reed & Susan Kellner
SW Montague Lane
Lake City, FL

Project Title:
241248 Kellner Res
Building Type: User

2024-12-03

Component Loads for Room #2: 2nd floor

Window	Panes/Type	Frame	U	Orientation	Area(sqft)	X	HTM=	Load
5	2, NFRC 0.22	Vinyl	0.30	N	120.0		12.0	1440 Btuh
6	2, NFRC 0.22	Vinyl	0.30	E	40.0		12.0	480 Btuh
7	2, NFRC 0.22	Vinyl	0.30	E	5.3		12.0	64 Btuh
8	2, NFRC 0.22	Vinyl	0.30	S	80.0		12.0	960 Btuh
9	2, NFRC 0.22	Vinyl	0.30	W	40.0		12.0	480 Btuh
	Window Total				285.3(sqft)			3424 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
8	Conc Blk,Hollow - Ext		(0.130)	5.1/0.0	240		5.19	1247 Btuh
9	Conc Blk,Hollow - Ext		(0.130)	5.1/0.0	441		5.19	2289 Btuh
10	Conc Blk,Hollow - Ext		(0.130)	5.1/0.0	280		5.19	1454 Btuh
11	Conc Blk,Hollow - Ext		(0.130)	5.1/0.0	446		5.19	2317 Btuh
	Wall Total				1407(sqft)			7307 Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load
1	Flat ceil/D/Metal		(0.025)	38.0/0.0	2160		1.0	2193 Btuh
	Ceiling Total				2160(sqft)			2193Btuh
Floors	Type		Ueff.	R-Value	Size	X	HTM=	Load
2	Raised Wood - Adj		(0.050)	19.0	922.0 sqft		2.0	1849 Btuh
3	Interior		(0.050)	0.0	1238.0 sqft		0.0	0 Btuh
	Floor Total				2160 sqft			1849 Btuh
	Room Envelope Subtotal:							14773 Btuh
Infiltration	Type	Wholehouse	ACH	Room Volume	Wall Ratio	CFM=		
	Natural		0.27	22705	0.55	81.1		3555 Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic) (DLM of 0.266)							4881 Btuh
Room #2	Sensible Room Subtotal							23209 Btuh

SYSTEM GROUPS (BLOCK LOADS)

Heating Loads For System(s):1 Block #1:Block1 Serving Rooms: 1	Block load	16193 Btuh
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Manual J Winter Calculations

Residential Load - Component Details (continued)

Reed & Susan Kellner
SW Montague Lane
Lake City, FL

Project Title:
241248 Kellner Res
Building Type: User

2024-12-03

Heating Loads For System(s):2 Block #2:Block2 Serving Rooms: 2	Block load	23209 Btuh
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WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sens. Heat Loss (Ex:0 cfm; Sup:0 cfm) Total Heat Loss	39402 Btuh 0 Btuh 39402 Btuh
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EQUIPMENT

1. Electric Heat Pump	#	17000 Btuh
2. Electric Heat Pump	#	28000 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 - Room by Room Component Details

Reed & Susan Kellner
SW Montague Lane
Lake City, FL

Project Title:
241248 Kellner Res

2024-12-03

Reference City: Gainesville, FL (Defaults)
Humidity difference: 51gr.

Temperature Difference: 19.0F(TMY3 99%)
Summer Setpoint: 75 °F (Required Manual J default)

Component Loads for Room #1: 1st floor

Window	Type*						Overhang		Window Area(sqft)			HTM		Load	
	Panes	SHGC	U	InSh	IS	Ornt	Len	Hgt	Gross	Shaded	Unshaded	Shaded	Unshaded		
1	2 NFRC	0.22, 0.30	No	No	N		8.0ft	0.7ft	26.7	26.7	0.0	10	21	275 Btuh	
2	2 NFRC	0.22, 0.30	No	No	N		1.5ft	11.2f	45.0	0.0	45.0	10	21	966 Btuh	
3	2 NFRC	0.22, 0.30	No	No	E		1.5ft	11.2f	30.0	0.0	30.0	10	21	644 Btuh	
4	2 NFRC	0.22, 0.30	No	No	E		1.5ft	11.2f	6.7	0.0	6.7	10	21	143 Btuh	
	Window Total									108 (sqft)					2028 Btuh
Walls	Type					U-Value	R-Value	Area(sqft)			HTM		Load		
							Cav/Sheath								
1	Concrete Blk,Hollow - Ext						0.13	5.1/0.0			2.5		291 Btuh		
2	Concrete Blk,Hollow - Ext						0.13	5.1/0.0			2.5		190 Btuh		
3	Concrete Blk,Hollow - Ext						0.13	5.1/0.0			2.5		566 Btuh		
4	Concrete Blk,Hollow - Ext						0.13	5.1/0.0			2.5		627 Btuh		
5	Frame - Wood - Adj						0.09	13.0/0.0			1.7		541 Btuh		
6	Frame - Wood - Adj						0.09	13.0/0.0			1.7		184 Btuh		
7	Frame - Wood - Adj						0.09	13.0/0.0			1.7		77 Btuh		
	Wall Total									1143 (sqft)			2476 Btuh		
Doors	Type								Area (sqft)	HTM		Load			
1	Insulated - Exterior									13.3	6.0		80 Btuh		
2	Insulated - Garage									20.0	6.0		120 Btuh		
3	Insulated - Garage									20.0	6.0		120 Btuh		
	Door Total									53 (sqft)			320 Btuh		
Floors	Type					R-Value		Size			HTM		Load		
1	Slab On Grade						0.0		1254 (ft-perimeter)			0.0		0 Btuh	
	Floor Total								1254.0 (sqft)					0 Btuh	
	Zone Envelope Subtotal:													4824 Btuh	
Infiltration	Type					Wholehouse ACH		Volume(cuft)			Wall Ratio		CFM=	Load	
Natural							0.20		10032			0.45		49.4	1029 Btuh
Internal gain							Occupants		Btuh/occupant			Appliance		Load	
							3		X 230 +			1800		2490 Btuh	
	Sensible Envelope Load:													8343 Btuh	
Duct load	Average sealed, Supply(R6.0-Cond.), Return(R6.0-Cond.) (DGM of 0.000)													0 Btuh	
	Sensible Zone Load													8343 Btuh	

Manual J Summer Calculations

Residential Load - Component Details (continued)

Reed & Susan Kellner
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Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
241248 Kellner Res

2024-12-03

Component Loads for Room #2: 2nd floor

Window	Type*						Overhang		Window Area(sqft)			HTM		Load	
	Panes	SHGC	U	InSh	IS	Ornt	Len	Hgt	Gross	Shaded	Unshaded	Shaded	Unshaded		
5	2 NFRC	0.22, 0.30	No	No	N		1.5ft	1.5ft	120.0	23.2	96.8	10	21	2317 Btuh	
6	2 NFRC	0.22, 0.30	No	No	E		1.5ft	1.5ft	40.0	15.5	24.5	10	21	686 Btuh	
7	2 NFRC	0.22, 0.30	No	No	E		1.5ft	1.5ft	5.3	3.9	1.5	10	21	71 Btuh	
8	2 NFRC	0.22, 0.30	No	No	S		1.5ft	1.5ft	80.0	0.0	80.0	10	20	1639 Btuh	
9	2 NFRC	0.22, 0.30	No	No	W		1.5ft	1.5ft	40.0	0.0	40.0	10	20	819 Btuh	
	Window Total								285 (sqft)					5532 Btuh	
Walls	Type						U-Value		R-Value		Area(sqft)		HTM		Load
									Cav/Sheath						
	8	Concrete Blk,Hollow - Ext					0.13		5.1/0.0		240.0		2.5		601 Btuh
	9	Concrete Blk,Hollow - Ext					0.13		5.1/0.0		440.7		2.5		1104 Btuh
	10	Concrete Blk,Hollow - Ext					0.13		5.1/0.0		280.0		2.5		702 Btuh
	11	Concrete Blk,Hollow - Ext					0.13		5.1/0.0		446.0		2.5		1118 Btuh
	Wall Total										1407 (sqft)				3525 Btuh
Ceilings	Type/Color/Surface					U-Value		R-Value		Area(sqft)		HTM		Load	
1	Vented Attic/DarkMetal/RB					0.025		38.0/0.0		2160.0		1.12		2412 Btuh	
	Ceiling Total									2160 (sqft)				2412 Btuh	
Floors	Type								R-Value		Size		HTM		Load
2	Raised Wood - Adj							19.0		922 (sqft)		0.7		647 Btuh	
3	Interior							0.0		1238 (sqft)		0.0		0 Btuh	
	Floor Total									2160.0 (sqft)				647 Btuh	
	Zone Envelope Subtotal:													12117 Btuh	
Infiltration	Type	Wholehouse ACH					Volume(cuft)		Wall Ratio		CFM=		Load		
	Natural	0.20					22705		0.55		60.8		1267 Btuh		
Internal gain						Occupants		Btuh/occupant		Appliance		Load			
						2		X 230	+	2400		2860 Btuh			
	Sensible Envelope Load:													16244 Btuh	
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic)											(DGM of 0.306)		4968 Btuh	
	Sensible Zone Load													21212 Btuh	

The following window Excursion will be assigned to the system loads.

Windows	July excursion for System 1	0 Btuh
	July excursion for System 2	15 Btuh
	Excursion Subtotal:	15 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

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Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
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2024-12-03

Duct load		4 Btuh
	Sensible Excursion Load	19 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Reed & Susan Kellner
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Lake City, FL

Project Title:
241248 Kellner Res

Climate:FL_GAINESVILLE_REGIONAL_A

2024-12-03

SYSTEM GROUPS (BLOCK LOADS)

Cooling Loads For System(s): 1 Block #1:Block1 Serving Zones: 1	Sensible Envelope Load	8343 Btuh
	Window Excursion	0 Btuh
	Sensible Duct Load (duct gain multiplier of 0.000)	0 Btuh
	Sensible ventilation (Ex:0 cfm; Sup:0 cfm)	0 Btuh
	Zone Sensible gain	8343 Btuh
	Latent infiltration/ventilation gain	1708 Btuh
	Latent duct gain	0 Btuh
	Latent occupant gain	600 Btuh
	Latent other gain	0 Btuh
	Total block load	10652 Btuh

Cooling Loads For System(s): 2 Block #2:Block2 Serving Zones: 2	Sensible Envelope Load	16244 Btuh
	Window Excursion	15 Btuh
	Sensible Duct Load (duct gain multiplier of 0.306) (Includes 4 Btuh due to window excursion)	4972 Btuh
	Sensible ventilation (Ex:0 cfm; Sup:0 cfm)	0 Btuh
	Zone Sensible gain	21231 Btuh
	Latent infiltration/ventilation gain	2102 Btuh
	Latent duct gain	1180 Btuh
	Latent occupant gain	400 Btuh
	Latent other gain	0 Btuh
	Total block load	24912 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Reed & Susan Kellner
SW Montague Lane
Lake City, FL

Project Title:
241248 Kellner Res

Climate:FL_GAINESVILLE_REGIONAL_A

2024-12-03

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	24602 Btuh
	Sensible Duct Load	4972 Btuh
	Total Sensible Zone Loads	29574 Btuh
	Sensible ventilation (Ex:0 cfm; Sup:0 cfm)	0 Btuh
	Blower	0 Btuh
	Total sensible gain	29574 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	3810 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1180 Btuh
	Latent occupant gain (5.0 people @ 200 Btuh per person)	1000 Btuh
	Latent other gain	0 Btuh
	Latent total gain	5990 Btuh
	TOTAL GAIN	35564 Btuh

EQUIPMENT

1. Central Unit	#	17000 Btuh
2. Central Unit	#	28000 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