



Residential System Sizing Calculation

Summary

Hiram Soler
144 SE Cedarwood Gln
Lake City, FL

Project Title:
211557 Solar

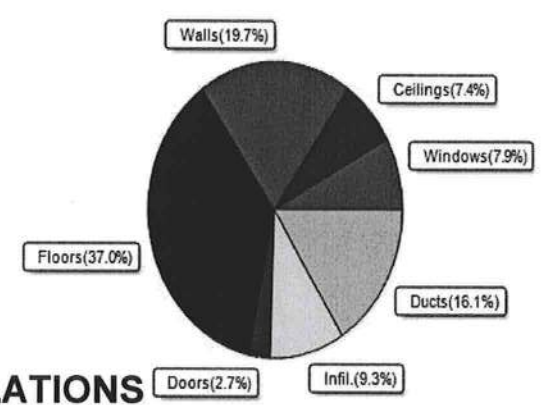
2021-11-19

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			26290	Btuh	Total cooling load calculation			22612	Btuh
Submitted heating capacity			% of calc	Btuh	Submitted cooling capacity			% of calc	Btuh
Total (Electric Heat Pump)			106.5	28000	Sensible (SHR = 0.75)			111.0	21000
Heat Pump + Auxiliary(0.0kW)			106.5	28000	Latent			189.8	7000
					Total (Electric Heat Pump)			123.8	28000

WINTER CALCULATIONS

Winter Heating Load (for 1755 sqft)

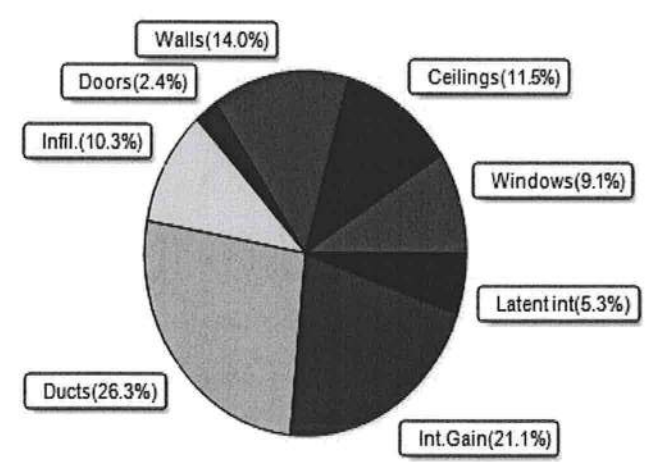
Load component		Load
Window total	149 sqft	2086 Btuh
Wall total	1455 sqft	5167 Btuh
Door total	44 sqft	711 Btuh
Ceiling total	1905 sqft	1934 Btuh
Floor total	1755 sqft	9723 Btuh
Infiltration	56 cfm	2448 Btuh
Duct loss		4221 Btuh
Subtotal		26290 Btuh
Ventilation	0 cfm	0 Btuh
TOTAL HEAT LOSS		26290 Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 1755 sqft)

Load component		Load
Window total	149 sqft	2057 Btuh
Wall total	1455 sqft	3155 Btuh
Door total	44 sqft	533 Btuh
Ceiling total	1905 sqft	2611 Btuh
Floor total		0 Btuh
Infiltration	42 cfm	872 Btuh
Internal gain		4780 Btuh
Duct gain		4916 Btuh
Sens. Ventilation	0 cfm	0 Btuh
Blower Load		0 Btuh
Total sensible gain		18924 Btuh
Latent gain(ducts)		1040 Btuh
Latent gain(infiltration)		1447 Btuh
Latent gain(ventilation)		0 Btuh
Latent gain(internal/occupants/other)		1200 Btuh
Total latent gain		3687 Btuh
TOTAL HEAT GAIN		22612 Btuh



8th Edition

EnergyGauge® System Sizing
PREPARED BY: <u>Evan Beamsley</u>
DATE: <u>2021-11-19</u>

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

Hiram Soler
144 SE Cedarwood Gln
Lake City, FL

Project Title:
211557 Solar
Building Type: User

2021-11-19

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	Metal	0.35	N	9.0		14.0	126 Btuh
2	2, NFRC 0.25	Metal	0.35	N	20.0		14.0	280 Btuh
3	2, NFRC 0.25	Metal	0.35	E	15.0		14.0	210 Btuh
4	2, NFRC 0.25	Metal	0.35	S	15.0		14.0	210 Btuh
5	2, NFRC 0.25	Metal	0.35	S	20.0		14.0	280 Btuh
6	2, NFRC 0.25	Metal	0.35	S	30.0		14.0	420 Btuh
7	2, NFRC 0.25	Metal	0.35	S	30.0		14.0	420 Btuh
8	2, NFRC 0.25	Metal	0.35	S	10.0		14.0	140 Btuh
Window Total					149.0(sqft)			2086 Btuh
Walls	Type	Omt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Adj	(0.089)	13.0/0.0	145		3.55	514 Btuh
2	Frame - Wood	- Adj	(0.089)	13.0/0.0	95		3.55	336 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	118		3.55	418 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	121		3.55	428 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	97		3.55	344 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	24		3.55	85 Btuh
7	Frame - Wood	- Ext	(0.089)	13.0/0.0	87		3.55	308 Btuh
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	24		3.55	85 Btuh
9	Frame - Wood	- Ext	(0.089)	13.0/0.0	51		3.55	180 Btuh
10	Frame - Wood	- Ext	(0.089)	13.0/0.0	99		3.55	351 Btuh
11	Frame - Wood	- Ext	(0.089)	13.0/0.0	92		3.55	327 Btuh
12	Frame - Wood	- Ext	(0.089)	13.0/0.0	73		3.55	260 Btuh
13	Frame - Wood	- Ext	(0.089)	13.0/0.0	79		3.55	279 Btuh
14	Frame - Wood	- Ext	(0.089)	13.0/0.0	8		3.55	28 Btuh
15	Frame - Wood	- Ext	(0.089)	13.0/0.0	58		3.55	206 Btuh
16	Frame - Wood	- Ext	(0.089)	13.0/0.0	45		3.55	161 Btuh
17	Frame - Wood	- Ext	(0.089)	13.0/0.0	33		3.55	118 Btuh
18	Frame - Wood	- Ext	(0.089)	13.0/0.0	73		3.55	258 Btuh
19	Frame - Wood	- Ext	(0.089)	13.0/0.0	33		3.55	118 Btuh
20	Frame - Wood	- Ext	(0.089)	13.0/0.0	101		3.55	360 Btuh
Wall Total					1455(sqft)			5167 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior,	n	(0.400)		13		16.0	213 Btuh
2	Insulated - Exterior,	n	(0.400)		13		16.0	213 Btuh
3	Insulated - Garage,	n	(0.400)		18		16.0	284 Btuh
Door Total					44(sqft)			711Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load
1	Vented Attic/D/Shing		(0.025)	38.0/0.0	1905		1.0	1934 Btuh
Ceiling Total					1905(sqft)			1934Btuh
Floors	Type		Ueff.	R-Value	Size	X	HTM=	Load
1	Slab On Grade		(1.180)	0.0	206.0	ft(perim.)	47.2	9723 Btuh
Floor Total					1755	sqft		9723 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

Hiram Soler
144 SE Cedarwood Gln
Lake City, FL

Project Title:
211557 Solar
Building Type: User

2021-11-19

	Envelope Subtotal:						19621 Btuh
Infiltration	Type Natural	Wholehouse ACH 0.22	Volume(cuft) 14918	Wall Ratio 1.00	CFM= 55.9		2448 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.191)						4221 Btuh
All Zones	Sensible Subtotal All Zones						26290 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	26290 Btuh 0 Btuh 26290 Btuh
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EQUIPMENT

1. Electric Heat Pump	#	28000 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

Hiram Soler
144 SE Cedarwood Gln
Lake City, FL

Project Title:
211557 Solar

2021-11-19

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, 0.35	No	No	N		9.5ft	0.0ft	9.0	9.0	0.0	12	14	107	Btuh
2	2 NFRC	0.25, 0.35	No	No	N		9.5ft	0.0ft	20.0	20.0	0.0	12	14	238	Btuh
3	2 NFRC	0.25, 0.35	No	No	E		1.5ft	3.0ft	15.0	0.0	15.0	12	31	461	Btuh
4	2 NFRC	0.25, 0.35	No	No	S		1.5ft	0.5ft	15.0	0.0	15.0	12	12	179	Btuh
5	2 NFRC	0.25, 0.35	No	No	S		6.5ft	0.0ft	20.0	0.0	20.0	12	12	238	Btuh
6	2 NFRC	0.25, 0.35	No	No	S		5.5ft	0.0ft	30.0	0.0	30.0	12	12	357	Btuh
7	2 NFRC	0.25, 0.35	No	No	S		1.5ft	2.0ft	30.0	0.0	30.0	12	12	357	Btuh
8	2 NFRC	0.25, 0.35	No	No	S		1.5ft	6.0ft	10.0	0.0	10.0	12	12	119	Btuh
Window Total									149 (sqft)					2057 Btuh	
Walls	Type		U-Value		R-Value		Area(sqft)		HTM		Load				
					Cav/Sheath										
1	Frame - Wood - Adj		0.09		13.0/0.0		144.9		1.7		244 Btuh				
2	Frame - Wood - Adj		0.09		13.0/0.0		94.7		1.7		160 Btuh				
3	Frame - Wood - Ext		0.09		13.0/0.0		117.7		2.3		266 Btuh				
4	Frame - Wood - Ext		0.09		13.0/0.0		120.7		2.3		273 Btuh				
5	Frame - Wood - Ext		0.09		13.0/0.0		97.0		2.3		220 Btuh				
6	Frame - Wood - Ext		0.09		13.0/0.0		24.0		2.3		54 Btuh				
7	Frame - Wood - Ext		0.09		13.0/0.0		86.7		2.3		196 Btuh				
8	Frame - Wood - Ext		0.09		13.0/0.0		24.0		2.3		54 Btuh				
9	Frame - Wood - Ext		0.09		13.0/0.0		50.7		2.3		115 Btuh				
10	Frame - Wood - Ext		0.09		13.0/0.0		99.0		2.3		224 Btuh				
11	Frame - Wood - Ext		0.09		13.0/0.0		92.0		2.3		208 Btuh				
12	Frame - Wood - Ext		0.09		13.0/0.0		73.3		2.3		166 Btuh				
13	Frame - Wood - Ext		0.09		13.0/0.0		78.7		2.3		178 Btuh				
14	Frame - Wood - Ext		0.09		13.0/0.0		8.0		2.3		18 Btuh				
15	Frame - Wood - Ext		0.09		13.0/0.0		58.0		2.3		131 Btuh				
16	Frame - Wood - Ext		0.09		13.0/0.0		45.3		2.3		103 Btuh				
17	Frame - Wood - Ext		0.09		13.0/0.0		33.3		2.3		75 Btuh				
18	Frame - Wood - Ext		0.09		13.0/0.0		72.7		2.3		164 Btuh				
19	Frame - Wood - Ext		0.09		13.0/0.0		33.3		2.3		75 Btuh				
20	Frame - Wood - Ext		0.09		13.0/0.0		101.3		2.3		229 Btuh				
Wall Total									1455 (sqft)					3155 Btuh	
Doors	Type		Area (sqft)		HTM		Load								
1	Insulated - Exterior		13.3		12.0		160 Btuh								
2	Insulated - Exterior		13.3		12.0		160 Btuh								
3	Insulated - Garage		17.8		12.0		213 Btuh								
Door Total									44 (sqft)					533 Btuh	
Ceilings	Type/Color/Surface		U-Value		R-Value		Area(sqft)		HTM		Load				
1	Vented Attic/DarkShingle		0.025		38.0/0.0		1905.0		1.37		2611 Btuh				
Ceiling Total									1905 (sqft)					2611 Btuh	
Floors	Type		R-Value		Size		HTM		Load						
1	Slab On Grade		0.0		1755 (ft-perimeter)		0.0		0 Btuh						
Floor Total									1755.0 (sqft)					0 Btuh	
Envelope Subtotal:													8357 Btuh		

Manual J Summer Calculations

Residential Load - Component Details (continued)

Hiram Soler
144 SE Cedarwood Gln
Lake City, FL

Project Title:
211557 Solar

Climate:FL_GAINESVILLE_REGIONAL_A

2021-11-19

Infiltration	Type Natural	Average ACH 0.17	Volume(cuft) 14918	Wall Ratio 1	CFM= 41.9	Load 872 Btuh
Internal gain		Occupants 6	Btuh/occupant X 230	Appliance +	3400	Load 4780 Btuh
					Sensible Envelope Load:	14009 Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic)				(DGM of 0.351)	4916 Btuh
					Sensible Load All Zones	18924 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

Hiram Soler
144 SE Cedarwood Gln
Lake City, FL

Project Title:
211557 Solar

Climate:FL_GAINESVILLE_REGIONAL_A

2021-11-19

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	14009 Btuh
	Sensible Duct Load	4916 Btuh
	Total Sensible Zone Loads	18924 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	18924 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	1447 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1040 Btuh
	Latent occupant gain (6.0 people @ 200 Btuh per person)	1200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	3687 Btuh
	TOTAL GAIN	22612 Btuh

EQUIPMENT

1. Central Unit	#	28000 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(1/2))

(Ornt - compass orientation)



Version 8