

Residential System Sizing Calculation

Summary

1730 Spec

Project Title:

210344 1730 Spec - Lot 92 Emerald Cove

Lake City, FL

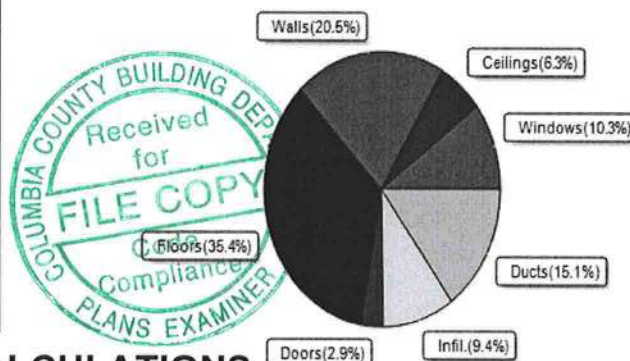
2021-04-21

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	27749 Btuh	Total cooling load calculation	24428 Btuh
Submitted heating capacity	% of calc Btuh	Submitted cooling capacity	% of calc Btuh
Total (Electric Heat Pump)	108.1 30000	Sensible (SHR = 0.75)	109.2 22500
Heat Pump + Auxiliary(0.0kW)	108.1 30000	Latent	196.4 7500
		Total (Electric Heat Pump)	122.8 30000

WINTER CALCULATIONS

Winter Heating Load (for 1730 sqft)

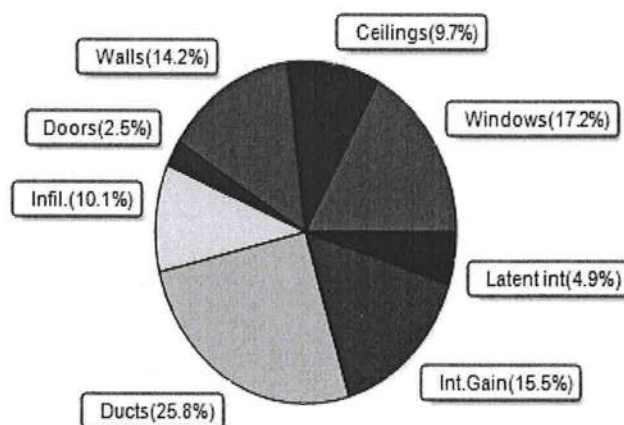
Load component		Load
Window total	224 sqft	2870 Btuh
Wall total	1600 sqft	5679 Btuh
Door total	51 sqft	818 Btuh
Ceiling total	1730 sqft	1756 Btuh
Floor total	1730 sqft	9818 Btuh
Infiltration	60 cfm	2614 Btuh
Duct loss		4194 Btuh
Subtotal		27749 Btuh
Ventilation	0 cfm	0 Btuh
TOTAL HEAT LOSS		27749 Btuh



SUMMER CALCULATIONS

Summer Cooling Load (for 1730 sqft)

Load component		Load
Window total	224 sqft	4199 Btuh
Wall total	1600 sqft	3477 Btuh
Door total	51 sqft	613 Btuh
Ceiling total	1730 sqft	2371 Btuh
Floor total		0 Btuh
Infiltration	45 cfm	931 Btuh
Internal gain		3780 Btuh
Duct gain		5236 Btuh
Sens. Ventilation	0 cfm	0 Btuh
Blower Load		0 Btuh
Total sensible gain		20609 Btuh
Latent gain(ducts)		1074 Btuh
Latent gain(infiltration)		1545 Btuh
Latent gain(ventilation)		0 Btuh
Latent gain(internal/occupants/other)		1200 Btuh
Total latent gain		3820 Btuh
TOTAL HEAT GAIN		24428 Btuh



8th Edition

EnergyGauge® System Sizing
PREPARED BY: Evan Beamsley
DATE: 2021-04-21

System Sizing Calculations - Winter

Residential Load - Whole House Component Details

1730 Spec

Lake City, FL

Project Title:
210344 1730 Spec - Lot 92 Emerald Cove
Building Type: User

2021-04-21

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 0.22	Metal	0.32	N	30.0		12.8	384 Btuh
2	2, NFRC 0.22	Metal	0.32	E	11.1		12.8	142 Btuh
3	2, NFRC 0.22	Metal	0.32	N	45.0		12.8	576 Btuh
4	2, NFRC 0.22	Metal	0.32	W	11.1		12.8	142 Btuh
5	2, NFRC 0.22	Metal	0.32	N	30.0		12.8	384 Btuh
6	2, NFRC 0.22	Metal	0.32	E	30.0		12.8	384 Btuh
7	2, NFRC 0.22	Metal	0.32	E	6.0		12.8	77 Btuh
8	2, NFRC 0.22	Metal	0.32	S	30.0		12.8	384 Btuh
9	2, NFRC 0.22	Metal	0.32	S	30.0		12.8	384 Btuh
10	2, NFRC 0.22	Metal	0.32	W	1.0		12.8	13 Btuh
Window Total					224.2(sqft)			2870 Btuh
Walls	Type	Ornt.	Ueff.	R-Value (Cav/Sh)	Area	X	HTM=	Load
1	Frame - Wood	- Ext	(0.089)	13.0/0.0	159		3.55	565 Btuh
2	Frame - Wood	- Ext	(0.089)	13.0/0.0	39		3.55	139 Btuh
3	Frame - Wood	- Ext	(0.089)	13.0/0.0	114		3.55	405 Btuh
4	Frame - Wood	- Ext	(0.089)	13.0/0.0	39		3.55	139 Btuh
5	Frame - Wood	- Ext	(0.089)	13.0/0.0	75		3.55	266 Btuh
6	Frame - Wood	- Ext	(0.089)	13.0/0.0	392		3.55	1390 Btuh
7	Frame - Wood	- Ext	(0.089)	13.0/0.0	75		3.55	266 Btuh
8	Frame - Wood	- Ext	(0.089)	13.0/0.0	53		3.55	186 Btuh
9	Frame - Wood	- Ext	(0.089)	13.0/0.0	75		3.55	266 Btuh
10	Frame - Wood	- Ext	(0.089)	13.0/0.0	59		3.55	208 Btuh
11	Frame - Wood	- Ext	(0.089)	13.0/0.0	34		3.55	121 Btuh
12	Frame - Wood	- Adj	(0.089)	13.0/0.0	77		3.55	274 Btuh
13	Frame - Wood	- Adj	(0.089)	13.0/0.0	171		3.55	608 Btuh
14	Frame - Wood	- Ext	(0.089)	13.0/0.0	238		3.55	846 Btuh
Wall Total					1600(sqft)			5679 Btuh
Doors	Type	Storm	Ueff.		Area	X	HTM=	Load
1	Insulated - Exterior, n		(0.400)		7		16.0	107 Btuh
2	Insulated - Exterior, n		(0.400)		7		16.0	107 Btuh
3	Insulated - Exterior, n		(0.400)		20		16.0	320 Btuh
4	Insulated - Garage, n		(0.400)		18		16.0	284 Btuh
Door Total					51(sqft)			818Btuh
Ceilings	Type/Color/Surface		Ueff.	R-Value	Area	X	HTM=	Load
1	Vented Attic/D/Shing		(0.025)	38.0/0.0	1730		1.0	1756 Btuh
Ceiling Total					1730(sqft)			1756Btuh
Floors	Type		Ueff.	R-Value	Size	X	HTM=	Load
1	Slab On Grade		(1.180)	0.0	208.0 ft(perim.)		47.2	9818 Btuh
Floor Total					1730 sqft			9818 Btuh

Manual J Winter Calculations

Residential Load - Component Details (continued)

1730 Spec

Lake City, FL

Project Title:
210344 1730 Spec - Lot 92 Emerald Cove
Building Type: User

2021-04-21

	Envelope Subtotal:						20941 Btuh
Infiltration	Type Natural	Wholehouse ACH 0.23	Volume(cuft) 15570	Wall Ratio 1.00	CFM= 59.7		2614 Btuh
Duct load	Average sealed, R6.0, Supply(Att), Return(Att) (DLM of 0.178)						4194 Btuh
All Zones	Sensible Subtotal All Zones						27749 Btuh

WHOLE HOUSE TOTALS

Totals for Heating	Subtotal Sensible Heat Loss Ventilation Sensible Heat Loss Total Heat Loss	27749 Btuh 0 Btuh 27749 Btuh
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EQUIPMENT

1. Electric Heat Pump	#	30000 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

1730 Spec

Project Title:

210344 1730 Spec - Lot 92 Emerald Cove

Lake City, FL

2021-04-21

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			
1	2 NFRC	0.22, 0.32	No	No	N		1.5ft	1.0ft	30.0	1.5	28.5	11	27	794 Btuh
2	2 NFRC	0.22, 0.32	No	No	E		99.5f	1.0ft	11.1	0.0	11.1	11	11	119 Btuh
3	2 NFRC	0.22, 0.32	No	No	N		7.8ft	1.0ft	45.0	45.0	0.0	11	27	482 Btuh
4	2 NFRC	0.22, 0.32	No	No	W		99.5f	1.0ft	11.1	11.1	0.0	11	12	119 Btuh
5	2 NFRC	0.22, 0.32	No	No	N		1.5ft	1.0ft	30.0	1.5	28.5	11	27	794 Btuh
6	2 NFRC	0.22, 0.32	No	No	E		1.5ft	1.0ft	30.0	0.0	30.0	11	11	321 Btuh
7	2 NFRC	0.22, 0.32	No	No	E		1.5ft	1.0ft	6.0	0.0	6.0	11	11	64 Btuh
8	2 NFRC	0.22, 0.32	No	No	S		1.5ft	1.0ft	30.0	1.5	28.5	11	27	794 Btuh
9	2 NFRC	0.22, 0.32	No	No	S		7.3ft	1.0ft	30.0	30.0	0.0	11	27	321 Btuh
10	2 NFRC	0.22, 0.32	No	No	W		1.5ft	1.0ft	1.0	1.0	0.0	11	12	11 Btuh
	Excursion													379 Btuh
	Window Total								224 (sqft)					4199 Btuh
Walls	Type	U-Value		R-Value		Area(sqft)		HTM		Load				
				Cav/Sheath										
1	Frame - Wood - Ext		0.09	13.0/0.0			159.0		2.3		360 Btuh			
2	Frame - Wood - Ext		0.09	13.0/0.0			39.2		2.3		89 Btuh			
3	Frame - Wood - Ext		0.09	13.0/0.0			114.0		2.3		258 Btuh			
4	Frame - Wood - Ext		0.09	13.0/0.0			39.2		2.3		89 Btuh			
5	Frame - Wood - Ext		0.09	13.0/0.0			75.0		2.3		170 Btuh			
6	Frame - Wood - Ext		0.09	13.0/0.0			391.5		2.3		886 Btuh			
7	Frame - Wood - Ext		0.09	13.0/0.0			75.0		2.3		170 Btuh			
8	Frame - Wood - Ext		0.09	13.0/0.0			52.5		2.3		119 Btuh			
9	Frame - Wood - Ext		0.09	13.0/0.0			75.0		2.3		170 Btuh			
10	Frame - Wood - Ext		0.09	13.0/0.0			58.5		2.3		132 Btuh			
11	Frame - Wood - Ext		0.09	13.0/0.0			34.0		2.3		77 Btuh			
12	Frame - Wood - Adj		0.09	13.0/0.0			77.3		1.7		130 Btuh			
13	Frame - Wood - Adj		0.09	13.0/0.0			171.2		1.7		289 Btuh			
14	Frame - Wood - Ext		0.09	13.0/0.0			238.3		2.3		539 Btuh			
	Wall Total							1600 (sqft)				3477 Btuh		
Doors	Type	Area (sqft)		HTM		Load								
1	Insulated - Exterior		6.7		12.0	80 Btuh								
2	Insulated - Exterior		6.7		12.0	80 Btuh								
3	Insulated - Exterior		20.0		12.0	240 Btuh								
4	Insulated - Garage		17.8		12.0	213 Btuh								
	Door Total					51 (sqft)	613 Btuh							
Ceilings	Type/Color/Surface	U-Value		R-Value		Area(sqft)		HTM		Load				
1	Vented Attic/DarkShingle		0.025	38.0/0.0			1730.0		1.37		2371 Btuh			
	Ceiling Total						1730 (sqft)				2371 Btuh			
Floors	Type	R-Value		Size		HTM		Load						
1	Slab On Grade		0.0	1730 (ft-perimeter)			0.0		0 Btuh					
	Floor Total						1730.0 (sqft)				0 Btuh			
	Envelope Subtotal:										10661 Btuh			

Manual J Summer Calculations

Residential Load - Component Details (continued)

1730 Spec

Lake City, FL

Project Title: Climate:FL_GAINESVILLE_REGIONAL_A
210344 1730 Spec - Lot 92 Emerald Cove

2021-04-21

Infiltration	Type Natural	Average ACH 0.17	Volume(cuft) 15570	Wall Ratio 1	CFM= 44.8	Load 931 Btuh
Internal gain		Occupants 6	Btuh/occupant X 230	Appliance +	2400	Load 3780 Btuh
					Sensible Envelope Load:	15372 Btuh
Duct load	Average sealed, Supply(R6.0-Attic), Return(R6.0-Attic)			(DGM of 0.341)		5236 Btuh
					Sensible Load All Zones	20609 Btuh

Manual J Summer Calculations

Residential Load - Component Details (continued)

1730 Spec

Project Title:

Climate:FL_GAINESVILLE_REGIONAL_A

Lake City, FL

210344 1730 Spec - Lot 92 Emerald Cove

2021-04-21

WHOLE HOUSE TOTALS

Whole House Totals for Cooling	Sensible Envelope Load All Zones	15372 Btuh
	Sensible Duct Load	5236 Btuh
	Total Sensible Zone Loads	20609 Btuh
	Sensible ventilation	0 Btuh
	Blower	0 Btuh
	Total sensible gain	20609 Btuh
	Latent infiltration gain (for 51 gr. humidity difference)	1545 Btuh
	Latent ventilation gain	0 Btuh
	Latent duct gain	1074 Btuh
	Latent occupant gain (6.0 people @ 200 Btuh per person)	1200 Btuh
	Latent other gain	0 Btuh
	Latent total gain	3820 Btuh
	TOTAL GAIN	24428 Btuh

EQUIPMENT

1. Central Unit	#	30000 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